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ECB Crisis Management: Institutional Constraints and Communication Strategies During COVID-19

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Abstract

This study investigates to what extent and how the European Central Bank's (ECB) communication strategies during the COVID-19 pandemic had influenced its capacity to effectively manage crisis, with the ECB having gone on to respond swiftly with a large-scale intervention, with this being most notable in the case of the Pandemic Emergency Purchase Programme (PEPP), as the markets had reacted with confusion, which is suggestive of a legally cautious and opaque messaging which can go on to undermine the policy objectives (ECB, 2021a; Koranyi & Canepa, 2020; Reuters, 2020). This thesis goes on to combine the institutional discourse and market-impact analysis of ECB COVID-19 communications (BIS, 2020; IMF, 2020; ECB, 2021a; 2020a). By focusing on the March 2020 PEPP and September 2021 tapering signal, this study is able to apply a mixed-methods design that combines a natural language processing (NLP) of ECB texts (Hutto & Gilbert, 2014; Loughran & McDonald, 2011) with the event-study analysis of the financial reactions (MacKinlay, 1997; Born et al., 2019). This research is framed by a dual theoretical lens, that being historical institutionalism (HI), which examines just how legal and political constraints have shaped the ECB's messaging (Hall & Taylor, 1996; Pierson, 2000) and discursive institutionalism (DI), which explores the narrative that was used to frame the crisis response (Schmidt, 2008; Schmidt, 2010).

The March 2020 PEPP announcement had registered maximally positive polarity scores, yet the Loughran–McDonald (LM) lexicon had revealed high legalistic caution and uncertainty, which coincided with EuroStoxx 50 decline, with widening spreads, and an elevated VIX (ECB, 2020b; Koranyi & Canepa, 2020; Ortmans & Tripier, 2020). By September 2021, the tone had stayed positive, with the press release having used fewer uncertainty and constraining terms than in March 2020, which signalled a shift from an alarmist phrasing, while the Lagarde's remarks had reflected a risk-aware delivery (Author's analysis: VADER and LM applied to ECB, 2021c; 2021d). The shift from defensive legalism in 2020 to reassuring clarity in 2021 highlights just how institutional learning and strategic discourse, reinforces central bank legitimacy and market stability, with this contributing to debates on central bank legitimacy, with the strategic use of ambiguity in monetary communication, and in the discourse of EU economic governance (Schmidt, 2013; Coenen et al., 2022; Blinder, 2001; Riles, 2018). These findings go onto indicate that the institutional constraints initially had pushed the ECB towards defensive legalism, but the subsequent discursive adaptation had improved the communication effectiveness without going on to breach the mandate limits.

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1. Introduction

The COVID-19 crisis was a period in which central banks were required to act quickly, not only just in terms of monetary interventions, but also in terms of clear and reassuring communications, this was the case in the period of March 2020 under the Article of the Treaty on the Functioning of the European Union (TFEU), the ECB introduced a €750 billion PEPP so as to stabilise the market (BIS, 2020; IMF, 2020; ECB, 2021a; 2020a). While the scale of the ECB's interventions had been substantial, the markets' reactions and commentary would suggest that the ECB's messaging was hesitant and restrained, however, to the best of my knowledge no prior research had jointly analysed ECB discourse and market reaction during COVID-19. Accordingly, this study explores the question: **How and to what extent did the ECB's communication strategies during the COVID-19 pandemic influence the effectiveness of its crisis management efforts?**

Effective central bank communication is essential during times of crisis, due to its ability to shape market expectations, build public trust and to help prevent unnecessary financial instability (Blinder et al., 2008; Gürkaynak et al., 2005). The ability of central banks to act as communicative stabilisers is particularly important in the setting of a unified fiscal framework, especially monetary unions like the Eurozone (Verdun, 2017). Claeys and Demertzis (2017) also argue that monetary policy credibility in the EU hinges not only on the content of decisions, but on the clarity with which decisions are articulated in a politically diverse and economically asymmetric region. Indeed, poorly calibrated crisis communication may amplify market volatility rather than reduce it, with these outcomes challenging the notion that independence alone is enough to ensure stability, with them instead referring to the communicative dimension of monetary policy as one that is institutionally constrained and strategically deployed (Blinder et al., 2008). In order to assess how the ECB communicated at the time of COVID-19 the study takes use of a functional definition of communication effectiveness, that follows the IMF (2020, Section III, p. 14) and Coenen et al. (2022, pp. 4–5), which enables for a structured and testable evaluation of ECB announcements, based upon their ability to reduce market volatility, to maintain internal coherence and to signal alignment.

In this thesis, effectiveness is assessed empirically using text-based sentiment and short-window market reactions around announcements (Hansen & McMahon, 2016). A failure to influence such indicators following major announcements, can suggest a lack of clarity, credibility or institutional alignment between the message and the mandate, so therefore, analysing not only what was said, but how and when it was said, becomes a crucial aspect. Therefore, this study assesses how ECB communications affected the credibility of its monetary policy among market participants and the wider public, and on the short-run financial market stability in the euro area, focusing in on the March 2020 PEPP launch and on the mid-2021 'recalibration'.

The effectiveness of ECB communication is measured by using two complementary approaches, first, I conduct a text-based sentiment analysis of the ECB press releases, speeches, and statements, focusing on the tone, legalistic phrasing, and the levels of uncertainty. Second, I perform a short-window event study of the market reactions, looking at the changes in bond yields, equity indices, as well as volatility, so as to test whether the communication reassured or unsettled investors. These two strands are linked, with sentiment results showing how messages had been framed, while the market data shows just how audiences responded, after this empirical step, I go onto explore the institutional, political, and the legal factors that may explain any weaknesses that were revealed in the messaging. This design ensures that the thesis moves in sequence, going from measuring the communication effectiveness, to then diagnosing the causes of ineffective messaging, and finally to interpreting the findings through the dual theoretical lens of HI and DI. Rather than attempting an overall comparative analysis, the thesis uses the U.S. Federal Reserve (FED) and the Bank of England (BoE) selectively to highlight contrasting communication patterns. The use of these benchmarks provides partial contextual contrast, which allows for the distillation of ECB communication characteristics tackling its unique institutional and legal challenges. These examples highlight features of ECB communication that were driven by its unique institutional architecture and legal constraints, rather than forming the basis of a structured cross-national evaluation. The central research question arises directly from the tension between the ECB's need for policy credibility and its ability to reassure markets under crisis conditions, in relation to this the existing literature consists of debates on whether the ECB communication reduces volatility or instead amplifies uncertainty under legal and political constraints, yet though little is known about how these communicative dynamics had played out during COVID-19, when both the institutional pressures and financial fragility were both at their peak.

1.1. Literature Review

Institutional vs. Adaptive Communication

Existing literature on ECB crisis communication and its effects on monetary-policy credibility and short-run market stability provides conflicting evidence about its communication abilities in times of crisis. Some studies such as that of Woodford (2003) and Schmidt (2013) show that over time the ECB has improved its communication transparency, whereas it has been argued by others that the political and legal constraints have resulted in an inconsistent messaging and heightened market uncertainty (Amato, 2023; Kokott & Sobotta, 2017). This divergence of viewpoints suggests that whilst improvement in transparency were noted, the benefits may be limited due to the enduring institutional constraints, which highlights the gap there is in understanding just how these factors interact during times of crisis. Schmidt (2013) finds that the ECB's communication post-Draghi is more consistent and intelligible, in contrast to this, the legal commentaries by authors such as Amato (2023) and Kokott and Sobotta (2017) discuss how political; pressure and institutional ambiguity generated enduring communication uncertainty in COVID-19.

