

Economia Aziendale Online

Economia Aziendale Online

Business and Management Sciences
International Quarterly Review

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Stefano De Nichilo

Pavia, December 31, 2024
Volume 15 – N. 4/2024

DOI: 10.13132/2038-5498/15.4.757-773

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Insurance or Assurance? Equilibrium for Insurtech Perspectives in Accounting Organizations: an Empirical Examining of IFRS 17 Transition

Stefano D. De Nichilo

[alias: DeNichilo]

PhD, 2013, Università degli Studi di Roma Tre, Italy.

PhD, 2019, Università degli Studi di Cagliari, Italy

Lectures, University of Cagliari. Cagliari, Italy

Corresponding Author:

Stefano De Nichilo

stefanodenichilo1985@gmail.com

Cite as:

De Nichilo, S. D. (2024). Insurance or Assurance? Equilibrium for Insurtech Perspectives in Accounting Organizations: an Empirical Examining of IFRS 17 Transition. *Economia Aziendale Online*, 15(4), 757-773.

Section:

Refereed Paper

Received: September 2024

Published: 31/12/2024

ABSTRACT

The reporting and organizational settings of accounting activities are changing due to the advent of new Insurtech technologies in our daily life and the business environment. In particular, new technologies provide new opportunities for the development and improvement of the accounting organizational structure in “Insurance” and “Reinsurance” enterprises. This paper shows the results of a research study whose main objectives have been to understand the way and the extent of dependence and consideration the directors of internal audit departments and the partners in external audit firms have of each other on using block-chain as assurance tool; and the research is focused on companies that have adopted IFRS 17. The work done is interested in the role of new technologies on audit quality and in whether this relationship is moderated by switching to IFRS 17 or not. Equivalently, the paper is interested in determining whether companies that move to IFRS 17 have better audit quality and whether this report is moderated by the use of blockchain and DeFi technology. This report presents new opportunities related to artificial intelligence technologies for managing accounting documents, providing accounting services, and risk management of Decentralized Finance (DeFi).

Le strutture di reporting e organizzative delle attività contabili stanno cambiando a causa dell'avvento delle nuove tecnologie Insurtech nella nostra vita quotidiana e nell'ambiente aziendale. In particolare, le nuove tecnologie offrono nuove opportunità per lo sviluppo e il miglioramento della struttura organizzativa contabile nelle imprese di "Assicurazione" e "Riassicurazione". Questo lavoro mostra i risultati di uno studio di ricerca i cui obiettivi principali sono stati quelli di comprendere il modo e l'entità della dipendenza e della considerazione che i direttori dei dipartimenti di internal audit e i partner delle società di revisione esterna hanno l'uno dell'altro sull'utilizzo della block-chain come strumento di assurance; e la ricerca è focalizzata sulle aziende che hanno adottato l'IFRS 17. Il lavoro svolto è interessato al ruolo delle nuove tecnologie sulla qualità dell'audit e alla possibilità che questa relazione sia moderata dal passaggio all'IFRS 17 o meno. Allo stesso modo, la ricerca è interessata a determinare se le aziende che passano all'IFRS 17 hanno una migliore qualità di audit e se questo rapporto è moderato dall'uso della

blockchain e della tecnologia DeFi. Questo report presenta nuove opportunità legate alle tecnologie di intelligenza artificiale per la gestione dei documenti contabili, la fornitura di servizi contabili e la gestione del rischio della Finanza Decentralizzata (DeFi).

Keywords: Accounting Organization, Audit Quality, Blockchain, DeFi, IFRS 17 Transition.

1 – Introduction

The utilisation of technology to improve efficiency and savings in underwriting, risk pooling and claims management from the current insurance model has come to be known as “InsurTech”, deriving inspiration from the more well established concept of “FinTech”. The Insurtech sector, which is a very sensitive part of the economy, has become the most exposed sector, using discretion in preparing and reporting accounting information to external users, despite all regulatory measures and auditing processes (Ege & Stuber 2021).

Questions regarding the relevance (earnings management) and reliability (audit quality) of accounting information continue to persist. Accounting information is considered to be more relevant when it creates a difference in the decisions made by users and to be more reliable when it is materially accurate and faithfully represents the phenomena that it claims to represent. The relevance of accounting information has been recently boosted by the widespread adoption of International Financial Reporting Standards (IFRS) (Al-Mousawi & Al-Thuneibat, 2011). One of the most common criteria regarding IFRS is that this set of accounting standards is market oriented (Tarca, 2012) and fosters fair value principles. Therefore, the adoption of IFRS can cause a significant impact on the value relevance of accounting information. This is especially important for “Insurance” and “Reinsurance” companies in which most of their assets and liabilities are close to their fair value (Nissim, 2010).

The corporate governance system is made up of four pillars that interact with each other for the efficiency and effectiveness of the company's activities, including management, an external auditor, an Audit Committee and Internal Audit (IA) (Gramling *et al.*, 2004; Cohen *et al.* 2008). In this context, blockchain creates an environment where there is no need for any middlemen to establish trust between people and facilitate transactions. Blockchain technology also introduces the idea of smart contracts, which are computer protocols intended to digitally facilitate, verify, or enforce the negotiation or performance of a contract (Wachter, Rude Jensen, Ross 2021).

Audit is a key contributor to financial stability and in other to re-establish trust and market confidence (Dittmeier, 2015). The auditor is entrusted by law with the responsibility of conducting statutory audits and fulfilling an important role in offering an opinion on whether the financial statements are true and fairly stated. Many studies have been conducted on audit quality and earnings management because earnings manipulating has long been of interest to analysts, legislators, researchers, and other investment professionals such as Aliyu *et al.* (2015) in Nigeria.

DeFi is the acronym of Decentralized Finance: it represents the set of financial services, which aim to reduce or eliminate intermediaries in a whole series of operations with the use of decentralized computer networks (Gudgeon, Werner, Perez, and Knottenbelt, 2020). We can easily see that DeFi is therefore the expression of all those traditional financial services in an “open” market accessible to all and independent of a central authority. Therefore, simplifying

DeFi, it allows you to trade cryptocurrencies on decentralized exchanges, provide or request loans, use derivative instruments and then create tokens based on the performance of assets (exploiting the blockchain system as previously seen) and to make instant payments in Bitcoin without commissions (Perez, Werner, Xu and Livshits, 2020). An important role attributed to this new matter is the "tokenization" of real assets, such as the Insurtech services that a company can offer, but with more automation and traceability of the same (Wachter, Rude Jensen, and Ross, 2021).

