

Out of the Shadows: Embracing RegTech solutions in the NBFIs sector

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Abstract

The Shadow Banking sector in the EU has grown significantly over the past two decades, establishing itself as a concern for regulators following the global financial crisis. This policy paper evaluates the potential risks the sector presents, as well as the complexities for regulators in adequately addressing these risks. As a sector founded in the context of regulatory arbitrage and innovation, a variety of problems arise stemming from the many unknowns of the sector- from the consequences of interconnections between traditional banks and non-banking institutions, potential for systemic risk, and the dynamic and constantly developing state of financial regulations. Efforts at regulating the sector have so far had limited success. In aid of mitigating a number of these issues, this paper suggests the adoption of RegTech solutions. Working in conjunction with the European Commission's digital transformation, RegTech should be at the forefront of efforts in the financial sector, with the prospect of significantly improving the work of supervisors, regulators, and industry.

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List of Abbreviations

ABCP – Asset-backed commercial paper conduits

AI – Artificial Intelligence

AML – Anti Money-Laundering

CCP – Central Clearing Counterparty

CFT – Combating the Financing of Terrorism

CRA – Credit Rating Agency

DLT – Distributed Ledger Technology

EBA – European Banking Authority

ECB – European Central Bank

EMIR – European Market Infrastructure Regulation

ESMA – European Securities and Markets Authority

ESRB – European Systemic Risk Board

EU – European Union

FSB – Financial Stability Board

GDPR – General Data Protection Regulation

GFC – Global Financial Crisis

ICT – Information and Communications Technology

MiFID II – Markets in Financial Instruments Directive

MMF – Money Market Funds

NBFI – Non-Banking Financial Intermediation

OECD – Organisation for Economic Cooperation and Development

OFI – Other Financial Intermediary

SFTR – Securities Financing Transaction Regulation

SPV – Special Purpose Vehicle

SIV – Structured Investment Vehicles

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1. Background

The growth of the shadow banking sector over the past two decades has posed several problems for regulators in Europe. The global financial crisis (GFC) exposed these issues, shedding a light on the shortcomings of cross-sector and cross-border linkages in the financial system, and, inevitably, led to significant reform of the financial services sector in Europe. Despite the reforms within the traditional banking sector, shadow banking has remained largely unregulated, with the few attempts made falling short. The complex intermediary chains and interactions between actors have led to an amplification of risks and spillovers that are not confined to sectors or by geographical borders. As of 2018, shadow banking assets in the euro area accounted for more than 40% of financial sector assets¹ (or almost 34.5 trillion euros), highlighting the need for a comprehensive understanding of the potential negative externalities that the shadow banking sector can expose.²

The COVID-19 shock and pandemic has tested the resilience of the current regulatory framework, or lack thereof, and subsequently highlighted several successes and failures. Initial responses to the market turmoil experienced in March 2020 illustrates the unprecedented policy action by central banks and securities regulators to alleviate market stress. However, as the FSB's recent report³ indicates, the March turmoil has reinforced the need to better understand interconnections and amplification channels in the financial system. Understanding these relationships is crucial, particularly when considering the nature of vulnerabilities in the Non-Bank Financial Intermediation (NBFI) sector,⁴ an example of which is the liquidity stress and the implications of central bank liquidity support.

In the context of crises, the shadow banking sector represents a greater risk of instability without the access to central bank funding or safety nets like deposit insurance that traditional banks have. The COVID-19 shock poses a serious liquidity risk for the shadow banking sector, where significant funding has been extended based on cash flow rather than real collateral. The FSB report created a workflow to increase the resilience of the NBFI sector, and these goals will be built upon in the advice and recommendations given in this paper.⁵ The extensive program is included in Appendix 1 and summarised in the footnotes; however, the three focus points are: (1) examining and addressing the risk factors that contributed to the amplification of the shock, (2) improving the understanding of systemic NBFI risks, and (3) assessing the adequacy of policies that address systemic risk. Clearly, the problems of regulatory arbitrage

¹ Exact measurements of the sector vary. See: Hodula, 2013 and 2018.

² Hodula, 2020.

³ FSB, 2020.

⁴ The NBFI sector represents a significant portion of the shadow banking sector. More specific definitions of shadow banking will be explored in the following sections of the paper.

⁵ The FSB work programme on NBFI indicates three main areas to be advanced. Firstly, analytical and policy work on specific issues, this includes money market fund (MMF) resilience, liquidity risk and its management in open ended funds (OEFs), margining practices and liquidity and the structure and resilience of core bond markets. Secondly, is a focus on systemic risk assessments, specifically focusing on strengthening the ongoing monitoring of NBFI risks and advancing the understanding of systemic risks in the NBFI and the financial system. Finally, the work programme aims to examine policies to address systemic risks in NBFI, including the adequacy of current policy tools and the concept and desired level of resilience in NBFI.

and lack of global coordination underlined by the GFC have not been overcome by subsequent reforms. The aim of this proposal is to build upon these goals and develop concrete policy and regulatory solutions. A central tenet of this proposal will be built upon the usage of RegTech solutions to combat the vast unknown of shadow banking within the European Union.

2. Shadow Banking: A complex system

The Financial Stability Board (FSB) broadly defines shadow banking as “a system of credit intermediation that involves entities and activities outside the regular banking system”.⁶ This includes entities that raise funding with deposit-like characteristics, perform maturity and/or liquidity transformation, allow credit risk transfer and use direct or indirect leverage.⁷ Figure 1 provides a simplified illustration of the shadow banking sector, displaying how it can be separated into sections of a credit intermediation chain. These sections are located in various jurisdictions and shaped by their regulatory frameworks. Thus, an approach that prioritises the economic relevance of an actor, rather than its status as a certain legal entity is beneficial in overcoming these complexities. Significant euro area components of the sector are primarily in securitisation activity, money market funds (MMFs) and repo markets.⁸ Euro area banks continue to increase their reliance on funding from the financial sector, particularly from other financial intermediaries (OFIs), which cover shadow banking entities, including securitisation vehicles.⁹ This source of funding is mainly short-term and therefore more susceptible to runs and to the drying-up of liquidity.

