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Digital transformation of financial regulators and the emergence of supervisory technologies (SupTech): a case study of the UK Financial Conduct Authority¹

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Digital Transformation of Financial Regulators and the Emergence of Supervisory Technologies (SupTech): A Case Study of the U.K. Financial Conduct Authority

Pavle Avramović

The ability of financial regulators to supervise the fast-evolving and technologically enabled world of financial services is uncertain. Scars from the 2007–2008 crisis remain and, with novel technological approaches being deployed at an unprecedented rate, the question of regulatory ability is often overlooked. How can financial regulators meet the challenges of this growing ecosystem and prevent harmful outcomes for consumers and markets? Could supervisory technologies (SupTech) be the answer?

This article provides a case study of the use of SupTech by the U.K. Financial Conduct Authority (FCA). Through 16 qualitative interviews with senior colleagues at the FCA and other regulators, this study focuses on how the field of SupTech has emerged and how the FCA developed its SupTech tool (BLENDER) to monitor market abuse in financial markets.

Novel institutional drivers of SupTech emergence are identified, centering on 'regulatory competition' and how regulators' mimetic behaviors result in competition and potentially contribute to further SupTech growth. Through a dynamic capability lens (Teece et al., 1997), the research also provides insights into the development journey of a SupTech tool.

The article provides an important foundation for the research of SupTech and calls for further explorations within this field to provide regulators with the insight needed to deliver their objectives in the interest of consumers, firms, and markets.

Keywords: digital transformation, SupTech, financial regulation, innovation

Media Summary

This article provides a case study of the use of supervisory technologies (SupTech) by the U.K. Financial Conduct Authority (FCA), one of the leading financial regulators in the world. Through 16 qualitative interviews with senior colleagues at the FCA and other international regulators, the study focuses on how the field of SupTech has emerged and how the FCA developed its SupTech tool (BLENDER) to monitor market abuse in financial markets. Novel institutional drivers of SupTech emergence are identified, centering on 'regulatory competition' and how regulators' mimetic behaviors result in competition and could contribute to further SupTech growth. Through a dynamic capability lens (Teece et al., 1997), the research provides a rare insight into the development journey of a SupTech tool and highlights key factors of sensing opportunities, visionary leadership, and flexible delivery frameworks as crucial for SupTech creation. The article provides an important foundation for the research of SupTech and calls for further explorations within this field to

provide regulators with the insight needed to deliver their objectives in the interest of consumers, firms, and markets.

1. Introduction

The financial services industry has historically been an early adopter of information technology (IT), due to its data-centric focus and close interrelationships between consumers, financial institutions, and intermediaries (Zhu et al., 2004). This adoption of IT fueled the increased digitization and digitalization of the sector, as firms looked for opportunities to improve processes and build new offerings (Alt et al., 2018). These factors together have resulted in the rise of 'FinTech,' "the fusion of finance and technology" (Goldstein et al., 2019, p. 1647). Financial services firms are rapidly digitally transforming and adopting technologies such as artificial intelligence (AI) and cloud computing to develop efficiencies and improve their service offerings (World Economic Forum, 2020).

On the other side of the fast-evolving financial services sector are financial regulatory bodies, organizations with crucial regulatory responsibilities to ensure well-functioning markets. These organizations with restricted budgets, limited technological ability, and growing mandates are expected to be able to regulate efficiently and effectively complex and often-changing financial markets (Financial Stability Board [FSB], 2017).

With such novel technological innovations, an important question raised is, are financial regulatory bodies able to fulfill their duties and ensure consumers are protected and financial collapses are avoided?

Digital transformations of government functions have been often explored, such as e-portals (Luna-Reyes & Gil-Garcia, 2014) and business-to-government reporting (Troshani et al., 2018). However, there is a research gap in information systems (IS) literature regarding the digital transformation of regulatory bodies, particularly within financial services regulation. Within the "Senior Scholars' Basket of IS Journals" (Association for Information Systems, 2011), a limited number of articles were found using a mix of keywords, including 'digital transformation,' 'regulatory authorities,' 'regulation,' 'regulatory agencies,' and others. Other, less recognized journals contained literature on this topic, but this demonstrable gap leaves regulators potentially ill-informed and underprepared for the challenges they are facing.

The question of overall regulatory ability, however, has been recognized in industry research. Global institutions such as the Bank for International Settlements (BIS, 2018), the Cambridge SupTech Lab (Cambridge SupTech Lab, 2022), consultancies (Oliver Wyman, 2017), and media (Gilman, 2021; Holden, 2020) explored how regulators have been slow to respond and institutionally bound in their activities, thus increasing the need to digitally transform in order to successfully regulate financial services. The crisis of 2007–2008 demonstrates the impact of regulatory failures; in the context of today's interconnected global economy, the impact of technologically driven failure could be significantly more severe.

One emerging response to this question is the development of the supervisory technologies (SupTech) field, which is defined by the World Bank (2021) as “the use of technology to facilitate and enhance supervisory processes from the perspective of supervisory authorities.” Regulators are increasingly turning to technology to assist their supervisory activities.

This research article seeks to assess how the SupTech field emerges and develops within financial regulatory agencies to provide an adequate response to the challenges faced by the regulatory system. By focusing on the two elements of emergence and development, the aim is to understand and inform regulators of the driving factors of this novel field and how such technological approaches could be developed to support regulators. To achieve this, this article will focus on the experience of the UK Financial Conduct Authority (FCA), one of the more technologically advanced regulators in the world (Friend, 2021). In a case study format, it seeks to understand how the FCA has approached the development of a SupTech solution (BLENDER) through a dynamic capabilities lens (Teece et al., 1997), and what institutional factors have contributed to the growth of the SupTech field within the organization and more widely in the global ecosystem of financial services.

The article starts with an overview of the relevant literature to provide an understanding of the topic and a reflection of the theoretical foundation for further analysis. After exploring the research design and question, it provides key findings and sets out the BLENDER development journey. Finally, it considers the implications of these findings, namely, what these institutional drivers mean for global SupTech emergence, learnings for SupTech development, and important lessons for research, regulators, and industry.

2. Context

2.1. Digitalization of Financial Services and Regulatory Gap

Financial regulatory bodies refer to organizations responsible for delivering objectives ‘in the public interest,’ which often consist of protecting consumers and ensuring markets work well (Baldwin et al., 2011). Historically, these organizations have been perceived as key actors in the successful functioning of the financial services ecosystem. However, after the 2007–2008 crisis, there has been an increased focus on their role, remit, and activities, and increased attention on how they affect the lives of consumers and firms, particularly around the potential risks and effects of regulatory failures (Moshirian, 2011). This newly developed scrutiny has resulted in regulators being increasingly in the public eye and having progressively higher expectations of delivering their objectives, with technology playing a growing role in enabling their work (Cambridge Centre for Alternative Finance [CCAF], 2019).

Similarly, technology continues to be a key enabler for financial services firms, supporting the creation of new products and services at unprecedented rates (Organisation for Economic Co-operation and Development [OECD], 2018). The introduction of technology-enabled opportunities like Open Banking (Deloitte, 2017), the prospect of improving financial inclusion (Consultative Group to Assist the Poor, 2020), and the availability of fast

payments, which could be critical for time-sensitive incidents (BIS, 2016), provide manifold benefits for consumers and markets.

Nevertheless, technology drives complex challenges as well. For example, the lack of explainability of AI algorithms (Ostmann & Dorobantu, 2021), algorithmic trading and impact on market monitoring (Kunz & Martin, 2015), and the challenge of crypto-asset regulation (FSB, 2022) are all examples of difficult issues for regulators.

Therefore, it is to be expected that regulators, just like industry, are also turning to technology—for support in managing their growing portfolios of work and increasing their insight, efficiency, and effectiveness.

2.2. SupTech as an Emerging Field

Digital transformation has been a widespread effort within the public sector and government. The potential for technology to advance the delivery of public sector goals and objectives has been extensively researched (Dada, 2006; Fountain, 2001; Twizeyimana & Andersson, 2019; West, 2007). For financial regulators, however, the area is only now starting to be explored.

Industry research captures the digital transformation of regulators through the SupTech field. Multiple definitions currently exist (Zeranski & Sancak, 2020). These range from one of the original definitions by the Financial Stability Institute at the BIS as “the use of innovative technologies by supervisory agencies to support supervision” (Broeders & Prenio, 2018) to broader classifications. The rationale behind the introduction of this new term is to capture the extensive efforts by financial regulators across the world who use technology to assist their work programs.

In terms of types of regulators that are utilizing these tools, central banks and market regulators are often included and there is a broad regional split, with examples of more than 130 international regulators participating in global surveys on their use of SupTech (Cambridge SupTech Lab, 2022). SupTech has been mainly recognized within financial services; however, other sectoral regulators are exploring the applications of such approaches. For example, the Digital Regulation Cooperation Forum is creating a network to enable regulators to join up on the use of SupTech in the United Kingdom across communications, data privacy, competition, and financial services (Digital Regulation Cooperation Forum, 2022).

From a use-case perspective, SupTech represents a broad and complex field with a breadth of applications split across different regulatory functions. Research by the World Bank (2021) captured the diversity of potential SupTech applications, outlining the key regulatory activities and technologies being applied, with data being at the ‘heart’ of all efforts as a critical way for regulators to understand what is occurring in their respective markets. Figure 1 outlines the four primary sectors of AML/CFT (anti-money laundering/combatting the finance of terrorism) supervision, macro-prudential supervision (market monitoring), micro-prudential supervision (firm monitoring), and licensing (record management). These regulatory responsibilities are enabled through the combination of SupTech tools and data analysis. For example, prudential SupTech tools

have been critical during the COVID-19 pandemic, with more than 20 regulators experimenting with more than 70 different prudential tools to enable oversight of companies (Beerman et al., 2021).