With the introduction of IFRS, DeFi has developed as a general term used to indicate financial services performed on public block-chains, mainly on the Ethereum block-chain (Chen & Bellavitis, 2020). DeFi builds on the fundamental digital currency concept of Bitcoin and expands it further, creating a digital alternative to traditional stock market products, but without the costs associated with them (think office towers, stock exchange halls and salaries of bankers).

In this context, blockchain creates an environment where there is no need for any middlemen to establish trust between people and facilitate transactions. This new technology has the potential to change the world of finance as we know it, making it more transparent and efficient. Blockchain can be used to store and access records of transactions, which eliminates the need for a third-party intermediary. The DeFi system (Figure 1) has the potential to create more open, free and fair financial markets, accessible to anyone with an internet connection (Harvey, Ramachandran & Santoro, 2020).

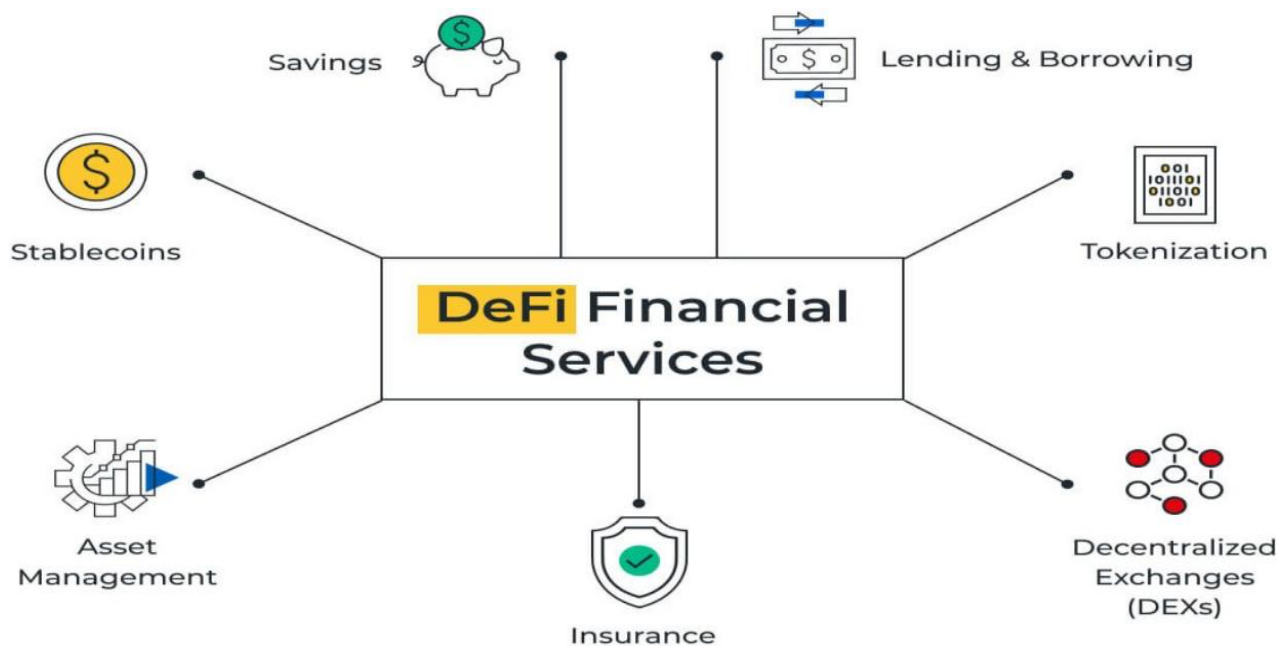


Fig. 1 – Institutional Settings of DeFi Financial Services (Source: Our Elaborations)

Previous studies have produced mixed results with respect to the impact of the adoption of IFRS on fair value relevance and reliability of accounting information in Insurtech big data era. This may be due to the environment and structure of the industry, market, and economy, which includes the type of the industry, legal environment, advancement of the business, education, or the development of the economy (Afifa, Alsufy, & Abdallah, 2020). Blockchain technology has the potential to revolutionize auditing and accounting by removing unnecessary

middlemen from transactions and making information more accessible for all to see (Liu, Wu, & Xu, 2019).

Research Questions in this paper are:

RQ₁: *There's an equilibrium between earnings management and audit quality in Insurtech accounting organizations?*

RQ₂: *How does IFRS 17 first adoption legitimize block-chain and Decentralized Finance (DeFi) in Insurtech?*

Based on the above questions, the main objective of the study is to determine the effect of audit quality on earnings management for Insurtech information.

The full paper is structured as follows: literature review, research methodology, results, discussion of results and conclusions.

2 – Literature Review

Over the past few years, there has been a boom in the development of Insurtech technologies. The term Insurtech has been defined in the EU as "technology-oriented financial innovations that can lead to new business models, applications, processes or products related to them, material impact on financial markets and institutions, and the provision of entrepreneurship financial services" (Cai, 2018).

Due to new technologies, accounting is also changing, as well as a new organizational structure, namely, cloud accounting. Risk management is very important for modern "Insurance" and "Reinsurance" companies. The use of block-chain technology in the field of risk management can reduce risk generation to some extent and even eliminate it in some cases. The duties and responsibilities attributed to the external audit have gradually increased and required IA support to ensure efficiency, effectiveness and timeliness of the audit of block-chain (Grant Thornton, 2011). With these emerging technologies, financial markets will become more efficient and secure (Ahluwalia, Mahto & Guerrero, 2020).

During recent years, an intense debate has arisen relative to FVA (Fair Value Accounting) approach and the trade-off between earnings management and audit quality of financial statement information reported adopting through FVA audit assertions and block-chain criteria (predictability, persistence, volatility, value relevance and conservatism) (Almarayeh, Abdullatif & Aibar-Guzmán, 2020).

For IASB and FASB the primary users of financial reports are actual and potential investors, and fair value represents the main criterion to allow them to take decisions on investment policy and asset allocation strategy (Barth & Taylor, 2010). FVA requires the use of market values for financial statements preparation (Landsman, Maydewa & Thornmock, 2012); in this approach, income statement showing "potential and not fully realized" income due to unrealized gains and losses recognized in order to align the value of assets and liabilities at their market value even if they are not subject to purchase or sale (Gaio, 2010).