Communication in Crisis Contexts

These scholarly disagreements are reflective of the broader tension that are present, as while some authors have viewed the institutional design as being a fundamental constraint upon a central bank's communicative performance, others have instead made sure to emphasise central bank's adaptive capacity when tailoring their communication, such as for instance Blinder et al. (2008) and Gürkaynak et al. (2005) having both examined the communication effectiveness under normal conditions, whereas Schonhardt-Bailey (2013) and Born et al. (2019) having instead shown that crises can heighten the impact of messaging, which can in itself expose the limitations of standard communication strategies. While these frameworks were developed largely within corporate and political communication contexts, their insights also apply to central banks as well, as clarity and consistency can help to reduce uncertainty, whereas ambiguity risks to exacerbate panic, thereby positioning the ECB's communication within this wider literature allows for a more systematic understanding of what "success" or "failure" means during times of crises.

Adaptive Communication and Intra-Crisis Learning

Bonatti et al. (2021) provides evidence that during the COVID-19 crisis the ECB's language had actually become deliberately more legally cautious even though its overall tone had gone on to become much more assertive, which had raised concerns about its messaging consistency and its credibility. Similarly, Quaglia and Verdun (2022) and Fontan (2018) had all argued that the ECB had undergone 'intra-crisis learning,' in which it adapted its rhetoric in real time as the market and political conditions evolved, with these providing observations that help to provide justification for this thesis's dual focus on the institutional constraints and discursive adaptations. Born et al. (2019) utilised an event study approach in order to show that any shifts in a central bank forward guidance can directly affect asset prices. This thesis goes on to engage with the existing literature on ECB crisis communication and its effects on monetary-policy credibility and the short-run financial market stability, with the prior studies typically analysing the text or markets in isolation, leaving the link between message content and the immediate market reception underexplored for COVID-19. I bridge this gap in this thesis by combining NLP content analysis with a short-window event study for the two key episodes, which provides evidence on how the specific communicative features map into market reactions and credibility cues. Therefore, while the existing literature has shed light upon either institutional constraints or market reactions in isolation, there still remains a deep lack of integrated analysis that combines both of these perspectives.

1.2. Research Objectives

Building on the research question and the gaps in the literature, this study pursues three linked objectives, the first, is to evaluate empirically whether the ECB's communications in the two critical episodes (March 2020 PEPP launch and September 2021 tapering signal) were effective in stabilising markets, in bolstering investor confidence, and in clarifying policy intent. The second, is to analyse the institutional, political, and legal factors that contributed to any weaknesses in messaging, and finally the third, is to contextualise the ECB's performance by comparing its communicative strategies selectively with the FED and the BoE.

The two selected critical episodes:

March 2020 – PEPP Announcement: The ECB's initial response to the COVID-19 through PEPP was crucial in the stabilisation of financial markets amid peak volatility, this was selected as it was the ECB's first large-scale response during the peak of market panic, with it being delivered under conditions of legal scrutiny and of institutional ambiguity (Bonatti et al., 2021).

Mid-2021, Post-Pandemic Policy Shift: The ECB's transition from its emergency policies to tapering measures, has resulted in an increase in uncertainty surrounding its long-term monetary policy direction, with this being selected as it marked the beginning of the transition out of emergency policy, when the ECB had faced the challenge of managing expectations without going on to trigger renewed instability.

These two episodes were selected due to not only their importance within public discourse, but due to the high-pressure moments that exposed the ECB's institutional constraints and communicative challenges. The announcements of PEPP occurred under the peak of market panic and heighted judicial scrutiny, whilst this shift tested the ECB's ability to signal the policy normalisation amid the lingering economic fragility and legal uncertainty, resulting in the formulation of this studies objective to be:

The Evaluation of the ECB's Communication Effectiveness: It must be determined to what extent the ECB's communication within the two selected periods for this study succeeded in promoting market stability, investor confidence and clarifying policy intent.

Analysing the Reasons for Ineffective Communication: The possible reasons for any ineffective communication observed must be identified, including the internal organisational dynamics, political pressures or legal ambiguities that may have affected clear messaging.

Contextualising with Other Central Banks: Comparison the ECB's crisis communication with the Federal Reserve and Bank of England to identify whether the ECB's institutional constraints produced systematically different messaging choices and market receptions. (e.g., Ehrmann & Fratzscher, 2007).

1.3. Research Design and Case Selection

In order to pursue these objectives, the study goes on to employ a two-pronged empirical design, with the it first, conducting a textual analysis of the ECB communications; second, it undertakes a market-based event study of asset price reactions, as such this mixed-methods approach is structured in such a way, that it as such links the content of the ECB discourse directly with the short-run market outcomes.

The two selected cases, that being the March 2020 PEPP announcement and the mid-2021 tapering signal, were both chosen as they represent critical junctures in ECB crisis communication, with the first episode marking the ECB's initial emergency response at the height of uncertainty, while the second episode reflected the difficult transition toward post-crisis normalisation. These cases are therefore illustrative examples of both the acute phase of crisis management and the subsequent challenge that was faced in the recalibration expectations, however this focus on only two episodes limits the generalisability of the thesis.

1.4. Methods

This study conducts a textual analysis of ECB press releases, policy statements, and speeches from the selected periods utilising NLP techniques, such as sentiment analysis in order to classify ECB statements by tone, rhetorical stance and by narrative coherence over time. The rhetorical stance of this is informed using lexicon-based sentiment scoring, such as VADER (Valence Aware Dictionary and Sentiment Reasoner) and the LM financial dictionary, so as to quantify the changes in the tone before and after critical events, with this allowing for the study to detect shifts within the communicative sentiment and in the framing associated with the crisis episodes. Given the technical nature of the ECB's communication, financial terminology was cross-checked so as to ensure appropriate lexicon coverage. For clarity, the VADER compound scores have a range from –1 (very negative sentiment) to +1 (very positive sentiment), while the LM dictionary instead quantifies the financial tone by counting the positive, negative, and uncertainty related terms, with both these measures being able to provide the interpretable indicators of whether or not the ECB's messaging had leaned more towards reassurance or more towards caution during each crisis episode.

This study additionally conducts an event study analysis of market reactions to the ECB's announcements, through utilising financial metrics, through sovereign bond yields and stock index levels in short windows surrounding the key communication events, such as one to three days after announcements. The event study design follows the approaches by Born et al. (2019, p. 202) and Hansen and McMahon (2016), which enables for an assessment of the causal impact of communication on markets by the isolation of the effect of the message itself (filtering out the events that coincide with actual policy rate changes, as per Cochrane, 2011).

The study considers whether or not these market reactions are statistically significant, as they compare observed changes with pre-event baselines, and while a full econometric event study design may be beyond the scope of this project, the application of simple tests of abnormal returns and volatility changes (such as t-tests) is noted as being a valuable way to verify whether or not the observed market shifts are distinguishable from the normal fluctuations, with this methodological choice acknowledging both the limitations of the present study and the potential avenues that may be available for future research.

