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MITIGATION OF REGULATIONS BURDEN IN FINANCIAL SECTOR BY APPLICATION OF HIGH TECH SOLUTIONS

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Abstract

Introduction of new complex regulations after the crisis of 2007-08 made financial institutions face a peculiar burden caused by the significant increase in their regulatory spending. Meanwhile the application of blockchain-based technologies, artificial intelligence and big data is gaining more and more popularity in different segments of finance, including the regulatory related areas. Appearance of RegTech firms changes the traditional model for treatment of regulatory related issues by financial intermediaries themselves, introducing the opportunity for cooperation with external providers of technological expertise. The article treats the interaction between financial institutions and compliance orientated technological innovations outlining three possible perspectives for future development.

Keywords: *financial regulation, compliance, financial and technological innovations*
JEL Codes: *G20, G 28, O30*

1. Introduction

Post-crisis years could be characterized as a period of significant changes in the field of financial regulations. Following the worst economic turbulence after the Great Depression, the updated financial supervision framework imposes numbers of stricter and more complex regulatory requirements. Basel III, Solvency II, Fourth and Fifth EU AML directives, PSD 2, MiFID II, FATCA are only some examples for more sophisticated regulations with global impact. In order to give adequate response to the fast changing environment, authorities extend the range and scope of existing supervisory requirements, increase their number significantly and sometimes place financial intermediaries in the difficult position of non-compliance with regulatory basis. In their attempts to deal with constantly growing burden of regulations, financial institutions introduce a new way of

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outsourcing regulatory orientated issues by cooperation with small, independent and innovative technology firms originating from the FinTech industry.

The study focuses on the adoption of blockchain technologies, artificial intelligence and big data technologies in the compliance toolbox of financial institutions. It points several perspectives of the interaction between the high tech sector and the financial industry, and the main research objective aims to highlight some arguments supporting the thesis for new technologies as an appropriate option for softening the pressure of regulatory costs.

2. The burden of post-crisis financial regulations

Passed decades of deregulation in the field of finance, together with globalization and the revolution in information technologies undoubtedly contributed to global economic development and social well-being. Recalling the fundamental cyclicality principle today the pendulum turns in opposite direction causing a wave of over-regulation for financial industry, which more and more often is defined as a burden. Financial sector itself also could be blamed for falling in this situation. Some of the reasons behind present trends to over-regulation follow processes like:

- financialization of the economy[1];
- formation of large structures, too big to fail;
- the interconnection and interdependence between large financial intermediaries;
- complexity of different types of structured, hybrid and derivative financial instruments;
- formation of brand new channels for creation and distribution of financial products;
- appearance of slightly regulated and even unregulated financial areas and services.

In this line of thought, global financial crisis of 2007-08 should not be seen as a sole factor for tightening the regulatory regime, but rather as an occasion provoking a reaction to more regulation. Accustomed to working in more liberal environment for a period of more than three decades, financial institutions, and especially banks, face a significant challenge trying to respond to changed and stricter regulatory framework. Below are presented several figures illustrating constantly increasing regulatory spending made by global financial community[2].

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[1] Financialization is a term associated with the growing domination of the financial sector at the expense of the real. Known also as “financial capitalism” or “deindustrialization”, together with deregulation and globalization, it is one of the three megatrends, characterizing the development of world economy for last thirty years. See: Georgiev 2016: 157-159.

[2] Conditionally, two main drivers of regulatory costs growth could be summarized as: 1) stricter capital and liquidity requirements (introduced by regulations like Basel III and Solvency II) and 2)

According to Thomson Reuters the number of financial regulatory updates in 2016 globally reaches the number of 52 506 or average 201 per each working day. Especially for banks, the number of regulations they have to observe on global scale has increased more than three times in the period between 2011 and 2017 (English and Hammond 2017: 22; Grasshoff et. al. 2017: 4). RegTech Council estimates over 50 000 regulatory amendments published in the period between 2009 and 2012 in G20 countries (Butler et al. 2018: 4) while research of Burnmark, Alvarez & Marsal points an annual increase of 429% in the period between 2008 and 2015 (Burnmark, Alvarez & Marsal 2018: 21). Table 1 summarizes data for the period between 2008 and 2017 showing the constant increase of regulatory changes in numbers and as a percentage.