Moreover, fair value seems to be able to increase transparency and comparability of financial statements, in both time and space, and in this way, it achieves one of the main goals of international accounting standards even if many factors are able to modify the real ability of FVA approach in providing a higher quality accounting information considering the full range of stakeholders (Tutino, 2016). An example in "Insurance" and "Reinsurance" industry is the transition from IFRS 4 to IFRS 17 (Figure 2).



Fig. 2 – Risk Appetite of IFRS 17 Transition (Source: Our Elaboration)

In this paper are explained benefits to use block-chain technology both internal and external auditors in “Insurance” and “Reinsurance” enterprises, any difference expected and learning activities.

In literature Valkanov (2019) treats the interaction between financial institutions and compliance orientated technological innovations outlining three possible perspectives for future development in auditing. According to Valkanov (2019), the application of block-chain-based technologies, artificial intelligence, and big data is gaining more and more popularity in different segments of finance, including the “Insurance” and “Reinsurance” regulatory related areas. The literature pertaining to the value relevance of accounting information is relatively extensive and has been approached from different angles across the block-chain (DeFond, Zhang, 2014).

Instead Yermak (2017) shows how block-chain technology can be used in financial market analysis, providing transparency, liquidity, and real-time placement. It presents a variety of opportunities for outsourcing the audit of transactions with shares through the use of block-chain technology. If we assume that the block-chain technology accurately and correctly identifies the holder of shares, then the issuing company will be able to identify unfavourable positions.

This study contributes to the literature in the following ways: first, it expands the previous research by focusing on the “Insurance” and “Reinsurance” industry, which is more vulnerable to the accounting evaluation Insurtech model; secondly, it examines the relationships occurring between the quality of accounting and the implementation of new technologies with respect to the effect of the transaction to IFRS 17.

So the hypotheses of this paper are as follow:

H₁: *We expect to find an increase in audit quality in the transition from IFRS 4 to IFRS 17. The paper refers to “early adopters” who could apply IFRS 17 before 2023, provided that they also applied IFRS 9 (Becker, DeFond, Jiambalvo, Subramanyam, 1998).*

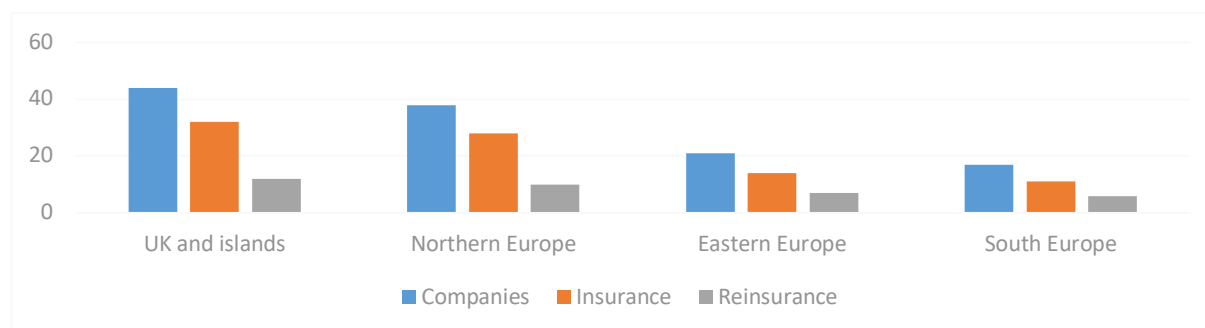
H₂: *We expect DeFi to enhance audit quality in companies that adopted IFRS 17 (Bonyuet, 2020).*

3 – Methodology

The study relied as a first step on the exploratory approach, and this approach is useful in case of planning to explain the nature of the problem or phenomenon and helps in how to deal with it, especially in case of uncertainty (Alnodel, 2018). The second step was to rely on the descriptive (analytical) approach to explain the researched phenomenon, relying on all facts and data, classifying them, and then processing the data modelling and analysing it to extract its significance and arrive at conclusions or generalizations about the phenomenon or problem (DeNichilo, 2022b).

Sampling, which has been extracted from EIOPA site, consists of 120 European listed companies, operating in two different sectors (“Insurance” and “Reinsurance”), observed during the 2018-2020 period (Graph 1 and 2) for “early adoption” of IFRS 17.

Graph 1 – Distribution of sample in European Areas (Source: Extracted from EIOPA site)



Graph 2 – Composition of sample (Source: Extracted from EIOPA site)



This number of companies is representative of European Public Interest Entities (PIE) in the “Insurance” and “Reinsurance” sector (Table 1) (Kousenidis, Ladas, & Negakis, 2010).

4 – Result

IA provides a monitoring function to assess the effectiveness of control, risk management, and governance of block-chain (Carcello *et al.*, 2005). Efficient utilization of the Internal Auditor’s work in DeFi, as implementation of block-chain, can help external auditors in reducing their effort (Krishnamoorthy, 2002) improving timeliness. Studies have shown that external auditors

effort's is negatively correlated with the overall quality of the IA function, when block-chain is implementing (Desai *et al.*, 2011).

Table 1 – Sample of European “Insurance” and “Reinsurance” listed companies (Source: Extracted from EIOPA site)

European Areas	Companies	Insurance	Reinsurance
UK and islands	37%	73%	27%
Northern Europe	32%	74%	26%
Eastern Europe	18%	67%	33%
South Europe	14%	65%	35%
Total	100%	71%	29%

Thus, when the external auditor can rely on the Internal Auditor's work, economic savings will be achieved (Gramling *et al.*, 2004; Prawitt *et al.*, 2011) and audit fees will decrease (Felix *et al.*, 2001; Abbott *et al.*, 2012, Mat Zain *et al.*, 2015). This relationship can lead to further advantages such as to reduce replication and redundancy of work performed in providing an assessment of management assertions with regard to internal controls and financial statement disclosures. The appropriate reliance by external audit on Internal Audit can also achieve significant benefits such as block-chain planning and ensuring timely audits (McPhee, 2005; Lambert *et al.*, 2010). From the organizational and operational point of view, Glover *et al.*, (2008) and Desai *et al.*, (2011) show that external auditors reliance on IA function is significantly affected by how Internal Audit activities are organized (Figure 3). The extent of reliance is greater when the structure and the role of the Internal Audit function are more formal (Gudgeon, Werner, Perez and Knottenbelt, 2020). Specifically, the extent of reliance is positively related with the extent of the scope of the internal auditors work, the size of the Internal Audit function, measured by the number of personnel and Internal Audit hours worked, and the amount of expenditure on Internal Audit (Al-Twaijry *et al.*, 2004).