1.5. Integration of Methods

The integration of these two methods provides for a more comprehensive evaluation of the communication effectiveness, with textual analysis revealing what was said and how it was said and the event study revealing the effect these words had on the financial markets. Importantly, both methods are applied to the same episodes, creating a direct linkage between narrative characteristics and market outcomes.

The research approach is largely inductive, with it starting from observable outcomes (communication effectiveness indicators) and then going on to probe the potential explanatory factors, with this approach helping to ensure that the conclusions are grounded in empirical evidence and interpreted through the dual theoretical lens of Historical Institutionalism and Discursive Institutionalism.

1.6. Contribution

This study provides new contributes to the existing literature on central bank communication and crisis management by offering a unique data driven evaluation of ECB performance that is grounded in both institutional theory and financial analysis, with it first establishing the communication outcomes and then diagnosing the institutional constraints, with the study mirroring a real-world policy evaluation structure. In addition to this the study moves beyond the normative debate about institutional design by examining how the ECB’s communication strategies materially influence the ECB’s crisis management capacity, with it doing so by offering insights not just solely for academics, but also for policymakers, institutional designers and for central bank officials seeking to improve the effectiveness of future crisis responses. Through combining structural political economy with behavioural finance methods, this approach helps bridge disciplines in a way not previously applied to studies of ECB communication during COVID-19, as such marking this study as an innovative blend of perspectives. The findings additionally are of interest to EU law scholars and observers of European governance given the ongoing debates around the ECB's legal accountability and transparency. Finally, this study is timely, with the ECB continuing to face a growing scrutiny regarding transparency and effectiveness in its communication. By examining the COVID-19 crisis in detail, in relation to communication it is possible for this study to provide lessons which inform the ECB's communication strategy in future crises, as such contributing to both scholarship and practical policy discussions. In highlighting these specific communication pitfalls and successes, with the findings possibly helping institutions such as ECB to refine their crisis communication policies and protocols going forward.

1.7. Thesis Outline

In order to interpret the ECB's performance during the crisis the rest of this thesis is structured with: Chapter 2 constructing a dual theoretical lens that combines structural constraints with rhetorical agency through both HI and DI; Chapter 3 outlines the case selection and the data sources; Chapter 4 presents the empirical findings from the two selected episodes; Chapter 5 provides the discussion and the conclusion, with it drawing out the academic contributions, the policy implications, the limitations, as well as the avenues for future research, and with it additionally offering a final reflection on central bank communication in times of crisis.

2. Theoretical Framework

This second chapter explores the theoretical framework which guides the analysis of the ECB's crisis communication during the COVID-19 pandemic, with it aiming to establish the key concepts and the theoretical perspectives that inform how the ECB's actions are interpreted. This is done by drawing from institutional theories, in particular HI and DI, this chapter provides the analytical tools required to evaluate how institutional constraints and strategic communications shaped the ECB's messaging during the two pivotal crisis episodes.

2.1. Defining Key Concepts

Central bank communication refers to the deliberate transmission of information from a central bank to the public, financial markets, or political actors, in addition, effective communication according to Blinder et al. (2008), is considered a "third pillar" of monetary policy, alongside interest rate setting and liquidity operations, this is similarly argued by Gürkaynak et al. (2005) who explores the idea that the markets not only respond to dictates but to the tone, structure and timing of the central banks messaging. Additionally, within the context of crisis management, communication helps to serve three primary goals, that being to anchor expectations, to signal their policy intentions, and to help to mitigate any uncertainty. Before detailing the theoretical lenses utilised in this study, it is important to clarify the core concepts, such as the concept of central bank communication used in this thesis which encompasses not only the dissemination of information, but also the strategic use of language used to shape expectations, with this influencing market behaviour, but also signalling institutional credibility (Blinder et al., 2008; ECB, 2021a). During these periods of crises, this communicative function ends up becoming ever more complex, with this communication being needed in order to reassure markets all the while adhering to institutional constraints and to legal limits (Blinder et al., 2008; ECB, 2021a).

Effective communication is defined in several studies in terms of credibility, accurate forward guidance, and market anticipation (Blinder et al., 2008; Hansen & McMahon, 2016). The dimensions are inspired from the frameworks of the IMF (2020) and were adapted to the ECB's context by Coenen et al. (2022) and Verdun (2017). This operational definition helps inform the empirical strategy, particularly in how crisis episodes are selected and by how ECB statements are analysed using sentiment and coherence metrics. By evaluating both dimensions, the analysis is utilised to capture not only whether the ECB's communications were internally consistent and credible in the eyes of investors and the public. For the purpose of this study, communicating effectiveness is therefore defined as being the extent to which the ECB's messaging reduces or stabilises the market volatility following announcements, maintains both coherence and predictability overtime and aligns with the subsequent policy actions.

Institutional constraints refer to the structural and legal limitations that shape the behaviour and output of an organisation. In this case the ECB holds constraints, including legal mandates, particularly in regard to Article 127 of the TFEU (see fn. 1), which leads to limits in the ECB's scope to monetary, not fiscal policy; political dynamics, such as disagreements amongst the member states in regard to debt mutualisation or asset purchases; and governance structure, including the separation of the ECB's Governing Council and the European Parliament, as well as the lack of any fiscal counterpoint at the EU level. These constraints limit what the ECB is able to say and do, especially in this crisis scenario, in which fast and decisive action is expected (see fn. 1).

2.2. Historical Institutionalism

HI explains policy outcomes as a path dependent result of past decisions, which are shaped by institutional structures, and from formal rules, Hall and Taylor (1996) and Pierson (2000) argues that once institutions become established, they develop a self-reinforcing pattern that constrains future behaviour. Applied to the ECB, this suggests that communication strategies during COVID-19 were conditioned by legal precedents such as the Maastricht Treaty (1992)[1], previous court rulings, most notably the German Federal Constitutional Court's PSPP ruling in May 2020 (BVerfG, 2020), and the ECB's historical reluctance to overstep its price stability mandate (Amato, 2023)." Kokott and Sobotta (2017, pp. 107-114) argue that the principle of institutional balance sets a limit on the ECB's discretion within communicating fiscal implication, even in exceptional circumstances. Although early HI theory was critiqued for overemphasising inertia, later contributions (e.g., Mahoney & Thelen, 2010) demonstrate that institutional change can occur through gradual mechanisms such as layering and reinterpretation.

However, temporal dynamics are often under theorised in standard HI applications, Fioretos et al. (2016) calls for a greater attention to "reactive sequencing," where institutions adapt not from gradual layering, but from punctuated interpretive shifts in response to crisis. The reactive sequencing refers to a non-linear institutional evolution triggered in response to external events, which lead to short-term recalibration without the long-term restructuring (Fioretos et al., 2016). HI also provides a lens for which to understand how the internal organisational routines and the legal culture limit rhetorical

[1] European Union, 1992. Treaty on European Union (Maastricht Treaty). Official Journal of the European Communities, C 191, 29.07.1992. [online] Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A11992M%2FTXT [Accessed 23 April 2025].

adaptability, such as for instance, the ECB's reliance upon coded, legalistic language, which reflects the institutional learning shaped by the previous legal scrutiny (de Boer & van 't Klooster, 2020). The consistency in patterns of such communication can be seen clearly as a path dependant feature that shapes both the message content and the form, as institutions have a tendency to develop self-reinforcing practices that are resistant to change (Pierson, 2000, p. 254).