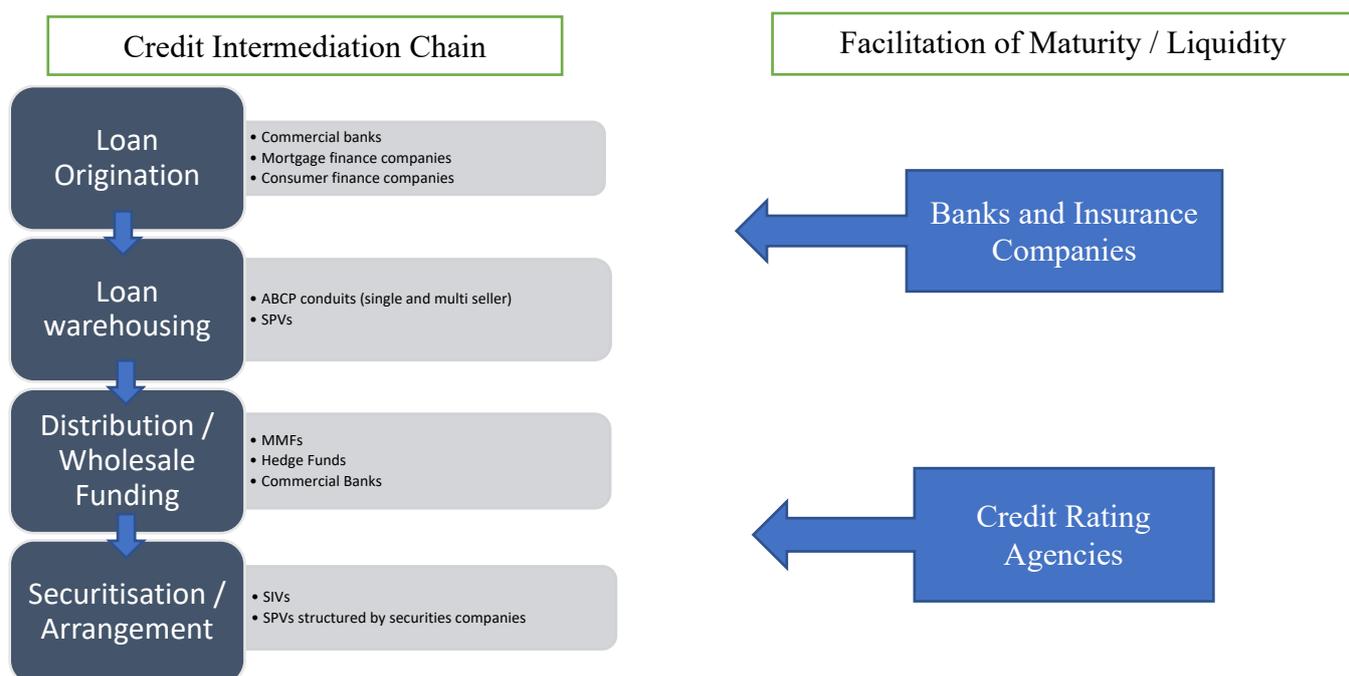
⁶ Financial Stability Board Report, 2011.

⁷ European Commission Communication, 2013.

⁸ Other shadow banking entities include securitisation vehicles like ABCPs or SIVs, securities lending, repurchase agreements, money market funds, securities broker-dealers, investment funds (including exchange traded funds and hedge funds that provide credit or are leveraged, finance companies, and providers of credit insurance and financial guarantees.

⁹ Bakk-Simon et al., 2011.

Figure 1 Illustration of the Shadow Banking System (Simplified)



Important to note here is that shadow banking entities are not inherently harmful, in fact they perform useful functions in the financial system. Benefits created by shadow banking entities include overall efficiency in the delivery of financial services, increased supply of credit to the economy, facilitation of greater diversification of risk, and enhanced innovation and competition.¹⁰ What is *shadowy* about the sector, however, is its many unknowns, the potential for spillovers into the traditional sector causing instability, the potential for systemic risk, and the complexities it presents for regulators. In fact, banking supervisors have been blamed by some scholars for allowing banking organisations to become shadow banks to preserve the regulated system, whilst simultaneously failing to adapt their supervisory programs to account for the evolution of financial risks that followed.¹¹ Two approaches, based on supply and demand, are useful in understanding the system.¹² The supply side examines how banks conduct securitisation-based credit intermediation through the globally connected shadow banking system, with a central focus on regulatory arbitrage. Conversely, the demand side examines why investors chose to fund banks through wholesale funding markets instead of deposits, concluding that it was about the safety preferences of institutional cash investors. Intersecting these two approaches, the idea of credit intermediation as risk intermediation is explored.¹³ In further exploring these approaches together, it can be understood that the shadow banking sector performs essential market functions, whether born as a byproduct of arbitrage or resulting from consumer demand.

¹⁰ Fein 2013.

¹¹ Blinder 2013 and Fein 2013.

¹² Pozsar et al., 2010 and Pozsar, 2011.

¹³ Pozsar, 2011.