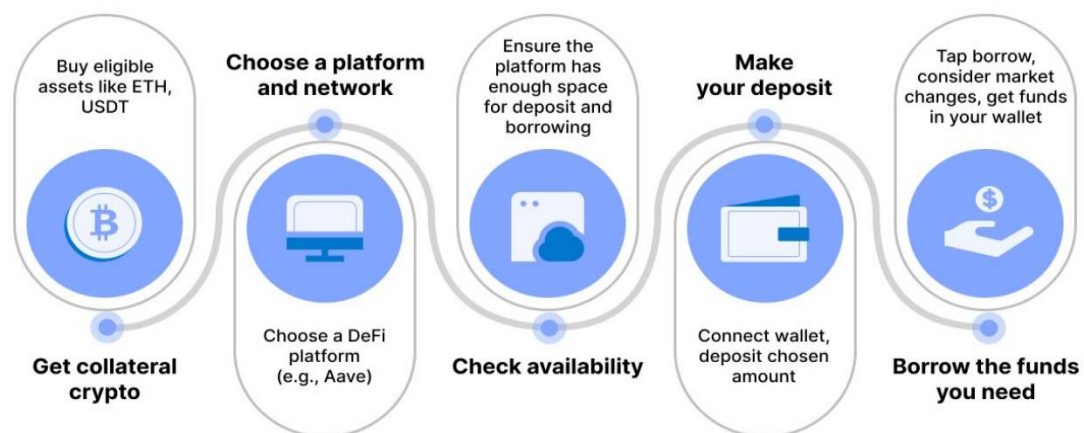


Fig. 3 – Insurance Audit Activities with DeFi: an Internal Audit Narrative (Source: Our Elaborations)

Continuous Audits improves the accuracy, timeliness, relevance, breadth, and level of information provided (Debreceeny & Rahman, 2005; Hunton *et al.*, 2007). The distinctive feature

of the continuous audit is that audit related activities are performed on a more continuous basis, which improves the relevance of the results.

From a financial point of view, continuous audit allows for the rapid and timely analysis of critical transactions to prevent material misstatements from entering the accounting system (Coderre, 2005). Consequently, external auditors increase reliance on internal auditors work and reduce budgeted audit hours when internal auditors have incentives and opportunities to be objective, when the auditors are high competence, when they have adequate work performance and when they reduce subjectivity in their work (Table 2 and 3). Furthermore, when the external audit relies on a high-quality Internal Audit Function, it contributes to maintain the transparency and accountability of financial reporting (Abdolmohammadi *et al.*, 2006).

Blockchain technology can reduce transaction costs, generate distributed trust, and empower decentralized platforms, potentially becoming a new foundation for decentralized business models (Hölbl, Kompara, Kamišalić, Nemeč Zlatolas, 2018). Through tokenization, block-chain technology has also sparked a new wave of innovation, which started to revolutionize entrepreneurship and innovation (Table 4, 5 and 6) (Sun, 2016). Importantly in Insurtech, the opportunities provided by Decentralize Finance in terms of lower costs, almost-immediate transactions and global reach play a crucial role for entrepreneurs in developing their businesses (Formula 1) (Hughes, Park, Kietzmann, & Archer-Brown, 2019). This is because DeFi has the potential to drastically change the financing and investment processes for entrepreneurship and innovation (Kar & Navin, 2021).

Table 2 – Effect of IA activities on External Audit: Quality of Internal Controls (QIC) (Source: Extracted and Elaborated from EIOPA site)

External Audit Activities Score	Driver	Sign	IFRS 4	IFRS 17
Efficiency of Audit Reports	Mean Number of Annual Audit Reports	-	11	9
Timeliness of Audit Reports	Standard Deviation of Annual Audit Reports	-	2.33	1.34
Block-Chain Planning	Mean Number of Implemented Activities	+	33.23	60.66
External Audit Issues: Reporting Errors (Misstatements)	Mean Absolute of the Reported Error on Total Asset	-	3.23	2.99
External Audit Issues: Reporting Irregularity (Reclassification)	Mean Absolute of the Reported Irregularity on Total Asset	-	2.22	1.95
Internal Audit Issues: Replication and Redundancy of Audit Reports	Mean of External Audit Replications of Audit Data Base	-	30.25	13.5
Quality of Accounting Informations (Accuracy, Timeliness and Relevance)	Mean of Audit Hours	-	66.33	55.71
Rapid and Timely Critical Analysis	Mean % Increase in Audit Hourly Fees	+	2.25%	6.23%

Table 3 – Effect of External Audit activities on IA: Quality of External Auditing (QEA)
(Source: Extracted and Elaborated from EIOPA site)

IA Activities Score	Driver	Sign	IFRS 4	IFRS 17
Effectiveness of Controls	Mean Number of Annual Risk Advisory Projects	+	25.33	35.22
Capital Budgeting	Mean of Audit Hours	-	30.24	22.22
Implementation Block-Chain Technology	Mean % Increase in Internal Audit Hourly Fee	+	2.26%	6.22%

Table 4 – Descriptive Statistics of dependent variable (Source: Extracted and Elaborated from EIOPA site)

Variabile	Proxy	Mean	St. Dev.	Min	Max
Earnings Quality (EQ)	$(1 - \frac{Cost\ Model}{Fair\ Value\ Best\ Estimate})$	0.88	0.11	0.77	0.99
Audit Quality (AQ)	$\frac{Audit\ Issues\ Reported}{Audit\ Issues\ Approved}$	1.28	0.22	0.99	1.50

Table 5 – Descriptive Statistics and Signs of independent variable (Source: Extracted and Elaborated from EIOPA site)

Variabile	Proxy	Mean	St. Dev.	Min	Max	Sign
DeFi Investment on Total Asset (DeFi)	$\frac{De.Fi.\ Investment}{Total\ Asset}$	0.18	0.31	0.09	0.39	-
Quality of Internal Controls (QIC)	Total External Audit Score	154.19	2.05	0.02	80.55	+
Quality of External Auditing (QEA)	Total Internal Audit Score	61.01	1.95	0.03	55.22	+
Sectors (S)	0 Insurance 1 Reinsurance	0.66	0.22	0	1	+
Coverage of transition from IFRS 4 to IFRS 17 (IFRS)	% of Transaction to IFRS 17	0.89	0.55	0.55	1	+