2.3. Discursive Institutionalism

DI is focused on the role of ideas, language, and discourse in shaping institutional behaviour and unlike HI, which stresses continuity, DI is attentive to change and agency, with it examining how actors use discourse (narratives, framing, and rhetoric) to change policies or adapt to new situations (Schmidt, 2008, 2010). Within the context of this study, DI provides a clear lens to analyse how the ECB crafted and adapted to its crisis narrative and how this narrative might have evolved during the pandemic in response to this feedback and learning. In accordance with Schmidt (2010), institutions are not just simply 'sites of discourse'; this means that ECB officials, when articulating policy, are actively construct meaning, legitimising certain actions, persuading audiences, and are actually sometimes reshaping the institution's role through their own words. DI distinguishes between the coordinative discourse, which is the internal discussion among policymakers (e.g., within the ECB Governing Council), and the communicative discourse, which is an external discussion directed at the public and markets, with this thesis being concerned among primarily with the ECB's communicative discourse during the COVID-19 crisis.

Quaglia and Verdun (2022) argue that while during the COVID-19 crisis the ECB had engaged in "intra-crisis learning," with it having gradually adapted its messaging strategy, so as to maintain its credibility under an evolving legal and political constraints. Similarly, Bonatti et al. (2001) had noted that the ECB had initially framed its pandemic response as being cautious, legalistic terms, with it having used words, such as "proportional" and "temporary", however, overtime in a framework consistent with DI, the ECB's language had shifted to a more confident clear tone, which suggests that the institution had learned and adjusted its own discourse. Schmidt (2013) provides three different types of discursive legitimacy, the first is input legitimacy (who participates in the discourse), the second is output (the policy results or outcomes of the discourse), and the third is throughput (i.e., legitimacy derived from the quality of governance processes and communication, not only inputs/outputs). For this study the throughput legitimacy is the most relevant dimension, this is because it relates most closely to how transparently and accountably the ECB communicates its decisions during this time of crisis.

A key strength of DI is its ability to recognise that rhetorical ambiguity can sometimes be deliberate and strategic, with central banks often utilising "constructive ambiguity," which is intentionally vague language, so as to preserve its flexibility (Riles, 2018). Ambiguity, vagueness and coded language are all not necessarily signs of weakness; they can be instruments of flexibility and control, as Blinder (2001) observed about the former Federal Reserve Chair Alan Greenspan's infamous use of constructive ambiguity, with a certain level of opacity assisting in managing the markets expectations without binding the bank to specific future actions.[2] In this way the ECB crisis discourse can be seen to utilise strategic ambiguity, deployed when needed to help balance the conflicting demands required to reassure markets versus legal and political coherence (Fontan, 2018; Riles, 2018).

DI allows for us to interpret this use of strategic vagueness as a deliberate communicative strategy rather than as a policy failure, as such for this study this thesis shall stay agnostic on whether ambiguity in central bank communication is inherently good or bad, instead this ambiguous language shall be valuated upon its context specific effects. Within this study's analysis, ambiguity it is not presumed to be inherently beneficial or detrimental; its value is judged by outcomes in each instance, in this study, the DI perspective also guides the textual analysis methods. Through examining speech tone, wording choices and narrative framing, this study captures how the ECB's language adjusted in response to unfolding events. In doing so, this analysis links macro level institutional discourse theory with micro level textual data, reflecting emerging best practices in interpretive political economy research (Schonhardt-Bailey, 2013). For instance, certain linguistic constructions are treated as evidence of rhetorical constraint, phrases with conditional modality ("we may act"), use of impersonal or vague agency ("measures are being considered"), or appeals to external conditions ("under the present circumstances") often function as institutional shielding language (Schmidt, 2013; Riles, 2018). Such phrases in ECB communications are just not necessarily communicative weaknesses, but rather, they are instead rhetorical tools embedded within the ECB's institutional role, so as to carefully balance its messaging. In summary, DI sensitises the analysis to the dynamic, with adaptive aspects of ECB communication, with this suggests that if the ECB's tone were to become gradually more assertive over time, or if it were to employ more ambiguity within specific moments of time, these could then become conscious choices influenced by the efforts used to manage legitimacy and expectations, with DI helping to explain not just what constraints had existed, but also how the ECB leaders had navigated through the discourse.

[2] Blinder (2001) describes Greenspan's rhetorical strategy as one of "constructive ambiguity," arguing that deliberate vagueness was used to manage market expectations without overcommitting on policy direction.

2.4. Applying Theory to the Research Design

HI and DI are often seen as being contrasting perspectives, with one emphasising the structural constraints and continuity, and with the other emphasising the ideas and change, however though, this dissertation treats them as being a complementary lens that jointly illuminates the ECB's crisis communication. HI explains why certain communication strategies were constrained by mandate, law, and precedent, whereas DI shows how ECB actors adapted phrasing and narrative within those constraints to shape expectations.

HI and DI are used here in function as two complementary lenses, so as to interpret ECB crisis communication, with HI explaining why these episodes were legally and politically fraught, while DI shows how the language was used in such a way to navigate the challenges (Hall & Taylor, 1996; Pierson, 2000; Kokott & Sobotta, 2017; Amato, 2023). HI highlights just how the role of structural and legal constraints, such as that of past precedents, treaty obligations, and of judicial rulings restrict the range of acceptable messages and creates path dependence, while DI, in contrast, highlights the agency and adaptation, such as for example how policymakers use discourse, framing, and narrative construction so as to shape the expectations within those constraints (Schmidt, 2008; 2010; Hay, 2002; Quaglia & Verdun, 2022). Taken together, HI explains why the certain communicative strategies were unavailable, while DI shows just how discourse was nevertheless adapted to maintain the credibility, as well as to ensure that both the institutional limits and the rhetorical practices of the ECB are captured in the analysis (Hall & Taylor, 1996; Pierson, 2000; Schmidt, 2008; 2013; Riles, 2018; Blinder et al., 2008).

The combination of both HI and DI does not just simply juxtapose the two perspectives but also uses them in such a way that complements them, in order to illuminate both the structural constraints and the adaptive discursive strategies that shape the ECB's communication, with this combined use aligning with the best practices in interpretive political economy, which helps to emphasise meaning-making within an institutional context (Hay, 2002; Schmidt, 2013). As such, where HI tells us why the ECB could not say certain things, for example, it could not openly commit to unlimited bond purchases due to treaty restrictions, DI shows that the ECB nevertheless reassured markets through careful framing and narrative. In the case of this study, the ECB's ability to manage the expectations was shaped from constraints (a HI insight) but was also executed through the evolving communicative strategies (a DI insight), which resulted in a feedback loop between the perceived legitimacy and the market reactions (Schmidt, 2013; Riles, 2018).