The complexity of the instruments, markets and entities that make up the shadow banking system have traditionally existed outside the focus of regulatory authorities. Associated regulatory issues and systemic risks were first recognised on the global stage by G20 leaders at the November 2010 Seoul Summit. The 2011 FSB report highlights that the ‘opaque’ nature of shadow banking has led to its frequent exclusion from standard statistical collection frameworks.¹⁴ Furthermore, the constant evolution of market conditions, and the changing operations that follow, compound the difficulty of supervisory and monitoring efforts. The Commission’s 2013 Communication on shadow banking outlined three primary reasons for monitoring the sector: its size, close links to the regulated financial sector and the systemic risk that it poses.

2.1 Systemic Risk

Shadow banking holds a unique position in the financial system in that it brings both prosperity and vulnerability. The GFC illustrated that the occurrence of systemic risk can lead to significant destruction of the financial system.¹⁵ Systemic risk is generally defined as a risk of disruption in the financial system with the potential to have serious negative consequences for the internal market and the real economy.¹⁶ All types of financial intermediaries, markets and infrastructure have the potential for systemic importance. Existing studies on systemic risk have tended to focus on an analysis of systemic risk conducted from the perspective of interbank lending, leading to the belief that the interbank lending relationship has an important impact on systemic risk.¹⁷ Comparatively, studies that explore the systemic importance of the NBFIs sector are lacking considerably. So far, links have been made between the sudden increase in the shadow banking sector prior to the outbreak of the GFC, developing the link between shadow banking and systemic risk.¹⁸ Several reasons have been given for the association of shadow banking and systemic risk, to name a few: the utilisation of balance sheets by NBFIs entities to provide credit loans like commercial banks and use of term conversion to avoid bankruptcy risk (induces systemic risk),¹⁹ and the diversification of shadow bank’s portfolios by buying and selling risky loans.²⁰ While much is still unknown about the sector, as well as the precise mechanisms that link NBFIs and systemic risk, there is a strong consensus establishing the relationship between systemic risk and shadow banking – if for no other reason than its size and interconnectedness with the traditional sector.

¹⁴ FSB, 2011.

¹⁵ Jin and Zeng, 2014 and Poledna, Molina-Borboa, Martínez-Jarmillo, van der Leij and Thurner, 2015

¹⁶ Regulation (EU) No 1095/2010 of the European Parliament and of the Council of 24 November 2010 establishing a European Supervisory Authority (European Securities and Markets Authority), amending Decision No 716/2009/EC and repealing Commission Decision 2009/77/EC <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32010R1095>

¹⁷ Silva, Kimura and Sobreiro, 2016.

¹⁸ Pozsar et al. 2010 and Tucker, 2010.

¹⁹ Bernanke et al, 2011.

²⁰ Diamond, 1984.

2.2 Interconnectedness: Mapping the sector

An important first step in regulatory design is to map and understand the regulatory space and its actors.²¹ The limited literature on the shadow banking sector has stressed the importance of mapping the interconnectedness between banks and shadow banking entities, particularly to guide regulatory efforts in data collection and limiting instabilities resulting from these linkages.²² Despite this focus on interconnectedness as a financial stability concern, EU data is still somewhat lacking.²³ A 2015 dataset from the European Banking Authority (EBA) attempts to overcome this weakness, highlighting that about 60% of EU banks' exposures are to entities outside of the EU (primarily the United States) – emphasising the global nature of the problem. An additional problem is the information limitations for monitoring activities, with 13% of bank exposures in the EU from unidentified entities and 90% of total exposures either unsupervised or not identified by the reporting bank.²⁴ The EBA dataset showed that primary exposures for EU banks (approximately 65%) came from securitisations, investment funds (other than MMFs), and finance companies.

Major critiques on previous attempts at establishing a regulatory framework have been that it is too early to regulate with too much still unknown about the sector.²⁵ The FSB's 2013 policy proposal was an example of this. From a governance perspective, the proposal was well designed in that it prioritised classification based on function, rather than institution.²⁶ The proposal included three main steps: assessment based on economic functions, adoption of policy tools and, information sharing with other jurisdictions through FSB processes. Although the proposal propelled some EU level efforts, as will be discussed later, a broader framework and toolkit for monitoring the sector is still lacking.

3. Regulatory Issues

Since the beginning of the COVID-19 pandemic and its consequential impacts to the economy, regulatory efforts from the EBA have focused on limiting connections between traditional banks and the NBFIs sector. This continued 'bank centric' approach neglects the search for long-term solutions. Literature on shadow banking regulation suggests a trend in traditional discourse of interpreting the failure of shadow banking as a market failure caused by market imperfections, rather than as the incapacity of private risk management systems to price risks properly.²⁷ Based on this framing, regulators have neglected to question the epistemic authority of private risk management to correctly respond to data and instead focus on information

²¹ Windholz, 2018.

²² See Abad et al. 2017, Acharya et al. 2013 and Fischer, 2015.

²³ Hodula, 2020 and Abad et al. 2017.

²⁴ EBA, 2015.

²⁵ Gabor, 2016.

²⁶ Ford, 2017.