Table no. 1. Annual number of amendments of global financial regulations

Year	Total number of regulatory amendments	Growth compared to previous year	Average number of regulatory amendments per one business day
2008	8 704	–	~ 34
2009	10 075	+ 16 %	~ 40
2010	12 179	+ 21 %	~ 48
2011	14 215	+ 17%	~ 60
2012	17 763	+ 25 %	~ 75
2013	26 950	+ 52 %	~ 100
2014	40 603	+ 51 %	~ 150
2015	51 583	+ 27 %	~ 200
2016	52 506	+ 2 %	~ 200
2017	56 321	+ 4 %	~ 223

Sources: English and Hammond 2018: 16; Grashoff et al. 2017: 10.

Numerous changes of existing regulations and the adoption of new supervisory requirements undoubtedly affect the compliance costs made by financial institutions, especially large banking institutions. For example, the compliance staff of Citi counts 30 000 employees (Citi 2014), while the number of HSBC`s personnel engaged with the verification of business and institutional customers` identification consists of more than 2 000 employees (Arnold 2018).

Is the coverage of compliance costs no longer too costly for financial institutions? A study of Deloitte's Canadian division finds that financial institution leaders often

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tightened rules for complying with new and updated EU and US regulations like 4th and 5th AMLD, PSD 2, GDPR, MiFID II, FATCA, EMIR, CSMAD, MAR, AIFMD and etc.

express a feeling of frustration over the environment surrounding their compliance. The research leads to the conclusion that signals received by the regulators are not always clear, making it difficult for financial institutions to plan their next moves. The challenge is compounded as well by the fact that both national regulations and international rules should be respected at the same time (Deloitte 2017: 1). Hence, if in medium to long term, the cost paid for new regulations could result in a higher level of stability and security at systemic level and ultimately result in, at least partially recovering confidence lost after the financial crisis, in short term the trend towards maximum supervisory coverage could be perceived as an additional cost burden. Interesting in this regard is the conclusion of OECD that compliance may sometimes cost too much and lead to more negatives than meeting the objectives of the relevant regulation, which could lead to a situation causing more harms than benefits. A specific example here is the situation when due to excessive compliance costs some market players are getting out of business (OECD 2000: 11).

According to some calculations, financial industry spends on regulatory issues globally around $80 billion per year (Mesropyan 2018), and adoption of a single regulation like MiFID II costed to financial sector the sum of $2,5 billion. (Butler et al. 2018: 4). According to Bain & Company similar costs take between 15 and 20% of daily operational costs and 40% of reorganization projects expenses (Memminger, Lin and Keswakaroon 2016). Juniper Research analysis points that in 2017 compliance costs of financial institutions took around 4% (around $270 billion) of their income with expectations this percentage to increase to 10% in 2011 (Juniper Research 2017). Another estimations point even more drastic trend of growth of 20% (Grigg 2017: 4).

3. The invasion of new technologies and the cooperation with the "tech" sector

In parallel with constantly rising cost burden in the financial sphere, another process takes its place. It is connected with the appearance of the financial technology (FinTech) sector represented by innovative, independent, highly profiled and very often small technology firms, which unnoticed turn in significant competitors of major financial institutions. Acronyms like FinTech, InsurTech and WealthTech represent a short description of changed landscape for traditional financial services providers like banks and insurers, for example. Thanks to new technologies financial activities like payments, lending, insurance, financial planning, wealth management, traditionally perceived as prerogatives of classical financial intermediaries, nowadays are accessible thorough brand new and different distribution channels.

Speaking about application of newest IT innovations, first association is often connected with cryptocurrencies and namely the most popular Bitcoin. Standing behind them *blockchain technology* definitely has a much wider application potential in

economics, as a whole, and more specifically in finance and especially compliance[1]. Shared databases, for example, are gaining popularity in routine know your customer (KYC) and customer due diligence (CDD) compliance operations. This helps customer onboarding verification process, as well as different anti-money laundering (AML) and counter-terrorist financing (CTF) related tasks, minimizing compliance costs.

