International Centre for Digital Finance

Working Paper 05/2022

REGULATORY AND SUPERVISORY SYSTEMS AND FINANCIAL INNOVATIONS: CHALLENGES, IMPACT AND ANSWERS - SEEKING

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Warsaw, December 2022

MCFIC Working Papers No 5 2022

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1. Introductory remarks

Supervision of the financial markets has become over recent twenty or so years an increasingly important element of the financial systems. It is progressively moving away from passive compliance check out towards an active influence of the financial markets reality. It is encompassing both a growing range of issues and entities and is undertaking an ever deeper penetration into the material processes in the financial market and in the activities of the financial institutions. It is also acquiring increasingly regulatory powers of the financial markets inter alia through the extensive application of self-produced 'soft' regulatory norms.

All of this results in the enormous growth of importance of the supervisory systems and their old and new institutions,proliferating particularly after the recent global financial crisis.They are also consuming increasing amount of public resources allocated to them.US Securities and Exchange Commission for example,the most powerful financial supervisor in the world,may be taken as a good example of the existing situation.It oversees currently over 4300 stock US listed companies with the capitalisation level of over 30 trillion USD.It supervises the equity market of an annual value of ca 80 trillion USD and of the debt market of ca 40 trillion USD.It also supervises directly over 26000 registered investment companies.It has on its payroll over 4500 people of which 1200 in the enforcement alone.

The goal of this chapter is to provide a strategic overview of principal challenges facing concurrently the financial market supervision and its responses.Particular area of our interest is the interaction of supervisory systems with the financial innovations taking place on the market as well as their own innovative drive.Supervision ought not only respond reactively to the development of financial innovations taking place on the market but also implement its own innovative agenda.Some parts of this agenda has its cause roots in the financial system developments however another part is derived from supervisory experience and scientific analysis.

The first part of the chapter discusses theoretical foundations of the supervisory system trying to indicate the sources of its powers and its societal role.It deserves today more attention than in the past in view of the unprecedented powers acquired by supervisors over supervised institutions and the financial markets in recent period.In the second part we take a close look at the changing supervisory paradigm in its current form,which emerges in the aftermath of the recent global financial crisis. The third part of the paper

reviews the new challenges facing the financial supervision in its search for innovations and adequate supervisory tools,adapting to new needs,challenges and available opportunities.

2.Why is financial supervision needed?:theoretical foundations

The oversight of the financial market, referred to as supervision over the financial sector, or simply financial supervision, means application by the State of administrative law vis a vis financial markets,their infrustructure and financial institutions,to ensure that they comply with the law.Today this formal compliance is frequently broadened to include also proper conduct of business.

This oversight system may relate to various areas of the financial activity and may be exercised either by a single, a few or by more numerous specialized entities.

Contrary to what one might think, neither the concept itself nor the premises of supervision over the financial market are based on a uniform understanding and interpretation. Theoretical achievements with regard to supervision are particularly poor[1].

The principal component of supervision consist of the control of supervised entities and modification of their activities by means of applied supervisory instruments. Thus supervision not only checks for compliance of the actual state of affairs with the requirements of the law and art of bussiness, but also must have the means of influencing the behaviour of the supervised entities.In other words,it needs to possess the enforcement measures. Without such measures, the supervising authority would only be a passive observer of the events. At the same time, supervised entities must accept the supervisory activities undertaken by the oversight organs and cooperate with them in the course of their activities.

The special role of the public oversight system and its powers with regard to financial institutions as well as its far-reaching quasi-ownership rights, incomparable concurrently to any other sectoral solutions, have not yet been the subject of intense theoretical interest.[2] A lot more consideration is devoted to the issue of how to perform various supervisory tasks from the point of the institutional set up than to the premises of special supervisory powers and its boundaries[3].

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1 D.Masciandaro , M.Quintyn, “The evolution of financial supervision: the continuing search for the Holy Grail”,263-318 [in] Balling M, Gnan E, (ed.): 50 *Years of money and finance: lessons and challenges,* Vienna: Suerf, Larcier, 2013

2 J.Monkiewicz,Wyzwania współczesnego nadzoru nad rynkiem finansowym,w:L.Gąsiorkiewicz,J.Monkiewicz(red naukowa),Wyzwania współczesnych rynków finansowych,Wydział Zarządzania,Politechnika Warszawska,2019,pp.61-74

3 W.Szpringer, *Instytucje nadzoru w sektorze finansowym. Kierunki rozwoju,* Poltext, 2014

Most often, the particular importance of the financial system and financial institutions in the operation of microeconomic and macroeconomic systems as well as the need for the protection of clients' funds are given as the justification of its unique role[4] This is not a convincing argument, as there are many examples of equally important human activities for example in the areas of health, safety, energy, transport, nuclear energy, operation of internet,the digital economy, etc., in which case,public regulatory and supervisory intervention is much weaker,if any. There is no control and certification of their market access,no control and certification of the qualifications of their shareholders, no control and certification of key persons including members of the management board and supervisory boards in the institutions concerned, no control and certification of internal corporate governance and applied business models, no control and certification of IT systems used, absence of rules for leaving the market,administrative controlling of product policy, etc.