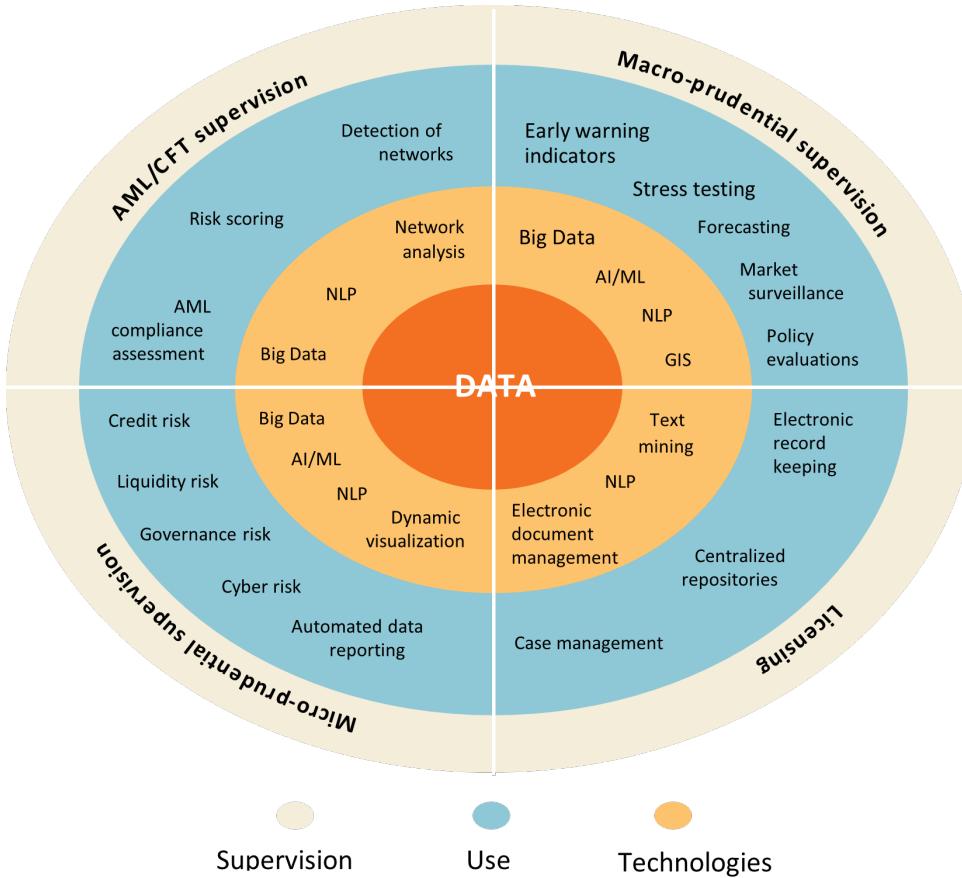


Figure 1. SupTech taxonomy with SupTech use cases. From Appaya et al. (2020).

Di Castri et al. (2019) capture the historical journey of SupTech in the influential “suptech generations” paper outlining the different maturity of technologies and regulatory processes. In their view, SupTech captures ‘innovative’ applications of technology (third and fourth generations), however, they acknowledge previous technological efforts and their contribution (Figure 2).

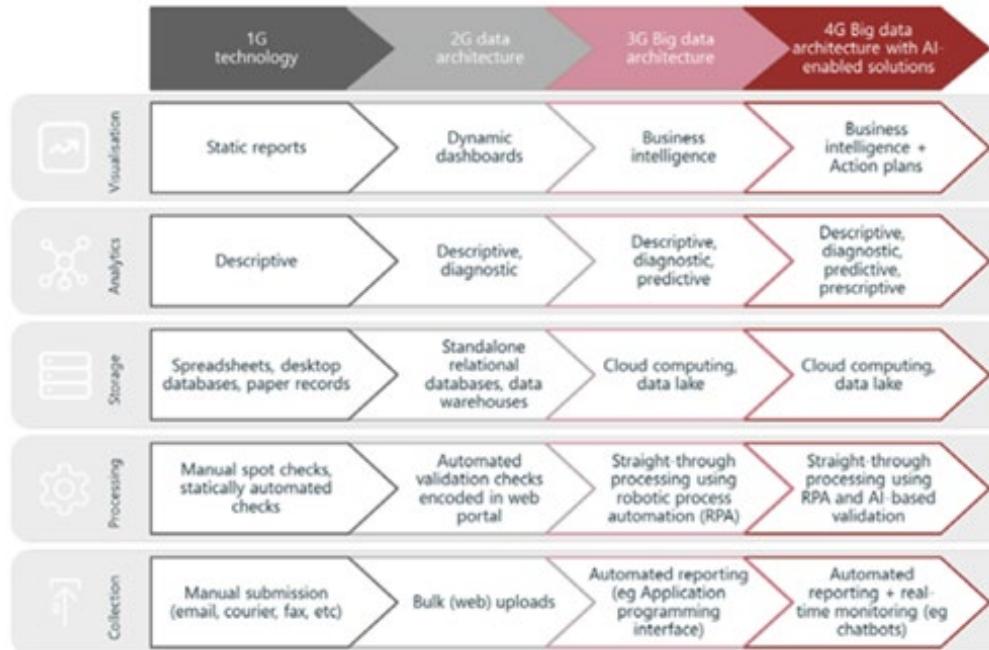


Figure 2. Evolution of technology within SupTech (Di Castri et al., 2019).

Industry and think tank research demonstrates that regulatory agencies around the world are working more closely to understand how this field is developing and how the usage of technology is assisting regulators to meet increasing regulatory supervision needs. Nevertheless, it should be acknowledged that regulators are still pursuing existing supervisory approaches to monitor markets and some technological applications could be considered out of scope for SupTech, and this should be addressed as the field matures and is further researched (FinCoNet [International Financial Consumer Protection Organisation], 2020; FSB, 2020; International Association of Insurance Supervisors and Access to Insurance Initiative, 2019; Toronto Centre, 2018; World Bank, 2018).

Despite the growing industry literature, there is partial information on how any one particular SupTech solution is developed. The focus of the industry research has been on showcasing the breadth and diversity in case studies of financial regulators. However, due to potential market risks of sharing too much information held by regulators, there have been limited explorations of SupTech development.

2.3. Theoretical Foundations—Institutional Theory and Dynamic Capabilities

Given the inherent novelty, complexity, and breadth of SupTech and the digital transformation lifecycle, the focus of this article is on both the emergence and development aspects of SupTech through the research question of 'how does SupTech emerge and develop within financial regulatory agencies?' From a theoretical perspective, this article uses a combined approach to answer this question, looking at institutional factors driving the emergence of SupTech and how SupTech is developed through a dynamic capabilities lens.

Firstly, it explores institutional factors that are affecting the emergence process, using literature on institutional theory and information systems (Currie & Swanson, 2009; Hinings et al., 2018; Orlikowski & Barley, 2001). As previously highlighted, SupTech's growth is on a global scale and most of the literature discusses the common and often duplicative approaches and challenges faced by regulators in SupTech development (Cambridge SupTech Lab, 2022; FinCoNet, 2020; FSB, 2020; OECD, 2019). This commonality provides a connection to new institutionalism and the isomorphic pressures that drive organizations to behave similarly. In this case, the isomorphic pressures drive regulators to pursue analogous approaches and use technology for the supervision of markets.(DiMaggio & Powell, 1983).

DiMaggio and Powell (1983) discuss in depth how institutions tend to copy and mimic each other, motivated by different pressures. These include meeting social expectations (coercive), tackling uncertainty (mimetic), or building legitimacy (normative). A relevant example is the mimetic behavior portrayed by financial services firms and regulators to create a crisis environment during the financial crash. It could be argued that a case of 'contagion of legitimacy' occurred between these two types of institutions in the United States (Riaz, 2009; Wolfson, 2013). The successes of firms caused a 'reverse-legitimacy' of the system and creation of 'blind spots' for financial regulators, resulting in the subsequent crash. Considering the similar approaches regulators are taking toward SupTech development, it could be valuable to explore the drivers and pressures for SupTech and understand the overlaps.

Initial comparison between the isomorphic pressures and identified drivers of SupTech development from literature highlight that both coercive and mimetic pressures exist, with limited normative pressures identified. Interestingly, mimetic behaviors in technology are already identified, but there is no underlying detail around the level of solution or approach similarity.

Table 1. Isomorphic pressures and SupTech; adapted from DiMaggio and Powell (1983).

Types of Pressures	Description	Regulatory SupTech Examples/Equivalents
Coercive Pressures	Result from both formal and informal pressures applied on organizations by other organizations upon which they are dependent and by societal cultural expectations	<ul style="list-style-type: none"> Regulatory obligations and duty of operating effectively and efficiently (FSB, 2020) Consumer attitudes have changed, and they have higher expectations of financial regulators and of their role in protecting consumers (OECD, 2019)
Mimetic Pressures	Result from uncertainty and encourage organization to imitate each other in order to manage the ambiguity of the	<ul style="list-style-type: none"> Common supervisory needs of automating supervisory procedures and analysing datasets result in 'greater similarity' of SupTech tools

Types of Pressures	Description	Regulatory SupTech Examples/Equivalents
	environment	being developed (FinCoNet, 2020)
Normative Pressures	Result from the need for professionalization and a group wanting to define the conditions and methods of their work	<ul style="list-style-type: none"> Overall availability of technology at an affordable price drives regulators to pursue similar technological approaches, for example, the move to cloud computing (FSB, 2020) Not applicable to the SupTech field due to the inherent novelty. Potential future certifications and courses could be created (e.g., the Cambridge Innovation Leadership Programme [CSL1], 2022) as well as further efforts on SupTech standards. However, it is too early to assess at this stage due to lack of industry and academic evidence of such definitions of conditions and methods

Secondly, from a development perspective, dynamic capability theory (Teece, 2007; Teece et al., 1997) is used to understand the development process and how regulators enable digital transformation and creation of SupTech tools. Dynamic capabilities are organizational capabilities driven by internal and external factors (a dynamic environment). They require dynamic efforts by organizations to reconfigure their processes and assets to address the opportunities and risks (Eisenhardt & Martin, 2000). Although some challenge the dynamism of regulatory agencies and the public sector (Piening, 2013), the dynamic capabilities processes of sensing, seizing, and transforming align well with regulatory processes of how regulation is created and implemented.

The fast evolution of the financial services ecosystem contributes to the appropriateness of dynamic capability theory (Figure 3). The dynamism of the industry proportionally affects the dynamism of the capabilities being created. We can identify important links between the novel products and services being created by financial services firms, and financial regulators' opportunities to develop themselves to address these advances (Salvato & Vassolo, 2017). Aligning dynamic capabilities with 'technological capabilities' enabled by IT (rather than solely people or process-related capabilities) ensures the required breadth and alignment with the literature and the framework to interpret the development of the BLENDER tool (Li & Chan, 2019; Mikalef & Pateli, 2017).

