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Digitalization and Cyber Crime –
"Opportunity Makes the Thief"

Perspectives on Cloud Adoption

The Status Quo of Research on
Digital Finance and FinTech

Standards:
Key Element for Regulation!



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Editorial

Digitalization and Cyber Crime – “Opportunity Makes the Thief”

Joachim Wuermeling

More Digitalization Means More Data and More Systems

In the age of the Internet of Things, computers deal with more than just abstract data, they are increasingly reaching out into the real world of physical objects. This digitalization trend means that everyday electronic appliances are increasingly being transformed into interlinked IT systems – such as the networked home. More systems, more data – the number of IT systems is increasing at breakneck speed, including at central banks. Of course, this also raises the question of whether they are sufficiently secure.

More Data, More Damage

The increasing digitalization of essential tasks means that even data that was formerly unavailable in an electronic format can now be collected, stored and evaluated. However, more data, possibly of a sensitive nature, also means that the potential for damage is greater in case of loss. Current figures show that the risk of harm has increased substantially. The

WannaCry attack in May 2017 confirmed this hypothesis and demonstrated that critical infrastructures such as hospitals, too, are vulnerable.

More Systems, More Weak Points

The greater the number of IT systems in use worldwide and the more interlinked they are, the higher the number of potential victims and possible weak points. Identifying these weak points, assessing their potential harm, and rectifying them in a timely manner represents an immense challenge for manufacturers and users alike.

More Weak Points, More Attacks

Any system with weak points can be targeted by attackers and/or be exploited as a means of attack. Organized crime has established new business models in this field. This is demonstrated by the increasing number of malware attacks, in which malicious software (known as ransomware) encrypts the victim's data and promises to decrypt them again in



Professor Joachim Wuermeling
Member of the Executive Board
Deutsche Bundesbank
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return for payment. As the number of victims increases, cyber criminals are able to further expand their network of botnets, computers they control, and use to carry out cyber-attacks. In the age of the Internet of Things, where every household – and, in some cases, every household member – has multiple connected devices, it is only a matter of time before everyone has been attacked or weaponized.

More Attacks, More Security

Manufacturers must ensure that their products are more inherently secure, particularly in the Internet of Things. This necessitates a commitment to uniform security standards and the principle of “secure by default”. Even today, ensuring heightened security poses an immense challenge. This statement is also valid for central banks as part of the critical infrastructures. In a world of growing numbers of IT systems and ever shorter product cycles, it will become a critical issue. Yet, this is not solely a matter for the manufacturers. Private

and business users alike also need to develop a sense of increased responsibility for keeping digital infrastructures and their sensitive data secure.

More Security, More Trust

In my view, efforts to manage the risks stemming from cyber crime are still in their infancy and must be improved, e.g., through mandatory security designs. Forcing “critical” security configurations to be remedied and patches applied as soon as flaws are found would reduce the potential for zero-day exploits such as the WannaCry case. There may also be further ways for governments to promote cyber security as a public good.

Electronic “things” embrace more and more real-world physical objects. We therefore need more secure systems from trustworthy manufacturers plus users who are more security-conscious. This is an absolute must if the challenge of “digitalization” is to be successfully met.

Research Report

Perspectives on Cloud Adoption

IN COMPARISON TO TRADITIONAL IT PARADIGMS, CLOUD COMPUTING ENABLES TO OBTAIN DESIRED COMPUTING RESOURCES ON-DEMAND WITHOUT REQUIRING LARGE, UPFRONT INVESTMENTS AND TO DYNAMICALLY ADAPT AND SCALE THESE RESOURCES TO VARYING BUSINESS REQUIREMENTS. HOWEVER, CLOUD COMPUTING IS NOT A PANACEA. THIS DRIVES THE NEED TO EXAMINE THE SPECIFIC REASONS AND REQUIREMENTS FOR CLOUD ADOPTION IN PRACTICE. HERE, WE FOLLOW AN ANALYTICAL APPROACH TO EXAMINE CLOUD ADOPTION BY CONDUCTING A LITERATURE SURVEY AND AN EMPIRICAL STUDY.