So what is the problem with the financial markets and financial institutions.Why these special rules have emerged and are tolerated and expanded?

The best known theoretical attempt to address this issue offers so far the theory of representation which was formulated in 1994 [5].In line with this concept, the special powers of public supervision in the financial market is the result of the coexistence of a set of unique factors. The most important of them is the fact that basic financial institutions such as banks,insurance and investment funds apply a specific business model.Its essence relies in financing their operations to a large extent by debt rather and not by their own funds.They are so called the debt driven institutions.The financial leverage ratio, measured as the ratio of assets to equity, is usually concurrently above the level of 10 and may reach much higher levels.It means that these institutions are in a possession of the assets ten times or more of their own funds invested.

This debt is incurred mostly from unprofessional market participants who are unable to control and effectively influence the way it is used by financial institutions, as banks are able to do in the case of non-financial corporations. It would require, among other things, that they receive adequate informations from the boards,possess appropriate competencies as well as adequate economic potential to perform monitoring duties.

In practice, such a business model may produce a strong tendency in financial institutions to excessively load their resources with risk. The reason is that the bulk of possible losses is borne by clients who, with their funds, finance the lion's share of the financial institutions' activity. On the other hand, if this activity brings positive results then the entire surplus falls to the financial institutions,means to its investors, which do

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[4] P.Zawadzka, *Modele nadzoru rynku finansowego,*Cedewu, 2017,pp.24-25

[5] M.Dewatripont , J.Tirole, *Prudential Regulation of Banks,* MIT Press,1994.

not share such financial success with others. This assymmetrical balance in the financing of losses and the appropriation of additional benefits may ultimately induce shareholders of financial institutions to exert undue influence on their management boards to take excessive risk.

Additionally, the boards themselves may be the source of an excessive level of risk accepted by the institutions managed by them, due to the architecture of their remuneration systems. Its characteristic feature is the widespread use of variable remuneration elements, which depend on the current, and thus short-term, economic results of the institutions they manage. Such management policy is further favoured by the fragmentation of the shareholding structure and its high fluidity due to the predominance of speculative thinking among investors. It results in a significant autonomy of management structures in relation to their shareholders and limits the possibility of the effective corporate control in the entities owned by such a shareholder base.

In this situation, taking into account the macroeconomic importance of the financial system and threats to financial stability resulting from its improper functioning, it is justified to limit ownership rights and the economic freedom of financial institutions by creating a public system that will exercise supervision over the risk management system in financial institutions in the name of their clients, and in growing degree , in the name of their owners.This is precisely why supervisory systems grow and prosper and gain in importance with the subsequent financial crisises.The growing degree of supervisory penetration into modern financial systems indicates that such a direction of thinking is finding increasing acceptance.

3. New paradigm of the financial markets supervisory model

The pillars of the financial sector supervisory system reflect each time the dominating view of the features and characteristics of the financial activities. It should be noted that the basic components of this view are, at least from the 80's of the last century, common to all segments of the financial market;the banking, insurance and securities markets. In its elaboration, the banking sector has for a long time enjoyed a special role ,thus leading to the dominance of other related areas by the banking model.It is still the case also as of today.

The model, sometimes referred to as a paradigm, always changes as a result of a change in dominant views, which most often occur as a result of some external shocks, especially in the form of a financial crises. Testing its resilience by these external shocks is probably the best way to check its correctness and to formulate possible normative proposals aimed at modifying the existing regulatory and supervisory model. In this sense, it is legitimate to treat the existing regulatory and supervisory model as a cumulative set of responses to crises experienced in the past.

As a result of the experience of the last global financial crisis, there is a rapid and deep change of the paradigm that has been in force before its outbreak. This paradigm, called the Washington consensus, due to the special role assigned to the International Monetary Fund in defining global financial standards, was in force since the 1980's[6]. Its essence boiled down to an absolute belief in the rationality and efficiency of financial markets. They were considered to be essentially effective,though prone to short-term turmoil. Their proper functioning required only good access to market information by market participants.The functioning of these markets should not be disturbed by public intervention.Only the efficient operation of their own mechanisms should be enabledand supported.This consistently meant assigning the main role to market discipline, supported only in a second row by regulatory discipline.

This consensus acknowledged that the financial system is safe through private risk management at the level of individual financial institutions.The quality of this management was guaranteed by public financial supervisory systems in the form of micro-prudential supervision. The supervisors focused mainly on the financial stability of individual entities,without taking into account their external links and the external consequences of their decisions.Additionally, their task was not to interfere in the internal corporate governance of these entities, their risk culture, or the business models adopted by them.They were considered complete internal issues.

It was also believed that financial innovations are by definition good as they increase the resilience of financial systems to shocks and increase the quality of risk management. They were viewed therefore as a desirable element of financial development and financial systems.

Supervision in this system was formal and superficial,with no special material powers and the sole object of its care was the safety of individual financial institutions. There was a belief that the whole system would then be safe.