But blockchain is not the only streamlining technology affecting modern compliance activities. They rely as well on *big data* manipulation and interpretation. The enormous amounts of data, connected with contemporary financial operations often require usage of multiple systems and databases. Nowadays` silos compliance infrastructure in larger financial infrastructure is based preliminary on different and non-relational databases (also known as "NoSQL databases"). Thus for a simple verification task, e.g. check of new customer in different blacklists, conventional compliance software has to perform separate queries in different internal and external databases, increasing the processing time and probability of incorrect return (due to different data structures of separate databases). When speaking about more complicated financial operations, risk of delay and unreliable information rises significantly.

Application of big data techniques allows the connection of different types of databases and finding different patterns and relations in data, which is impossible for traditional software tools. Furthermore, in sense of cost optimization, big data, together with crypto technologies, allow sharing information between separate financial institutions and supervising authorities, creating common databases and lists with negative information and etc.

Third main technological vector of change in compliance is connected with the *artificial intelligence* (AI). Initially entered into everyday life by mobile devices, internet of things and other smart technologies, its adoption in financial services industry was a matter of time. Away from all other benefits it brings in commercial point of view, its application for compliance related purposes offers very wide scope for development. In the field of customer onboarding, KYC, AML and CTF popularity gains smart technologies, allowing: conversion of analog data into digital (e.g. speech, text and face recognition), analysis of data (by knowledge discoveries in databases, application of rule-based automated systems, analysis by analogy, verification of data and etc.). A good example in this direction is the adoption of AI-based solutions for detection of trade-based money laundering[2]. Automated process using AI also find application in

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[1] Based on cryptographic techniques, the distributed ledger technology (DLT) enables greater level of security of different kinds of digital information – transactions, customer files, contracts, databases, records keeping and etc. The technology does not allow data manipulation without the approval of all counterparties in the system.

[2] Being one of most complex and difficult for identification mechanism for money laundering, trade-bases money laundering uses the cover of legitimate import and export activities in order to conceal integration of dirty money into financial system. Usage of complex documentary financial

transactions monitoring, finding anomalies, business continuity management, reporting activities and etc.

Who are the developers and vendors of these high tech solutions? Financial institution themselves, traditional financial software developers or somebody else? All three assumptions could be considered as correct, but special attention deserve namely the smallest and newest among them, and namely the specific Regulatory Technology (RegTech) companies. It can reasonably be argued that their appearance has given a significant impetus to the development of the high-tech initiative in the field of compliance.

According to some definitions, appearance of RegTech could be connected with the FinTech industry or more precisely, their activity is described "as any range of fintech applications for regulatory reporting and compliance purposes by regulated financial institutions" (BCBS 2018:43) or as "technology that addresses regulatory challenges and facilitates the delivery of compliance requirements" (CB Insights 2017: 13). Institutionalization of RegTech as a separate activity is linked to the publication of UK`s Financial Regulator (FCA) "Call for Input: Supporting the development and Adoption of RegTech", explaining the need to attract new digital technologies in support of financial regulation (FCA 2015: 3).

Cited document points the following directions related to the formation of RegTech initiatives: 1) technological accelerators; (2) risk assessment and regulatory compliance tools (in the field of trade-related fraud prevention, financial crime, money laundering, customer segmentation and the risk of irregularity); 3) large data processing techniques; 4) tools in the field of visualization and robotics; 5) software integration tools and 6) usage of cloud technologies (FCA 2015: 4).

The European Parliament's motion for a European Parliament resolution on financial technology (FinTech) of the Committee on Economic and Monetary Affairs notes that regulatory technology (RegTech) "can lead to considerable benefits for financial institutions and supervisors by allowing new technologies to be used to address regulatory and compliance requirements more transparently and efficiently and in real time" and "has the potential to improve compliance processes, in particular the quality and timeliness of supervisory information, by making them less complicated and more cost-efficient" (ECON 2017).