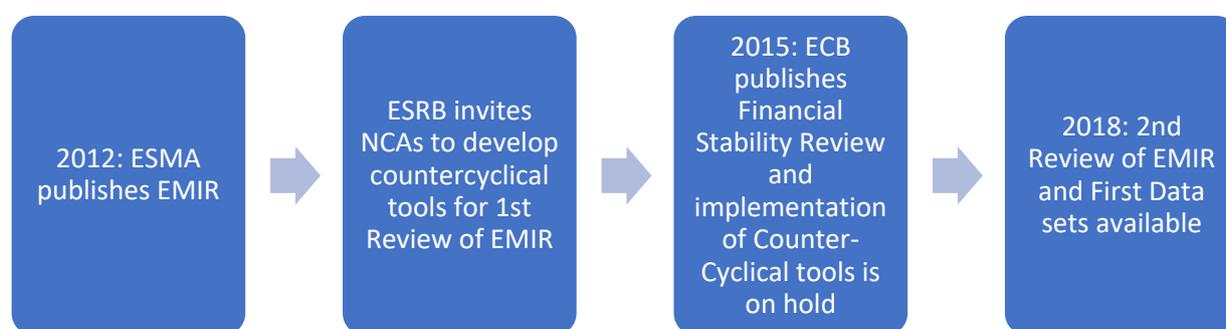
²⁷ Kessler and Wilhelm, 2013.

asymmetry.²⁸ This idea follows the assumption that market-based governance, which relies on transparency and private risk management, has largely triumphed post-GFC.²⁹ With this widely acknowledged reliance on private risk management, significant improvements to these processes, as well as increased understanding of the size and scope of the sector are needed to alleviate systemic risk and mitigate its consequences.

3.1 EU Regulatory Milestones

As indicated above, regulatory efforts at the European level have been limited. Stemming from the sector's introduction to the global stage in 2010, however, some EU level efforts have been made as a first step in combatting the potential negative consequences of the NBFIs sector. An outline of major efforts is included in Figure 2 below.

Figure 2 EU Regulatory Milestones



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The following section provides a discussion of the primary issues faced by regulators in the EU, namely: data and monitoring, innovation, and regulatory cost.

3.2 Data and Monitoring

As the discussion above on the interconnectedness of the sector indicates, a lot is still unknown about the size and scope of the sector and overcoming this will be a major step in successfully regulating. Additionally, the current reliance on private risk instruments to mitigate the potential of systemic risk consequences stemming from NBFIs actors has proven to be a significant weakness. Without the matched ICT monitoring capabilities of private actors and government agencies alike, available data would be unable to be used effectively and likely result in a failure of policy objectives.

²⁸ Thiemann et al. 2018.

²⁹ Underhill, 2015.

³⁰ Other efforts on the EU level at regulating is the Regulation on the Transparency of securities financing transactions (SFTR) and the proposal on MMFs.

3.3 Innovation

Regulation and innovation have a somewhat symbiotic relationship, motivating and stimulating each other in unintentional ways. A central problem for regulators in responding to innovation is that political innovation and the rule of law require public, state-sanctioned rules to have and maintain a degree of certainty, transparency, and public accountability. Due to these necessary but cumbersome considerations, regulation is constricted by law and institutions in responding to change in a way that private sector financial innovations are not. The shadow banking sector itself grew out of innovation that aimed to escape regulations that face traditional banks and continues to be a primary issue for regulators.

Regulation that focuses on sectors with high levels of innovation, evolving from both regulatory circumvention and financial innovation, requires careful consideration from a legal perspective. Detailed rules are largely ineffective in that they ignore the pace of regulatory change and speed of financial innovation.³¹ The Dodd-Frank rules in the US,³² while useful in establishing systemically important institutions, were attempted in the EU to little avail. Thus, embracing legal instruments like the Basel Accords that indicate capital requirement standards, whilst allowing for innovation, alongside regulations like EMIR, which address the need for universal data standards to be mandated, should be effectively supplemented with a means to achieve this. The supplementation recommendation offered in this brief is the introduction of RegTech solutions, which will be discussed in greater detail in the following sections.

3.4 Cost

Many critics find that financial regulation has little benefit and large costs.³³ Reporting in the UK suggests that economy-wide costs of complying with regulation exceeds 10% of GDP.³⁴ With regulatory arbitrage a dominant reason for the growth of NBFIs sector,³⁵ minimising the negative externality of cost for shadow banking entities, as well as traditional banks, to comply with regulators should lead to less circumvention of regulations. A primary economic benefit to introducing RegTech solutions is to reduce the cost of compliance.³⁶ Most of RegTech today centres around solutions for regulated financial institutions, helping them comply more efficiently and with greater certainty with regulations and improving risk management, while cutting costs.

³¹ Ford, 2017.

³² The Dodd-Frank Act is a comprehensive and complex bill that contains hundreds of pages and includes 16 major areas of reform. Simply put, the law places strict regulations on lenders and banks to protect consumers and prevent another economic crisis. Dodd-Frank also created several new agencies to oversee the regulatory process and implement certain changes. The Act promotes financial stability in the United States by improving accountability and transparency in the financial system, to end “too big to fail”, to protect the American taxpayer by ending bailouts, to protect consumers from abusive financial services practices, and for other purposes.

³³ Cochrane, 2014.

³⁴ National Audit Office, 2017.

³⁵ Fein, 2013 and Hodula, 2020.

³⁶ Schizas et al. 2019.

With pressures on industry and regulators, technology enabled compliance and oversight solutions are necessary to keep up with controls before they become redundant. A movement towards technology based regulatory solutions (RegTech) already exists and is expanding every day.³⁷ The following section explores the capacities of RegTech to address the risks emanating from shadow banking activities and entities.

4. RegTech

RegTech is a contraction of the terms ‘regulatory’ and ‘technology’ and harnesses the use of technology to make regulatory monitoring, reporting and compliance more efficient and cost-effective.³⁸ RegTech focuses on technology-based solutions to offset or solve regulatory and supervisory challenges, including the challenges posed by increasing financial innovation. With the aim of improving regulatory processes, the automation of certain regulatory methods allows for more efficient risk identification and greater compliance.³⁹ The use of RegTech in the shadow banking sector has the potential to benefit individual institutions, as well as increased market function through greater knowledge of the systemic risks involved in the sector. Future research and policymaking could go further to incorporate SupTech⁴⁰ to improve market function and oversight for supervisory agencies. SupTech, like RegTech, represents the conjunction of two words - supervisory and technology, and distinguishes between a portion of RegTech that focuses on technology for supervisory authorities (further discussed below). Important to note here is that RegTech is not in and of itself a solution, rather a necessary supplement to make policy and regulations effective. Figures 1 and 2 summarise areas where RegTech/SupTech functions could improve regulatory efforts. Although not all are applicable to the EU context, they provide a basis for understanding the significant role RegTech can play.