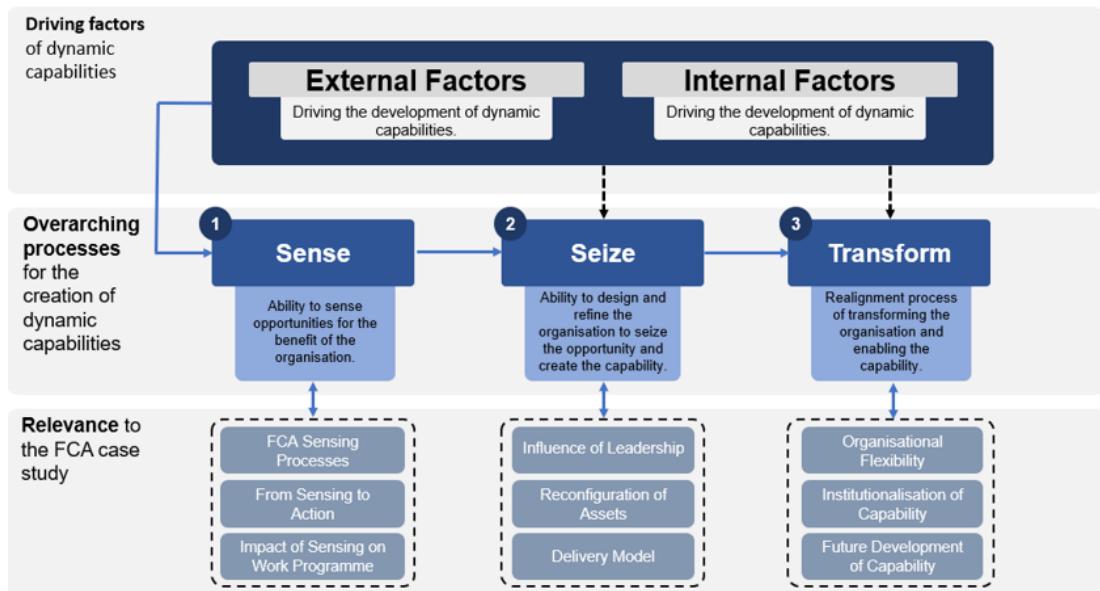


Figure 3. Dynamic Capability Framework. Adapted from Teece et al. (1997), Teece (2007), Teece (2018).

From a theoretical limitation perspective, institutional theory approaches in information systems research have been often applied with success. However, dynamic capability theory has been academically challenged due to its lack of specificity (Arend & Bromiley, 2009; Barreto, 2010). Also, as a strategic management framework, it was originally created with profit-making organizations in mind and research shows some limitations for using it for nonprofit/government bodies due to the lack of profit incentives (Bryson et al., 2007; Nelson & Winter, 2002).

Given these limitations, this approach combines these two theories to create a new theoretical framework (Figure 4). Between these two lenses, primary focus is given to the macro analysis to provide valuable background and scene-setting for the topic. The micro analysis offers the technical detail needed to understand the development process (which would not be possible through a singular theory approach). To validate usage of the theory for non-profit bodies, credible examples of research in public sector have been identified, with mentions of how the theory allows for the development of novel insights (Kattel & Mazzucato, 2018; Piening, 2013).

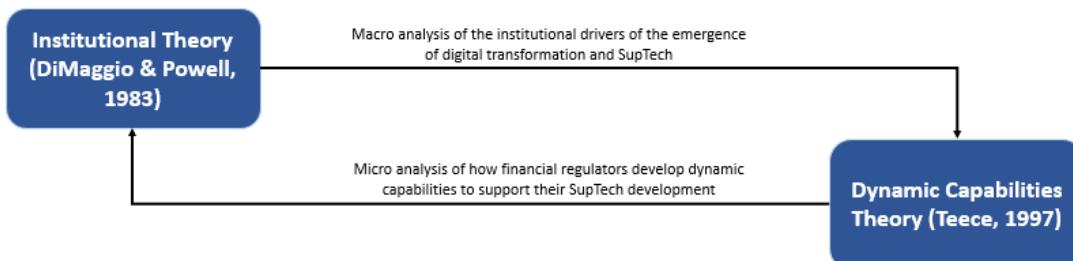


Figure 4. Research theoretical framework.

Even with the aforementioned industry explorations, there are limited academic studies to understand the drivers of SupTech. Similarly, there is a lack of detailed exploration of its development. A combined framework should provide a value-adding way of understanding the institutional isomorphic drivers of change and the dynamic capabilities creation process.

2.4. BLENDER History

This case study focuses on a singular project, the 'BLENDER' project within the FCA Market Oversight Division. It looks at the journey from its inception in 2013 to its current usage and future plans. BLENDER is a technology tool that assists supervisors to identify market abuse. Market abuse is behavior such as market manipulation, where market participants artificially affect the price of a stock, and these activities are enforceable by the regulator (FCA, 2020). BLENDER acts as 'middleware' and brings together data from different data sources (trading venues), 'blends' the data, and feeds it into a market surveillance tool to support supervisors to see transactions from multiple sources and identify patterns and diverse types of market abuse.

BLENDER was selected because it is a technology tool that enables the FCA to carry out one of its primary objectives of ensuring market integrity (FCA, 2016). It is also a finalized project, providing a complete 'picture,' and there was agreement to provide sufficient information from a confidentiality perspective. There are other SupTech tools at the FCA, however, due to market risks, limited information can be shared.

The BLENDER tool is an integral part of the market monitoring process of the FCA, without which it would not be able to have a holistic view of the market and see market manipulation occurring. It is a relevant example of a macro-prudential solution within the World Bank (2021) SupTech taxonomy and a late second generation / early third generation SupTech tool, according to Di Castri et al. (2019). Tackling market abuse is one of the primary objectives of many international financial regulators (European Securities Markets Authority, 2016), therefore, development of the BLENDER tool can be representative of SupTech tool development more broadly and provide insights. Lastly, it meets criteria from a dynamic capabilities perspective of being a capability that is driven by dynamic external and internal factors.

For context, BLENDER started in 2013 as a new project to create a technology application to help merge (blend) multiple data sources to a single data set. This was a result of the Markets in Financial Instruments Directive (MiFID) directive, which was created to increase competition for equity trading and stimulate innovation in the market (CFA Institute, 2009). As a result of MiFID, several new trading venues were being formed, creating a potential risk where the FCA is unable to have a 'helicopter view' of the market and the trading happening within it.

The Market Oversight Division, responsible for monitoring markets, agreed to run a proof of concept (PoC). This tested out how they could bring in the different data sources, merge them into a standardized format, and feed them into the overall FCA markets surveillance tool SMARTS to visualize the data and identify market abuse (NASDAQ, 2013).

Importantly, the PoC was delivered in-house, led by technology staff from the Market Oversight division itself, with limited input by the FCA IT division (allowing for the needed flexibility and speed to develop the tool, while also saving on cost). From 2013 to 2015, the PoC evolved to a pilot system with multiple venues feeding into it, followed by entering full production on the cloud in 2017. In 2018, BLENDER was migrated to the needed format to meet MiFID 2 regulations. Today, it is an active part of the Market Oversight technology stack with potential plans of evolving it further.

3. Approach

3.1. Data Collection

The data collection approach for this research is qualitative, focused on interview data. The interviews allowed for a broad understanding of people's experiences and perspectives of digital transformation and SupTech, within the required structured method (Weiss, 1995). Interviews were conducted with 16 senior stakeholders from the FCA and other international regulators, using a specific interview protocol to understand their experiences in a consistent way with the conceptual theoretical framework as a foundation.

The interviews were delivered in a semistructured manner. This provided the opportunity for interviewees to share their experiences and dive deeper into areas that seemed more relevant for the research, while the open interview format put them at ease. The focus was on the interviewees' experiences, rather than their personal views and opinions. This was crucial to gain more tangible and credible insights into their role and how they partake in the digital transformation and SupTech work of the FCA.

This two-way approach provided a comprehensive view of the SupTech journey of the FCA by i) analyzing senior leaders' experiences and perspectives of how and why institutional factors drive the development of SupTech, and ii) understanding how the BLENDER project becomes developed through a dynamic capability lens.

3.2. Data Analysis

To support the research, a qualitative interview analysis approach was applied (Creswell & Poth, 2017; Gioia et al., 2013; Robson & McCartan, 2016). Through the interview data, themes were identified (Attride-Stirling, 2001; Braun & Clarke, 2020), focusing on how the information shared by the interviewees relates back to the literature and provides more information on the emergence factors and development journey of SupTech at the FCA.

A similar thematic approach was followed for both levels of the data analysis. Following transcription of the interviews, the data was codified, identifying the basic, organizing, and global themes (Attride-Stirling, 2001). By juxtaposing the relevant themes and wider context, several principal thematic networks were created to provide a consistent way of analyzing the data using literature and the theoretical framework. An example of a thematic network can be found in Appendix A.

For the contextual analysis of the institutional drivers of the emergence of SupTech, the focus was on identifying areas where the data is 'overflowing' the literature, looking for the novel factors that could be impacting the environment and growth of this field. The themes were analyzed in relation to the isomorphic drivers (DiMaggio & Powell, 1983) to understand which drivers were already recognized in literature (and which ones were not), while taking into account perspectives from FCA interviewees and international stakeholders to see potential overlaps and differences.

For the BLENDER tool, a dynamic capability lens (Teece, 2007; Teece et al., 1997) was applied, assessing how the thematic networks and interview data overlap with the key concepts. Overarching processes of sensing, seizing, and transforming were considered in the BLENDER context, in addition to understanding the external and internal drivers that motivated its development.

4. Findings

4.1. Regulatory Competition—A SupTech Institutional Driver

DiMaggio and Powell (1983) discuss the three isomorphic pressures that drive organizations into action. Table 2 outlines relevant data points in comparison to previously identified literature and how interview participants perceived these pressures. Most of the captured types of pressures are commonly found in literature and do not represent novel knowledge. Participants discussed how the focus on digital transformation and SupTech stemmed from a variety of factors—including the impact of statutory obligations, the need for regulators to be proactive in protecting consumers (Friend, 2021), and the availability of technology to support regulatory activities when it is untenable to do so manually and when it could enable better decision-making (Di Castri et al., 2019).

Table 2. Isomorphic pressures and findings; adapted from DiMaggio and Powell (1983).