In general, the heart of the Washington consensus constituted a kind of ‘regulatory trilogy’ - greater transparency, more disclosure, and better risk management by financial institutions [7]

The crisis has caused the belief in the rationality of markets and financial institutions to be questioned. Before the crisis, it seemed that possible problems related to insolvency might affect rather small, ‘lower-grade’ institutions of the system. It was believed that large, first-class financial entities have their own experts, excellent risk management

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[6] E.A.Helleiner, Bretton Woods Moment? The 2007-2008 crisis and the future of global finance”, *International Affairs*, 86(3) , 2010,pp.619-636.

[7] J.Eatwell, Practical proposals for regulatory reform”, [in] P.Subacchi , R.Monsarrat (eds.): *New ideas for the London summit: recommendations to the G20 leaders*, Royal Institute for International Affairs, Chatham, The Atlantic Council , 2009,pp.11-15

systems, flawless conduct procedures,and are basically resilient to eventual instability. But the crisis showed that this did not work and that the biggest problems came exactly from large, rich and innovative institutions. Their risk management systems proved to be unreliable and provided improper informations and false solutions when they started to operate under stress conditions.

The new consensus, known as the 'Basel' consensus - from the place where the centre of global regulatory solutions in the financial sector has been effectively transferred during the crises, is based on quite different premises. Its starting point is the assumption that the financial market is fundamentally unstable and pro-cyclical, with a tendency to herd behaviour. Its instability is further increased by the excessive complexity of financial systems and by the business models used, as well as by the financial innovations introduced into circulation[8]

This may sometimes require appropriate public intervention,prohibiting the use of certain solutions in financial models or the prohibition of, or restrictions on, the sale of certain products .Innovation has ceased to be something by definition good and sought after, but has become an element increasing the complexity of the financial system and in some cases increasing its instability.

In addition, internal corporate governance and internal risk management by financial institutions have become elements subject to the assessment and validation processes of supervisory bodies.

The Basel consensus is going away from the dominance of microprudential perspective and giving a fundamental role to the macro-prudential perspective,which in reality constitutes a call for the public risk management of the financial system. In this way, financial safety becomes a public domain, and financial supervision over the market is justified to become material and deep. This approach transfers to the State huge responsibility and a huge reputational risk that it will have to face. Such an approach also gives new role to central banks, which necessarily become the most natural macro-Macro-prudential supervision has different objectives, a different analytical perspective and a different subject of interest from micro-prudential supervision, although it often uses the same instruments. Main goal is to avoid the macroeconomic costs of financial crises, and its area of interest - the entire financial sector.

Macro-prudential supervision also has a different manner of accomplishing its tasks than micro-prudential supervision does. It is fundamentally based on applying to the world of financial institutions new regulation standards that address identified aspects of systemic risk. This may concern, for example, new capital requirements towards the

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[8] A. Baker, The new political economy of the macroprudential ideational shift, *New Political Economy,* 18(1), 2013,pp112-139.

supervised institutions, the introduction of anti-cyclical buffers, new border levels of their debt, leverage ratios, the introduction of LTV or DTI thresholds, etc.[9] Macro-prudential supervision decisions thus assume, in principle, the form of new regulations introduced to the financial system. It is thus, contrary to micro-prudential supervision, directly related to regulatory rights that have a legislative character. Basically it is a legislative-supervisorial hybrid. It must thus remain in close relation to entities from the legislative world, which practically means its strong institutional relationship with governmental institutions from the world of politics.

Table 1. Micro and macro-prudential supervision - basic characteristics

Specification	Micro supervision	Macro supervision
Proximate objective	Limiting the risk for a single financial institution	Limiting the threat to the financial system as a whole
Ultimate objective	Protection of consumers and investors	Avoiding the macroeconomic costs of the crisis
Correlations and mutual relations between financial institutions	Irrelevant	Important
Characterisation of risk	Seen as exogenous/independent of the individual agents' behaviour/	Seen as endogenous/dependent on collective behaviour/
Subject of analysis	Individual institutions	Entire financial system
Time perspective of analysis	Approach based on the past ('backward looking')	Approach based on the future ('forward looking')

Source:C.Borio, *Implementing a macroprudential framework:blending boldness and realism,* BIS,2010,p.18

This supervision has no controlling or sanctioning instruments over the financial institutions which it supervises that is so typical of micro-prudential supervision. That is why, for its operational activity, it must remain in close cooperation with supervisorial systems of a micro-prudential character, which perform tasks of a direct enforcement type.

Along with supervision of a macro-prudential character, a characteristic of modern supervisory systems is the appearance – increasingly independent and separate – of supervision over the protection of the rights and interests of consumers.[10] This is

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[9] D.Schoenmaker , P.Wierts, *Macroprudential supervision: from theory to policy,* ESRB, WPRS 2,2016,pp.5-10

[10] J.Monkiewicz,M.Monkiewicz,Ochrona konsumentów w nowym paradygmacie regulacyjno-nadzorczym rynków finansowych,w:J.Monkiewicz,M.Orlicki(red)Ochrona konsumentów na rynku ubezpieczniowym w Polsce.Współczesne wyzwania,Poltext2015,pp.13-38

connected not only with the need,of more protection for consumers.It also reflects the growing awareness of the fact that insufficient protection of consumers can lead to the destabilization of the entire financial system. Its proper development is thus not only in the interest of private parties but of the public as well.[11]

The new consensus places regulatory discipline, which is supposed to correct market mechanisms, at the forefront of market enforcement measures.By doing so it also strongly increases the role and responsibility of supervisory systems. This additionally includes the right of questioning the principle of the inviolability of private ownership with respect to financial institutions.The consent in crisis management today ecompasses the application of solutions limiting ownership rights in case of public interest needs[12].This resolvability function becomes,apart from macro approach and consumer protection,a third element of the new powers of the todays supervisory systems.The resolution systems in question have been developed so far mainly for the banking sector, but in the intention of global regulators, they are also meant to function in the insurance and some parts of the capital market.

