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LEGAL FRAMEWORK FOR RISK-BASED BANKING SUPERVISION IN THE DIGITAL AGE

Abstract

This contribution deals with the system of financial and economic relations, which is evolving due to supervision of digital financial products and services (DFSP). The article presents an overview of the most relevant DFPS and supervisory tools and practices. The contribution aims at analysing an available supervisory toolbox used in different countries. In order to achieve the aim, such methods as logical, systematic functional and situational analysis, as well as grouping and monographic methods, were employed. Digitalisation may boost competition, efficiency and profitability of banking sector and bring benefits to financial entities and customers. Nevertheless, it also carries certain risks posing major challenges to supervisory authorities. They have to find a balance between securing financial stability, protecting customers and fostering innovation.

Key words: risks, digitalisation, banking, supervision

JEL Classification: K22

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1. Introduction

Digital technology is rapidly transforming all areas of business. This process is most telling in the banking sector and the financial services market. This digital transformation shows the potential to increase competitiveness, innovation and efficiency, which is beneficial for both consumers and financial institutions. Nevertheless, it is accompanied by certain risks for consumers.

Nowadays supervisory authorities take on a tremendous challenge of adapting their current supervisory approach to digital financial products and services (DFSP). They find themselves in a difficult situation juggling financial system soundness and adequate consumer protection with promoting technological advances.

Our study provides an overview of the most relevant DFPS and current supervisory tools and practices. The aim of the study is to analyse an existing supervisory toolbox introduced in different countries.

2. Adapting to innovation and digitalisation of financial services

Years after the financial crisis (2008-2010), a new business environment has developed. It has changed to a large degree on several fronts. Financial institutions find themselves at a disadvantage due to greater regulatory requirements and shrinking profitability. In the meantime, customers' habits have also shifted since traditional banks have lost their trust to newer fintech players. Clients expect more personalised products and services. They are also quite willing to interact with financial entities in a digital ecosystem. Providing DFSP thus means not only reinventing them in a new form, but also constantly expanding a product range. To meet the clients' demands traditional financial entities have to change their business models and keep up with technological innovations.

Digitalisation has already brought significant benefits to banking players. Through introducing innovation and incorporating non-banking financial services into a product range, financial institutions have been able to increase their customer base. It is of great importance to offer a wide range of high quality services in order to get the public to trust the banking sector. Consumers may enjoy benefits of digitalisation when they are provided with more consumer-centric products, better prices and possibly more inclusive financial services. However, in spite of the positive input DFSP may pose significant risks to consumers. They include security issues, lack of consumer protection and lack of digital financial literacy, to name a few.

In such environment, supervisory authorities identify defective compliance with regulation (mostly anti-money laundering; counter-terrorist financing) or a lack of redress mechanisms. At the same time, the focus should be put on designing new analytical tools. Moreover, the development and implementation of new financial technologies are triggered by regulatory and supervisory decisions. Considering that, supervisory and regulatory authorities must efficiently and timely adapt legal and supervisory frameworks to ensure supervised entities comply with regulation and, at the same time, to find ways to encourage financial sector innovation.

All around the world the appeal of, and need for traditional banks keep dying out. Recently the emphasis has been placed on the need to focus on the effects of digital transformation. The International Financial Consumer Protection Organisation (FinCoNet) has stated that the shift from traditional financial-sector delivery channels to online will be a gradual process and mobile technology has important implications, e.g. supervisory authorities might use them to identify emerging consumer risks and to have appropriate tools to mitigate such risks.

FinCoNet pays special attention to digitalisation and the impact of technologies on the provision of financial products and services. The main interest areas for this international organisation are the following:

- supervisory toolbox and its adaptation to digitalisation;

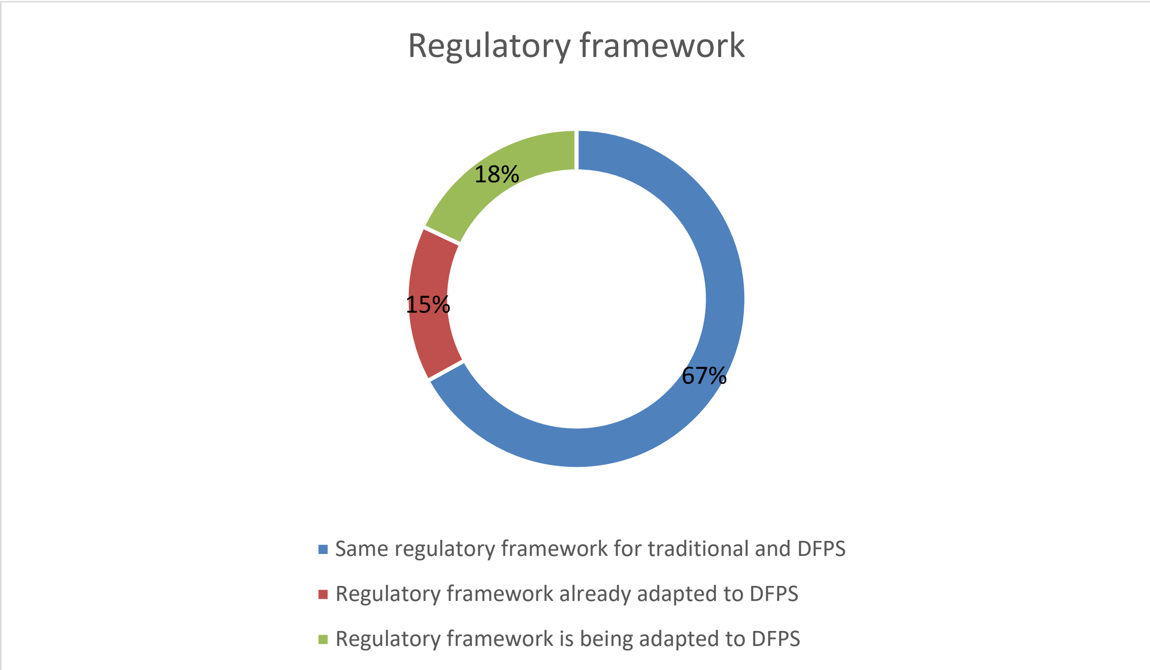
- digitalisation of short-term, high-cost lending: supervisory problems with promoting responsible lending;

- online and mobile payments: supervisory issues with mitigating security risk [Online and Mobile Payments: An Overview of Supervisory Practices to Mitigate Security Risks].