Figure 3 Summary of RegTech in NBF1 regulation

Compliance	Compliance represents a significant portion of the RegTech industry. Examples include enterprise-wide solutions for identifying and keeping track of changes in regulatory requirements, at local or global levels, and solutions for automated real-time monitoring of compliance levels and compliance risk, based on the analysis of operational and other data. This form of automated compliance is called ‘dynamic compliance’-regulatory requirements are embedded into IT protocols to ensure continuous compliance and confirm whether the data reported to supervisors is accurate and relevant. This type of RegTech can dramatically reduce the costs of manual compliance procedures. A wave of start-ups and a few tech
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³⁷ For an overview of the RegTech ‘universe’, see:

<https://www2.deloitte.com/lu/en/pages/technology/articles/regtech-companies-compliance.html>

³⁸ Arner et al, 2017.

³⁹ Fernández de Lis et al., 2016.

⁴⁰ SupTech is not a term widely used in RegTech publications but is used here to facilitate the differentiation of RegTech’s two sub-segments.

	giants operate in this area to help institutions keep up to date with regulatory requirements, identify potential financial crimes, and manage financial risk.
Risk Management	This area focuses on tools to improve the risk management process at financial institutions by bringing efficiencies to the generation of risk data, risk data aggregation, internal risk reporting, automatically identifying and monitoring risks according to internal methodologies or regulatory definitions and creating alerts and automated actions triggered when pre-determined risk levels are reached. These solutions may rely on advanced data analytics supported by machine learning or other AI applications.
Regulatory Reporting	This is a crucial area for supervisory agencies and a central element in regulatory compliance. RegTech solutions help automate and integrate regulatory reporting requirements to cut costs and streamline and increase the accuracy and timeliness of reporting, including making real-time reporting possible.

Figure 4 Summary of SupTech in NBF1 supervision

Data-input approach	Reporting institutions automatically package business data in a standard and highly granular format according to specifications by the supervisory agency and send it to a central database. No aggregation is done prior to reporting, which reduces the compliance costs and helps avoid errors or losses.
Data-pull approach	Raw (non-standardised) business data is sourced directly from the institutions' operational systems by automated processes triggered and controlled by the supervisory agency, and only later standardised by the agency itself.
Real-time access	The supervisor pulls or 'sees' operational data at will (rather than at pre-determined reporting periods) by directly accessing the institutions' operational systems, which could include monitoring transactions in real time basis. ⁴¹
Reporting utilities	SupTech can create reporting utilities for example, centralised structures that function not only as a common database of reported granular data but also as a repository of the interpretation of reporting rules, in a format that is readable by computers. Reporting utilities could reduce the costs and inefficiencies of the current reporting environment, in which each reporting institution designs and implements its own processes and interpretations of the reporting rules, often relying on external legal advice for complex regulations. Together with machine-readable regulations (i.e. regulations issued as programming codes that can be assimilated immediately by institutions' operational systems, without the need for a human to interpret them), reporting utilities could 'industrialise' (fully automate) the reporting value chain.

⁴¹ See the explanation of how the UK FCA would 'pull' data from regulated firms, a discussion that was part of FCA's Regulatory Reporting TechSprint 2016: <https://www.youtube.com/watch?v=tG4kNsveVqY>

Gathering intelligence from unstructured data	In addition to transforming regulatory reporting, SupTech can also create opportunities for supervisory agencies to collect and analyse unstructured data with greater efficiency, which could relieve supervisors from time-consuming tasks.
Regulatory submissions and data quality management	Although many supervisory agencies have fully automated procedures to manage submissions by reporting institutions and manage the quality of the reported data, including running validation tests, new SupTech products and services are being offered specifically for submission and data quality management, which could benefit supervisors in jurisdictions where these tasks involve manual processes.

One area where regulators have already seen some success in using technology to monitor markets is in the trade reporting systems of public securities markets.⁴² Data is held by securities exchanges on all trades making it easier to look for unusual activity.⁴³ Limited information, post GFC, has hindered the effectiveness of such tools. Mandated reporting of all transactions, whether on or off-exchange, was an attempt by regulators to overcome this.⁴⁴ Regulators have recognised the stabilising consequence of central counterparties (CCPs) in making derivatives markets safer, however further improvements can be made.⁴⁵ Revisions to EMIR and consultations from the FSB aim to improve incentives for using CCPs and improve access to central clearing⁴⁶ for smaller market participants (EMIR REFIT).

In August 2020, the EBA released a RegTech industry survey to invite all relevant stakeholders, like financial institutions and ICT third party providers⁴⁷ (and separated based on these distinctions) to share their views and experience on the use of RegTech solutions, on a best effort basis. The survey aim was to better understand ongoing activities in this area, as well as raising awareness on RegTech within the supervisory and regulatory community.⁴⁸ The survey focuses on mapping existing RegTech solutions and firms, identifying the main barriers to the use of RegTech solutions, and identifying potential ways to support the uptake of RegTech across the EU. The EBA indicates its primary interest in Anti Money-Laundering / Combating the Financing of Terrorism (AML/CFT), creditworthiness assessment, compliance,

⁴² Arner et al., 2017.

⁴³ IOSC, 2013.

⁴⁴ A core example of this is the European Market Infrastructure Regulation or EU Regulation 648/2012.