Melanie Holloway

Ralf Steinmetz

Introduction

Today's CIOs still consider cloud computing to be among the most promising IT investment priorities. While every organization in the past had to maintain its own infrastructure yielding large upfront investments and underutilized resources, the consolidation of IT resources in large data centers managed by a cloud provider offers major advantages. First, the cost of entry is significantly lowered. Often, a pay-per-use model is applied. Second, IT resources can be seamlessly scaled according to the needs of an organization. This provides major advantages for example for startups, allowing IT landscape scaling depending on the growth of business. Finally, cloud computing allows for new and

Amr Rizk

disruptive types of applications. For example, applications running on smartphones now become able to offload data to the cloud for further processing. Despite the aforementioned advantages, several issues still exist that are currently addressed in research, e.g., security concerns and the migration of on-premise legacy systems. However, research on cloud adoption is lacking an industrial perspective (Jamshidi et al., 2013). Therefore, we performed a joint analysis by conducting a literature survey which is complemented by an empirical study, in which we exploit the knowledge obtained from interviews with IT experts in order to derive the main drivers and obstacles of cloud adoption in industry (Holloway et al., 2017).

Literature View on Cloud Adoption

Existing research that has been conducted in the field of cloud adoption so far can be distinguished into two different research directions: (i) migration frameworks and (ii) influencing factors. While the former provides explicit guidance when cloud adoption is taken into account, the latter research work explores advantages, drawbacks, and obstacles:

- *Migration frameworks* can be distinguished into frameworks that focus on the decision process and those considering the whole lifecycle of cloud adoption resulting in all-embracing migration frameworks. All of them share the definition of different phases. Beginning with some preparation steps, the real adoption is done in some kind of operate phase followed by an adaptation phase (e.g., Conway and Curry, 2012). By investigating the different migration frameworks, we derive three hypotheses (M1–M3) about the adoption process:
 - M1: Not every kind of service is suitable to be moved to the cloud.
 - M2: Enterprises decide on a per-service-basis if they move to the cloud or not.
 - M3: Among the migration types cloudification prevails.

Here, cloudification means to move a service to the cloud. This expression refers to the migration of locally installed applications to web-based equivalents.

- *Influencing factors* are the factors relevant for the decision of cloud adoption. To analyze

these factors, we conducted a literature review. To determine the impact of a paper we considered, e.g., the number of citations (at least 35 citations), the significance of the authors, and the impact of the conference or journal. Hence, we identified 18 relevant papers and 9 influencing factors, e.g., relative advantage, complexity, suitability of the application, security concerns, or control of IT resources. Concerning data-related issues, there is a widespread perception that sensitive business data will never be moved to the cloud. Moreover, performance unpredictability is mentioned as one of the ten major cloud obstacles. From the results of our analysis of influencing factors, we derived two additional hypotheses (F1–F2):

- F1: Applications that impact key competencies will not be migrated into the cloud.
- F2: Applications that are migrated for a longterm usage prevail.

Empirical Study of Cloud Adoption

For our empirical study, we conducted five interviews with IT experts from different organizations. We chose interview partners on the executive level with authority or insight into cloud operations among organizations that exhibit a lifetime of more than ten years and that use cloud computing for their internal business tasks. The interviews were performed using a questionnaire in an oral and semi-structured way in order to be able to adaptively react to the received answers. In doing so, we closely followed the features of an expert interview. The questionnaire was structured as follows: At the beginning, it contained some gen-

eral questions about the business corporation and the role of the interviewee in the company. This was followed by general questions on cloud computing. The main part of the questionnaire comprised questions about the first cloud project. This part was structured based on the stages in the migration framework proposed by (Conway and Curry, 2012). That model was chosen since it constitutes a conjoint work of leading organizations from the industry, the non-profit sector, and academia, and thus can be considered as the most mature one. However, we had to extend the model because our study also aimed to account for aborted cloud migrations and temporary usage scenarios. Each stage of the project in the questionnaire dealt with the benefits, obstacles, and conditions from both a technical and an organizational perspective. The questionnaire finished with questions on future cloud projects.

The transcripts of the interviews consisted of 10 pages on average and were analyzed using a qualitative content analysis. Basically, the qualitative content analysis constitutes a systematic method in which techniques for content analysis are applied in order to retrieve a system of categories from a given text material. As result, we obtained a system of categories over three levels. Table 1 shows the first-level categories: 14 factors that affect companies in the process of cloud adoption in practice. For the second-level categories, see Holloway et al. (2017).