To tackle the first problem it is of great importance to find out to what extent institutional and regulatory framework could be effectively adapted to meet market demands. Regulatory powers in this field are usually given to the respective institution (ministry or department of finance, parliaments, the central bank, consumer protection authority). In the majority of countries, laws and regulations enacted by the government allow the competent authorities to issue regulation. Depending on the institutional model in a particular jurisdiction, DFPS regulation and supervision may be shared between different authorities (prudential and supervisory authorities): conduct authorities, banking, insurance and investment and securities authorities, etc. This type of setup has implications in terms of coordination between all the authorities involved.

According to FinCoNet's report [Practices and Tools Required to Support Risk-based Supervision in the Digital Age], only 15% of supervisory authorities among respondents stated to have already adapted their regulatory framework to digital realities. However, this adaptation seems to be limited only to certain products. 67% of respondents believe that the applicable regulatory framework is generally the same for digital and traditional financial products and services, while 18% of authorities are adapting the framework to DFPS (see Graph 1).

Graph 1. Regulatory framework



Source: Author's own elaboration based on Practices and Tools required to support Risk-based Supervision in the Digital Age International Financial Consumer Protection Organization November 2018.

Most countries devise new rules based on the existing framework, which regulates traditional services. Many respondents recognise the need of global adaptation of financial regulation. The Financial Consumer Agency of Canada (FCAC) refers to the Government of Canada's consideration of new and modernised legislation to address developments in products and services and to meet the demands and banking habits of Canadians. The Central Bank of Ireland published a report Consumer Protection Code and the Digitalisation of Financial Services [Discussion Paper: Consumer Protection Code and the

Digitalisation of Financial Services]. It is dedicated to the question whether the code should be enhanced or amended in the face of innovative products. Netherlands Authority for the Financial Markets (Netherlands AFM) relies on a principles-based regulatory approach that alleviates the need to revise the framework to accommodate digitalisation (see Table 1).

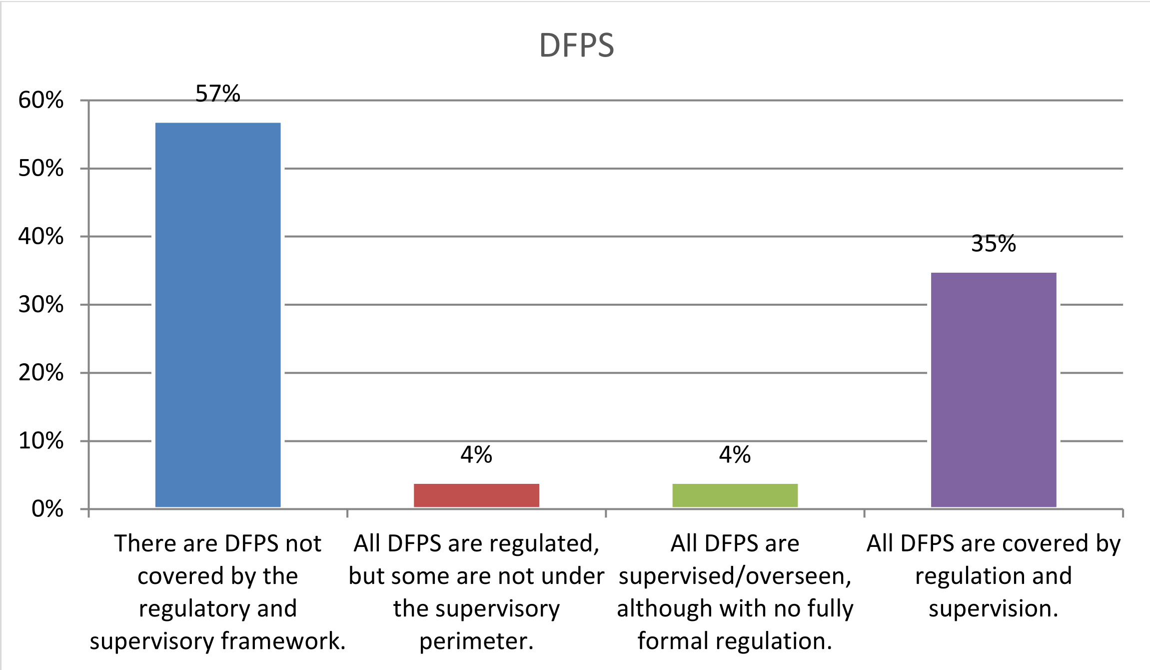
Table 1. Adaptation of rules governing digital financial products and services (DFPS)

Country	Product/service	Implemented	In the process of implementation
Australia	Crowdfunding	+	
Brazil	Digitisation of paper documents related to financial transactions	+	
	Accounts through electronic means	+	
	Client identification in currency exchange contracts agreed upon electronic means	+	
	Crowdfunding	+	
	P2P lending	+	
France	Crowdfunding	+	
	Banking account aggregators	+	
	Digital subscription to financial products		+
	E-signature and registered e-mail		+
Germany	Crowdinvesting	+	
	Bank account opening via digital channels	+	
Indonesia	P2P lending	+	
Lithuania	Contracts concluded through distant communication	+	
Mauritius	Mobile banking and mobile payment systems	+	
	Digital payments		+
Portugal	Bank account opening via digital channels	+	
	Crowdfunding	+	
	P2P lending	+	
Romania	Digital payments	+	
Spain	Crowdfunding	+	
	Contracts concluded through distant communication	+	
	Digital payments		+

Source: Author's own elaboration based on Practices and Tools required to support Risk-based Supervision in the Digital Age International Financial Consumer Protection Organization November 2018.