The increasing powers of the supervisory systems is accompanied by their growing politicization.This pertains not only to the stage of crisis management,as was commonly in the past, but also to the standard supervisory tasks in normal times[13]. This manifests itself, amongst other, in the direct participation of the representatives of governmental institutions in the process of exercising supervision as well as in the process of undertaking decisions. This is a fundamental change in relation to the old consensus in which the basic characteristic of financial supervision was its broad understanding of political neutrality[14].

4.Financial innovations–a growing challenge to the regulatory and supervisory systems

Financial innovations are by their nature always difficult to regulate and supervise.It is even more so today because of the fact that dominant part of financial innovations is concurrently based on technology enabled solutions-fintechs-which are to a large extent applying digitalization,computers and internet

[11] Global survey on consumer protection and financial literacy: oversight frameworks and practices in 114 economies, The World Bank, 2013.

[12] Directive 2014/59/EU of the EP and of the Council of 15 May 2014 establishing a framework for the recovery and resolution of credit institutions and investment firms

[13] S.Gadinis,From independence to politics in financial regulation, California, *California Law Review* 2013, *pp.327-406*.

[14] D.Masciandaro,R.V. Pansini, M.Quintyn, *The economic crises: did financial supervision matter?* IMF, WP 11/261.

in their complex combination[15].European Commission claims that precisely the financial sector is concurrently a major user of digital technologies and a leading driver of digital transformation in the economy.The development of these two areas is mutually dependent and requires active coordination of the State as well as direct cooperation of the financial sector and the real one[16].

The difficult task of regulators and supervisors relates to their search how to fit these new technological solutions into legal framework.

Fin Tech is most often defined as technology enabled innovation in financial services which may result in new business models,applications,products or processesThe same notion is frequently applied to economic agents offering digital services for the financial world[17].

Key technologies making up for FinTech world include artificial intelligence(AI),machine learning(ML),internet of things(IoT),Big Data analytics,distributed ledger technology(DLT),smart contracts,cloud computing,cryptography and biometrics[18].

Artificial intelligence enables computer programs applied in the process of problem solving,speech recognition,decision making or language translation.It is widely applied in the financial services inter alia in robo-advice,transaction authentification,data analysis,visualization,etc

Machine learning as subsector of artificial intelligence is the ability of the computers to learn by themselves without being specifically programmed,applying selfoptimizing algorithms.It is data based and uses neural networks and deep learning.It is widely used in supervisory systems.

Application of AI and ML could support inter alia automatization of credit decisions and better detection of market manipulation and misseling practices[19].

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[15] FinTech,RegTech and Suptech:What they mean for financial supervision,Torontocentre,August 2017

[16] European Commission,Press release,8 March,2018

[17] Financial stability implications from fintech,27 June 2017,FSB,s.1

[18] He D I inni-Virtual currencies and beyond:initial considerations,IMF Staff Discussion Note,2016,s.11

[19] Kabza M-Sztuczna inteligencja w finansach moze stworzyć nowe ryzyko systemowe,Obserwator finansowy,Warszawa 29.11.2017

Internet of things on the other hand is not a single technology but a concept using several different technologies which allow more efficient management of everydays' life devices for arranging autonomously different transactions without personal intervention like purchasing,stock control,payments,house management,cars management,etc

Big Data analytics is again composed of different technologies that allow for the analysis of large amounts of both structured and unstructured data bases collected via internet,intranet or generated in the course of normal activities,press reports and the like.It is used to discover trends,structures and customer preferences.It can be based on machine learning technology,natural language processing or other technologies.

Integration of the technologies of artificial intelligence and Big Data allows for the analysis of large amounts of transactional information to identify some trends and correlations and some typical patterns.It may be used thereafter in forecasting future behaviour of financial market participants.This in turn could be managed by automated decision making process.It is leading therefore to the development of predictive analysis and application of smart contracts.This in turn could provide for substantial advantages in the lowering of transactional costs.

Development of artificial intelligence and machine learning could lead to the improvement of supervisory efficiency and to lower the compliance costs involved.It is a growing problem of the financial institutions where compliance costs have increased substantially in recent years.In a study produced recently by FinTech Poland it is estimated that compliance costs of big banks are soaring and compliance services are constantly growing[20].