Revisiting our Hypotheses

As part of our literature research, we compiled some first hypotheses to be reconsidered within

First-Level Categories
Business trend
Service immaturity
Preparation
Pilot cloud applications
Requirements
User acceptance
Deployment model
Qualified applications
Organizational issues
Technical issues
Organizational reasons
Technical reasons
General advantages
General disadvantages

Table 1: Factors Affecting Cloud Adoption in Practice

the scope of our empirical study. Concerning hypothesis M1, we assumed that not every kind of service is suitable to be moved to the cloud, but some interviewees explicitly stated that all applications are suited in general. Therefore, M1 could not be confirmed. Hypothesis M2 claimed that the decision of a company to move to the cloud is made on a per-service basis. The results of our study are confirming this hypothesis. Regarding the migration types in hypothesis M3, we expected that cloudification prevails. However, our findings are in contrast to that assumption. Replacing legacy systems by cloud offers was the dominant migration type.

We could not find any evidence supporting that applications affecting key competencies of com-

panies will not be migrated to the cloud (hypothesis F1). On the contrary, one interviewee explicitly stated that he expects his organization to be completely cloud-based by 2020. Finally, hypothesis F2 was confirmed: cloud projects are intended for a permanent usage of cloud services. No company had either initiated nor was planning a temporary use of cloud services.

Conclusion

Today, moving to the cloud seems very promising due to low upfront investments, optimal resource utilization, unlimited scalability, and new types of applications. The results of our study revealed that companies are influenced by multiple, partially conflicting factors in the decision process of cloud adoption of which many have already been attributed to cloud computing by researchers so far. However, some of these factors are considered differently in practice. For example, all interviewees considered the security standards of cloud services to outperform on-premise solutions. In contrast, security is often considered as a major obstacle in literature. Also new factors were introduced within our empirical study. To the best of our knowledge, for example, service immaturity and user acceptance have not been mentioned in research so far.

Enterprises regard cloud computing as still evolving. Cloud services are perceived to be immature compared to on-premise solutions and pilot cloud projects are best to be started with applications that affect only a small user group and demand low investments. Within the results of our study, a single use case was

dominant: the permanent usage of public cloud services with a migration strategy that replaces legacy applications with publicly available cloud offers.

Overall, our study revealed that companies consider cloud computing as a business trend where adoption is indispensable in order to successfully compete in the market. For the future, we found that the companies consider more applications for cloud migration. In the next years, the growth of cloud computing will continue since more companies will take their step into the cloud. This will also keep the interest in exploring the factors which affect companies in cloud adoption.

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Research Report

The Status Quo of Research on Digital Finance and FinTech

THE FINANCIAL INDUSTRY HAS EXPERIENCED A CONTINUOUS EVOLUTION IN SERVICE DELIVERY DUE TO DIGITALIZATION. THIS CHANGE MANIFESTS ITSELF IN EXPANDED CONNECTIVITY, ENHANCED SPEED OF INFORMATION PROCESSING, A MULTITUDE OF NEW FINANCIAL PRODUCTS, AND NOVEL FORMS OF CUSTOMER INTERACTION. AGAINST THIS BACKDROP, ACADEMIC RESEARCH HAS ANALYZED THE IMPACT OF DIGITAL PROGRESS IN THE FINANCIAL SECTOR. IN ORDER TO PROVIDE AN OVERVIEW ON THIS RESEARCH AND TO IDENTIFY POSSIBLE GAPS, WE HAVE REVIEWED THE RELEVANT LITERATURE IN THIS FIELD APPLYING A SYSTEMATIC AND COMPREHENSIVE SEARCH.

Peter Gomber

Jascha-Alexander Koch

Michael Siering

Introduction

Nowadays, customers in the financial sector demand intelligent, however easy-to-use financial services independent of location and time, and at continually decreasing costs. An increasing Internet-based economy, new usage patterns of digital (especially mobile) devices and media, as well as a decreasing reluctance to use online channels for financial information search and for financial transactions (even among the elderly, more wealthy Internet users) are key structural changes driving these developments. New business models and technological concepts provide a basis for innovative solutions in finance.

Thereby, Digital Finance challenges existing financial service providers, such as established banks or insurance providers, due to new competition by FinTechs. In parallel, Digital Finance offers new opportunities for the incumbents to reach their younger and more technology-savvy clientele.