⁴⁵ Deutsche Börse Group, 2018.

⁴⁶ Central clearing is a key element of the reforms made following the GFC. To reduce the systemic risk from bilateral trading, the G20 leaders agreed at the 2009 Pittsburgh Summit that all standardised derivatives contracts should be traded on exchanges or electronic trading platforms and cleared through CCPs. For more information see the Bank for International Settlements report on current central clearing trends and issues: https://www.bis.org/publ/qtrpdf/r_qt1512g.pdf

⁴⁷ The DOR Regulation widely defines ICT third-party service providers as any "*undertaking providing digital and data services, including providers of cloud computing services, software, data analytics services, [and] data centres...*" but excluding "*providers of hardware components*" and those already authorised under EU law and which provide electronic communications services (as defined in the European Electronic Communications Code). (There are also some very limited exceptions for micro-enterprises and entities already subject to EU-wide supervision.)

⁴⁸ <https://www.eba.europa.eu/eba-consults-use-regtech-solutions-and-ways-support-uptake-regtech-across-eu>

and supervisory reporting. On the 29th of June 2021, the results of the survey were published.⁴⁹ Established in the EBA's analysis was a focus on the priorities of (1) further deepening knowledge and addressing skill gaps among regulators and supervisors on RegTech; (2) supporting the convergence of supervisory practices across the EU in the treatment of RegTech and in providing clarity on supervisory expectations; (3) take further steps to harmonise the legal and regulatory requirements, where appropriate; and (4) further leverage the role and expertise of the European Forum of Innovation Facilitators and the national regulatory sandboxes and innovation hubs. The close timing of the release of these results and the release of this paper has meant that the findings do not factor significantly into the analysis presented here. Nevertheless, the EBA's report sympathises with the priorities of this paper in its need to adopt RegTech solutions, provide a clear supervisory framework and work towards regulatory convergence in this area.

FinTech and RegTech standardisation across the EU has been on the agenda of the Commission since 2017. The interoperability and standards work stream of the Financial Technology Task Force was kicked off in January 2017 and a first consultation on FinTech took place from 23 March to 15 June 2017. More recently, the Commission released the results from their 2020 Consultation on a new Digital Finance Strategy.⁵⁰ The 2020 consultation identified some potential areas where the financial services regulatory framework in the EU might need to be adapted to facilitate the use of certain new technologies, specifically distributed ledger technology (DLT), cloud computing and artificial intelligence (AI), and biometrics. Moving towards the standardisation of ICT capabilities within the EU financial regulatory sphere will involve significant investment and overhaul at all levels. The 2019 Commission's fitness check of the EU supervisory reporting requirements around financial services indicated the problem of inconsistencies between reporting frameworks.⁵¹ Such inconsistencies reduce data quality and increase the administrative burden for supervisors.

Supported by this context, the argument for RegTech and SupTech solutions to NBFIs regulator's problems is as follows:

1. Reduces the cost of compliance
2. Improved monitoring and reporting capabilities to map the regulatory space and use of Big Data to measure systemic risk
3. Embraces financial innovation
4. Improve private risk management processes at financial institutions.

⁴⁹ See EBA, 2021. 'EBA analysis of RegTech in the EU financial sector' and 'RegTech in the EU financial sector: EBA analysis at a glance'. At: https://www.eba.europa.eu/sites/default/documents/files/document_library/Publications/Reports/2021/1015484/EBA%20analysis%20of%20RegTech%20in%20the%20EU%20financial%20sector.pdf and https://www.eba.europa.eu/sites/default/documents/files/document_library/News%20and%20Press/Communication%20materials/Factsheets/1016165/RegTech%20factsheet.pdf

⁵⁰ European Commission, 2020. 'Summary: Consultation on a new Digital Finance Strategy'. https://ec.europa.eu/info/sites/default/files/business_economy_euro/banking_and_finance/2020-digital-finance-strategy-consultation-summary-of-responses_en.pdf

⁵¹ Commission Staff Working Document – Fitness Check of EU supervisory reporting requirements. November 2019.

5. Exploring the advantages of RegTech

This section explores the arguments for implementing RegTech solutions. As RegTech is still relatively underutilised, even in the traditional banking sector, examples of its usage are not widely available. Examples explored in this section come from varying jurisdictions and focus on the banking sector. With RegTech recognised on the European policy level as an important solution, these cases provide examples of how RegTech can be utilised for NBFi activities.

5.1 Reduced Cost of Compliance

The economic costs created by recessions from financial crises are severe, yet the costs associated with ever-changing and expanding regulatory frameworks are significant. Compliance costs refer to all business expenses related to achieving regulatory compliance.⁵² OECD guidance breaks down these areas into administrative burdens, administration and enforcement costs, and substantive compliance costs.⁵³ These costs have substantially increased for banks and other financial institutions in the years post crisis, with regulations like GDPR and MiFID II increasing this exigent landscape of never-ending compliance. The Bank of England has been a leading central bank in embracing RegTech as a supervisory and reporting solution. Some estimates suggest that the costs of regulatory reporting in the UK banking industry are as high as 4.5 billion pounds every year.⁵⁴ The introduction of new technologies can streamline and mitigate these costs. The City of London Corporation has stated that the annual costs of compliance of the UK's top 5 banks could be cut by a minimum of 0.05% (or 720 million euros) if there was a greater use of RegTech.⁵⁵ Initial steps from the Bank of England have focussed on natural language processing and machine-readable rules,⁵⁶ however, they suggest a variety of potential options that are available. Pulling data directly from firms, 'post and subscribe' models,⁵⁷ use of APIs,⁵⁸ and the use of DLT networks.⁵⁹ Cut off from the EU by Brexit, and with a strong FinTech sector, the UK has been a leading developer of RegTech. Lack of funding and reliance on private actors to advance the sector, however, has made progress slow. The EU, on the other hand, can establish policy in conjunction with technological developments. The EBA's interest in RegTech solutions is evidence of a recognition that regulation will move in that direction for the traditional banking sector. The potential spill over implications for the NBFi sector are far-reaching, changing the way financial activities are monitored in the EU and allowing for a greater understanding of the sector.