5.Innovations in the supervisory toolbox:the need for retooling

Fundamental changes taking place in general supervisory paradigm have been accompanied since the recent global financial crisis by the application of many new innovative supervisory tools frequently described as supervisory instruments.They are supposed to enhance the effectiveness and efficiency of the supervision and to better reflect the new market reality.They are also a pragmatic reflection of the new tasks and powers allocated to the supervisory institutions.Interestingly enough they are not subject so far to comprehensive analysis and empirical evaluations,neither in Polish nor in foreign or international studies.This is in spite of their frequently very repressive nature and deep influence on the material processes taking place in the financial markets.Let us briefly elaborate on their spectrum.We will concentrate our attention on early supervisory powers,stress tests,suptech and whistleblowers,which are the cornerstone of the new supervisory toolbox.

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[20] Regtech:the significance of regulatory innovations for the financial sector and the state,Fintech Poland ,2017,s.4

a. Early supervisory powers

This is, as a matter of principle, about undertaking supervisory interventions before there is a breach of prudent conduct[21]. The aim of these activities is to limit the impact of the material effects of bankruptcy on the stability of the financial system.Early supervisory powers have been initially applied in the banking supervision to accelerate the actions against banks where weaknesses have been identified,though no formal breach of law has taken place.Thereafter this instrument has been applied to other segments of the financial sector,insurance and securities in particular.

Historically this instrument was first applied in the United States,back in 1991,in response to the financial crisis taking place at the end of 80's in Savings and Loan Associations.This crisis led to the bankruptcy of around one thousand of the said associations out of total over 3200 and resulted in the public bail out in the value of over 130 billions of USD.In result the Congress approved new regulations which effectively reinforced supervision of the banking institutions subject to federal oversight.It included inter alia annual supervisory reviews,auditing and risk evaluation as well as Prompt Corrective Actions-PCA.Thereafter this instrument have been popularized by the recommendation of the Basel Committee and became approved since 2014 in the supervisory practice of the EU[22].

The essence of this tool lies in the possibility of undertaking supervisory actions either of corrective or liquidating nature vis a vis supervised entity before it falls into the state of formal insolvency.It means that the point of activation is not a breach of prudential regulatory prescriptions and non compliance with existing regulations,which is a normal case in standard supervisory instruments.It means that the actions are taken due to the non compliance with the spirit of regulation and possible threats which may materialize in the future [23] .It effectively means allocating to the supervisory system the rights to act on the base of expert assessments and undertaking decisions in the administrative process.

Undertaking such measures means frequently the limitation of the owwnersip rights of the shareholders and boards of the institutions involved.In extreme cases it may mean effective transfer of the said rights to the supervisory institutions or other indicated bodies[24].

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[21] Framework for early supervisory intervention, BIS, BCBS, 2018.

[22] Understanding bank recovery and resolution in the EU;a guidebook to the BRRD,World Bank Group,April 2017

[23] Frameworks for early supervisory intervention,BCBS,BIS,March 2018,p.4

[24] J.P.Svoronos -Early intervention regimes for weak banks,FSI Insights,BIS, (April 2018), pp.18-34

Extremely important consequence of the application of the said tool is transferring bankruptcy decisions from civil judicial process and private law to the administrative procedures and public law and thus providing inter alia different priorities to the process.The major aim of the whole process become lowering the costs of bancruptcy process,protection of the critical functions of the institutions invoved and financial stability and not the interests of individual claimsholders,which was the case in the judicial insolvency process.

b. Stress tests

Stress testing is a technique of an early measurement of the sensitivity of individual financial institutions,their groups or else the entire financial system vis a vis the events characterized by small probability of their appearance but having great importance once they come up[25].

Stress tests encompass both the set of techniques of quantitative and qualitative nature.They are used to assess the degree of impact on a selected institution in a defined time horizon of unfavourable factors,in particular the change in its level of risk.

Stress tests are an extremely important of forward looking supervision in the process of risk management process within financial institutions.It allows taking supervisory actions before negative scenarious are taking place.It is an important supervisory innovation which destroy the reactive supervisory model which essence lies in taking measures only post factum and hence the supervision is frequently in retard and thus less effective.

Stress tests have come into national regulations and supervisory practice after adoption of Basel III. US was the pacesetter,introducing this tool in the Dodd-Frank Act in 2010.EU followed with CRD IV[26].

The aim of stress tests includes:

-identification of the key risks factors of the institution

-assessment of the sensitivity of the given institution vis a vis changes in its key risk factors

-evaluation of the impact of potentially unfavourable changes of the factors surrounding institutions on its risk profile[27].

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[25] M.Borsuk,K.Klupa,Testy warunków skrajnych jako metoda pomiaru ryzyka banków,Bezpieczny Bank,3(64),2016,p.29

[26] Final report on guidelines on institutions stress testing,EBA,GL-2018-04

[27]E. Renz,M.Tarnowska-Testowanie warunków skrajnych,KNF,2011,p.3

Stress tests may be carried out in different planes.EBA recommends in this regard four different approaches:

-solvency stress test,which assesses the impact of future macro and micro factors upon the general capital position of the institution,including its minimum capital needs.

-liquidity stress test in which case the changes taking place in the institution and outside are evaluated from the point of view of its liquidity

- scenario analysis in which case the subject matter of the analysis is the resistance of the institution against the appearance of different scenarious which rely on the simultaneous change in a range of factors.The scenarious may be based on a historical past or be absolutely hypothetical invention.