Academic research on Digital Finance and FinTech have developed in parallel to the emerging business models and technologies. In a comprehensive overview article (Gomber et al., 2017), we structure this relatively new field and systematically analyze the existing academic literature. Therefore, we propose to

orientate in the field based on the three central Digital Finance dimensions: (I) Digital Finance business functions, (II) relevant technologies and technological concepts as well as (III) institutions providing Digital Finance solutions. These three dimensions can be arranged in form of a cube (Figure 1). This Digital Finance Cube enables the arrangement of academic research relative to each other and to identify cross-linkages and research gaps. Concerning the first dimension, i.e., Digital Finance business functions, we consider (1) Digital Financing, (2) Digital Investments, (3) Digital Money, (4) Digital Payments, (5) Digital Insurances, and (6) Digital Financial Advice. The second dimension embraces all technologies and technological concepts, for example, blockchain technology, near field communication (NFC), mobile devices, and many other. Finally, the third dimension of the Cube consists of the Digital Finance institutions embracing both FinTechs, i.e., startups as well as established IT companies entering the financial domain, and traditional service providers.

The three dimensions are arranged orthogonal to each other so that each area inside the Cube can be described by certain properties of the three dimensions. All areas inside the Cube represent smaller sub-cubes that refer to a specific combination of one business function, a certain technology, and a specific type of institution. Not all sub-cubes need to be occupied. A number of sub-cubes is neither researched nor touched by practitioners of the financial industry.

Research Methodology

In order to identify the state of research and possible future research directions in the field of Digital Finance, a literature review was conducted following the methodology proposed by Webster and Watson (2002). Therefore, we conducted a systematic search based on a predefined list of keywords in a pre-selected list of high-ranked international outlets including journals as well as conferences. As a measure of outlet quality, we consider the ranking regularly published by the "Verband der Hochschullehrer für Betriebswirtschaft" (VHB, 2016). Here, all journals and conference proceedings ranked A+, A, and B in the areas of (i) business administration, (ii) financial research, and (iii) information systems research were selected in order to take into

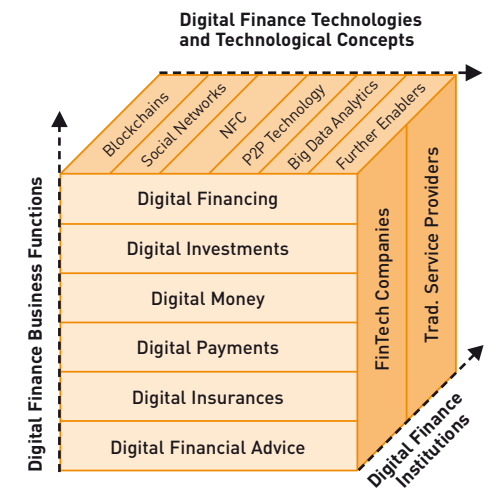


Figure 1: The Digital Finance Cube

account a comprehensive number of outlets representing the interdisciplinary nature of the Digital Finance field. We also considered the Annual Meetings of the American and the European Finance Association (AFA & EFA) which are not contained in the VHB ranking. All papers published between 2009 and 2015 were taken into account.

Meta Analysis

In total, 142 journals and conferences were screened. These outlets are composed of 13 venues that are ranked A+, 31 venues that are ranked A, and 96 venues that are ranked B – plus AFA and EFA. After elimination of irrelevant articles, the search resulted in a set of 83 relevant articles consisting of 49 journal and 34 conference articles.

We observe an increasing number of articles concerning Digital Finance topics over time (Table 1). While in the years 2009-2011 only very few articles addressed one of the six Digital

Finance business functions, from 2012 on, numbers began to rise. In 2015, already 30 relevant articles were published. Digital Financing, Digital Investments, and Digital Payment were addressed by publications already in 2009. The first identified paper relating to Digital Financial Advice was published in 2010, with more activity on this topic observed in the last years. Concerning Digital Money, we find the first relevant article in 2014. In contrast, Digital Insurance has not been addressed in this time period.

The articles were also categorized concerning their main methodology applied (Table 2). The majority of the articles apply an empirical methodology. Among these 58 empirical articles, we find that 50 were based on archival data which had been acquired, for example, from data bases, repositories, or platforms. Only eight papers were based on survey data. The second most commonly applied methodologies are of qualitative nature and embrace, e.g., case studies and interviews (12 papers).