⁵² <https://pideeco.be/articles/regulatory-compliance-costs-meaning/>

⁵³ OECD Regulatory Compliance Cost Assessment Guidance, 2014.

⁵⁴ McKinsey & Company - <https://www.bankofengland.co.uk/-/media/boe/files/report/2019/response-to-the-future-of-finance-report.pdf?la=en&hash=C4FA7E3D277DC82934050840DBCFC7C67509A4#page=10>

⁵⁵ <https://www.reuters.com/business/finance/city-london-calls-paradigm-shift-tech-banks-2021-04-15/>

⁵⁶ Bank of England Report, 2019.

⁵⁷ This idea would utilise a web portal or other such mechanism.

⁵⁸ Use of APIs (Application Programming Interface) allowing communication over various platforms without manual intervention.

⁵⁹ Distributed Ledger Technology could allow networks of shared, replicated, and synchronised data.

5.2 Innovating monitoring and reporting capabilities

The way financial data is exchanged across institutions and companies globally is becoming increasingly automated and complex. The financial sector is at the forefront, playing a crucial role in identifying and responding to new trends like digitalisation and new business models. The financial services sector has seen a profound technology led evolution in the past few years, including a significant increase in RegTech and FinTech start-ups in the EU. In terms of improving reporting and monitoring capabilities, regulatory technology offers solutions like data input approaches. A data input approach automatically sends highly granular data set to the regulators specifications to a central database.⁶⁰ This approach improves on template-based approaches in that no aggregation is done prior to reporting, both reducing compliance costs for firms and helping to reduce errors. Current failures of regulators in the financial sector to embrace and develop technological advances makes achieving policy goals nearly impossible (including the FSB's 2020 proposal). With higher reporting rates, greater awareness of the risks and improved private risk management, policy objectives can be more effectively implemented to overcome critiques outlined above. Austria's central bank OeNB has taken steps towards this more immediate and high-quality bank data, with increased integration between the operating systems of banks and central banks.⁶¹ The success of the new system is being debated in Europe and has the potential to encourage more European regulators in both traditional and NBFIs sectors.

This growing recognition of RegTech solutions in the traditional banking sector has the potential to cause spill over effects on the regulation of shadow banking entities. With the two sectors so intertwined, it is important now to include the NBFIs sector in steps taken to transform the financial regulatory space. In the period following the GFC, it has been suggested that the crisis fault lies more with the inability of banking regulators and supervisors to recognise the development of risky activities within the traditional and NBFIs sectors, rather than NBFIs entities themselves.⁶² This mistake should be avoided in future efforts through emphasising a dialogue between industry and regulators, as well as an emphasis on developing monitoring and reporting capabilities.

6. Embracing innovation and technology at the policy level

Since the GFC, the banking sector has gradually collected data and information on potential vulnerabilities. Banking supervisors have made advances on exposures of traditional banks to shadow banking through better capital and liquidity regulations. Although it is undoubtedly too early to suggest concrete policy level solutions to the NBFIs sector with so much still unknown, moves towards regulation based on function is a significant step in the right direction. Bridling innovation through regulatory efforts should be avoided, instead promoting RegTech innovators, facilitating greater and easier access to regulatory requirements and reporting

⁶⁰ Schizas et al., 2019.

⁶¹ Piechocki and Dabringhausen, 2015.

⁶² Fein, 2013.

should be prioritised. As stated by President von der Leyen in her Political Guidelines and set out in the Communication ‘Shaping Europe’s digital future’, it is crucial for Europe to reap all the benefits of the digital age and to strengthen its industry and innovation capacity, within safe and ethical boundaries.

6.1 Conclusion and Recommendations

Staying abreast of financial innovation in the shadow banking sector through embracing RegTech and ICT standardisation at the policy level should be a priority for European policy makers moving forward. The sector has, particularly in times of crisis, highlighted its potential for systemic risk and the creation of financial instabilities. On a policy level, the sector’s growth also has negative implications for attempts at reducing the procyclicality in bank lending in the traditional sector. Some scholars have suggested that the effectiveness of capital-based regulations and borrower-based limits, as exhibited in the Basel III reforms, is undermined by the growth of shadow banking entities.⁶³ Thus, policy recommendations explored in this section will work towards the goal of a framework for testing the interconnectedness of financial institutions at an EU level. At this stage, when there is much still to be learnt about the sector, this goal should be prioritised through monitoring and reporting. In doing so, a more developed understanding of the implications and interconnections involved between traditional and NBFIs sectors and their specific economic activity related potential systemic risk consequences can be evaluated. Therefore, the following recommendations refrain from offering detailed policy options; rather, they focus on developing a dialogue between industry and regulators, education on the benefits of RegTech (for supervisors and financial institutions) and a greater understanding of the benefits and risks of the shadow banking sector.

Firstly, consultation on RegTech should be expanded to include efforts made by the European Securities and Markets Authority (ESMA). Coordinating responses from both the EBA and ESMA, as well as additional third-party contributors (in the form of RegTechs, FinTechs and other financial institutions), would create an opportunity to harmonise efforts in the traditional and non-traditional sectors. The creation of a constructive dialogue between RegTech companies, supervisors, regulators, and financial institutions will lead to an increased awareness of the sector, risks it poses and potential opportunities to further regulate and monitor. Encouraging this process without stifling innovation will be a major challenge for policymakers, however, can be mitigated through adequate monetary support and education on the benefits of making this digital transition.