- sensitivity analysis in which case the subject matter of investigation is the impact on the institution of the single risk factor.

c. Suptech /supervisory technology/

Suptech is simple speaking a reflection of fintech in the area of supervision.It is defined as the application of innovative technological solutions in financial supervision to digitalize supervisory reporting and implementation of other supervisory processes like monitoring,predictive analysis and use of roboadvisors.[28]

Basically the aim of application of suptech is more effective and proactive monitoring of risk and compliance issues in the supervised entities.Its development is a natural consequence of the digitalization of the financial markets activities.

Principal area of suptech application are concurrently two supervisory areas-aggregation of data and its processing.In the first case new applications are widely utilized for supervisory reporting,management of data base qnd virtual assistance.An example is the utilization of supervisory data directly from the information systems of the financial institutions,their automatic validation and consolidation.Additionally they can be used to communication with the customers and processing of their claims,to better detect eventual irregularities and fraudulent activities of the supervised entities.

In the second area-data analytics,suptech applications may be used for the monitoring of the processes taking place in the financial markets,detection of improper market conduct,utilization of the system of enhanced risk indicators or systems of early warning.Examples are detection of insider trading activities or

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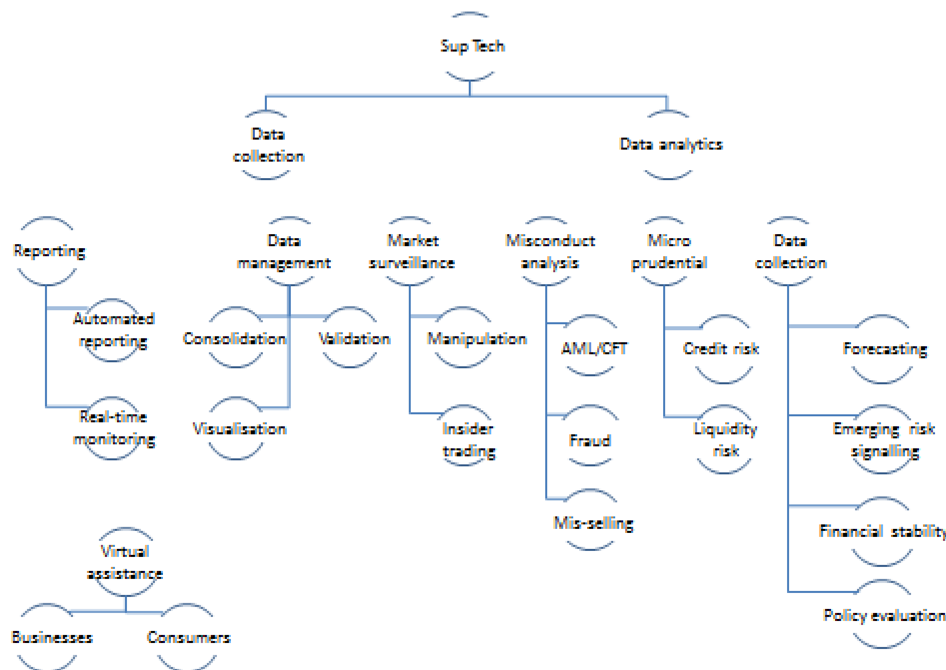
[28] D.Broeders,J.Prenio -Innovative technology in financial supervision/suptech/-the experience of early users,FSI Insights,No9,BIS,FSI,July 2018,p.1

Figure 1 Suptech application area



Source:Broeders D.Prenio J- Innovative technology in financial supervision/suptech/-the experience of early users,FSI Insights,No9,BIS,FSI,July 2018,p.6

identification of money laundering incidents.Finally it may find its direct application in micro and macro supervisory processes.

d. Whistleblowers

New supervisory tool gaining recently rapidly in importance in supervisory practice of the financial markets and its institutions relies on making use of the system of reporting on financial abuses by the outsiders to the supervisory bodies-whistleblowers' community.The notion of whistleblowers may be defined in many different ways which we will skip out.Its essence however lies always in reporting on illegal,improper,dangerous or unethical practices of employers revealed by their current or past employees which provide such information revealing their identity to supervisory auyhority[29].

The kind of persons covered by this notion may be of course much larger,including all those which voluntarily provide the tips on identified

[29] Ł.Cichy,Whistleblowing w bankach,KNF,Warszawa 2017,p.6

irregularities.Such an approach is for example used by US Dodd-Frank Act of 2010.

The whole concept of whistleblowing is very simple.It effectively means socialization of the part of the supervisory system which becomes co-generated by private people.It is interesting to note that these people are frequently top experts in the financial matters,more advanced than officials from the supervisory institutions.They might be unwilling to work within these institutions due to their uncompetitive work terms and limits associated with their public duties.Use of whistleblowers allows supervisory bodies to enhance effectively their resources and cut the costs down.In practice practical implementation of whistleblowing system is norty an easy task and principally requires provision of protective system to the whistleblowers from the actions taken against them by the affected subjects.Its effective use may also require application of a special rewarding system.