Year	2009	2010	2011	2012	2013	2014	2015	total
Total	7	2	5	8	12	19	30	83
Digital Financing	3	1	3	6	6	8	14	41
Digital Investments	2	-	-	-	1	-	4	7
Digital Money	-	-	-	-	-	1	6	7
Digital Payment	2	-	1	2	2	5	5	17
Digital Insurance	-	-	-	-	-	-	-	-
Digital Advice	-	1	1	-	3	5	11	11

Table 1: Classification of Articles by Digital Finance Business Functions and Year

Methodology	Articles
Empirical	58
- thereof, articles using archival data	50
- thereof, articles using survey data	8
Qualitative (Case Study/Interviews/Qual. Analysis)	12
Experimental	4
Conceptual	3
Simulative	2
Theoretical	2
Design Science	1
Literature Review	1

Table 2: Classification of Articles by Methodology

Results Concerning the Different Digital Finance Business Functions

In the following, we briefly describe some key results of the analysis concerning the state of the art in academic literature. This description refers to the respective Digital Finance business function.

1. RESEARCH ON DIGITAL FINANCING

Digital Financing allows individuals, firms, and startups to become independent from traditional ways of financing, like bank credits, by using the Internet. Digital Financing embraces all digital types of acquiring capital. About half of all relevant papers identified (41 of 83 papers) deal with this topic. While reward-based (20 papers) and lending-based crowdfunding (20 papers) make up the biggest part of considered crowdfunding types, equity-based crowdfunding is rarely addressed (5 papers). Moreover, only one paper regarding digital invoicing was discovered. The papers can be classified into three sub-categories: platforms and models (4 papers), user behavior

of participants (21 papers), and performance of crowdfunding campaigns (16 papers). The topics of digital invoicing, electronic factoring, as well as electronic leasing deserve more attention of research in the future.

2. RESEARCH ON DIGITAL INVESTMENTS

Digital Investments support individuals or institutions in making investment decisions and in arranging the required investment transactions. Digital Investments include mobile trading, social trading, online brokerage, and online trading in the B2C area as well as high-frequency and algorithmic trading in the B2B context. Since substantial literature reviews on high-frequency and algorithmic trading are already available, we excluded this field and refer to the respective existing literature overviews (e.g.: Gomber et al., 2011; Menkveld, 2016; O'Hara, 2015).

Concerning Digital Investments in the B2C area, only seven relevant research articles were identified. These research papers can be categorized into articles dealing with online platforms and providers (2 papers), articles focusing on user behavior (2 papers) as well as articles focusing on performance of users (3 papers). Most strikingly, studies only rarely focus on the recently emerged social trading platforms. Especially here, we see high potential for future research.

3. RESEARCH ON DIGITAL MONEY

The terms digital currency, virtual currency, e-money, and cryptocurrency describe a type of currency that fulfills (more or less) all typical functions of money but exists only digitally. Such Digital Money serves as a medium of

exchange, unit of account, and store of value. We only identified seven papers concerning Digital Money that match our criteria. These papers can be categorized into articles investigating the behavior of individuals using cryptocurrencies (1 paper), studies investigating whether cryptocurrencies should be used to increase trading performance (4 papers), and papers providing conceptual discussions (2 papers). While the main focus of research is on Bitcoin, other cryptocurrencies are mostly disregarded.

4. RESEARCH ON DIGITAL PAYMENTS

In the last years, innovative and easy-to-use solutions came up that fit well the needs of merchants (e.g., Internet shops) and customers, such as mobile payments or peer-to-peer payments. Furthermore, so-called digital wallets were proposed, which do not only store money, but fulfill also the tasks of holding identification information (e.g., ID cards) and storing temporary tokens (e.g., bus tickets).

In our set of research literature, the business function Digital Payment covers the second highest number of articles (17). This can be attributed to the fact that this topic was one of the first to be established, discussed, and researched. We identified three main streams of research in this field: First, there are studies investigating Digital Payment platforms and providers (6 papers). A second stream of research deals with the behavior of users of Digital Payment systems (8 papers), specifically with adoption decisions. Finally, a third stream

investigates the competition between different Digital Payment systems (3 papers). Especially the new possibilities of payments using smartphones or smartwatches as well payments using NFC solutions or even biometric methods deserve more attention in research.