Above-mentioned report demonstrates the political will at the highest supranational level to stimulate the development of the activities for the implementation of the high-tech potential in the field of financial regulation. This view is shared as well by the other side of the Atlantic. A US Department of Treasury`s report on new financial technologies

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instruments (bills of exchange, bills of lading, letters of credit, different forms of trade financing and others) in foreign trade creates favorable conditions for infusion of illegal capital and their subsequent legalization through fictitious commercial operations.

is made the conclusion that the development of financial technology has allowed financial firms to improve their efficiency by lowering their regulatory costs (U.S. Department of the Treasury 2018: 5).

Versatile nature of RegTech activities does not allow unitary systematization in specific category areas. Nevertheless, different successful classifications are available. For example, Deloitte`s database on RegTech`s firms classify their activities in five different spheres: 1) regulatory reporting, 2) risk management, 3) identity management and control, 4) general compliance activities and 5) transaction monitoring[1]. According to Burnmark's RegTech classification, main RegTech areas, based on all digital use cases of banks are: 1) Regulatory Compliance (including: regulatory intelligence, compliance and governance, and regulatory reporting); 2) risk management (including: market risk, conduct risk and cyber risk); 3) financial crime (including: financial fraud; money laundering and terrorist financing and market abuse) and 4) identity management (including: KYC for identity verification, KYC for onboarding and KYC for AML checks)[2].

Lack of a uniform classification of RegTech activities should not be treated as an obstacle. What could be analyzed in this case are the several main competitive advantages of firms providing such high tech services. As it is well seen from mentioned Deloitte`s database, RegTech companies are primarily: 1) small (mostly with personal below 100 employees); 2) new (established in last 10 years) and 3) with global presence (functioning mainly in the virtual space where no boundary limitations exist). Especially their flexibility and agility give RegTech firms the potential to meet the fast changing technological environment predetermining the future development of financial industry – something not typical for traditionally conservative and cumbersome financial institutions.

4. Some aspects of change that has already begun

In brief, present day financial sector faces the pressure of new regulations, the aftermath of technological turbulence and the appearance of a brand new player – the "tech" sector. In view of the trends mentioned above and without claiming exhaustiveness, three possible perspectives, describing future interaction between financial institutions and compliance orientated technological innovations, could be outlined.

Perspective one – *traditional financial institutions to become high tech companies*. Good illustration of the intensive penetration of high tech solution in financial business

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[1] See: https://www2.deloitte.com/lu/en/pages/technology/articles/regtech-companies-compliance.html.

[2] Burnmark, Alvarez & Marsal 2018: 7.

are the words of JPMorgan Chase` CFO Marianne Lake. Speaking in front of banks` investors in 2016, Ms. Lake declares that JPMorgan is a "technology company" with its $9 billion technology budget and a team of 40,000 technologists, including 18,000 developers who create intellectual property (Crowe and Turner 2016).

Inevitable binding of contemporary financial intermediaries with innovative informational technologies unconditionally provokes the implementation of corresponding solutions in their compliance[1]. It is no longer an exception but a rule technologically upgraded compliance systems to be referred as Compliance 2.0, i.e. when taking into account the integration of solutions using AI, big data and blockchain. Implementation and maintenance of such automation requires its specific expert potential. Maybe that way, part of the compliance personnel, unloaded from some routine operations, gains the potential to turn into quasi technological staff. And is not that the case with many other types of specialists, engaged in the financial sphere?

Perspective two – *new level of collaboration with the technology sector*. Unlike traditional outsourcing practices, where specific activities are being transferred to external contractors following mainly cost optimization motives, the case of cooperation between financial institutions and RegTech is different. Here the leading incentives are connected not only with the financial factor, but with the possession of marginal levels of technological expertise and agility. Even if for a large scale financial institution creating own research and development departments, or even divisions, is not a significant obstacle, nature of big organizational structures influences and predetermines the impetus to constant innovation. This little, but significant detail makes numerous, small and independent high tech innovative RegTech companies worthy competitors of financial mastodons.