Adaptation of the regulation to the digital era comes with some regulatory gaps. A number of respondents mentioned that some changes are not covered by the existing regulatory and supervisory framework of their jurisdiction, e.g. data aggregator providers, online lending providers classified as non-deposit-taking institutions, cross-border DFPS (cryptocurrencies used as remittances), loan brokerage platforms, non-financial providers etc. In some cases there are DFPS that do not fit specific regulatory definitions, but they are somehow supervised inasmuch as they are provided by supervised entities or institutions (see Graph 2) [Regulatory Sandbox Lessons Learned Report].

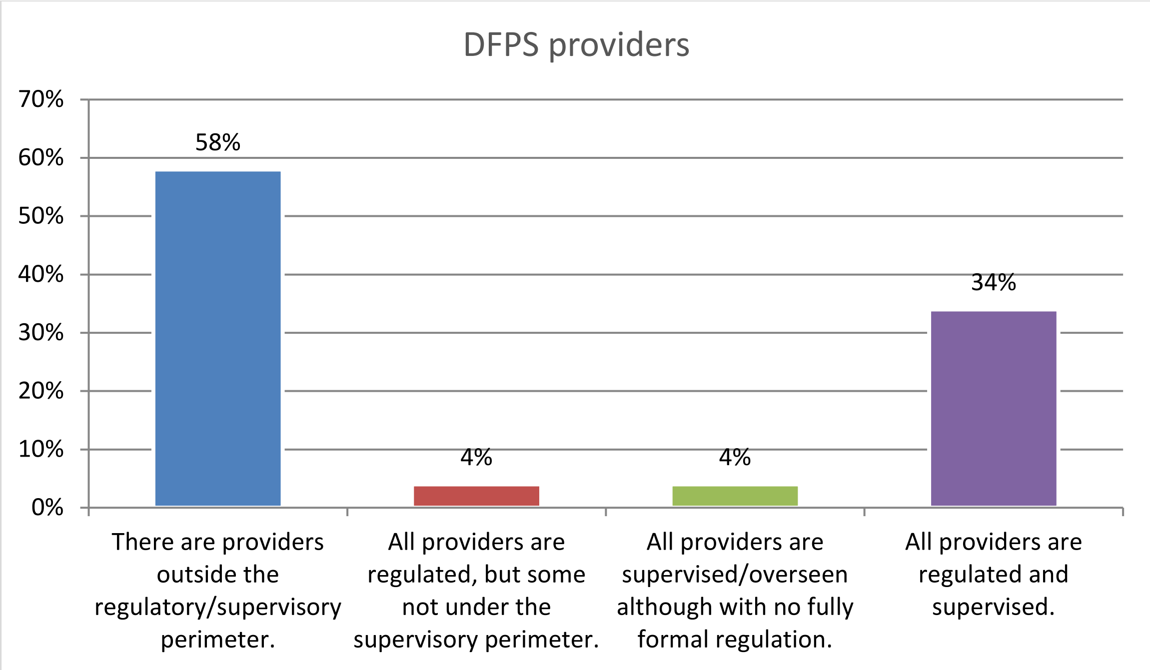
Graph 2. DFPS and DFPS providers



Source: Author's own elaboration based on Practices and Tools required to support Risk-based Supervision in the Digital Age International Financial Consumer Protection Organization November 2018.

As can be seen from the graph below, in 34% of jurisdictions all DFPS providers are regulated and supervised, while in most cases (58%) new agents emerge and provide DFPS outside the regulatory and supervisory scope (see Graph 3).

Graph 3. DFPS and DFPS providers



Source: Author's own elaboration based on Practices and Tools required to support Risk-based Supervision in the Digital Age International Financial Consumer Protection Organization November 2018.

Competent authorities are introducing several measures to eliminate gaps in the regulatory framework. Among them are innovation hubs. BaFin (Germany) offer on their website a tool explaining the authorisation requirements. The Financial Conduct Authority in UK (UK FCA) founded an advice unit providing regulatory feedback to firms developing automated models [Mobile Financial Services: Consumer Protection in Mobile Financial Services]. A special focus is being put on virtual currencies (or crypto-currencies), since they are not considered taxable by supervisory framework [Sound Practices: Implications of Fintech Developments for Banks and Bank Supervisors]. Various authorities warned consumers about the risks of using crypto-currencies because they are neither regulated nor supervised. The same warnings are applied to crowdfunding. In February 2018, the European Supervisory Authorities (ESAs) for securities, banking, and insurance and pensions issued a joint, pan-EU warning about the risks of buying virtual currencies. Some EU countries have also issued national warnings on cryptocurrencies [FSI Insights on Policy Implementation No 9]. If we take an example from outside Europe, Japan's Financial Services Agency (FSA) introduced a registration framework for broker-dealers of crypto-assets for legal tender. In addition, warnings about the risks of crypto-assets (e.g. the risk of their high volatility) have also been issued. The Australian Securities and Investments

Commission (ASIC) has developed an information sheet (INFO 225) that gives guidance about the potential application of virtual currencies [Financial Stability Review No. 20, 2016. Financial Stability in the Digital Era]. In Germany, BaFin has qualified crypto-currencies, with legally binding effect, as “financial instruments” in the form of “units of account” subject to the German Banking Act [Machine Learning: A Revolution in Risk Management and Compliance?]. As a result, BaFin may determine that, depending on the business model of a firm engaging in cryptocurrencies activities, it may be qualified to be performing a regulated activity under the national banking legislation (such as broking services or operation of a multilateral trading facility) that requires authorisation.