Formula 1. Modelling of General Equilibrium between Earnings Management, Audit Quality and DeFi Investment on Total Asset.

$$e^{AQ+EQ} = \alpha + \beta_1 \ln(\text{DeFi}) + \beta_2 (\text{QIC}) + \beta_3 (\text{QEA}) + \beta_4 (\text{S}) + \beta_5 (\text{IFRS}) + \varepsilon_i$$

Table 6 – Univariate Analysis (Source: Our Elaborations)

Variable	DeFi	QIC	QEA	S	IFRS
DeFi	1				
QIC	-0.01	1			
QEA	-0.02	0.01	1		
S	-0.09	0.03	0.01	1	
IFRS	-0.08	0.04	0.02	0.01	1

Table 7 – Multivariate Analysis (Source: Our Elaborations)

Independent Variable	Coefficient	T Test
Intercept	-3.88	1.04***
DeFi	1.98	-2.88***
QIC	0.42	3.22
QEA	-0.22	2.25
S	2.22	1.95**
IFRS	1.35	2.95**
*, **, *** p-value at 0.10, 0.05 and 0.01		

The research model is significant (p value 0.01 level), R^2 is 0.88 and F test is 3.88.

5 – Discussion and interpretation of the results

The results show that in the transition to IFRS 17, “Insurance” and “Reinsurance” invest a lot of money and resources in Insurtech services, with the largest expenditures related to accounting services for audit quality and earnings management issues (Table 6 and 7).

5.1 – Audit Quality Issues

Introduction of De.Fi as system for exchanging value without centralized intermediaries (Larios-Hernández, 2017); it relies heavily on peer-to-peer lending and borrowing, decentralized exchanges and trust-less systems (Morkunas, Paschen, & Boon, 2019). DeFi is seen as a disruptive technology that could replace traditional banking and insurance systems in the future due to its advantages of being inclusive, non-discriminatory, resilient to risk management failures (Figure 4), cost-effective for lenders and borrowers to access the system and more efficient in terms of financial and insurance intermediation through automated trust-less systems (Queiroz, Telles and Bonilla, 2020).

Users typically interact with De.Fi services through decentralized software called dapps (from the English "decentralized apps"), which mostly use the Ethereum block-chain (Schär, 2021).

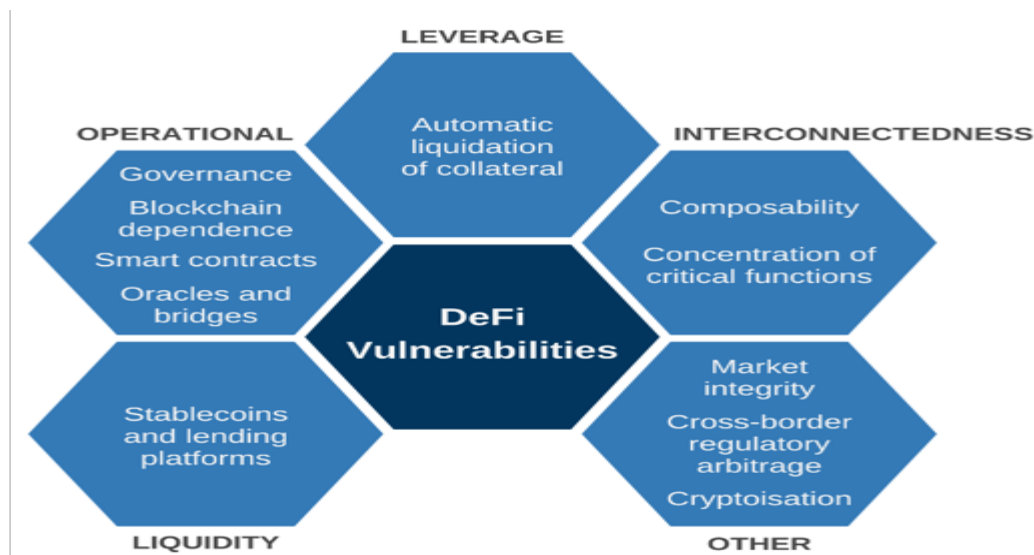


Fig. 4 – DeFi Vulnerabilities (Source: Our Elaborations)

Unlike what happens when using the service of a traditional insurance, to use De.Fi services it is not necessary to fill out an application or open an account (Table 8) (Fröwis, Fuchs and Böhme, 2019).

Table 8 – Advantages and Disadvantages of Insurtech with DeFi compliant (Source: Our Elaboration)

Advantages	Disadvantages
<p>Transparency Each connected block in a common chain is publicly accessible. Each user can check the entire transaction path.</p>	<p>Irreversibility of transactions The transfer of information is irreversible. It is impossible to cancel a block-chain transaction, even with an error when programming the operation.</p>
<p>DeFi Each of the nodes which are participating in the network has equal access and ability to transfer data directly.</p>	<p>Scalability If at least a small portion of Visa's transactions due to the Bitcoin system, the amount of stored data can reach hundreds of terabytes.</p>
<p>Reliability The operation of the system implies high protection against hacker attacks and data substitution by using special encryption keys.</p>	<p>51% Attack If the percentage of the computing power of the network which is possessed by one user, exceeds 51%, the integrity of the Block-chain platform may be compromised.</p>
<p>Efficiency Trust in traditional finance is created by centralized institutions. DeFi can replace this need for trust with smart contracts, at least partially. Since the transactions are settled atomically, it basically removes the counter-party risk. Removing the counter-party risk also makes transactions much more efficient.</p>	<p>ESG Another problem with DeFi regulation is that there are no Know-Your-Customer (KYC) and Anti-Money Laundering (AML) components. These two are the backbone of traditional finance's regulation toolbox. AML is the processes of how institutions can fight money laundering. KYC is one part of AML processes, and it means that institutions can verify the users' identity.</p>

5.2 – Earnings Quality Issues

The main advantages that businesses expect from the introduction of IFRS 17 accounting are based on Insurtech technology (Glover, Prawitt, & Wood, 2008):

a. Reduced time for administrative tasks and activities. One of the main advantages of implementing new technology in accounting is that it makes routine and time-consuming insurance accounting activities, such as posting and filling out payment documents and invoices, more efficient. Also, new financial accounting technologies offer new accounting applications that integrate and link individual data for the respective enterprise.