Types of Pressures	Description	Regulatory SupTech Examples/Equivalents	Findings Equivalents
Coercive Pressures	Result from both formal and informal pressures applied on organizations by other organizations upon which they are dependent and by societal cultural expectations	<ul style="list-style-type: none"> Regulatory obligations and duty of operating effectively and efficiently (FSB, 2020) Consumer attitudes have changed, and they have higher expectations of financial regulators and of their role in protecting 	<ul style="list-style-type: none"> <i>So, I think it is a big piece about effectiveness; how we use data and automation to be a more effective regulator and then also a more efficient regulator (Interview 1)</i>

Types of Pressures	Description	Regulatory SupTech Examples/Equivalents	Findings Equivalents
		consumers (OECD, 2019)	<ul style="list-style-type: none"> <i>The increased ability to produce and derive information from data... All of that leads to more efficiencies and new possibilities, new opportunities. And also leads to a change in expectations from institutional and retail actors and consumers (Interview 13)</i>
Mimetic Pressures	Result from uncertainty and encourage organizations to imitate each other in order to manage the ambiguity of the environment	<ul style="list-style-type: none"> Common supervisory needs of automating supervisory procedures and analyzing data sets result in 'greater similarity' of SupTech tools being developed (FinCoNet, 2020) Overall availability of technology at an affordable price drives regulators to pursue similar technological approaches, for example, the move 	<ul style="list-style-type: none"> <i>I see, I see a lot of similarities. As I mentioned before, some of the international regulators are further advanced than we are, and some are less advanced. But that being said, when we do speak to them, it tends to be that we're all following a similar approach, and</i>

Types of Pressures	Description	Regulatory SupTech Examples/Equivalents	Findings Equivalents
			<ul style="list-style-type: none"> <li data-bbox="1144 430 1432 1106"><i>I think that the main reason is that the technologies are there now. I mean, it's available, readily available. And, you know, financial authorities, regulators recognize the benefits these technologies bring</i> (Interview 14)
Normative Pressures	Result from the need for professionalization and a group wanting to define the conditions and methods of their work	<ul style="list-style-type: none"> <li data-bbox="736 1134 1090 1393">Not applicable to the SupTech field due to novelty. Potential future certifications and courses could be created, as well as standards 	<ul style="list-style-type: none"> <li data-bbox="1144 1134 1290 1165"><i>None</i>

However, one of the institutional factors that stood out is *regulatory competition*: a novel factor not found in literature. Participants noted the focus on SupTech and usage of technology to support supervisory processes was also connected to competition between regulators. Regulators could be seen as copying each other's efforts (mimetic behavior) and attempting to create the best SupTech solutions to keep up with the evolving market. Through an advanced SupTech portfolio, regulators can benefit from a well-functioning market, reduce regulatory burden for firms, and improve the overall attractiveness of the market itself. They are able to highlight an innovative national financial services ecosystem where they have a reputation of being advanced and able to deal with the fast-developing financial services and FinTech market with potential national benefit.

These perspectives came from FCA participants:

I think inevitably that there is competition, this is a quirk of regulators, but it is definitely not hostile competition. (Interview 8)

... a market that is open for business and a market that is good to do business, in an increasingly global world, increasingly, in a global world, that has to be, I think, a competitive advantage for a lot of regulators. (Interview 3)

And participants from international regulators also reflected:

I think some countries are much further ahead than others, some will put more emphasis on it, they may see it as a competitive advantage. (Interview 15)

And so, we all work together, but if one (a regulator) is doing something cool, then there is immediate pressure on all the others to do something similar. (Interview 13)

This is not the only driving factor. Many of the participants spoke about the potential for regulators to more actively collaborate and how this could also be observed as 'healthy' competition. Nevertheless, it is interesting to consider how mimetic behavior by regulators, in the face of uncertainty, could be driven by competition, and whether such competition could either lead to divisions and lack of sharing or lead to higher collaboration due to common goals.

4.2. BLENDER as a Dynamic Capability

The overarching finding based on the data is that the BLENDER tool can be perceived as a dynamic capability for the FCA because it was driven by external factors (e.g., change in regulations) and internal factors (e.g., senior management decision-making). A detailed breakdown can be found in Appendix B.

4.2.1. Sensing

Within the dynamic capabilities framework, sensing is an important starting point, and it is the ability of organizations to sense opportunities and potential risks in dynamic markets. Within the wider FCA interview participants, their views on FCA's capability to sense opportunities and risks were mixed. However, for the BLENDER project, the consensus was that the FCA's sensing ability worked better than usual. The risk of cross-market manipulation was identified, and with the United Kingdom having the largest market fragmentation and highest number of venues emerging (CFA Institute, 2009), there was a recognition that something needed to be done.

We at the FCA recognized the risk that people could do transactions on multiple venues, and nobody would ever join the dots. BLENDER was the organizational response to that. (Interview 10)

The fragmentation in the markets opened up opportunities for new types of abuse... so the unique thing BLENDER did was to bring those venues, the data from those venues into one place, so we could supervise them in one place. (Interview 9)

4.2.2. Seizing

After the successful sensing process, the more complex question was the seizing element and how the opportunity could be addressed through products, processes, and services (Teece, 2007). Multiple factors contributed to the FCA's ability to seize the opportunity: the 'visionary' leader, a strong investment case, and a flexible governance framework. Within the team, an individual drove the development of BLENDER and ensured that the opportunity was realized and actioned:

We had somebody who spotted the opportunity and brought people in specifically to find that to exploit those. (Interview 9)

'XYZ' was sort of a maverick genius, a visionary who had a lot of incentive to get things done. He wanted to do things that nobody else had done. And he was willing to give people free rein to let them experiment... (Interview 11)

Furthermore, the team came to an agreement to develop the tool with limited input from the IT division, resulting in faster working and more customization and flexibility. From a dynamic capabilities perspective, it was critical that the structural assets (governance), alignment, and organizational boundaries between the two teams were clear and respected:

The good thing about being developed in-house meant there wasn't the level of governance around it. It was run as a proof of concept and that did allow it to remain very flexible, very nimble, and managed by a business team fundamentally, rather than an IT support team. (Interview 12)

4.2.3. Transforming

BLENDER was successfully deployed and delivered and is used by a number of FCA staff to support daily market monitoring.

BLENDER exists now as a part the wider ecosystem. (Interview 8)

BLENDER as a capability can be seen to have gone through the full cycle, with a team using the data through the complementary visualization tools and providing important insight into the organization. However, it was clear from the participants that there is no endpoint and that the goal for the team is continuous development of the BLENDER tool and ways of working. This is aligned with the overall view from Teece that an organization needs to be able to continuously sense and seize opportunities, to be able to react when new threats and opportunities occur (Teece, 2007).

4.3. Imitation, Collaboration, and Institutionalization

Seeing the institutional drivers of SupTech and the evolution of BLENDER as a dynamic capability, it is important to consider the overlaps between these areas, and what novel findings they might contribute to the field of SupTech.

It can be argued that there is a relationship between mimetic drivers, the development of dynamic capabilities, and their inimitability principles. Teece (1997) sees inimitability of

dynamic capabilities as a crucial factor. This includes the development of tacit knowledge to limit the ability to copy work and the use of intellectual property to protect them. From the broader perspective of SupTech development, this raises important questions, as regulatory participants often discussed how copying each other's approaches were important ways for developing their own work programs, for example:

The FCA is repeatedly lionized and lauded and referenced as having been emulated and copied by other regulators. What is less frequently mentioned is the FCA has copied and emulated others, maybe not in the regulatory space, but in the retail space or in the financial markets themselves, and the academic space. So, there is no shame about borrowing or copying. (Interview 2)

The answer to this challenge of inimitability could potentially be through collaboration — regulators can explore how they can co-create solutions and work together. Research has shown that regulators often seek support from other financial regulators in developing their approach to innovation (World Bank & CCAF, 2020). Participants often spoke about the great opportunity there is for closer partnerships between regulators:

I suppose that collaboration is key. In this area and a new emerging field, we will be facing the same challenges and we can learn from each other and collaboration with knowledge sharing can be beneficial. (Interview 5)

Seeing the interaction between emergence and development, and the organizational focus to continuously improve, we can also reflect on the following step and how SupTech approaches become institutionalized in organizational ways of working and gain legitimacy (Hinings et al., 2018; Tolbert & Zucker, 1996). Participants noted that the FCA is still in the early phases of adopting technology. Exposure to data and digital technologies vary depending on factors such as the digitization of the sector and firm types. With the breadth of the SupTech field itself, it may prove difficult to conceptualize the legitimization and institutionalization of SupTech. However, it is still early to judge this, and participants noted that further scaling could drive adoption.

The future is already here, but it's unevenly distributed. And that's where we are at the moment, right? Like, there are examples of future practice and process occurring, but it is not, by any means, uniform across the organization. And that's the key thing, scaling up and across. (Interview 11)

The institutionalization of wider SupTech is uncertain, however, if we reflect on BLENDER, it provides functionality and crucial data that support the operation of the team. Without the tool, it would not be possible to monitor markets. This dependence on the tool could be perceived as it being legitimized in the eyes of the users. Time will tell what the tool's future evolution and developments will have on its legitimization.

5. Discussion

This research focuses on seeing how SupTech emerges and specifically develops within financial regulatory agencies, in this case, within the FCA. To answer this question, we will

reflect on what the findings mean for the literature and the theoretical framework used, to understand the impacts on industry and academic research.

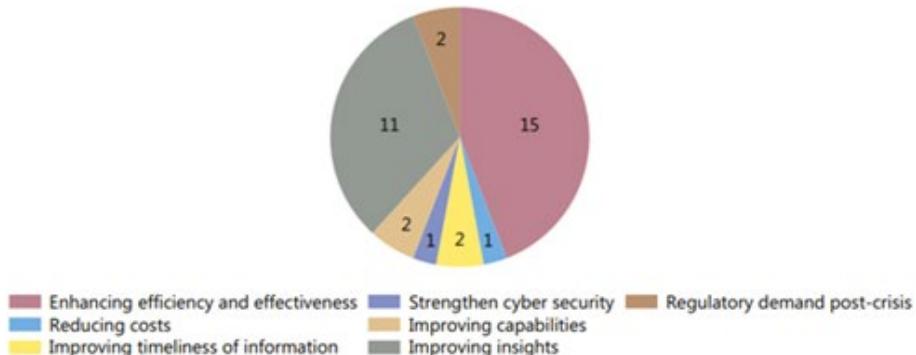
5.1. Regulatory Competition Expanded

Looking at the research question 'How does SupTech emerge and develop within financial regulatory agencies?' the approach taken was to look at areas where the findings provided novel insights not previously explored by the literature and identify what additional factors are driving the development of SupTech from an institutional lens. FSB (2020) carried out one of the more detailed explorations of the drivers of SupTech, in their case, what are the driving factors of a SupTech strategy (Figure 5). There were many overlaps with the interview data, from the drive for efficiency and effectiveness, to improving insights and availability of technology such as artificial intelligence and machine-readable data.