Table 2.1 below provides a summary of how the key theoretical concepts from HI and DI are operationalised via the specific indicators and the methods in this study's design, which provides a linking theory to the empirical approach:

Table 2.1 – Mapping Theoretical Concepts to Indicators and Methods

Theoretical Concept	Indicator in ECB Communication	Method of Analysis
Legal constraint (HI)	The use of legalistic language (e.g. references to EU treaties or mandates). The frequent use of qualifying modal verbs which indicate caution	The use of textual analysis (NLP sentiment for the detection of legalistic tone)
Reactive sequencing (HI)	Any shifts in communication tone following external legal or fiscal events (e.g. the court findings and the EU fiscal decisions)	Timeline analysis and event study (to correlate communication shifts with event timing)
Strategic ambiguity (DI)	The presence of a vague or a coded language, through the use of abstract metaphors or by hedging phrases (e.g. "any appropriate actions")	The use of linguistic annotation and sentiment analysis (in order to identify ambiguous phrasing and measuring sentiment analysis)
Discursive adaptation/legitimacy (DI)	Changes in narrative coherence and emphasis over time, with alignment between words and subsequent policy actions (perceived credibility)	The combining analysis of NLP (coherence metrics) and market data (to see if improved narrative clarity corresponds with calmer markets

DI informs what textual features to examine (such as instances of ambiguity or particular framing devices) and suggests evaluating narrative shifts or evidence of learning over time, with this dual theoretical lens underpinning the entire research strategy. As the following chapter shows, the case selection and methodological tools (NLP for text, and an event study design for market reactions) are not theory neutral, rather they were chosen precisely because they allow us to operationalise the insights from HI and DI, respectively. The use of a dual method mirrors the dual theory, with structural constraint (HI) and communicative strategy (DI) both needing to be measured and analysed to understand the ECB's crisis communication in full. In practical terms, this theoretical architecture assists in guiding how the results are interpreted in Chapter 4, for instance, if a period is observed in which the ECB's communications use unusually cautious in language and the markets as a result react negatively. Conversely so, if this study observers that the ECB's language is becoming much more assertive over time, alongside any of the improved market reception, with the DI perspective going on to help to explain that as discursive adaption or learning. Thus, in this design, theory shapes not only the research design, but also the interpretive logic applied to the findings.

The hypotheses/expectations of this study are based on the dual institutionalist framework; this study expects a clear contrast between the two crisis episodes:

- In the early crisis phase (March 2020), the ECB's communication, constrained by legal mandates and past precedents (HI), is cautious, legalistic, and ambiguous, which is likely to coincide with greater market uncertainty and volatility.
- In the later phase (mid-2021), the ECB's communication, having adapted through intra-crisis learning (DI), is more confident, coherent, and assertive, which should correspond to more positive or stabilising market reactions as the bank sought to reassure observers.

2.5. Summary

This chapter has provided the conceptual and theoretical foundations of the dissertation, with key concepts having been defined and linked to the relevant literature, such as central bank communication, crisis messaging and institutional constraint. Additionally, two institutional theories, HI and DI were introduced and combined to form a dual theoretical framework HI frames the ECB's legal rigidity and path dependent constraints, while DI interprets its communicative adaptation and strategy under those constraints. The dual theoretical lens also helps to underpin the design of this study's research strategy, as had been noted in the case selection (the episodes to study) and the methods that had been chosen (the textual analysis and the event studies) are all informed significantly by the theoretical expectations of the HI and DI, with this alignment helping to ensure that the analysis remains to be theoretically informed at every single step.

3. Data and Case Selection

This chapter outlines the empirical foundation of this thesis, through the detailing of the data sources, as well as the case selection rationale and all the employed analytical tools, with this section helping to build upon chapter 2 by introducing the two main crisis periods that are being examined for the analysis of the ECB's crisis communication, that being first the March 2020 announcement of PEPP and the second being the September 2021 policy shift which signalled the reduced asset purchases. These case studies were selected for both their policy significance, but also for the communicative contrasts that they offer in regard to the immediacy of the crisis onset, but also for the sensitivity of policy normalisation (Koranyi & Canepa, 2021). By combining textual sentiment analysis with short window event study methodology, this chapter sets out a structured design that links discourse to observable market reactions. The methods employed, VADER sentiment scoring, the LM financial lexicon, and high frequency financial indicators, are introduced with a view to operationalising the theoretical claims of institutional constraint and communicative agency in ECB decision making.

3.1. Research Design

This study focuses in on two pivotal episodes of ECB policy communication during the COVID-19 crisis, with it providing a contrast between the onset of the crisis and beginning of the exit from emergency measures (Lagarde, 2020; ECB, 2020B; 2021c; 2021). In total, the analysis covers four key ECB communications released in the periods of March 2020 and September 2021, these include two key documents from the initial outbreak of the pandemic and two form the later policy transition in 2021. By focusing on these texts, specifically, press releases, a presidential blog post, and press conference remarks, the study captures the ECB's messaging at two pivotal moments of the COVID-19 crisis. The sentiment of these texts was computed by using two tools, VADER (a lexicon and rule-based algorithm) via NLTK, and the LM financial lexicon (Hutto & Gilbert, 2014; Loughran & McDonald, 2011). The LM dictionary is widely utilised in financial discourse analysis in order to capture sector specific connotations, although it may miss any nuances of syntax or irony (Loughran & McDonald, 2011; Gentzkow, et al., 2019). The case studies chosen for this study are firstly, the 18th of March 2020 announcement of the €750 billion PEPP on the onset of the pandemic and the second is the 9th of September 2021 policy signal of the forthcoming tapering during the pandemic-era asset purchases as the crisis began to end (ECB, 2020a; 2021c).

This study conducts an analysis of the official ECB press releases from the 18th of March 2020 PEPP announcement and its key features, as well as this it goes onto examine President Christine Lagarde's ECB blog post on the 19th of March 2020 titled "Our response to the coronavirus emergency" (ECB, 2020b; Lagarde, 2020). The PEPP press release emphasised that the ECB would "do everything necessary within its mandate" and even signalled a willingness to revise "self-imposed limits" if they impeded action (ECB, 2021). Such phrasing which stresses the legal mandate and its constraints, were all viewed by many commentators as having been overly guarded at a moment, which had arguably called for much bolder reassurance (Böninghausen, et al., 2022), and indeed, the somewhat tentative messaging was also blamed for the initially failing so as to calm the markets (Ortmans & Tripier, 2020; Reuters, 2020). Notably, a week earlier Lagarde had said the ECB was 'not here to close spreads,' a comment that 'sent Italian bond yields sharply higher' (Reuters, 2020). In response to this backlash Lagarde communication quickly moved to clarify that the ECB's position in the subsequent days, with the 19th of March blogpost striking a more empathetic and urgent tone, with it underlining just how the ECB's commitment to "an ambitious, coordinated and urgent policy reaction" (Koranyi & Canepa, 2020; Clinch, 2020; Lagarde, 2020). These initial communications helped to suggest just how the ECB's communication evolved due to previous pressure, starting with its initial rules-based approach and then going on to pivot to a more clear and decisive language after the criticism (ECB, 2021e).

This study examines the ECB's Monetary Policy Decision press release from the 9th of September 2021, in which the Governing Council announced a "moderately lower pace" of PEPP asset purchases for the upcoming quarter (ECB, 2021c). Also included is President Lagarde's remarks from the press conference that day, where she took care to frame this adjustment explicitly not as the start of tapering (ECB, 2021d). By late 2021 the elevated level of vaccination rates fuelled by a bolstering in economic recovery the ECB had to face the arduous task of dialling back without spooking the markets (Koranyi & Canepa, 2021). The communications that surrounded the September 2021 decision were delivered in a measured and market-calming tone, with Lagarde going so far as to echo the words of Margaret Thatcher, saying "the lady isn't tapering", a quip that underscored the intent of the ECB to avoid the word "tapering" and any other word that may invoke the idea of a hasty withdrawal of support (Hubert & Labondance, 2021; Koranyi & Canepa, 2021). Instead of this the official statement went on to stress that the "favourable financing conditions can be maintained with a moderately lower pace of net asset purchases under the PEPP" going forward, this cautious phrasing signalled a gradual and a cautious step down, which was accompanied by assurances that the policy would remain accommodative (Treeck, 2021).