b. Reduce the number of inaccuracies and inconsistencies that occur due to human errors in each enterprise. For example, you can lose accounting documents, make mistakes in actuarial mathematical calculations or accounting data by referring to the wrong column in the corresponding spreadsheet. Thus, the corresponding amounts of accounting documents are compared, as well as existing errors and inconsistencies that need to be corrected are detected. By importing data from insurance statements and documents to the accounting software platform, accounting information is synchronized, and it takes only a few minutes to compile reports. This process saves significant time for accountants and reduces errors.

c. Assistance in the procedure for calculating tax liabilities and completing and submitting the necessary documents to state authorities.

d. Automatic preparation of insurance reports using data from accounting documents. By using Insurtech technologies in accounting, businesses can prepare their annual financial reports, as well as other reports that show limitations in their activities.

We can conclude that in transition to IFRS 17, applications such as DeFi and block chain are important, especially in auditing and accounting services, where Insurtech activities are already implemented (Said Suwaidan & Qasim, 2010). These findings are particularly relevant given the growing emphasis on the role of Internal Audit as an important corporate governance mechanism and on the new challenges faced by external auditors in the form of greater audit requirements (Raiborn, Butler, Martin & Pizzini, 2017). Moreover, the findings suggest that mutual collaboration increases the reliability of controls and block-chain in Insurtech and that, at least in part, avoids duplication of work, although there is no full agreement on the usefulness of the internal audit outcome for the external auditor entrepreneurship (Al-Shetwi, Ramadili, Chowdury & Sori, 2011).

6 – Conclusion

This study contributes to an improved understanding of the role of the Internal Audit Function in the external audit activity, by providing further insight into external auditors judgements and decisions as their work interrelates with that of internal auditors (DeNichilo 2022a).

The study shows that there are substantial interactions between the internal and external auditors, including accessing each other working papers and reports (ISA 610). In most companies there is a considerable room for improving such interactions by the block-chain, DeFi and Insurtech activities (Hunton, Wright & Wright, 2007).

In addition to financial services, block-chain will become the main technology for future risk management in a Insurtech perspective (Holt & DeZoort, 2009). Insurance and accounting must

do the following: build a block-chain project and make sure that the block-chain applications are running as intended from a financial and accounting point of view (Belchior, Vasconcelos, Guerreiro and Correia, 2021).

In the IFRS 17 Transition fair value finds its ideal context in the presence of efficient financial markets, which can be synthetically translated into fully informed investors; efficient markets means that they show a growing and stable trend even in the short period: the trade-off between value maximization and fair value measurement has to be achieved without compromising the principle of integrity of capital (Aziatul, Nur & Zuraidah, 2015).

However, there are still many limitations. In any case, the development of DeFi cannot be separated from the development of projects of using the block-chain, since these are closely related (Gudgeon, Perez, Harz, Livshits and Gervais, 2020). Despite that, in recent years many authors criticized this fair value criterion for its poor reliability. Indeed, if in a theoretical perspective fair value should satisfy the demand of investors for more representative information on business trend, many concerns arise concerning its practical application (Altamuro & Zhang, 2013). This evidence emerges particularly in contexts as illiquid or inefficient markets. With regard to this aspect, IFRS 17 provide an indicator of reliability of assessments reported in financial statements, thus investors could be able to deeply understand the recorded values (Stoykova, Paskaleva & Stoykov, 2020).

Policy-makers should take in consideration this evidence in order to grant the faithful representation of financial statements.

7 – References

- Abdolmohammadi, M. J., Burnaby, P., & Hass, S. (2006). A review of prior common body of knowledge (CBOK) studies in Internal Auditing and an overview of the global CBOK 2006. *Managerial Auditing Journal*, 21(8), 811- 821. <https://doi.org/10.1108/02686900610703750>
- Abbott, L. J., Parker, S., & Peters, G. F. (2012). Internal Audit assistance and external audit timeliness. *Auditing: A Journal of Practice & Theory*, 31(4), 3-20. <https://doi.org/10.2308/ajpt-10296>.
- Afifa, M. A., Alsufy, F., & Abdallah, A. (2020). Direct and Mediated Associations among Audit Quality, Earnings Quality, and Share Price: The Case of Jordan. *International Journal of Economics & Business Administration (IJEBA)*, 8(3), 500-516.
- Ahluwalia, S., Mahto, R. V., & Guerrero, M. (2020). Blockchain technology and startup financing: A transaction cost economics perspective. *Technological Forecasting and Social Change*, 151 (January). <https://doi.org/10.1016/j.techfore.2019.119854>
- Aliyu, M.D., Musa, A.U., & Zachariah, P. (2015). Impact of audit quality on earnings management of listed deposit money banks in Nigeria. *Journal of Accounting and Finance Management*, 1(4), 1-16.
- Almarayeh, M., Abdullatif, T., & Aibar-Guzmán, B. (2020). Does Audit Quality Influence Earnings Management in Emerging Markets? Evidence from Jordan. *Revista de contabilidad spanish accounting review*, 23(1), 64-74.
- Al-Mousawi, R.J., & Al-Thuneibat, A. (2011). The effect of audit quality on the earnings management activities. *Dirasat: Administrative Sciences*, 38(2), 614-628.
- Alnodel, A. A. (2018). The impact of IFRS adoption on the value relevance of accounting information: Evidence from the insurance sector. *International Journal of Business and Management*, 13(4), 138-148.
- Altamuro, J., & Zhang, H. (2013). The financial reporting of fair value based on managerial inputs versus market inputs: Evidence from mortgage servicing rights. *Review of Accounting Studies*, 18(3), 833-858. <https://doi.org/10.1007/s11142-013-9234-y>.