Primary demand drivers for developing a SupTech strategy

No. of authorities who rank driver as most important

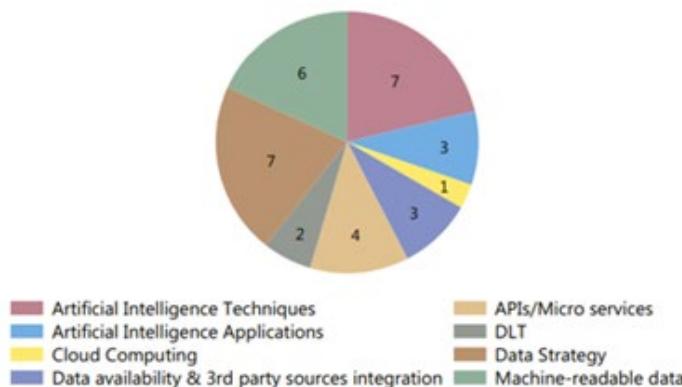
Graph 1



Primary supply drivers for developing a SupTech strategy

No. of authorities who rank driver as most important

Graph 2



Source: FSB survey

Figure 5. Demand and supply drivers of a SupTech strategy (FSB, 2020).

As outlined previously (Table 2), these drivers could be assessed from an institutional perspective (Di Maggio & Powell, 1983) and the majority would fall under coercive

pressures—regulators have a duty to fulfill, as expected by legal obligations and societal expectations, and they will do what they can to meet them.

However, an area that has not been recognized yet in SupTech literature and has been found in the data is 'regulatory competition,' originating from a combination of two factors. Firstly, aligned to mimetic pressures that cause market participants to copy each other to manage the ambiguity of the environment, interview participants referred to imitative behavior between each other, regulators 'coalescing' around SupTech, and starting multiple initiatives to explore how SupTech can support and improve their work (Cambridge SupTech Lab, 2022).

Secondly, participants reflected on how there is a potentially healthy dose of competition between them as a part of this SupTech development. This could stem from different reasons, for example, regulators wanting to improve the reputation of their organization, which has historically proven to be important for regulatory agencies and a way to build trust with industry and consumers (Gilad & Yoge, 2021; Yeung, 2009). Equally, it could also be driven by regulators wanting to create well-functioning markets to potentially drive investment and attractiveness. Some evidence exists that well-regulated markets could improve investment (Sinha, 2012). In the context of the United Kingdom, regulation has historically been seen as a way to ensure a well-performing market (Competition Markets Authority, 2020). This gains more relevance with the United Kingdom having left the European Union, and the newly assigned secondary international growth and competitiveness objective for the FCA, which will require the FCA to have regard to support the government's ambition to encourage economic growth (FCA, 2021; Norton Rose Fulbright, 2021; UK Gov, 2022). This poses an important question regarding the relationship between political will and the potential impact on regulatory behavior and competition between markets.

Furthermore, regulatory competition and mimetic behavior might provoke other types of reactions by regulators. For the field of SupTech, there is limited public information, both in literature and in industry reports. This could stem from regulatory opacity and limited transparency, due to the potential risks of outlining how specific technological approaches function (World Bank, 2019). This was also reflected in the data and could impact the amount of copying and mimetic behavior that can be carried out.

In turn, this potentially results in a higher spirit of collaboration between regulators. Being limited with how much information regulators can share externally may inspire greater levels of working together. As regulators spend more resources on developing SupTech, there could be an opportunity of collaborating either bilaterally or through international networks such as the recently launched Cambridge SupTech Lab (CSL2, 2022), Global Financial Innovation Network's RegTech & SupTech workstream (GFIN1, 2021), or the Bank of International Settlements Innovation Hubs (BIS, 2022). Similarly, regulators and industry have also reflected on the opportunity of open source and how it could aid SupTech development globally (FINOS, 2022]; GFIN2, 2021).

5.2. Sensing, Visionary Leadership, and Delivery Model

SupTech is a novel and complex area with multiple factors contributing to its development. Focusing on the FCA and the BLENDER project, several more detailed intricacies are provided on how SupTech develops. As we saw in the findings, the progress of the BLENDER project (and the tool itself) could be interpreted through the overarching processes of dynamic capabilities of sensing, seizing, and transforming (Teece, 2007; Teece et al., 1997).

In analyzing BLENDER, it appears that the tool's development was linear. There were particular elements that enabled the BLENDER tool to function as a capability for the FCA.

5.2.1. Sensing

Firstly, important processes that enable successful regulation rely on horizon scanning and anticipatory regulation, the ability for regulators to be able to identify issues early and react (National Audit Office, 2021; Regulatory Horizons Council, 2022). These processes could be paired with the sensing aspect of dynamic capabilities because they allow for the identification of opportunities to improve the organization in hand. Interview data demonstrated mixed feedback for the FCA's overall ability for this process, however, for BLENDER, the sensing elements of a proactive attitude, in-house regulatory expertise, and adoption of academic insight made a difference and allowed for the FCA to react appropriately.

5.2.2. Seizing

Similarly, for the seizing process, the investment case and senior buy-in allowed for the further development of BLENDER. The more important factor was the governance model of allowing the in-house build to be driven by the Market Oversight Department, rather than the IT division. West (2007) reflects on the importance of flexibility and speed in government digital transformation, and it has proven crucial in the case of BLENDER as well. Moreover, for the successful seizing process, Teece (2018) discusses the managerial impact and the ability to seize the resources appropriately; with BLENDER, we saw the impact of the project leader and how their visionary drive and capability was instrumental in developing BLENDER.

5.2.3. Transforming

BLENDER was completed and is now a regularly updated tool and enabler for the FCA to collect and 'blend' data from multiple venues to identify potential market abuse. As mentioned, it has become a 'part of the ecosystem' and has achieved legitimacy in the eyes of its users (Hinings et al., 2018), but questions are raised around the impact of continuous transformation and development on its legitimization.

5.3. Implications for Regulators, Academia, and Industry

Regulatory competition is a known concept within policy development literature, and it has been explored how it can affect regulatory–government relations, standards development,

and regulatory arbitrage (Frantz & Instefjord, 2018; Haufler & Maier, 2019; Radaelli, 2004). Nevertheless, the acknowledgment of regulatory competition within SupTech development could act as a positive driver of organizational change for regulators. This could take form as increased information sharing between regulators to support knowledge building and increased collaboration between regulatory bodies through the mentioned different networks to advance SupTech (for example, potential efficiencies through the sharing of code).

In regard to BLENDER, due to the U.K. specific position and high number of trading venues, there have not been similar tools identified in other markets, therefore, not all lessons will be applicable to other international regulators. However, key insights of (i) regulatory recognition of technology as an enabler, and (ii) innovative and agile in-house development approaches, which supported the iterative build of BLENDER, are still relevant. These insights can be applied to other regulators and combined with the understanding of the criticality of horizon scanning, visionary leadership, and flexible delivery models, a version of a SupTech roadmap is provided. With the FCA's advanced technology portfolio, this can inform both advanced financial regulators and those at the start of their digital transformation and SupTech journeys.

From an academic research perspective, one of the important implications is the recognition that SupTech and digital transformation of financial regulators are compelling areas to pursue further research with high benefits. More research can support the development of SupTech and inform much-needed standards. For example, as technological adoption evolves in industry, it can be valuable to understand how the evolution of SupTech is impacted by technological progress made by firms.

Furthermore, the dynamic capabilities framework provides a useful lens to interpret this phenomenon and reinforces previous research of dynamic capabilities in the public sector (Kattel & Mazzucato, 2018; Piening, 2013). In relation to industry, an important lesson for industry firms is to continue engaging with regulators and explore what different opportunities exist either to support regulators in their SupTech journey or to share insights to inform regulatory efforts. We are already seeing the FCA driving forward its 'RegTech-SupTech bridge' initiative, which explores how to jointly develop solutions with industry and many regulators are increasing their engagement efforts to hear about innovation in the industry (Australian Transaction Reports and Analysis Centre, 2018; FinCEN, 2022; Rusu, 2022).

6. Conclusion

The experience of one regulator will not be the 'golden truth' for all regulators and it will not highlight every single opportunity or challenge that could inform other organizations' SupTech development. However, this research highlights two important discoveries that could be impactful for the industry.

The first of the findings is that SupTech emergence is partially driven by regulators being competitive organizations, who want to deliver positive outcomes for a plethora of reasons,

some regulatory and some institutional. The realization of its existence might result in more open information sharing and more collaboration between regulators. In addition, it might support the establishment of further certifications and standards that are needed to formalize the field of SupTech and the required focus on assessing the success of SupTech development, ensuring the deployments are cost-effective and impactful.

Secondly, the research provides a comprehensive overview of one regulator's way of developing a SupTech tool and way of operating in the face of changing circumstances. It demonstrates how IS development foundations are applicable to regulators, and that leadership, delivery models, and senior stakeholder buy-in are critical for regulatory IT development and data science. It provides a blueprint for how regulators could think about the changing environment and highlights how the dynamic environment in which financial services regulators operate could result in dynamic efforts by the regulators themselves.

With the constant evolution of markets, regulators will have to leverage technology to support their activities (Cœuré, 2020). Consequently, academia has a critical observer role to play in collaborating with regulators and informing them through research of the potential opportunities, risks, and harms technology can pose.