The vast majority of authorities have existing enforcement powers for “traditional” financial products and services. The most common available powers are:

- issuance of orders, recommendations, warnings, reprimands or notices;

- administrative proceedings, sanctions, monetary penalties;

- license revocation, business closure, disqualification of the person.

Some authorities publish sanctions or specific decisions, which will be disclosed to the public unless the disclosure would seriously cause disproportionate damage to the parties involved [The Future of Retail Financial Services. What Policy Mix for a Balanced Digital Transformation?].

3. Supervisory tools and practices

A number of authorities are still in the process of defining a strategic supervisory approach to digitalisation [FinTech credit. Market Structure, Business Models and Financial Stability Implications]. In this situation, the set top priorities are ensuring financial stability and safeguarding consumer rights. Following the data from the table 2, financial stability is the key principle and the main priority, as chosen by respondent authorities. Consumer protection has also been mentioned at the top of priorities.

Table 2. Principles guiding the supervisory authorities’ approach to DFPS

Principle guiding supervisory authorities’ approach to DFPS[1]	Rank				
	1	2	3	4	5
Innovation	2	2	7	3	2
Fair Competition	1	4	3	3	2
Financial stability	14	1	2	1	3
Consumer protection	10	7	1	-	-
Financial inclusion	-	2	4	5	5

Source: Author’s own elaboration based on Practices and Tools required to support Risk-based Supervision in the Digital Age International Financial Consumer Protection Organization November 2018.

Promoting fair competition and innovation are also considered important guiding principles [Discussion Paper on the EBA’s Approach to Financial Technology (FinTech)]. Many supervisory authorities use the principle of “same business, same risks, same rules” as the basis of their approach, but it might limit innovation and reduce industry competitiveness [Guide to Assessments of Fintech Credit Institution Licence Applications]. Created in 2013, UK FCA's objective is to promote effective competition by:

- looking at market structure and dynamics through its market studies;

- adjusting the “rules of the game”, if necessary;

- investigating anti-competitive behaviour under UK and EU competition law [Consultation Document. Fintech: A More Competitive and Innovative European Financial Sector].

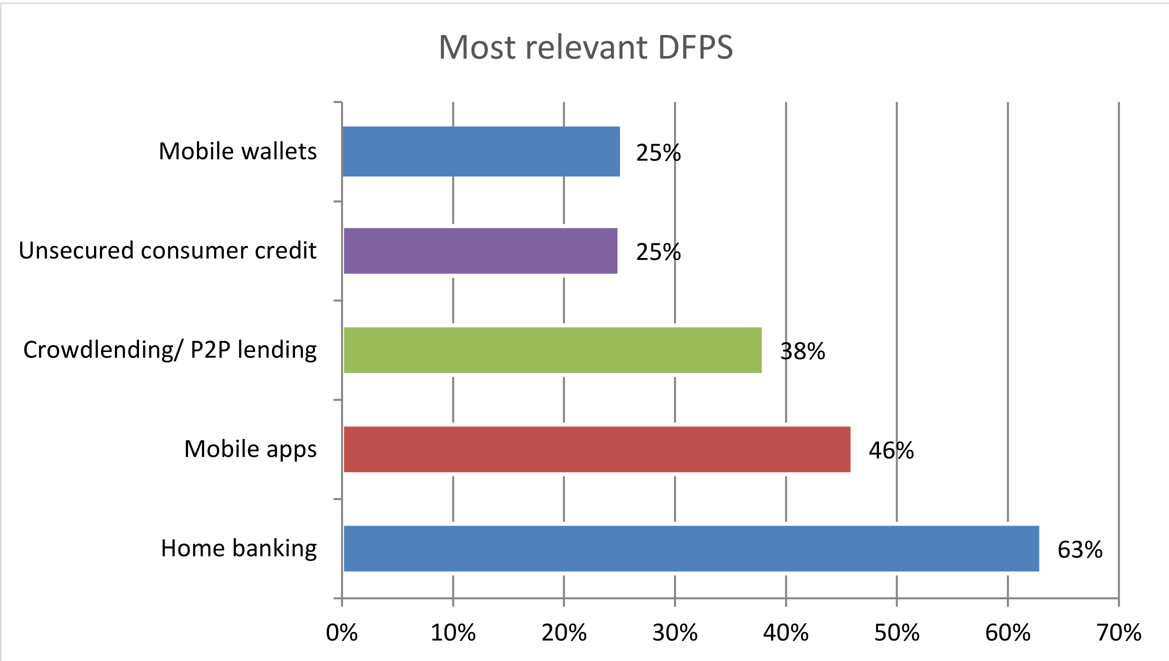
Aspects related to financial inclusion appear to be relevant for a number of respondents, but of minor importance compared with the aforementioned aspects. Regardless of the priorities, most countries have incorporated digitalisation issues in their agendas. Some authorities, such as the Bank of Lithuania and the Autorité des marchés financiers du Québec (AMF) in Canada have established long-term strategic plans (2017-2020) to address the regulatory challenges brought on by new technologies [Financial Stability Implications from FinTech Supervisory and Regulatory Issues that Merit Authorities’ Attention]. Other authorities, such as the relevant supervisory authority in Luxembourg, Brazil, Portugal and Spain, have set up or are involved in working groups to improve their knowledge of FinTech and digital economy and to assess the consequences of technological innovation [Fintech and Financial Services: Initial Considerations].

[1] Number of times the rank was selected for the respective principle, with 1 being the main guiding principle.

To better grasp the impact of digital economy from a regulatory and supervisory perspective, competent authorities take part in various analytical groups, which take into account social, cultural, demographic, technological, financial or legal factors [IOSCO Research Report on Financial Technologies (Fintech)]. This knowledge helps identify the corresponding factors. For instance, the more incorporated the Internet in life is, the more internet users there are or the closing of banking offices, especially in less densely populated or remote areas in order to maximise profits, has led people to consider digital financial services to replace the traditional ones formerly provided locally [Financial Inclusion and the Fintech Revolution: Implications for Supervision and Oversight].