3.2. Data Collection

For the analysis of each case study, financial market data was gathered in order to conduct a short horizon event study of market reactions, particularly this study focuses in on four key market indicators to different dimensions of investor response (MacKinlay, 1997):

10-year government bond yields in Germany and Italy: Represent the long-term sovereign borrowing costs within both a core Eurozone country, Germany and a vulnerable periphery country, Italy (Corradin, et al., 2021). German 10-year yields serve as a good benchmark for general euro area risk free rates, as the Italian 10-year yields reflect a stress in a more fragile economy, as a widening gap between the Italian and German yields (spread) indicate a rising concern surrounding fragmentation or country specific risk (Altavilla et al., 2020; Corradin, et al., 2021). Thus, by examining both, this study can identify if the ECB's communications helped to compress peripheral yields (a sign of eased stress) or if its missteps had caused spreads to widen as a result (Altavilla et al., 2020).

Euro Stoxx 50 equity index: This index of Eurozone blue chip stocks gauges equity market sentiment, with a positive market reaction being reflecting possibly in a stock gain, whilst a negative or confusing reaction triggering a possible equity sell off (Haitsma, et al., 2016; Valentin, 2022). Movement around the announcement indicates that investors reassessed economic prospects and risk within the Eurozone (Böninghausen & Hartmann, 2025).

VIX volatility index: The VIX index is utilised to measure the expected stock market volatility in the S&P 500 options, in order to serve as a barometer of global risk aversion, with this spike in the VIX signalling a surge in uncertainty and a risk off sentiment, by monitoring the VIX around the ECB announcement days, global market anxiety or relief can be captured beyond Eurozone specific assets (Apergis, et al., 2023). During COVID-19, the VIX had spiked to record levels in March 2020, with its response to policy news being especially telling of how reassured, or not the global market was (FSB, 2020; SIFMA, 2020).

I obtained the daily closing values for these indicators from a Bloomberg terminal (accessed June 2025) and analysed for changes over the two windows, that being a 1-day window, from the market close immediately before the announcement to the close on the next trading day, and a 3-day window, from the announcement day through three days after (Campbell, Lo & MacKinlay, 1997; MacKinlay, 1997; Wang, 2019). Daily closing prices (Bund 10Y, BTP 10Y, Euro Stoxx 50, VIX) are analysed over two windows: 1-day (pre-close → next-day close) and 3-day (D0 → D+3), isolating short-run communication effects (MacKinlay, 1997). The wider 3-day window allows for the observation of initial reactions if persisted or if markets have corrected themselves within the days following, for example a sharp move on an announcement day that partially reverses within a couple of days would suggest that an initial overreaction had occurred (Wang, 2019; Chen, et al., 2007). In this way the German 10-year yield and the Euro Stoxx 50 index serve as useful proxies for the general market response within the Eurozone's core, whilst the Italian 10-year yield specifically captures stress in a vulnerable sovereign (Wang, 2019; Altavilla, 2019; Kalyani, 2025; Akkaya, et al., 2024). These mix of indicators therefore ensure that this study covers a spectrum of market perceptions, from the European government bond markets, to equities, to global risk aversion, in reaction to the ECB's words (Altavilla et al., 2014; Altavilla et al., 2019; MacKinlay, 1997). This follows standard event-study practice (e.g., MacKinlay, 1997; Gürkaynak, Sack & Swanson, 2005) and recent work on communication shocks. This study treats communication as effective if short-window reactions tighten BTP–Bund spreads, lift Euro Stoxx 50, and/or lower VIX relative to pre-announcement; the opposite movements indicate weaker reassurance.

Through combining the textual data (ECB communication content) with the market data (asset price movements) a dual method analysis is possible, which allows for the linkage of what was said with how the markets reacted (Blinder et al., 2008; Ehrmann & Fratzscher, 2007; Ehrmann, M., & Fratzscher, M., 2005). In other words, it can be examined whether an ECB statement's tone and framing had corresponded with a calming or jittering effect on different markets, with this approach going on to strengthen the studies capability in drawing insights about the effectiveness of the ECB's crisis communication strategies (Kaminskas, et al., 2024; Harmon & Mariani, 2024).

The ECB communications for this study were all sourced from the official ECB releases (press releases, as well as the ECB's website and blog), which ensures that all the exact messages that were delivered are being properly analysed (ECB, 2020a; 2021c). The financial market data analysed consists of bond yields, equity index and VIX, were all sourced from a Bloomberg terminal daily closing prices around the events dates (Bloomberg, 2025), pairing textual sources with market data enables integrated analysis of discourse and impact (Hansen, et al., 2018).

Together, these documents constitute for the core dataset of this research, with the next section outlining just how the ECB's content and its corresponding market reactions were all examined, as using a combination of NLP techniques and an event study approach.

Table 3.1. Data and Methods Overview for Selected ECB Communication Episodes

Case Study	Date	ECB Communications Analysed	Sentiment Analysis Tools	Market Indicators (Event Window)
March 2020 – PEPP Launch	18–19 Mar 2020	ECB Press Release (18 Mar 2020); Lagarde ECB Blog post (19 Mar 2020)	**VADER** (compound score; % pos/neu/neg) **LM** lexicon (Negative, Positive, Uncertainty, Litigious, Constraining word counts)	10-year bond yields (Germany & Italy); Euro Stoxx 50 index; VIX (1-day and 3-day windows)
September 2021 – "Tapering" Signal	9 Sep 2021	ECB Policy Decision PR (9 Sep 2021); Lagarde press conference remarks (same day)	**VADER** (compound score; % pos/neu/neg) **LM** lexicon (Negative, Positive, Uncertainty, Litigious, Constraining word counts)	10-year bond yields (Germany & Italy); Euro Stoxx 50 index; VIX (1-day and 3-day windows)

Sources: ECB, (2020a; 2021c); Lagarde, (2020); Lagarde, (2021); Hutto & Gilbert, (2014); Loughran & McDonald, (2011); Altavilla et al., (2020); Jurkšas, et al., (2024); Whaley, (2009)

3.3. Data Analysis

Analytical Techniques

In order to analyse the content of the ECB's language, this study goes on to employ three analytical techniques that were each selected for their fit with the research question, that being VADER, LM, and a short-window event study, together these techniques help to quantify both the rhetorical tone of the ECB communications, as well as their immediate market impact (Altavilla et al., 2020; Hansen et al., 2018; Jurkšas, Kaminskas & Vasiliauskaitė, 2024; Schmeling & Wagner, 2023).

The two NLP tools that this study uses are VADER and LM financial lexicon, which both serve distinct yet complementary purposes, with VADER providing an overall sentiment score, as well as a breakdown of positive, negative and neutral word usage, with the LM lexicon identifying the frequency of the terms which relate to uncertainty, litigation, constraints and other financially relevant sentiment categories (Hutto & Gilbert, 2014; Loughran & McDonald, 2016), with all this together, enabling for a structured, replicable analysis of the tone and its thematic focus in regards to the ECB statements (Bholat et al., 2015).