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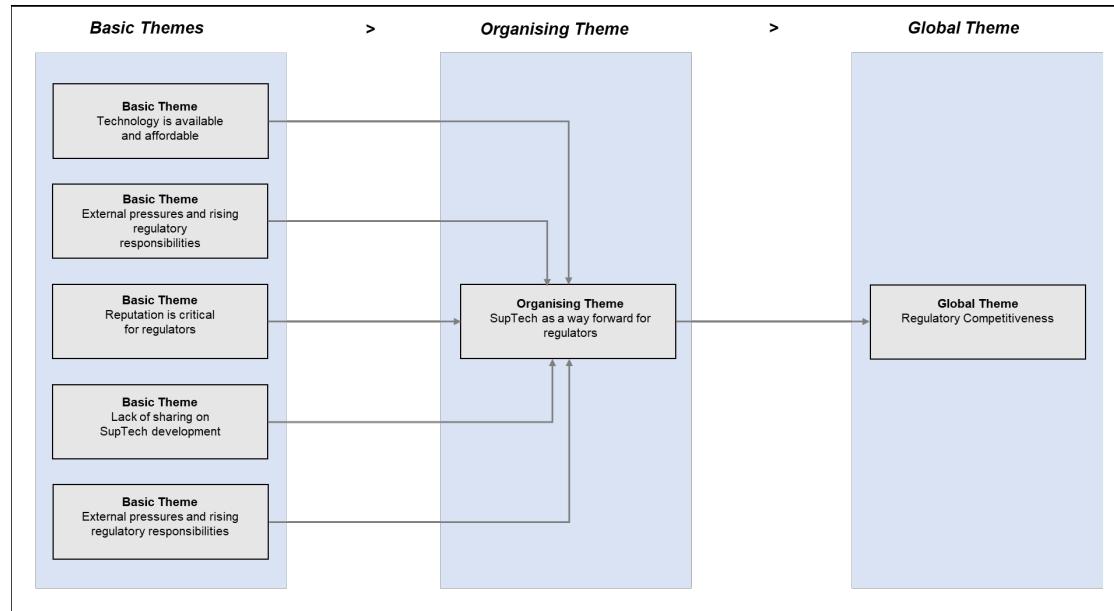
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Appendices

Appendix A. Thematic Network Example



Appendix B. Dynamic Capability Detailed Analysis

Description	Sensing			Seizing			Transforming					
	Observing Processes	Screening	Scanning	Acquisition	Assimilation	Integration	Position	Markets/Structure Assets	Organizational Boundaries	Path Dependence	Path	
BLENDER Overview	To identify and shape opportunities, enterprises must constantly scan, search, and explore across technologists and markets, both local and distant (sensing opportunities)	Once a new (technological or market) opportunity is sensed, it must be addressed through new products, processes, or services (to be seized)		To achieve dynamic capabilities, organisations must be able to continuously sense and seize opportunities, and to periodically transform aspects of the organisation and culture so as to be able to proactively reposition to address yet newer threats and opportunities as they arise								
	No existing processes recognised for the sensing of regulatory changes. Could be classified under "processes to identify target market segments, changing customer needs and customer innovation	Important for us to have the right communicating functions in the organisation and to assess the necessary budget and investment. Buy-in received through governance meetings and an outline of a potential impact of the new regulation		Complete delivery, creation of a new item to use the new tools and use the data provided by BLENDER and the complementary software to visualise the data and provide the insight, achievement of cultural transformation								
	Sensing identified with important support by in-house PhD students who provided detailed analysis of the potential impact of the new regulation	Managerial judgment (decision-making skills) take on great significance in such contexts. Visionary direction and leadership are critical to the success of the new regulation		The key is the ability to recognise and to re-recognise assets and organisational resources as the organisation grows. As the team grows and the data sources grow, BLENDER evolved as a tool in order to meet the demand								
	Senior management also identified the potential impact of the new regulation and the potential risks	Management of assets and ensuring that the new framework/model is present (delivered through the MO team), for the needed flexible delivery		As the FCA moved to the cloud, BLENDER was also transformed and moved to the cloud from the data centre								
	As it was a new development, there were no historical examples or comparisons that could have been used	Collaborating with IT department on needed infrastructural aspects, good alignment between departments		Other opportunities are considered also as to whether the BLENDER approach could be used in other teams or BLENDER could feed into other tools								
The below processes are subset of processes that support sensing, seizing and transforming activities [Teixeira et al., 1997]												
Subset Processes	Process			Position			Path					
BLENDER Overview	Coordination of different areas	Learning and development	Reconfiguration of assets	Technological Assets	Complementaries Assets	Financial Assets	Reputational Assets	Structural Assets	Institutional Assets	Market/Structure Assets	Organizational Boundaries	Path Dependence
	Ability for how effectively internal coordination is achieved	Ability to perform tasks better, own time involves individual skills, new routines in the organization	Ability to sense the need to recognise the firm's assets, structure and to acquire the right assets to support the internal transformation	Due to preexisting assets owned by the organization. May or may not be protected by IP	Typically dominant assets that could enhance the use of products and services in the market. Could be intellectual property or complementary assets	Capital position, degree of leverage and overall financial position (including cash flow)	Strategic assets that enable firms to achieve goals in the market. Could be intellectual property and external reputation	Formal and informal structure of an organization, level of centralization, hierarchy and governance model	Broader institutions, regulatory systems, and legal/political settings	Product/market fit, acquisition and the impact of that	The degree of integration, both from an external perspective and the internal perspective to internal nature of coordination and usage of existing	Technological opportunities
	BLENDER was developed mainly by stakeholders within the Market Oversight department, and the tool was developed in coordination with the IT department	BLENDER was sensor, appraising and the reconfiguring and the repositioning of the tool to the development of the tool. It was developed in order to deliver the tool to the relevant stakeholders (venues) as the tool was developed in coordination with the IT department	BLENDER was sensor, appraising and the reconfiguring and the repositioning of the tool to the development of the tool. It was developed in order to deliver the tool to the relevant stakeholders (venues) as the tool was developed in coordination with the IT department	FCA owned the technology assets, the relevant data and the tool. The tool was developed in order to deliver the tool to the relevant stakeholders (venues) as the tool was developed in coordination with the IT department	The tool (BLENDER) where BLENDER is fed from the FCA and to support FCA activities	The financial assets that are owned by the FCA and not a client (it was a confidential project), but the financial assets owned by the FCA were important and allowed the FCA to have a strong position in the market. The FCA was able to develop the solution with the support from the IT division	For the development of the tool, the FCA had to have a strong position in the market. The FCA was able to develop the solution with the support from the IT division	As the FCA is a regulator, these institutional assets were important to the FCA to have a strong position in the market. The FCA was able to develop the solution with the support from the IT division	As the FCA is a regulator, these institutional assets were important to the FCA to have a strong position in the market. The FCA was able to develop the solution with the support from the IT division	Not applicable to the FCA, as BLENDER is not the FCA and it has a market position	Reconfiguring and the path dependence have a strong impact, however, the FCA had to have a strong position in the market. The FCA was able to develop the solution with the support from the IT division	The potential for how far an organization can move and where future opportunities lie, based on the number of opportunities ahead of it
Assessment	Effectiveness coordination within the Market Oversight division for the deployment of the tool	The generic learning and development applicable for the deployment of the tool	Learning and development applicable for the deployment of the tool	Successful reconfiguration could result in the development and deployment of BLENDER	Technological assets were key for the successful usage of BLENDER	The complementary assets were important and have vast significant investment to deliver the project	Positioning and belief that the Market Oversight team and the FCA had the right belief in the delivery of the tool	The structure and organization was important and the FCA had the right belief in the delivery of the tool	Importance in doing the development of BLENDER and ensuring that the end product is fit for purpose	Did not have an impact on BLENDER and as the tool was developed in coordination with the IT department, there were not many changes in the tool, as the FCA had the right belief in the delivery of the tool	The cloud opportunity was well received for future development (Japan team) and the FCA had the right belief in the delivery of the tool, as the FCA had the right belief in the delivery of the tool	The main opportunity was to move BLENDER to the cloud and improve the efficiency and effectiveness of the tool

Note. FCA = U.K. Financial Conduct Authority; MO = Market Oversight. IP = Intellectual Property. BLENDER = FCA in-house SupTech tool that assist supervisors to identify market abuse.

Digital Transformation of Financial Regulators & Emergence of Supervisory Technologies (SupTech) – A Case Study of the FCA

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17 October 2023

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Learning Objectives

By the end of this presentation, you should be able to:

- **Understand why novel SupTech technologies are emerging in regulators and central banks**
- **Learn how dynamic capability theory can be applied to delivering technology projects with impact**

Current Landscape

The ability of financial regulators to supervise the fast-evolving and technologically enabled world of financial services is **uncertain**.



Scars from the 2007-2008 financial crisis still remain, with future instability potentially occurring



Novel technological deployments in financial services are continuously deployed at an increasing rate



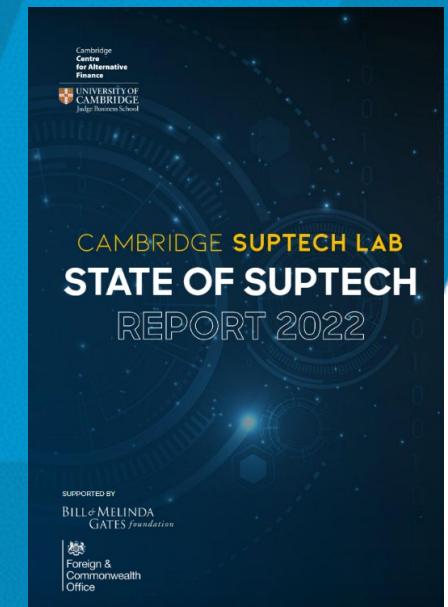
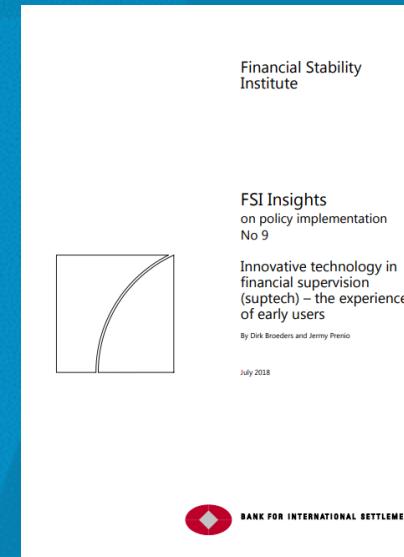
How can financial regulators meet the challenges of this growing ecosystem and prevent harmful outcomes for consumers and markets?

Could SupTech be the answer?