Due to the speed of technological change and to the lack of supervisory toolbox supervisors are challenged to effectively and timely adapt to constantly developing environment [The Promise of FinTech – Something New Under the Sun?]. The Graph 4 shows the supervisors' responses to the survey request to "select the three most relevant digital financial products and services developed in your jurisdiction from the list below".

Graph 4. Most relevant DFPS



Source: Author's own elaboration based on Practices and Tools required to support Risk-based Supervision in the Digital Age International Financial Consumer Protection Organization November 2018.

Home banking and mobile apps allow customers to check account balances, view bank statements, make credit transfers, transact payments through online platforms (internet banking) and mobile devices (apps) [Fintech Regulatory Sandbox Guidelines]. This technology is widely used in most countries, and is one of the most popular channels among consumers. A number of respondent authorities selected crowdlending and P2P lending: in some cases, authorities supervise crowdlending platforms [G20/OECD INFE Report on Ensuring Financial Education and Consumer Protection for All in the Digital Age].

A quarter of authorities mentioned unsecured consumer credit. It deserves special attention because it can stimulate over-indebtedness. DFPS has the potential to facilitate quick, easy and user-friendly access to credit [G20/OECD INFE Policy Guidance on Digitalisation and Financial Literacy]. Consumers may also value the anonymity and impersonal nature of borrowing through digital channels. This practical accessibility may encourage consumers to demand more credit than they need and, even worse, than they can repay [G20/OECD Policy Guidance on Financial Consumer Protection Approaches in the Digital Age]. Such irresponsible lending could result in a state of over-indebtedness. Mobile wallets have also been mentioned by 25% of the authorities.

Speaking about the most relevant risks in this area, let us group them by directions (Table 3) [Ontario Securities Commission, Securities Law & Instruments].

Table 3. Relevant risks associated with DFPS

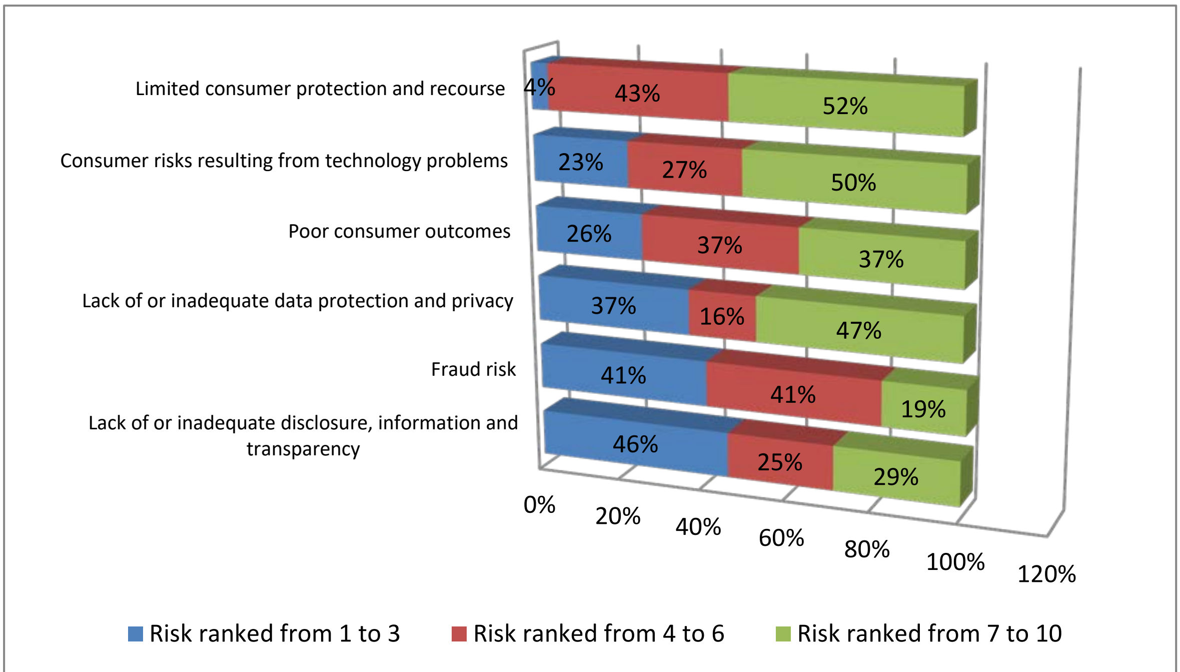
Lack of, or inadequate disclosure, information and transparency
- biased, incomplete or misleading advertisement - lack of adequate framework (e.g. devices) for pre-contractual information analysis - lack of consumer understanding of product characteristics or service terms and conditions, due to complicated and lengthy user agreements - unclear pricing, fee and exchange rate structure - inadequate environment to assess complex information - contract changes made unilaterally by service provider - abusive clauses
Fraud risk
- unauthorised account opening (identity theft, contractual capacity) - unauthorised access to consumer accounts and funds/unauthorised transfer - internal fraud, authorised agent fraud - risk of new scams - money laundering and terrorist financing
Lack of or inadequate data protection and privacy
- use of financial data by third parties - data breaches - problems in the treatment of personal data (also cross border)
Consumer risks resulting from technology problems
- inability to operate and access funds (no business continuity, systems unavailable) - market fragmentation – interoperability restricted

- insufficient operational capacity – slow response time - general security standards – unable to withstand hacking - general system errors – poor consumer experience/loss of funds
Limited consumer protection and recourse
- dilution of responsibilities when many companies are involved - inexistent or inaccessible complaints channels (at provider's level or by way of alternative dispute resolution) - lack of transparency in complaints handling - lack of response in a timely manner (complaints "black hole") - limits to dispute resolution, mandatory internal forum or arbitration agreement - shortage of cross-border service providers, or difficulties in having to litigate in another country under foreign laws - consumer misunderstanding, lack of awareness regarding their right to complain
Poor outcomes for consumers
- over-indebtedness - lack of clarity concerning intermediaries' responsibilities - service-provider failure or insolvency - financial exclusion/ethical discrimination/big data bias

Source: Author's own elaboration based on Practices and Tools required to support Risk-based Supervision in the Digital Age International Financial Consumer Protection Organization November 2018.