The event study methodology, on the other hand, assesses market reactions to these communications (MacKinlay, 1997). Through the examination of key financial indicators over tightly defined windows (1- and 3-day changes), it is possible to isolate the effects of the ECB announcements on the asset prices and the volatility, with this having helped to determine whether the particular styles of messaging are more legalistic or reassuring, and if they had correspond with a calmer or more turbulent market (Altavilla et al., 2014; 2019).

NLP Tool: VADER Sentiment Analysis

VADER is a lexicon and rule-based sentiment analysis tool originally designed to detect sentiment in social media and financial text (Hutto & Gilbert, 2014). Whilst indeed the Vader NLP was explicitly designed to 'perform well on social media text but effective across other text forms as well', which indicates its suitability in the application to formal ECB communications, with it being well suited for this purpose due to its ability to handle the short policy-oriented texts and press statements the ECB issued (Hutto & Gilbert, 2014; Möller & Reichmann, 2023). The VADER NLP produces a compound sentiment score for any given text, ranging from -1 (extremely negative) to +1 (extremely positive), with this compound score serving as an aggregate measure of the text's overall emotional valence, additionally, VADER outputs the proportion of words that were positive, neutral or negative, providing a breakdown of tone (Hutto & Gilbert, 2014).

This study computed the VADER sentiment scores for each ECB communication, in this case quantifying the overall sentiment, for example a strongly reassuring optimistic message may provide a high positive compound score, close to +1, with a high percentage of positive words, but very few negative (Altavilla et al., 2019). Conversely, a statement emphasising risks, uncertainties, or delivered in a dour tone would likely produce a negative compound score (toward –1) and a higher share of negative or cautious wording (Hutto & Gilbert, 2014). By extracting these metrics, it is possible to compare the emotional tone of the March 2020 announcements versus the September 2021 communications in a consistent way (Altavilla et al., 2019). For instance, this study reports each text's VADER compound score along with the % of words classified as positive, neutral, and negative, this provides an empirical sense of whether the language was on balance upbeat, neutral, or downbeat (Altavilla et al., 2019).

Utilising VADER, which is itself calibrated for financial texts helps to ensure that this studies colloquial expressions and emphasis, (such as “not tapering” or “challenging time”) are interpreted with reasonable accuracy, in regard to terms of sentiment (Hutto & Gilbert, 2014). It must be noted however, that VADER is not designed to specifically towards central bank discourse, and whilst it does outperform many dictionary based methods, it still may potentially miss many deeper rhetorical cues, most especially those involving metaphor, irony or institutional framing, overall VADER thus serves to give us a quantitative handle on the emotional sentiment conveyed within the ECB’s narrative (Bholat et al., 2015; Altavilla et al., 2019).

NLP Tool: Loughran–McDonald Financial Lexicon Analysis

Whilst the VADER index focuses on general positive/negative tone, the LM financial lexicon approach provides a much more granular look at specific categories of words which are relevant within financial communications (Loughran & McDonald, 2011). The LM lexicon is a curated dictionary which was originally developed for analysing corporate financial documents, such as 10-k reports and to classify words into sentiment categories tailored towards financial contexts (Hvitfeldt, n.d.). This study uses the LM lexicon to count the frequency of words in the ECB texts that fall into five key categories: Negative, Positive, Uncertainty, Litigious, and Constraining (Loughran & McDonald, 2011), (these are categories identified by Loughran & McDonald as especially meaningful in finance, among others, excluding the less relevant “Superfluous” category and focus on the five above) (Hvitfeldt, n.d.).

In practice, this means that the study scans the ECB communications for any word that appears in those sentiment lists and tally them, the result is a profile of how many negative words, uncertainty related terms, etc., each text contains (Loughran & McDonald, 2011). This provides insight into the themes and tones of the message beyond any simple positive/negative polarity, for instance a high count of uncertainty words, such as “uncertain”, “risk” and “volatility” would indicate that the statement spent considerable time acknowledging doubts or unknowns, which points to a more cautious worried stance (Loughran & McDonald, 2011). High counts of litigious terms, that being words that relate to legal or bureaucratic language, such as “mandate,” “compliance,” “requirement” and “court,” suggesting that a more legalistic or constrained tone, may possibly reflect institutional caution or awareness of legal limits (Loughran & McDonald, 2011). Many constraining words, that being “must”, “limit”, “within”, “cannot” signal an emphasis on rule, restrictions or self-imposed limits, highlighting the institutional constraints under which the ECB operates, whilst on the other hand a greater frequency of positive words, including “improve”, “ progress”, “confident”, supportive”, pointing to a more optimistic and reassuring communications (Loughran & McDonald, 2011; Schmeling & Wagner, 2023). Through counting these, it becomes possible to quantitatively compare for instance if the March 2020 texts had contained more negative or uncertain language, which is to be expected on the onset of a crisis, additionally it considers if the September 2021 remarks had more positive or fewer litigious terms, as the narrative began to shift more towards recovery and reassurance (Kaminskas, et al., 2024). The LM lexicon's financial orientation is also crucial, as it flags words in which general sentiment dictionaries may miss, due to for instance their context, such as for example, "uncertainty" or "downturn," which are clearly negative signals in a policy context, additionally, the LM then categorises them appropriately as being either Uncertain or Negative (Loughran & McDonald, 2011). This tool thus captures the subtleties in the ECB's rhetoric, such as whether it leaned more towards emphasising limits and mandates (constraining/legalistic tone) or instead towards confidence and support (positive tone), among many other dimensions (Hvitfeldt, n.d.; Loughran & McDonald, 2011).

It must also be noted that the use of fixed dictionary methods has known drawbacks, such as for example with lexicons 'often lack[ing] the nuanced understanding of context' (Gentzkow, et al., 2019; Zhang, 2025). In reality this means that some words may be misclassified, for example the word 'strike' can carry many different meanings, this study therefore interprets the LM category to counts with care and rely upon contextual reading to validate the results (Samuel, Rozzi & Palle, 2022; Rutkowska & Szyszko, 2024). By applying both a VADER and LM lexicon this study is able to obtain a comprehensive textual sentiment profile of each case, with VADER providing an overall sentiment score and a balance of positive/ negative tones, whilst the LM analysis provides this study with the specific content themes including uncertainty and legalistic language (Barbaglia et al., 2024). This dual textual analysis thus operationalise the narrative strategies derived from institutional theory, e.g. a high count of Litigious/Constraining terms signals the legal mandate emphasis that HI (Capoccia, 2016; Schmidt, 2008) predicts, whereas a strongly positive tone (or avoidance of alarmist terms) exemplifies the communicative framing emphasised by DI (Schmidt, 2008; Zhang, 2025). Scores and counts were computed in Python (VADER via vaderSentiment; LM via a curated dictionary lookup); code excerpts are provided in Appendix D.