5. RESEARCH ON DIGITAL INSURANCES

Online platforms, like friendsurance.com, enable individuals seeking for insurances to digitally ally with other Internet users – typically friends and family members – and reduce insurance costs at the same level of protection. Moenninghoff and Wieandt (2012) argue that such alliances are likely to reduce information asymmetry and moral hazard. However, in our literature review, we did not identify any research article on Digital Insurances. Consequently, topics like the adoption of Digital Insurance concepts or user behavior remain underexplored so far.

6. RESEARCH ON DIGITAL FINANCIAL ADVICE

Multiple review sites and comparison portals are available, on which products and services are rated, scored, ranked, evaluated, and compared. The academic work in this field (11 papers) can be grouped into papers focusing on the behavior of users in trading communities (2 papers) and into papers analyzing such communities in order to relate the communication within the communities to financial markets and, thereby, to make predictions of market reactions (9 papers). Interestingly, in the set of top-journal articles we analyzed, there is a lack of research regarding the impact of automated tools for financial advice that

suggest specific portfolio structures to retail clients, like robo-advice.

Conclusion

We have conducted a substantial literature review in the field of Digital Finance and FinTech, and have organized the field based on three central dimensions: Digital Finance business functions, relevant technologies and technological concepts as well as institutions providing Digital Finance solutions. Based on the three dimensions, we propose the Digital Finance Cube that enables the arrangement of existing academic research in the field relative to each other and to identify cross-linkages and research gaps. For each business function, we analyzed the respective research and formed sub-categories of papers addressing similar topics.

The full article concerning this study (Gomber et al., 2017) provides a detailed overview of all 83 relevant articles identified. A detailed discussion is provided on future research directions that have been identified based on the sub-categorization and by applying the Digital Finance (Research) Cube. Moreover, we provide a substantial online appendix that contains all papers categorized by the six business functions and by the respective sub-categories: <http://www.efinance.wiwi.uni-frankfurt.de/forschung/jbe-tables.html>.

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Insideview

Standards: Key Element for Regulation!

INTERVIEW WITH TORSTEN ULRICH

Currently, several regulations are about to become effective, such as MiFID II / MiFIR, or are under final review, such as the Prospectus Directive. What is the role and importance of international standards for these and other regulations?

In light of the financial crisis, regulators realized that it was difficult to obtain information in a transparent and standardized manner which led to significant delays and risks, for instance in identifying risks that banks were bearing due to their holdings in certain entities. At this stage, it was detected that it was even impossible to identify entities through a standardized mechanism which led finally to the mandate by the G20 to create a Legal Entity Identifier (LEI) according to an ISO Standard (ISO 17442 Standard). This was the signal for the regulators to look deeper into standards. Another lesson learned – even by regulators from earlier regulations – was to use ID standards to minimize mapping efforts and costs.

The LEI seems to become the identifier for entities. What are latest developments of the LEI system?

Indeed the LEI is more and more becoming *the* identifier to be used especially for several regulations. Core of the GLEIS (Global LEI System) is to provide high quality. While focus has been at the beginning on the “business card” information, LEI is now moving to the next phase, the so called Level-2 data, i.e., to the question who owns whom. Entities have to provide upon annual renewal of their LEI information to identify their direct and ultimate parents, and vice versa.

Finally: as of January 3rd, 2018, MiFID II / MiFIR will require also a LEI, e.g., for issuers. Entities should apply as early as possible to avoid delays.

Which other areas in regulations are or need to be covered by standards?

The different areas to be covered in regulations by international standards are related



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to the *identification, classification, and description* of financial instruments. For identification of all asset classes, regulators have chosen the over years proven ISIN according to ISO 6166 Standard as the identifier to be used for the aforesaid regulations as well as in others, like EMIR, MAR, and the Prospectus Directive. This also covers the so-called OTC derivatives. CFI (Classification for financial instruments) according to ISO 10962 is to be used to classify all types of instruments in a six-digit code. Finally, the FISN (Financial Instrument Short Name) according to the ISO 18774 Standard provides in a 35-digits code the issuer short name as well as an abbreviated securities description.

Referring to the identification of OTC instruments by the ISIN: What is the current status and outlook?