The aforementioned lists of risks should not be considered complete. To mitigate the risks supervisors all around the world have taken a course on promoting financial education. Using the definitions in table 3 above, respondents ranked each risk from 1 to 10 according to its importance, with 1 being the most relevant risk (see Graph 5). Each digital financial product and/or service presents a different set of risks for regulators and consumers and therefore might imply different potential concerns and challenges.

Graph 5. Prioritisation of relevant risk categories associated to DFPS



Source: Author's own elaboration based on Practices and Tools required to support Risk-based Supervision in the Digital Age International Financial Consumer Protection Organization November 2018.

Supervisory authorities are at different stages in adapting to the challenges digitalisation implies for their supervisory activity. The traditional way of dealing with this is to assess existing tools and revise them [Building Inclusive Digital Payments Ecosystems: Guidance Note for Governments].

The survey threw some light on:

- whether traditional tools to supervise traditional banking products are being used (or there is an intention to use them) to mitigate DFPS risks;

- whether this new use of traditional tools is successful;

- the initiatives underway to adapt traditional tools or create new ones (see Table 4).

Table 4. Supervisory tool or practice

Supervisory tool or practice	Traditional financial products and services used	Digital financial products and services	
		In use	Intend for use
Cooperation with other authorities	23	20	3
Issuing guidelines	22	16	6
Licensing and authorisation	22	16	6
Off-site surveillance	22	15	6
Complaints handling	23	20	3
Data reporting	24	16	9
On-site inspection	23	16	7
Financial education	17	14	2
Mystery shopping	8	3	3
Moral suasion	15	11	3
Enforcement	24	19	5
Sanctioning powers	24	19	4
Redress powers	9	7	2

Source: Author’s own elaboration based on Practices and Tools required to support Risk-based Supervision in the Digital Age International Financial Consumer Protection Organization November 2018.

According to the survey above, authorities mostly rely on traditional tools in supervising DFPS. At the same time, considering their results in risk mitigation, 37% of respondents concluded that those tools are inadequate. 53% of supervisors believe that digitalization should go hand in hand with new supervisory rules creation.

Taken everything into account, we can conclude that generally speaking, supervisory tools from Table 4 can be adequate in minimizing risks and controlling digitalization, while some of them demand adjustment. In this regard, onsite inspections, offsite surveillance, sanctioning powers may be implemented in the digital realities. However, they require change of approach, such as introduction of new IT tools [Distributed Ledger Technology: Beyond Block Chain].

Sometimes supervisory organisations face supervisory challenges and difficulties, as shown in Table 5.

Table 5. Challenges and difficulties in DFPS supervision

Challenges and difficulties	Number of authorities
Lack of adequate technological expertise Keeping staff up to date	16
Changing environment	9
Regulatory gaps Unregulated entities	8
Lack of statistics	5
Lengthy approval process for new legal regulation, may impact financial consumer protection	4
Cross-border issues	4

Source: Author's own elaboration based on Practices and Tools required to support Risk-based Supervision in the Digital Age International Financial Consumer Protection Organization November 2018.

Supervisory authorities responded that the main challenges they face are related to the lack of technological expertise. It prevents them from keeping up to date with the changing environment and adapting their current regulatory set up (regulatory gaps, cross border issues). The speed of technological innovation contrasts with the lengthy timeframes needed for recruiting the competent staff, understanding new needs and approving new regulation.

In the same vein, in February 2018 the Basel Committee on Banking Supervision published a report on Sound Practices on the Implications of FinTech Developments for Banks and Bank Supervisors [Beyond Fintech: A Pragmatic Assessment Of Disruptive Potential In Financial Services]. This report highlighted the need to reassess current supervisory models and resources, specialty training programmes for current staff and the addition of specialised staff.

Many countries created specific working groups (institutions) to handle the abovementioned challenges. These groups analyse the business models used in digital environment and their associated risks. They then design the regulatory and supervisory responses to such risks (see Table 6).

Table 6. Fostering digital adaptation – internal working groups

Country	Name	Task and composition
Peru	FinTech Working Group	Exploratory research in 2017 to identify business models that have been emerging in the Peruvian marketplace and to recommend actions towards each one. Departments of Technological Risk Supervision, Operational Risk Supervision, Banking Supervision, Insurance Supervision, Market Conduct Supervision, Regulation, Legal Advice and Economic Research.
Spain	Financial Innovation Group	Analyse the new trends; help define the Banco de España's DFPS strategy; coordinate the actions of different departments and with other authorities. Representatives of different areas: technology, prudential supervision, conduct supervision, payment systems and financial stability.
	Associate Directorate General	Banco de España has also recently created a new Associate Directorate General Financial Innovation and Market Infrastructures with the aim of monitoring and analysing financial market innovations.
Brazil		Assess the consequences of technological innovation on the provision of financial products and services.
Portugal		Analyse possible scenarios for strategically positioning the Banco de Portugal regarding FinTech and digital banking: (i) facilitator, (ii) catalyst, (iii) accelerator.
Netherlands		The mandate is to ensure that the Netherlands AFM accommodates technological innovation. The team interacts closely with market participants and cooperates with other departments within the Netherlands AFM. People with different backgrounds, i.e. IT, legal, strategy consultancy, capital markets experience.
Canada	FinTech Working Group	Analyse technological innovations in the financial sector and anticipate regulatory and consumer protection issues; analyse and make recommendations about the ability of the current regulatory framework to support changes in commercial practices, business models and financial sector technologies while ensuring a solid balance between consumer protection and market efficiency. Exchange with industry and consumer groups to better understand their concerns.
Germany	BaFin's innovations in financial technology unit	The unit is responsible for the identification and impact assessment of selected technology-driven developments of strategic importance for the financial market. It develops possible future scenarios in regard to the effects of financial technological developments, as a basis for the authorities´ strategic positioning, advises the divisions and management on specialist inquiries and on further regulatory development concerning financial technological developments.