In brief, pressed by heavier regulations, financial institutions have the necessity of innovative compliance technologies and the readiness for such types of investments. On the other had are the countless technology startups, introducing different high tech solutions for financial reporting, identity management, fraud prevention, business continuity and etc. By the perspective of the financial sector, expected to meet regulatory requirements, potential options are: 1) to buy different solutions (patents, codes and etc.); 2) to outsource regulatory related operations to external specialized RegTech firms and 3) to develop own high tech solutions. None of the three options should be excluded and even an assumption for their combination in different cases could be made.

[1] Example for such innovative service is the "One Pay FX", which is the first blockchain-based international money transfer service across four countries, developed by Spanish bank Santander. See: https://www.santander.com/csgs/Satellite/CFWCSancomQP01/en_GB/Corporate/Press-room/Santander-News/2018/04/12/Santander-launches-the-first-blockchain-based-international-money-transfer-service-across-four-countries-.html.

Discussing the appearance of multiple RegTech firms, thesis about the fruitful competition yielding good results is more than reasonable. Banks and other financial institutions can only be in favorable position by presence of different alternative, constantly updated and enhanced solutions.

Perspective three – *high tech financial regulators*. Adoption of high-tech arsenal by supervisors could be determined as one of the most significant dimensions of the process connected with penetration of newest IT achievements in the field of financial regulation. Main drivers provoking regulatory agencies perceive generously their potential could be found in: 1) the inability to regulate complicated products and high level of interdependence in financial sector without "smart" technology assistance; 2) already observed implementation of high-tech solutions by subordinated financial institutions – both in their business activities and for regulatory purposes; 3) the appearance of brand new type of high-tech providers of financial services in the face of FinTech sector, based entirely on new technologies.

Driven by similar motives, regulators` response leads to formation of another class in the "tech" segment, and namely the Supervision Technologies (SupTech), which term embrace all high-tech initiatives undertaken by financial regulators. Particular example here are organized by supervisors initiatives like sandboxes, accelerators, hackathons, innovative offices and etc.[1]

In this line of thought it is necessary to be considered once again the potential of small technology startups. As mentioned above, new technological environment makes them increasingly important factors when speaking about the formation of trends, that a little bit later financial institutions start to follow, as well as regulators themselves. According to some studies, the relations between the parties involved in the creation and application of SupTech, leads to the development of several models of cooperation, which could be systemized like: "bank - regulator"; "bank - regulator - startup"; "regulator-starter" and "regulator-regulator" (Burnmark, Alvarez & Marsal 2018: 36). A kind of peculiar innovation itself is also the fact that regulators are seeking for cooperation with all stakeholders in the SupTech ecosystems, attracting financial institutions, FinTech and RegTech companies, scientific and research organizations[2].

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[1] For example, see: Smart Financial Center, created by Monetary Authority of Singapore (http://www.mas.gov.sg/Singapore-Financial-Centre/Smart-Financial-Centre.aspx); The FinTech Accelerator Project, established by Bank of England (https://www.bankofengland.co.uk/research/fintech); Data Science Hub initiative of Dutch central bank (https://www.dnb.nl/en/supervision/innovationhub/index.jsp); The LabCFTC Project of the U.S. Commodity Futures Trading Commission (https://www.cftc.gov/LabCFTC/index.htm); CFPB Project Catalyst of United States` Consumer Financial Protection Bureau.

[2] Good example of cooperation between regulators, the "tech" sector and academic institutions is The FIN-TECH project, under the EU's Horizon2020 funding scheme, aiming to create a European training programme, by providing shared risk management solutions that automatize compliance

5. Conclusion

Trends marked above just outline the boundaries of one significant process of change covering all aspects of financial sphere, including its regulation. Something more, especially in the field of compliance, new technologies give financial institution unload to some degree by the burdensome regulatory costs imposed by fast changing regulatory framework. Apart from undeniable technological innovations, interesting is the new type of cooperation between both sides of the supervision process – financial institutions and regulators. Namely newborn "tech" sector could be perceived as peculiar mediator, creating a new type of basis for achievement of better regulatory efficiency.

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of Fintech companies (RegTech) and, at the same time, increases the efficiency of supervisory activities (SupTech) – see: https://fintech-ho2020.eu.

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