ISIN will be ready for all asset classes, especially OTC derivatives. ANNA (Association of National Numbering Agencies) as the Re-

gistration Authority for ISO 6166 has created the Derivatives Service Bureau (DSB), which will provide the technical and organizational frame to allocate and provide the corresponding ISINs for the different OTC asset classes. Currently, user acceptance tests with the industry are taking place and the DSB services will go into production at the beginning of Q4. Current focus is on the regulatory requirements to be met for MiFID II. Further potential enhancements will be focused on afterwards.

Could you briefly explain the CFI?

The latest version of the CFI standard has included the classification of OTC derivatives as well as CIVs (Collective Investment Vehicles) as a separate category. The members of ANNA will start allocating CFIs according to the new standard version as well as FISN as of July 1st, 2017, being mandatory especially for European regulations.

Thank you for this interesting conversation.

Infopool

News

Dr. Benjamin Loos Received University Prize of Deutsches Aktieninstitut

In May 2017, Dr. Benjamin Loos (academic supervisor: Prof. Hackethal, layer 3) was awarded with this year's University Prize of Deutsches Aktieninstitut for his dissertation "Potential Solutions to Individual Investors – Investment Mistakes". The price was endowed with EUR 25,000 and was shared with Prof. Patrick C. Leyens.

Interactive Data Managed Solutions Becomes FactSet Digital Solutions

In April 2017, FactSet, a global provider of integrated financial information, analytical applications, and industry-leading service, has completed its acquisition of Interactive Data Managed Solutions. Interactive Data Managed Solutions has supported the E-Finance Lab substantially over the last years. FactSet Digital Solutions takes over this longstanding sponsorship and continues to support the E-Finance Lab. We are looking forward to the future cooperation.

New Member in the Board of the E-Finance Lab

We are proud to welcome Tim Grünke (FactSet Digital Solutions) as a new member of the Board of the E-Finance Lab. Tim Grünke succeeds Joachim Lauterbach in this function. We thank Joachim Lauterbach for his significant and valuable support over the last years and look forward to work intensively with Mr. Grünke.

Prof. Matthias Rehahn Succeeds Prof. Mira Mezini in the Board of the E-Finance Lab

From April 2017, Prof. Matthias Rehahn, Vice President of the Technische Universität Darmstadt, succeeds Prof. Mira Mezini and becomes a new member of the Board of the E-Finance Lab. We thank Prof. Mira Mezini for her engagement and welcome Prof. Matthias Rehahn to our Board.

The E-Finance Lab Board and Team Visited the TechQuartier

On Mai 15th, 2017, the E-Finance Lab hosted its monthly Jour Fixe and, subsequently, the meeting of the Board of the E-Finance Lab in the TechQuartier. As the E-Finance Lab has a strong focus on Digital Finance and FinTech, this special location was chosen to learn about the status of the TechQuartier, to gain deep insights in this aspiring startup hub, and to deepen the relationship. The TechQuartier is a startup hub located in Frankfurt and serves as a focal access point to entrepreneurs, investors, service providers and corporates.

Darmstadt Wins "Digital City" Challenge

Darmstadt has participated in the bitkom challenge "digital city" and won the competition against the other finalists Heidelberg, Kaiserslautern, Paderborn, and Wolfsburg. Now Darmstadt will become a digital model city introducing new digital technologies and innovative services.

Selected E-Finance Lab Publications

Ament, C.; Jaeger, L.:

Unconscious of the Own Ignorance: Overconfidence in Information Security.
In: Proceedings of the 21st Pacific Asia Conference on Information Systems (PACIS), Langkawi, Malaysia, 2017.

Bayer, E.; Riedl, E.; Skiera, B.; Srinivasan, S.:

Quantifying Marketing's Holy Grail: Digital Advertising's Impact on Firm Performance and Valuation.
In: Proceedings of the 46th EMAC Annual Conference, Groningen, Netherlands, 2017.

Blaseg, D.; Schulze, C.; Skiera, B.:

Too Good To Be True? Adverse Consequences of Discounts Used in Advance Selling Via Crowdfunding.
In: Proceedings of the 46th EMAC Annual Conference, Groningen, Netherlands, 2017.

Clapham, B.; Gomber, P.; Haferkorn, M.;

Panz, S.:

Managing Excess Volatility: Design and Effectiveness of Circuit Breakers.
In: 34th International Conference of the French Finance Association (AFFI), Valence, France, 2017.