Source: Author's own elaboration based on Practices and Tools required to support Risk-based Supervision in the Digital Age International Financial Consumer Protection Organization November 2018.

Most of the newly created institutions are focused on developing early-warning tools. They include social media monitoring, online monitoring, press reviews, interviews with consumer representatives and other industry research, and questionnaires. Similarly, authorities operate a consumer helpline.

Other early-warning tools mentioned by authorities include information:

- obtained in day-to-day supervisory activity, such as meetings with entities (specifically information about new products);

- from on-site inspections;

- from external auditors;

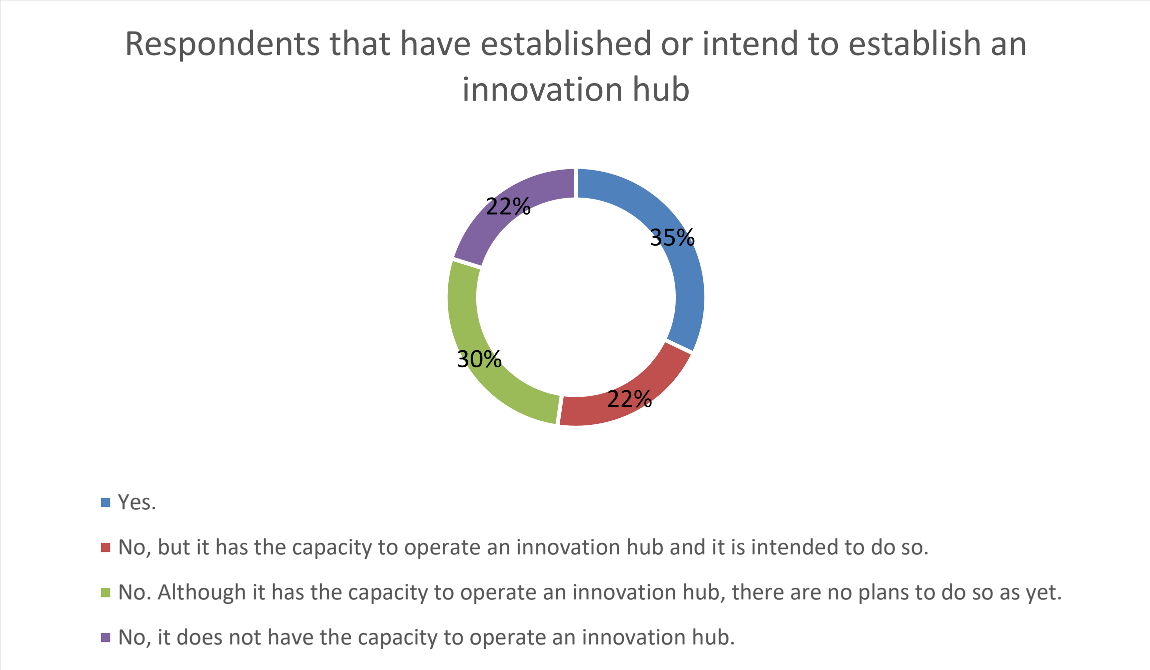
- from reviews of entities´ webpages, operational risk reports and incident reporting schemes.

One of the indispensable early-warning tools is participation in international forums.

As for aforementioned innovation centres, it is hard to give them a clear definition. It might be described as an institution within a regulatory agency that provides guidance and assistance to market participants to help them adapt to regulatory frameworks. Sometimes their purpose is to test and analyse digital financial services. Depending on the form, innovation centres might be divided into innovation hubs and so called “sandboxes”.

Approximately 50% of countries intend to establish an innovation centre to complement existing regulatory frameworks and support the development of innovative financial services and/or products (see Graph 6).

Graph 6. Respondents that have established or intend to establish an innovation hub



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Supervisory bodies, as a rule, design innovation hubs to provide guidance and assistance to market participants seeking to develop innovative financial products and/or services to navigate existing regulatory frameworks [Efremenko, Panasenkova, Artemenko, Larionov 2018: 117-124].

The main tasks of innovation hubs are to:

- provide a streamlined service for market participants and reduce perceived barriers to innovation within existing regulatory frameworks to foster and accelerate innovation within financial services;

- increase supervisory bodies' understanding of the regulatory issues arising from the development of innovative financial products and services [Radyukova, Sutyagin, Treschevsky, Artemenko 2018: 2877-2888].