- Al-Shetwi, M., Ramadili, S. M., Chowdury, T. H. S., & Sori, Z. M. (2011). Impact of Internal Audit function (IAF) on financial reporting quality (FRQ): Evidence from Saudi Arabia. *African Journal of Business Management*, 5(27), 11189-11198.
- Al-Twaijry, A. A., Brierley, J. A., & Gwilliam, D. R. (2004). An examination of the relationship between internal and external audit in the Saudi Arabian corporate sector. *Managerial Auditing Journal*, 19(7), 929-944. <https://doi.org/10.1108/02686900410549448>
- Aziatul, W., Nur, A., & Zuraidah, M. (2015). Earnings Management: An Analysis of Opportunistic Behavior, Monitoring Mechanism and Financial Distress, *Procedia Economics and Finance*, (28), 190-201.
- Barth, M., & Taylor, D. (2010). In defense of fair value: Weighing the evidence on earnings management and asset securitizations. *Journal of Accounting & Economics*, 49(1-2), 26-33. <https://doi.org/10.1016/j.jacceco.2009.10.001>
- Becker, C.L., DeFond, M., Jiambalvo, J., Subramanyam, K.R., (1998). The effect of audit quality on earnings management. *Contemporary Accounting Research* 15(1): 1–24.
- Belchior, R., Vasconcelos, A., Guerreiro, S., and Correia, M. (2021). A survey on blockchain interoperability: Past, present, and future trends. *ACM Computing Surveys (CSUR)* 54(8), 1–41. <https://doi.org/10.1145/3471140>
- Bonyuet, D., (2020). Overview and Impact of Blockchain on Auditing. *The International Journal of Digital Accounting Research* 20, 31-43.
- Cai, C. (2018). Disruption of financial intermediation by FinTech: a review on crowdfunding and blockchain. *Accounting & Finance*. 10.1111/acfi.12405
- Carcello, J. V., Hermanson, D. R., & Raghunandan, K. (2005). Changes in Internal Auditing during the time of the major US accounting scandals. *International Journal of Auditing*, 9(2), 117-127. <https://doi.org/10.1111/j.1099-1123.2005.00273.x>.
- Chen, Y., & Bellavitis, C. (2020). Blockchain disruption and decentralized finance: The rise of decentralized business models. *Journal of Business Venturing Insights*, 13 (October 2019), e00151. <https://doi.org/10.1016/j.jbvi.2019.e00151>
- Coderre, D., & Police, R. C. M. (2005). Global technology audit guide: continuous auditing implications for assurance, monitoring, and risk assessment. *The Institute of Internal Auditors*, 1-34.
- Cohen, D. A., Dey, A., & Lys, T. Z. (2008). Real and accrual-based earnings management in the pre-and post-Sarbanes-Oxley periods. *The accounting review*, 83(3), 757-787. <https://doi.org/10.2308/accr.2008.83.3.757>.
- Debreceny, R., & Rahman, A. (2005). Firm-specific determinants of continuous corporate disclosures. *The International Journal of Accounting*, 40(3), 249-278. <https://doi.org/10.1016/j.intacc.2005.06.002>
- DeFond M., Zhang, J., (2014). A review of archival auditing research. *Journal of Accounting and Economics* 58, 275-326.
- De Nichilo, S. (2022). Detecting Earnings Management Practices in European Insurance Sector: Purpose and Application of Accrual Modelling and Distribution of Earnings. *European Journal of Management Issues*, 30(3), 165-176.
- DeNichilo, S. (2022b). Implications of IFRS 17 in European financial stability: accounting methodology and evaluation modelling. *Risk Management Magazine*, 7(3). 4.
- Desai, V., Roberts, R. W., & Srivastava, R. (2010). An analytical model for external auditor evaluation of the Internal Audit function using belief functions. *Contemporary Accounting Research*, 27(2), 537-575. <https://doi.org/10.1111/j.1911-3846.2010.01016.x>

- Dittmeier, C., (2015), *La governance dei rischi: un riferimento per gli organi e le funzioni di governo e controllo*. Milano, Egea, 2015.
- Ege, M. S., & Stuber, S. B. (2021). Are auditors rewarded for low audit quality? The case of auditor lenience in the insurance industry. *Journal of Accounting and Economics*, 101424.
- Felix, Jr, W. L., Gramling, A. A., & Maletta, M. J. (2001). The contribution of Internal Audit as a determinant of external audit fees and factors influencing this contribution. *Journal of Accounting Research*, 39(3), 513-534. <https://doi.org/10.1111/1475-679X.00026>
- Fröwis, M., Fuchs, A., and Böhme, R. (2019). *Detecting token systems on Ethereum*. In *Financial Cryptography and Data Security*, Ian Goldberg and Tyler Moore (Eds.). Springer International Publishing, Cham, 93–112.
- Gaio, C. (2010). The relative importance of firm and country characteristics for earnings quality around the world. *European Accounting*, 19(4), 693-738.
- Glover, S. M., Prawitt, D. F., & Wood, D. A. (2008). Internal Audit sourcing arrangement and the external auditor's reliance decision. *Contemporary Accounting Research*, 25(1), 193-213. <https://doi.org/10.1506/car.25.1.7>
- Gramling, A. A., Maletta, M. J., Schneider, A., & Church, B. K. (2004). The role of the Internal Audit function in corporate governance: A synthesis of the extant Internal Auditing literature and directions for future research. *Journal of Accounting literature*, 23(1), 194 - 244.
- Gudgeon, L., Perez, D., Harz, D., Livshits, B. and Gervais, A. (2020). The decentralized financial crisis. In 2020 Crypto Valley. *Conference on Blockchain Technology (CVCBT'20)*. 1–15. <https://doi.org/10.1109/CVCBT50464.2020.00005>
- Gudgeon, L., Werner, S., Perez, D, and Knottenbelt, W. J. (2020). DeFi protocols for loanable funds: Interest rates, liquidity and market efficiency. In *Proceedings of the 2nd ACM Conference on Advances in Financial Technologies*. 92–112.
- Harvey, C. R., Ramachandran, A., & Santoro, J. (2020). DeFi and the Future of Finance. *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.3711777>
- Hölbl M, Kompara M, Kamišalić A, Nemeč Zlatolas L (2018). A Systematic Review of the Use of Blockchain in Healthcare. *Symmetry*. 2018; 10(10):470. <https://doi.org/10.3390/sym10100470>
- Holt, T. P., & DeZoort, T. (2009). The effects of Internal Audit report disclosure on investor confidence and investment decisions. *International Journal of Auditing*, 13(1), 61-77. <https://doi.org/10.1111/j.1099-1123.2008.00391.x>
- Hughes, A., Park, A., Kietzmann, J., & Archer-Brown, C. (2019). Beyond Bitcoin: What block-chain and distributed ledger technologies mean for firms. *Business Horizons*, 62(3), 273–281. <https://doi.org/10.1016/j.bushor.2019.01.002>
- Hunton, J. E., Wright, A. M., & Wright, S. (2007). The potential impact of more frequent financial reporting and assurance: User, preparer, and auditor assessments (retracted). *Journal of Emerging Technologies in Accounting*, 4(1), 47-67. <https://doi.org/10.2308/jeta.2007.4.1.47>
- Kar, A. K., & Navin, L. (2021). Diffusion of blockchain in insurance industry : An analysis through the review of academic and trade literature. *Telematics and Informatics*, 58, 101532. <https://doi.org/10.1016/j.tele.2020.101532>
- Kousenidis, D. V., Ladas, A. C., & Negakis, C. I. (2010). Value relevance of accounting information in pre-post-IFRS accounting periods. *European Research Studies*, 8(1), 145-154. Retrieved from <https://ideas.repec.org/a/ers/journal/vxiii2010i1p143-152.html>.