Dwarakanath, R.; Koldehofe, B.; Bharadwai, Y.;

Nguyen, T. A. B.; Steinmetz, R.:

TrustCEP: Adopting a Trust-Based Approach for Distributed Complex Event Processing.
In: Proceedings of the 18th IEEE International Conference on Mobile Data Management (MDM), Daejeon, South Korea, 2017.

Holloway, M.; Dickhaus, M.; Hans, R.; Emondts, B.; Rizk, A.; Steinmetz, R.:

Cloud Adoption in the Spotlight – Empirical Insights from German IT Experts.
In: Proceedings of the 23rd Americas Conference on Information Systems (AMCIS), Boston, US, 2017.

Koch, J.:

A Framework for the Notion of 'Utility' in the Landscape of Crowdfunding.
In: Proceedings of the 25th European Conference on Information Systems (ECIS), Guimarães, Portugal, 2017.

Lewandowska, O.; Glaser, F.:

The Recent Crises and Central Counterparty Risk Practices in the Light of Procyclicality: Empirical Evidence.
In: Journal of Financial Market Infrastructures, 5 (2017) 3, pp. 1-24.

Wunderlich, N.; Beck, R.:

We've Got The Power – The Relevance of IT Leadership and Organizational IT Capabilities in the Fully Digitized Business Era.
In: Proceedings of the 25th European Conference on Information Systems (ECIS), Guimarães, Portugal, 2017.

For a comprehensive list of all E-Finance Lab publications see <http://www.efinancelab.com/publications>

Infopool

RESEARCH PAPER: TOXIC ARBITRAGE

In contrast to theory, where arbitrage opportunities disappear instantaneously, prices adjust with a lag to new information, making it possible for short-lived arbitrage opportunities to arise. This is especially relevant in today's fragmented markets, where assets are traded on multiple venues. These opportunities are toxic since they expose market makers to the risk of being picked-off by high-frequency traders exploiting these arbitrage possibilities before market makers can update their quotes. The authors show that liquidity is lower on days when the fraction of toxic arbitrage opportunities and arbitrageurs' relative speed are higher. The findings suggest that the price efficiency gain of high-frequency arbitrage comes at the cost of increased adverse selection risk.

Foucault, T.; Kozhan, R.; Tham, W. W.

In: *Review of Financial Studies*, 30 (2017) 4, pp. 1053-1094.

RESEARCH PAPER: SHARING LEDGERS FOR SHARING ECONOMIES: AN EXPLORATION OF MUTUAL DISTRIBUTED LEDGERS (AKA BLOCK-CHAIN TECHNOLOGY)

Mutual distributed ledgers (MDLs), like blockchains, have the potential to transform the way people and organizations handle identity, transaction, and information. The ability to have a globally available, verifiable, and untamperable source of data provides anyone who wishes to provide trusted third-party services (i.e., most financial services firms) the opportunity to do so cheaply and robustly. After giving insights into blockchain basics, the authors show possible applications of blockchains in financial services. They describe a cooperative research project where they showcased distributed ledger configurations, exploring how they might work in a set of "use cases". The research consortium concluded that MDLs incorporating trusted third parties for some functions have significant potential in financial services, such as know-your-customer, antimony laundering, insurance, credit, and wholesale financial services.

Mainelli, M.; Smith, M.

In: *Journal of Financial Perspectives*, 3 (2015) 3, pp. 38-59.

E-Finance Lab Quarterly

The E-Finance Lab publishes the Quarterly in the form of a periodic newsletter which appears four times a year. Besides a number of printed copies, the EFL Quarterly is distributed digitally via E-mail for reasons of saving natural resources. The main purpose of the newsletter is to provide latest E-Finance Lab research results to our audience. Therefore, the main part is the description of two research results on a managerial level – complemented by an editorial, an interview, and some short news.

For receiving our EFL Quarterly regularly via E-Mail, please subscribe on our homepage www.efinancelab.de (→ news → sign up / off newsletter) as we need your E-mail address for sending the EFL Quarterly to you. Alternatively, you can mail your business card with the note "EFL Quarterly" to the subsequent postal address or send us an E-mail.

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www.efinancelab.com.



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For more information about the House of Finance, please visit www.hof.uni-frankfurt.de.

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