RegTech solutions in the following areas should be encouraged through consultation processes and funding:

(1) **Risk management:** an effective digital risk management program can help financial institutions build a platform comprised of data and interdependent technology systems and tools that support the customer, business processes and governance techniques of compliance

⁶³ Hodula et al., 2020.

functions. An example of such is 360Factors, which allows the detection of compliance and regulatory risk, assessing risk exposure and anticipating future threats.

(2) **Reporting:** the right software can aid reporting process by automating monitoring, reducing human error, and providing swift and accurate data. Acarda GmbH is an example of a RegTech that enables data distribution and regulatory reporting through big data analytics, real time reporting and cloud.⁶⁴

(3) **Compliance:** machine learning and AI help to ensure compliance by automating processing like searching for new or changed regulations, reporting, data analysis and sharing the impact of changes.⁶⁵ 6clicks uses AI algorithms to monitor and track the current state of compliance and regulations in real time.

These technological solutions have the potential to improve regulation, supervision, and compliance, as well as aid innovation for individual firms. Each of these RegTech solutions address the regulatory challenges introduced earlier in this paper, as well as provide a significant step in combatting the issues shadow banking exposes. In terms of implementation, additional challenges will be faced in incentivising its adoption. As it is unlikely to be effectively introduced as an obligatory solution, a two-pronged approach targeting both larger and smaller institutions should be used, emphasising education on the benefits of the approach for industry. Further, monetary support should be made available to support institutions in their digital transitions and innovative endeavours. As part of the Commission's emphasis on digital and climate transitions, RegTech should be at the forefront of the effort. The applicability of the technology exists far wider than solely financial reporting – it has the capacity to increase environmental standards reporting.

⁶⁴ AI technology is also effective in this area, improving processes in regulatory change management, data validation, data processing and preparation, categorization and classification, and analytical calculations.

⁶⁵ Initially, this step will not be a focus point – once more is understood about the sector, this step will be crucial in ensuring current regulations are complied with.

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Appendix 1: FSB work program on NBFIs

Topic	Brief description	Timing
1. Analytical and policy work on specific issues		
Money market fund (MMF) resilience	To make policy proposals, in light of the March experience, to enhance MMF resilience including with respect to the underlying short-term funding markets	2021, incl. report to the G20
Liquidity risk and its management in open-ended funds (OEFs)	To examine the availability and effectiveness of liquidity risk management tools for OEFs, including the experience of redemption pressures and use of tools in the March turmoil and their aggregate impact on the market	2021-22
Margining practices	To examine the frameworks and dynamics of margin calls in centrally cleared and uncleared derivatives markets and the liquidity management preparedness of market participants to meet margin calls	2021
Liquidity, structure and resilience of core bond markets	To examine the structure and liquidity provision in core funding markets during stress, including the role of leveraged investors and factors that limit dealer capacity to intermediate	2021-22
2. Systemic risk assessments		
Strengthening the ongoing monitoring of NBFIs risks	To assess NBFIs risks in light of COVID-19 developments and lessons from the March turmoil	Ongoing
Advancing the understanding of systemic risks in NBFIs and the financial system	To deepen the analysis of structural and interconnectedness issues in NBFIs, including the interaction of USD funding pressures and fund outflows in emerging market economies, as input into enhanced risk monitoring and discussions on policies to address systemic risks in NBFIs	Ongoing, incl. stakeholder workshop in 2021
3. Policies to address systemic risks in NBFIs		
Policies to address systemic risks in NBFIs	To examine policies to address systemic risks in NBFIs, including the adequacy of current policy tools and the concept and desired level of resilience in NBFIs	2022

Source: FSB Report 17 November 2020

Appendix 2: EBA RegTech Industry Survey

2.21 In your opinion, what are the main barriers for scaling up RegTech solutions across the Single Market?

(Please indicate the significance of each factor in a 1 to 5 scale, where 1 stands for "Not relevant" and 5 stands for "Very relevant")

	1 - not relevant	2	3	4	5 - very relevant
• Challenges in gaining financial institutions' trust	<input type="radio"/>				
• Language barrier	<input type="radio"/>				
• Challenges in communicating added value for financial entities	<input type="radio"/>				
• Challenges in negotiating contracts with financial entities	<input type="radio"/>				
• Cautious/reserved attitude by supervisory/regulatory authorities	<input type="radio"/>				
• Lack of clarity in certain EU regulatory requirements	<input type="radio"/>				
• Lack of clarity in certain national regulatory requirements	<input type="radio"/>				
• Challenges in ensuring compliance with General Data Protection Regulation (GDPR)	<input type="radio"/>				
• Frequent changes in relevant regulatory requirements	<input type="radio"/>				
• Competition barriers to entry	<input type="radio"/>				
• High costs of adapting tech-based solutions to national regulatory requirements	<input type="radio"/>				
• Poor quality of data in financial institutions	<input type="radio"/>				
Other(s)	<input type="radio"/>				

A Path for Europe (PfEU) is a Berlin-based independent non-profit think tank focusing on EU affairs.

Through future-oriented policy research and debate, PfEU aims to develop innovative policy solutions and promote policymaking that can make the EU fit for tomorrow. PfEU also facilitates much-needed engagement with the European project and the EU's future through the engagement platform "Future Hub" where decision-makers meet experts and young policy thinkers to jointly initiate policy solutions.

PfEU sees the inclusion of the young generation as key when shaping future paths for Europe. PfEU itself is unique in that its international team is entirely led by and comprised of young researchers and policy talents, enabling them to have an active voice and impact in today's policy sphere