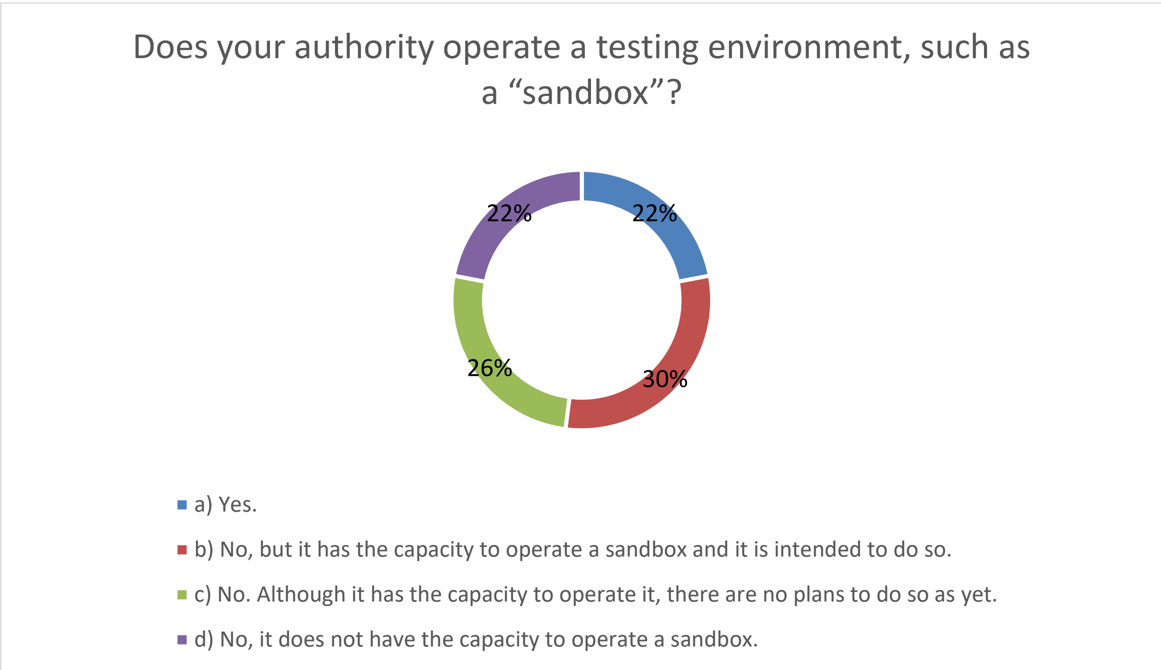
The Netherlands AFM indicated that its innovation hub had received over 200 approaches from market participants between 2016 and 2017. Participants sought guidance on various topics, including data, licensing, block chain, electronic identification and the revised PSD2. They were from diverse market sectors including payment and investment institutions, insurance, intermediaries, banks, crowdfunding businesses and RegTech-related companies.

The Australian Securities and Investments Commission (ASIC) indicated it had worked with 240 entities, 206 of which have received informal assistance and held over 183 meetings with FinTechs and other stakeholders. Australia has also granted 39 new financial service and credit licences.

As innovation hubs mature, increased empirical data may become available to help assess their contribution to the regulatory framework and how they facilitate innovation in financial services.

Approximately 50% of countries intend to establish so-called “sandboxes” on their territory. A regulatory sandbox to enable market participants to develop, test and analyse innovative financial services and/or products with real consumers, while operating within a controlled environment.

Graph 7. Respondents that have established or intend to establish a regulatory sandbox



Source: Author’s own elaboration based on Practices and Tools required to support Risk-based Supervision in the Digital Age International Financial Consumer Protection Organization November 2018.

Implementing a sandbox has the potential to facilitate and foster financial innovation by:

- increasing understanding of financial innovation and its interplay with current regulatory frameworks;

- meeting changing consumer needs in a safe and timely manner.

Nonetheless, “sandbox” implementation carries some risks, such as:

- **Competition concerns.** If a sandbox compromise a level-playing field, competition may be adversely affected, violating neutrality principles (e.g. access is not open to all market participants or some participants are eligible for certain waivers while others are not). Some respondents give the upmost importance to ensuring all market participants are subject to the same regulatory requirements.

- **Jurisdictional issues.** Jurisdictions that regulate financial services at both a state and federal/regional level may encounter significant challenges when attempting to design and implement a sandbox across all levels in a timely and consistent manner.

- **Supervisory risks.** Supervisory bodies could be held liable by consumers, or be perceived to be liable. where a sandbox participant engages in misconduct, is negligent, and/or fails to the detriment of a consumer. The likelihood of this occurring may increase where a sandbox participant is not required to notify consumers that they are purchasing a product or service in a test environment and/or the supervisory body does not take an active role in, or closely supervise the sandbox [Artemenko, Shishkov 2017: 34-39];

- **Resourcing.** Supervisory bodies may not be adequately resourced (e.g. lacking experienced staff or requisite technology) to operate a sandbox, particularly sandboxes designed to operate across multiple market sectors.

Amendments to the regulatory framework doing so would require varying degrees of amendments to their existing regulatory frameworks.

On balance, most respondents saw potential value in implementing a sandbox to foster innovation by complementing their existing regulatory frameworks. However, not all supervisory bodies considered a sandbox an appropriate solution.

There is value for supervisors in considering whether to introduce innovation hubs and sandboxes to increase their understanding of financial innovation, its interplay with current regulatory frameworks, and to address changing market conditions in a timely manner [Artemenko, Artemenko 2018: 63-70]. But these potential benefits must be carefully assessed against potential risks, taking into consideration the regulatory set-up of each jurisdiction.

4. Conclusion

Nowadays supervisory bodies face a significant challenge to adapt the current supervisory approach to DFPS. They struggle to find a balance between financial system soundness, adequate consumer protection and technological advances. Adequate consumer protection implies certain guarantees that consumers would have the same level of protection regardless of the channels and providers used to acquire financial products and services – traditional or digital.

In recent years, the institutions providing financial consumer protection are the following:

- authorities, that have stressed the need of focusing on implications of digital transformation in regard of legislation;

- the International Financial Consumer Protection Organisation, that studies practices and tools of risk-based supervision in digital age, with the respect to market behaviour.

Due to the nature and scope of the issue, supervisory approaches to DFPS are at different stages of development in various countries. Overall, supervisory bodies focus on adapting traditional supervisory tools to new environment, avoiding creation of new specific tools. In many cases, the lack of access to full data, such as social media complaints, aggravates the situation and makes supervisory authorities' work more challengeable.

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