SupTech Explained

“Use of innovative technologies by supervisory agencies to support supervision” – *Bank for International Settlements*

Catch-all term to capture regulatory initiatives using technology, recognised by many international bodies



SupTech Use Cases

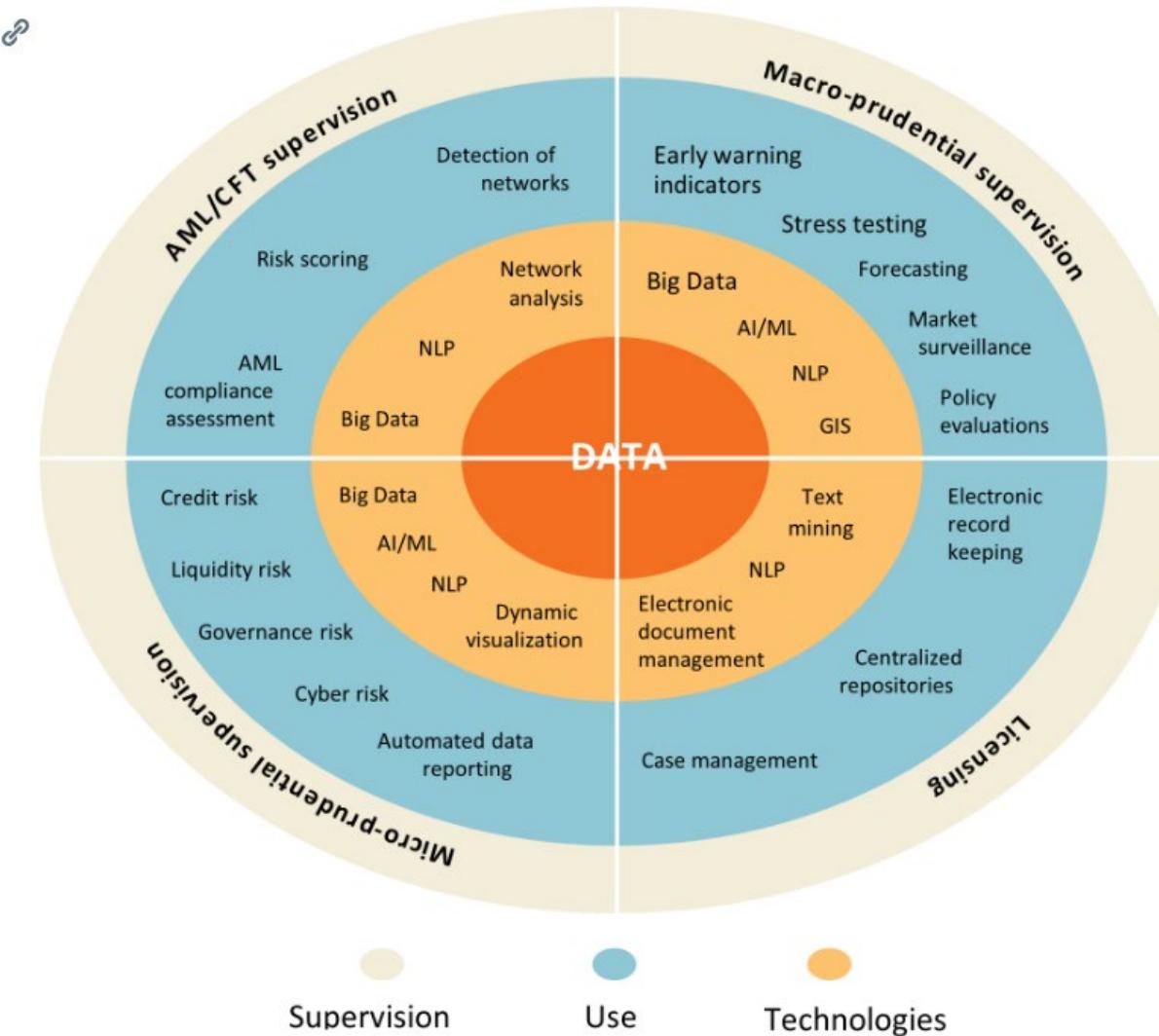
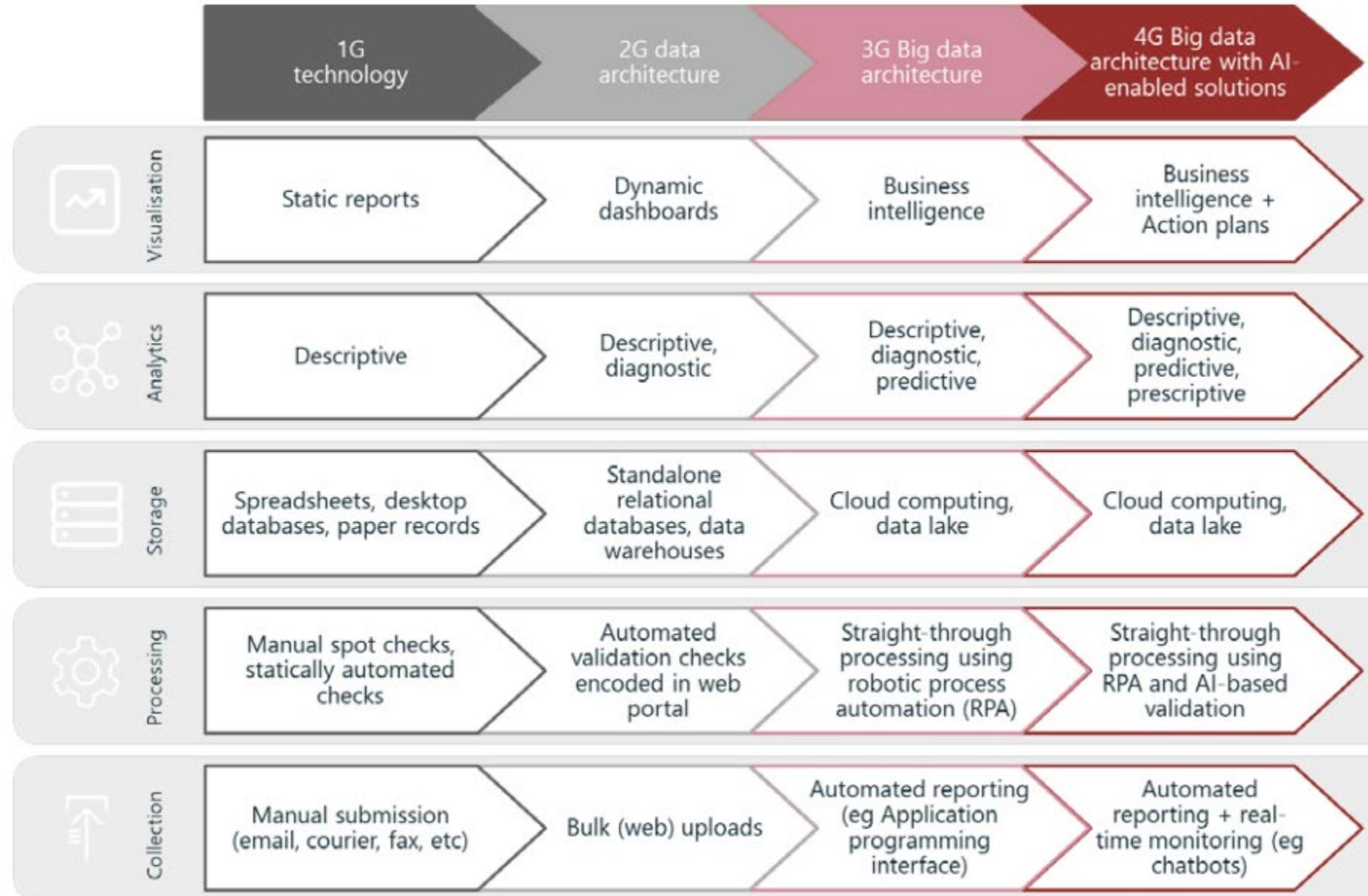


Figure 1. SupTech taxonomy with SupTech use cases. From Appaya et al. (2020).

SupTech Generations



Research Focus

Why does this matter?

Academic and industry research on regulatory use of technology is **limited**

There is a **lack of case studies** for regulators to learn from on how to **approach the development** of SupTech tools

Research Question

How does SupTech emerge and develop within financial regulatory agencies?



Research Approach

- 16 qualitative, semi-structured interviews with senior colleagues at the FCA and other international regulators (Australia, Canada, Switzerland, USA)
- Thematic analysis approach (Attride-Stirling, 2001); creation of thematic networks, seeing where the data is 'overflowing' the literature and identifying novel factors that could impact the environment
- Creation of a new framework to address the research question with a twofold focus

Research Approach

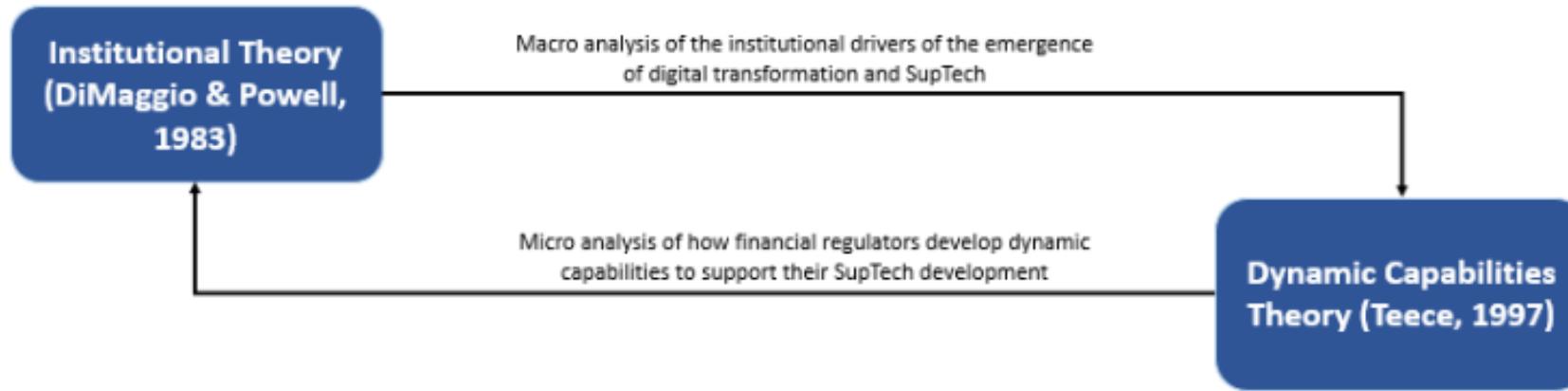


Figure 4. Research theoretical framework.

Key Findings

Key Findings

1. Emergence of SupTech

Drivers of SupTech Growth

Regulatory Competition –
Novel Factor

Future Impact on SupTech

2. Development of SupTech

BLENDER as a Dynamic
Capability

Sensing

Seizing

Transforming

Institutional Drivers – SupTech Emergence

DiMaggio and Powell provide an overview of different types of Isomorphic Pressures (those that drive organisations into action):

Types of Pressures	Description	Regulatory SupTech Examples/Equivalents
Coercive Pressures	Result from both formal and informal pressures applied on organizations by other organizations upon which they are dependent and by societal cultural expectations	Regulatory obligations and duty of operating effectively and efficiently (FSB, 2020)
Normative Pressures	Result from the need for professionalization and a group wanting to define the conditions and methods of their work	Not applicable to the SupTech field due to novelty. Potential future certifications and courses could be created, as well as standards
Mimetic Pressures	Result from uncertainty and encourage organizations to imitate each other in order to manage the ambiguity of the environment	Common supervisory needs of automating supervisory procedures and analysing data sets result in 'greater similarity' of SupTech tools being developed (FinCoNet, 2020)

Introducing Regulatory Competition

An area not identified in literature, is the idea of “regulatory competition” in SupTech development.