- Krishnamoorthy, G. (2002). A multistage approach to external auditors evaluation of the Internal Audit function. *Auditing: A Journal of Practice & Theory*, 21(1), 95-121.
<https://doi.org/10.2308/aud.2002.21.1.95>
- ISA 610 (Revised 2013). *Using the Work of Internal Auditors*. Retrieved from:
<https://www.iaasb.org/publications/isa-610-revised-2013-using-work-internal-auditors-0>
- Lambert, T. A., Jones, K. L., & Brazel, J. F. (2011). Unintended consequences of accelerated filings: Do mandatory reductions in audit delay lead to reductions in earnings quality. Retrieved from:
<https://business.illinois.edu/files/accy/events/forum/papers/08-09/Jones.pdf>
- Landsman, W. R., Maydewa, E. L., & Thornmock, J. R. (2012). The information content of annual earnings announcement and mandatory adoptions of IFRS. *Journal of Accounting and Economics*, 53(1&2), 34-54. <https://doi.org/10.1016/j.jacceco.2011.04.002>.
- Larios-Hernández, G. J. (2017). Blockchain entrepreneurship opportunity in the practices of the unbanked. *Business Horizons*, 60(6), 865-874. <https://doi.org/10.1016/j.bushor.2017.07.012>
- Liu, M., Wu, K., Xu, J.J., (2019). How Will Blockchain Technology Impact Auditing and Accounting: Permissionless versus Permissioned Blockchain. *Current Issues in Auditing* 13(2): A19–A29.
- Mat Zain, M., Zaman, M., & Mohamed, Z. (2015). The effect of internal audit function quality and internal audit contribution to external audit on audit fees. *International Journal of Auditing*, 19(3), 134-147. <https://doi.org/10.1111/ijau.12043>.
- McPhee, I. (2005). *The Relationship of the ANAO with Audit Committees and Internal Audit*. Retrieved from:
<https://www.anao.gov.au/work/speech/relationship-anao-audit-committees-and-internal-audit>.
- Morkunas, V. J., Paschen, J., & Boon, E. (2019). How blockchain technologies impact your business model. *Business Horizons*, 62(3), 295-306. <https://doi.org/10.1016/j.bushor.2019.01.009>
- Nissim, D. (2010). *Analysis and valuation of insurance companies-industry study number two*. Centre for Excellence in Accounting & Security Analysis, Columbia Business School. Retrieved from <http://www8.gsb.columbia.edu/ceasa/research>.
- Perez, D., Werner, S. M., Xu, J. and Livshits, B. (2020). Liquidations: DeFi on a knife-edge. *arXiv preprint arXiv:2009.13235*.
- Prawitt, D. F., Sharp, N. Y., & Wood, D. A. (2011). Reconciling archival and experimental research: Does Internal Audit contribution affect the external audit fee? *Behavioral Research in Accounting*, 23(2), 187-206. <https://doi.org/10.2308/bria-10065>
- Queiroz, M.M., Telles, R. and Bonilla, S.H. (2020). Blockchain and supply chain management integration: a systematic review of the literature. *Supply Chain Management*, 25(2), 241-254. <https://doi.org/10.1108/SCM-03-2018-0143>
- Raiborn, C., Butler, J. B., Martin, K., & Pizzini, M. (2017). The Internal audit function: A prerequisite for good governance. *Journal of Corporate Accounting & Finance*, 28(2), 10-21. <https://doi.org/10.1002/jcaf.22246>.
- Said Suwaidan, M., & Qasim, A. (2010). External auditors reliance on Internal Auditors and its impact on audit fees: An empirical investigation. *Managerial Auditing Journal*, 25(6), 509-525. <https://doi.org/10.1108/02686901011054845>
- Schär, F. (2021). Decentralized finance: on block-chain and smart contract-based financial markets. *Federal Reserve Bank of St. Louis Review*, 103(2), 153-174. <https://doi.org/10.20955/r.103.153-74>
- Schmitz, J., Leoni, G., (2019). Accounting and Auditing at the Time of Blockchain Technology: A Research Agenda. *Australian Accounting Review* 29(2): 331 – 342.

- Stoykova, A., Paskaleva, M., & Stoykov, D. (2020). Risk management and accounting with Fintech. *Entrepreneurship, Faculty of Economics. Blagoevgrad: South-West University "Neofit Rilski*, 8, 59-73.
- Sun, Y. (2016). Internal control weakness disclosure and firm investment. *Journal of Accounting, Auditing & Finance*, 31(2), 277-307. <https://doi.org/10.1177/0148558X15598027>
- Tarca, A. (2012). The case for global accounting standards: arguments and evidence. Retrieved from <https://ssrn.com/abstract=2204889>.
- Thornton, G. (2011). *Looking to the future: Perspectives and trends from Internal Audit leaders*. *Risk Management*, 6.
- Tutino, M. (2016). *La fair value accounting nei bilanci delle società*. Kluwer, Padova.
- Valkanov, N. (2019). Mitigation of regulations burden in financial sector by application of high tech solutions, *Economics and Management*, XVI (1), pp. 19- 30.
- Yermack, D. (2017). Corporate governance and block-chain. *Review of Finance*, 21(1), pp.7–31.
- Wachter, V., Rude Jensen, J. and Ross O. (2021). Measuring asset composability as a proxy for DeFi integration. In *International Conference on Financial Cryptography and Data Security*. Springer-Verlag, Berlin, Heidelberg, 109–114. https://doi.org/10.1007/978-3-662-63958-0_9