Initially a new tool has developed in US in the course of the financial scandals of dotcom companies in 2001-2002.The scandals led to the enactment in 2002 of Sarbanes-Oxley Act which inter alia substantially reinforced the corporate governance rules within the public companies.Introduction of whistleblowing system became a part of the new system.It has been given the new life with the subsequent enhancement in 2010 by the Dodd-Frank Act,which provided for the whistleblowers a formal rewarding system.According to the new rules all tips which result in the penalty of over 1 million USD are rewarded by US SEC, supervising the system.The reward is in the range of 10-30% of the payments received.In effect the whistleblowing became a very effective supervisory tool.According to the available statistics an annual delivery of tips amounts to over 5000.Total amount of remuneration paid within 2010-2018 accounted for over 326 million of USD.The highest single reward paid so far amounted to 35 million USD[30].

5. Concluding remarks

As follows from the considerations provided in this article, supervision over the financial market is currently undergoing a period of dynamic changes. It is becoming an increasingly important component of the financial system. It is moving progressively away from the role of a passive guardian of compliance with regulatory requirements to the active shaping of reality. It is also covering an increasingly broad range of subject areas and is making deeper and deeper inroads into the material processes of the financial market and in financial institutions. Its internal structure is becoming more and more

[30] Whistleblower Program.2018 Annual Report to Congress,SEC,2018,p.1

complex and extensive. It is also becoming an increasingly important market regulator, with growing technical competence, extensively applying soft regulation. Everything indicates that we are witnessing the birth of the second, after the central bank, public pillar of the financial system and a successive stage of the limitation of economic freedom in the financial market.

Bibliography

M.Adenas,H.J Chin, The foundations and future of financial regulation, Governance for responsibility, Routledge, N.Y., 2014

A.Baker, The new political economy of the macroprudential ideational shift, New Political Economy, 18(1) ,2013.pp.112-139

O.Ben Shahar ,C.E. Schneider , The futility of cost benefit analysis in financial

disclosure regulation, Chicago, University of Chicago Law School, Institute for Law and Economics Working Paper no. 680,2014.

O.Ben Shahar ,C.E. Schneider , The failure of mandated disclosure, Pennsylvania, University of Pennsylvania Law Review, vol.159,2014.

C.Borio, Implementing a macroprudential framework: blending boldness and realism, BIS,2010.

M.Borsuk,K.Klupa,Testy warunków skrajnych jako metoda pomiaru ryzyka banków,Bezpieczny Bank,3(64),2016,pp.29-46

D.Broeders,J.Prenio -Innovative technology in financial supervision/suptech/-the experience of early users,FSI Insights,No9,BIS,FSI,July 2018

Ł.Cichy,Whistleblowing w bankach,KNF,Warszawa 2017

M.Dewatripont,J. Tirole, Prudential Regulation of Banks, MIT Press, 1994.

J.Eatwell, "Practical proposals for regulatory reform", [in]P. Subacchi,R. Monsarrat (eds.): New ideas for the London summit: recommendations to the G20 leaders, Royal Institute for International Affairs, Chatham, The Atlantic Council,2009.

Final report on guidelines on institutions stress testing,EBA,GL-2018-04

Framework for early supervisory intervention, BIS, BCBS, 2018.

S.Gadinis, "From independence to politics in financial regulation", California, California Law Review.Vol 101,issue2,2013,pp 327-406.

Global survey on consumer protection and literacy: oversight frameworks and practices in 114 economies, 2013, The World Bank.

E.A.Helleiner, Bretton Woods Moment? The 2007-2008 crisis and the future of global finance, International Affairs, 86(3) , 2010,pp.619-636.

M.Kabza M, *Źródła ryzyka systemowego i metody jego ograniczania na przykładzie kredytów walutowych w systemach bankowych krajów Europy Środkowo Wschodniej* [Sources of systemic risk and methods of its mitigation on the example of foreign currency loans in the banking systems of the countries of Central and Eastern Europe], Key Text,2014.

D.Masciandaro D, Quintyn M, "The evolution of financial supervision: the continuing search for the Holy Grail", [in] Balling M, Gnan E, (ed.): 50 Years of money and finance: lessons and challenges, Vienna: Suerf, Larcier, 2013.
Masciandaro ,R.V. Pansini,M. Quintyn , The economic crises: did financial supervision matter*?* IMF, WP 11/261.

J.Monkiewicz,M.Monkiewicz,Ochrona konsumentów w nowym paradygmacie regulacyjno-nadzorczym rynków finansowych,w:J.Monkiewicz,M.Orlicki(red)Ochrona konsumentów na rynku ubezpieczniowym w Polsce.Współczesne wyzwania,Poltext,2015,pp.13-38

J.Monkiewicz,Wyzwania współczesnego nadzoru nad rynkiem finansowym,w:L.Gąsiorkiewicz,J.Monkiewicz(red naukowa),Wyzwania współczesnych rynków finansowych,Wydział Zarządzania,Politechnika Warszawska,2019,pp.61-74

D.Pridgen, Sea changes in consumer financial protection: stronger agency and stronger laws, ssrn.com/abstract=2186035, 2013.