There are several factors why this type of competition might arise

Market Attractiveness

Well-functioning markets could drive investment and increase international competitiveness

Regulatory Reputation

Important way for regulators to build trust with consumers and industry

Mimetic Pressures

In order to manage the ambiguity of the environment, regulators could imitate each other

Hostile Competition?

I think inevitably that there is competition, this is a quirk of regulators, but it is definitely not hostile competition (Interviewee 12)



Competitive Advantage

*I think some countries are much further ahead than others, some will put more emphasis on it, **they may see it as a competitive advantage.** (Interviewee 10)*



Regulatory Imitation



*And so, we all work together, but if one (a regulator) is doing something cool, then there **is immediate pressure on all the others to do something similar.** (interviewee 4)*

Future Impact on SupTech



Could the recognition of competition drive more collaboration?

Or will the opaque nature of SupTech result in more competitive behaviour and less joint work?

Key Findings

1. Emergence of SupTech

Drivers of SupTech Growth

Regulatory Competition –
Novel Factor

Future Impact on SupTech

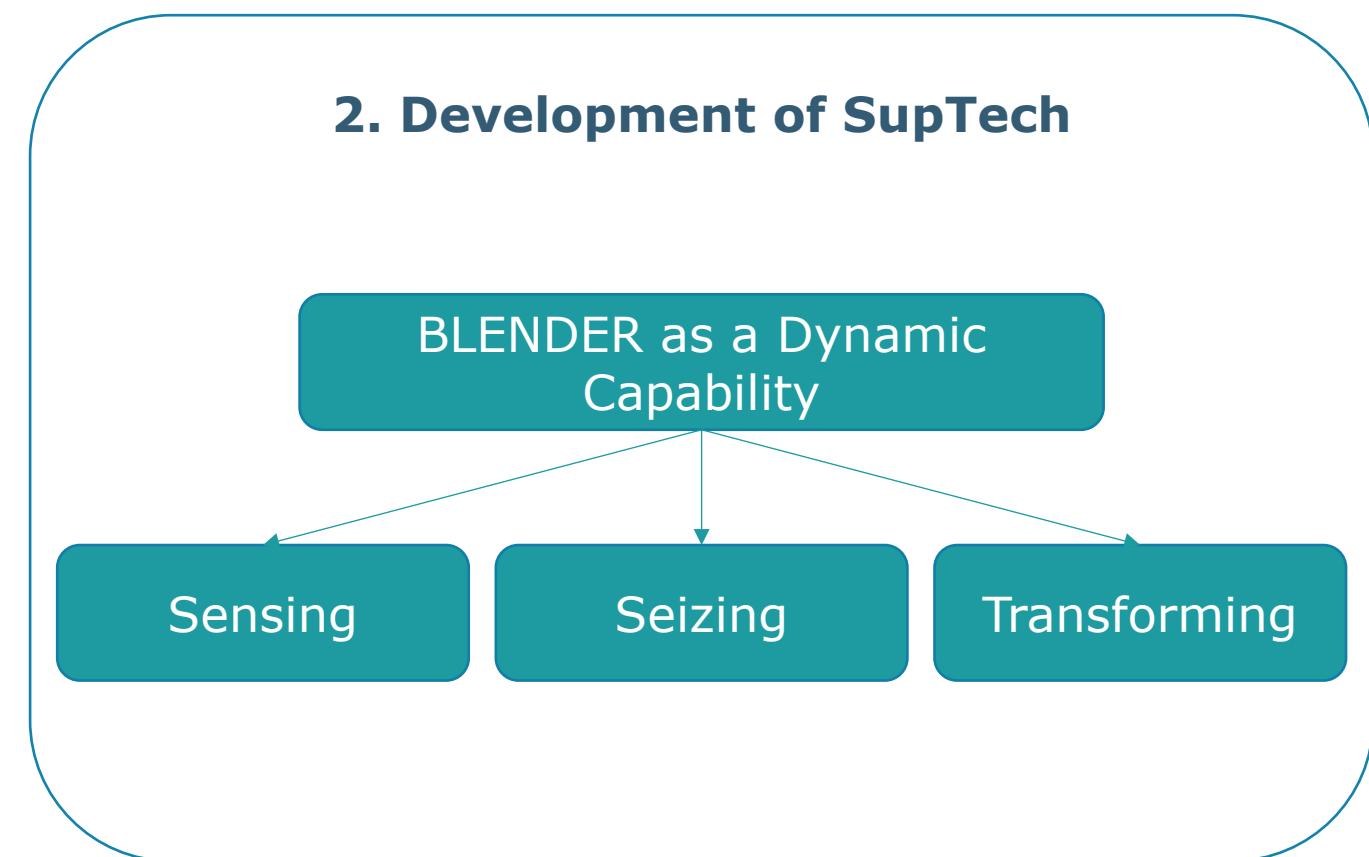
2. Development of SupTech

BLENDER as a Dynamic
Capability

Sensing

Seizing

Transforming



BLENDER Project

Project Overview

What is it?

Phase: Complete

FCA Objective: Market integrity

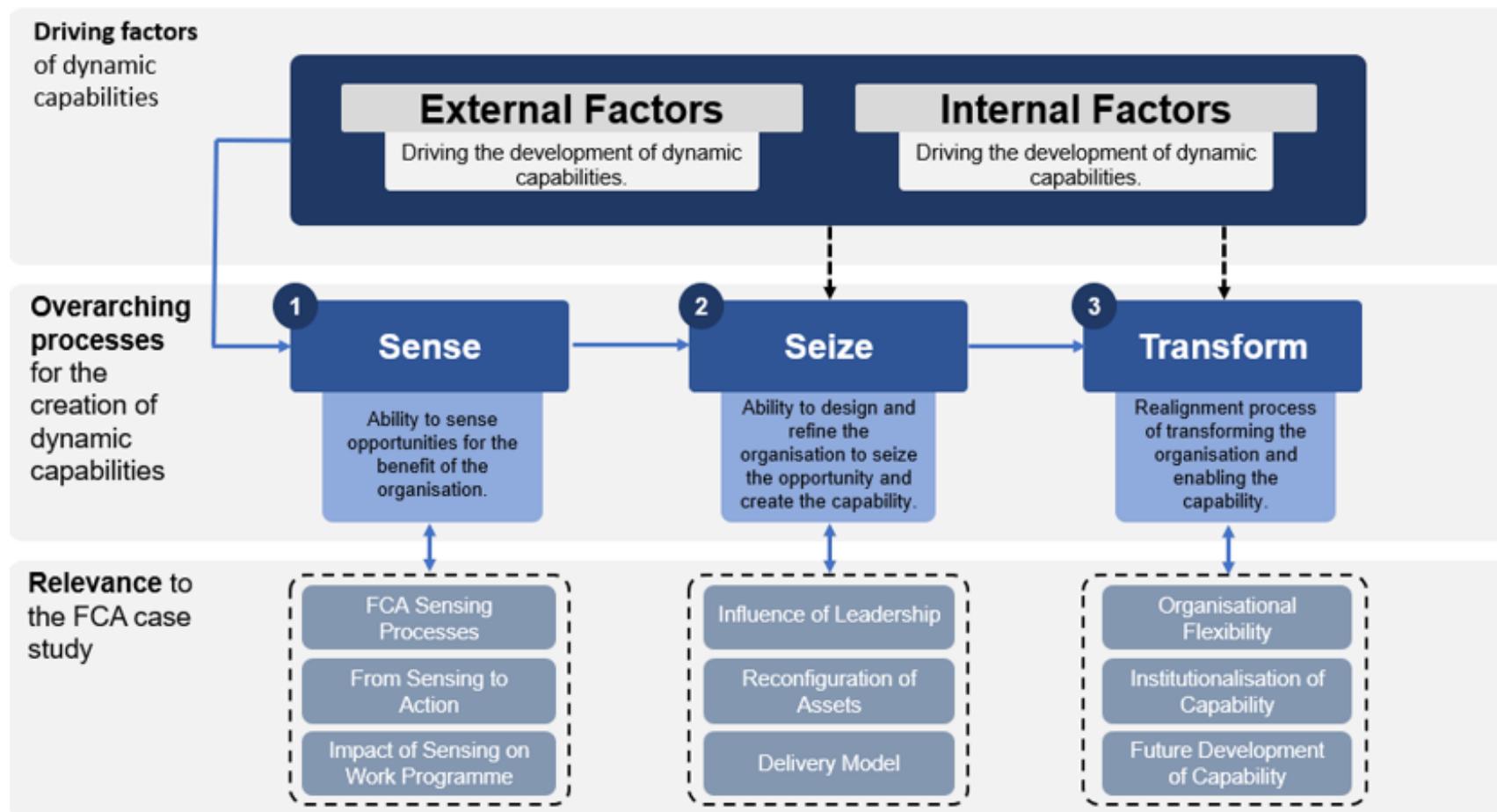
BLENDER is a technology tool that assists supervisors to identify market abuse.

BLENDER acts as 'middleware' and brings together data from different data sources (trading venues), 'blends' the data, and feeds it into a market surveillance tool to support supervisors to see transactions from multiple sources and identify patterns and diverse types of market abuse.

The BLENDER tool is an integral part of the market monitoring process of the FCA, without which it would not be able to have a holistic view of the market and see market manipulation occurring

Dynamic Capability Theory (Teece, 1997)

The organisational ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments.



BLENDER as a Dynamic Capability

Sensing

FCA Sensing practices worked positively, identifying the risk of cross-market manipulation early with the UK having the largest market fragmentation and highest number of venues emerging

Seizing

The right investment case and senior buy-in allowed for the further development of BLENDER. Many factors recognised in literature have occurred, such as the flexibility of delivering in-house, the managerial impact of seizing resources and a driven project leader

Transforming

BLENDER is a completed tool and enabler for the FCA to collect data from multiple venues. It has become part of the ecosystem and has achieved legitimacy in the eyes of its users.

The overarching finding based on the data is that the BLENDER tool can be perceived as a dynamic capability for the FCA .

Implications



- 1 Recognition of **regulatory competition in SupTech development** could act as a **positive driver for change and stimulate collaboration**.
- 2 Criticality of **horizon scanning, visionary leadership and flexible delivery models** in the development of SupTech tools (and the usage of the dynamic capabilities framework).
- 3 **Further academic and industry research** can support the development **of SupTech, including future talent, opensource code and needed standards**

Any questions?