E. Renz,M.Tarnowska-Testowanie warunków skrajnych,KNF,2011,p.3

D.Schoenmaker , P.Wierts, Macroprudential supervision: from theory to policy, ESRB, WPRS 2, 2016.

J.Sovern , Preventing future economic crises through consumer protection law or how the Truth in Lending Act failed the subprime borrowers, St John's School of Law, *Legal Studies Research Paper Series*, Paper 10-0189,2010.

W.Szpringer , Instytucje nadzoru w sektorze finansowym. Kierunki rozwoju Warszawa, Poltext, 2014,

P.Zawadzka, Modele nadzoru rynku finansowego, Warszawa, Cedewu,2017.

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Abstract

Supervision of the financial markets has become over recent twenty or so years an increasingly important element of the financial systems. It is progressively moving away from passive compliance check out towards an active influence of the financial markets reality. It is encompassing a growing range both of issues and entities and is undertaking an ever deeper penetration into the material processes in the financial market and in the activities of the financial institutions. It has also increasingly acquiring regulatory powers of the financial markets inter alia through the extensive application of self produced 'soft' regulatory norms.
All of this results in the enormous growth of importance of supervisory systems and its old and new institutions proliferating after the recent global financial crisis and of resources allocated to them.
US Securities and Exchange Commission,the most powerful financial supervisor in the world may be taken as a good example.It oversees currently over 4300 stock listed companies with the capitalisation level of over 30 trillions USD.It supervises the equity market of an annual value of ca 80 trillion USD and of debt market of ca 40 trillion USD.It also supervises directly over 26000 registered investment companies.It employs over 4500 people of which 1200 in the enforcement alone. Supervisory activities should therefore attract the attention of the theoreticians and practitioners.
The goal of this article is to provide a synthetic review of principal challenges facing concurrently the financial market supervision.It is split into three parts. Its first part discusses the theoretical foundations of the supervisory system trying to indicate the sources of its powers and its societal justification.It deserves a special attention in view of unprecedented powers acquired by supervisors over supervised institutions and the financial markets.In the second part we take a close look at the changing supervisory paradigm in its current form,which emerges in the aftermath of the recent global financial crisis. The third part of the chapter reviews the new challenges facing the financial supervision in its search for innovations,adapting to new needs and available opportunities and in the development of its new toolbox .
Key words:supervision,supervisory paradigm,supervisory toolbox,macroprudential approach

JEL classification:G18,G22,G28

Streszczenie

Nadzór nad rynkiem finansowym stał się w ciągu ostatnich kilkudziesięciu lat niezwykle istotnym elementem składowym systemów finansowych .Odchodzi on coraz bardziej od pasywnego rozumienia compliance na rzecz czynnego kształtowania rzeczywistości.Obejmuje także coraz szerszy zakres przedmiotowy i podmiotowy oraz dokonuje coraz glębszej penetracji w procesy materialne na rynku finansowym i instytucjach finansowych.Staje się także coraz ważniejszym faktycznym regulatorem rynkowym stosując szeroko miękkie normy regulacyjne. Jego wewnętrzna struktura staje się coraz bardziej złożona i rozbudowana. Staje się on także coraz ważniejszym regulatorem rynkowym, o rosnących kompetencjach technicznych, stosującym szeroko miękkie regulacje. Wszystko wskazuje na to, że jesteśmy świadkami rodzenia się drugiego, obok banku centralnego, publicznego filaru systemu finansowego i kolejnego etapu ograniczenia swobody gospodarczej na rynku finansowym.

Celem niniejszego opracowania jest dokonanie syntetycznej analizy wyzwań stojących obecnie przed nadzorem finansowym.W jego części pierwszej przeprowadzona jest analiza teoriopoznawcza,poświęcona pojęciu nadzoru finansowego oraz jego teoretycznych przeslanek.W części drugiej przybliżony jest kształt współczesnego paradygmatu regulacyjno nadzorczego rynków finansowych.Część trzecia artykułuje nowe wyzwania wobec nadzoru finansowego,w szczególności zajmuje się przedstawieniem nowego zestawu instrumentów nadzorczych.Są one zarówno wynikiem przeszłych doświadczeń kryzysowych jak i nowych możliwości i potrzeb technologicznych.Zmienić one mogą w sposób fundamentalny wykonywanie bieżącego nadzoru.

Słowa kluczowe:nadzór,paradygmat nadzorczy,podejście makroostrożnościowe,instrumenty nadzorcze

JEL Classification:G18,G22,G28

International Centre for Digital Finance

Aims:

1. Developing activities promoting socially responsible digital finance
2. Initiating activities for better understanding and use of digital finance and financial innovations
3. Organising platforms for cooperation of digital finance stakeholders , its institutions, investors, consumers, public sector agencies and academic community .

Forms of activities:

- undertaking theoretical and applied research in the area of digital finance
- undertaking educational activities in the area of digital finance
- organising of seminars and conferences ,national and international
- supporting domestic and international cooperation in the area of digital finance
- monitoring of digital finance developments and its social and economic implications
- undertaking other actions and initiatives which relate to its aims

Strategic partners:

Fundation for the Promotion of Education,Chamber of Insurance and Risk Assessment, Interrisk.