Linking Text and Markets

Finally, this study correlates these textual metrics with the market reactions from the event study, by examining language and market impact together, it assesses whether a more positive tone coincided with calmer markets, or if heavy uncertainty language corresponded with increased volatility, etc (Schmidt, 2008; Blinder et al., 2008). This combined approach ensures that this analysis (in Chapter 4) ties the theoretical insights from institutionalism to concrete evidence, in line with HI, this study pays attention to how institutional and legal constraints manifest in communication, for instance, if the ECB's need to stay "within its mandate" led to a constrained tone (observable via the Litigious and Constraining word counts) (Schmidt, 2008; Schmidt, 2019). In parallel to this, by following DI, this study considers the evolution of the ECB's strategic narrative framing and rhetoric, which is captured through the sentiment scores and choice of wording (e.g. avoiding "tapering" as a deliberate framing device) (Koranyi & Canepa, 2021). In this case selection and mixed method design are deliberately aligned with these lenses: the March 2020 vs. September 2021 contrast lets us see a shift in discourse (DI) under the influence of institutional pressures (HI), and the metrics gathered provide the data to back this up (Schmidt, 2008; Altavilla et al., 2019).

3.4. Summary

In summary, this chapter's design marries textual analysis with market analysis to provide a structured bridge between theory and evidence (Binder, 2017). By quantitatively analysing what was said (and how it was said) and comparing it to how markets responded, it is possible to rigorously evaluate the effectiveness of the ECB's crisis communications (Altavilla et al., 2019). The combination of methods, NLP sentiment analysis and short window event study, gives us a rich, multidimensional view of the ECB's crisis management via communication (Altavilla et al., 2014; 2019). A sentiment analysis was conducted by using the VADER algorithm and the LM lexicon; with VADER's strength being in its ability to handle modifiers and punctuation, which makes it suitable to analyse ECB press releases, however though, it may be prone to overestimate sentiment in sentences that are hedged positivity and it does not properly parse with deeper rhetorical cues such as metaphor or irony, meanwhile, the LM dictionary offers financial domain specificity but it lacks any coverage of non-market framing (Hutto & Gilbert, 2014; Loughran & McDonald, 2011). Following standard practice, it is possible to compute the one-day and three-day changes (abnormal returns/changes) in each indicator around the announcement dates (Fama, et al., 1969). This study then correlates the textual sentiment measures with the markets reactions in order to assess whether more positive or constrained language coincides with calmer or more volatile markets (Gürkaynak, Sack & Swanson, 2005).

It should be noted that this methodology has certain limitations, firstly, the focus on just two case studies means that the results are context specific and not broadly generalisable, secondly the analysis is largely descriptive, whilst it uses quantitative metrics, it doesn't employ a full econometric model in order to establish causality. This approach allows for the identification of correlations and patterns consistent with the theory, however if cannot be used to definitively prove cause and effect, as a result any conclusions drawn from the impact of the ECB's communication should be viewed as more suggestive than conclusive.

All data used in this thesis (e.g. ECB communications transcripts and market data) are from publicly available sources, with the ECB communications that were analysed being from sources such as press releases and official blog posts, with these being publicly available documents and with the financial market data coming from open financial databases, which ensures that no confidential or personal information is involved. There are this no human subjects or privacy concerns related to this thesis; however, it is worth noting that VADER/LM provide replicable metrics but can miss irony, metaphor, or institutional jargon; outputs were cross-checked qualitatively to ensure interpretive accuracy, thus it should not be interpreted with these caveats in mind. No ethical approval was required during this research as all the data used was public and non-sensitive, with the author of this thesis confirming that that all the research was conducted in accordance with the university's ethical guidelines and that there was no conflicts of interest that have influenced the study, and in addition, this study acknowledges these data/tool limitations.

This provides the foundation for the next chapters analysis, in which this study discusses the findings, such as how the ECB's communication strategies have either mitigated or exacerbated market turbulence and to what extent that the patterns observed support the arguments of institutional constraints versus discursive adaption in ECB crisis management (Schmidt, 2019). This approach ensures that the discussions are grounded in empirical data, which fulfil the aim to connect the theoretical framework to real world outcomes in a structured way (Blinder et al., 2008; ECB, 2020a). In order to ensure transparency and replicability, supplementary materials are provided in the appendices, with a full list of the ECB communications that were analysed in this thesis being presented in Appendix A. The detailed sentiment analysis outputs from both the VADER and the LM lexicon are available in Appendix B section, with it also illustrating the numerical results that underpin the discussion in Chapter 4. Finally, the selected code excerpts that were used in the implementing of the sentiment analysis that were provided in the Appendix C section, additionally all the complete scripts are available upon request.

4. Results

This chapter presents a detailed analysis of the ECB's crisis communication strategy during the two key points of the COVID-19 crisis, with it utilising the sentiment analysis tools alongside a comparative textual interpretation, so as to investigate just how the ECB's narrative had shifted from its legalistic caution to instead strategic reassurance. This structure uses the discussed dual institutionalist framework, with HI being used in order to interpret the constraints that are rooted in treaties and jurisprudence, whilst DI helps to explain just how the ECB had adapted its rhetorical strategy overtime. PEPP (March 2020) and the "recalibration" signal (September 2021) are critical junctures where messaging faced peak legal-political pressure and required adaptation, for context, not as the primary focus, the Fed and BoE's clearer, less legally hedged crisis communications provide useful external benchmarks.

4.1. March 2020: Communication under Legal and Market Strain

By mid-March 2020, as the COVID-19 crisis was intensifying the global financial markets had gone into turmoil, with the FED reacting on March 15th with aggressive easing, cutting rates to nearly zero and announcing large scale asset purchases in order to stabilise the markets (FED, 2020). In contrast to this the ECB unveiled with a rather notably cautious communication a €750 billion PEPP on March 18th (ECB, 2020a). The ECB's press release had framed its commitment as being "within its mandate," with it explicitly stating that the Governing Council would do "everything necessary within its mandate" and that it would even "consider revising" its own limits if it were necessary to do so (ECB, 2020a). This legalistic wording highlights the constraints, such as with the ECB emphasising the limits of its mandate in its choice of language, and with the discursive caution having been consistent with the prior ECB practices during the Eurozone sovereign debt crisis (Fontan, 2018; Schnabel, 2021; Böninghausen et al., 2022).

Within the legal terms of Articles 123 and 127 of the TFEU, which strictly limit the ECB's scope (prohibiting direct monetary financing and mandating price stability as the primary goal), the ECB's crisis response language was bound by formal constraints, with these provisions having shaped the ECB's cautious communications framing (European Union, 2012). Moreover, in May 2020 the German Constitutional Court's PSPP ruling had questioned whether the proportionality of the earlier ECB asset purchases, which reinforces the shadow of legal scrutiny even amidst the pandemic, with this intensifying the ECB's risk aversion in its March messaging (BVerfG, 2020). In comparison, the BoE, not bound by its EU treaty constraints communicated its large March 2020 interventions more straightforwardly in this effect the ECB's initial narrative is seen to have been born from strict legal and institutional norms rather than bold, unambiguous reassurances.

The sentiment analysis highlights the ECB's cautious, hesitant tone in these March 2020 communications, as while the VADER polarity was registered as being strongly positive, the LM lexicon had captured the underlying legalistic and uncertainty framing that was present. Table 4.1 below reports the VADER compound scores and LM category word counts for the 18th of March 2020 PEPP press release and President Lagarde's 19 March blog post (ECB, 2020a; Lagarde, 2020). While the VADER algorithm labels the March 2020 press release and Lagarde's blog post as strongly positive in tone, the LM lexicon tells a more nuanced story, with the unusually high counts of negative (94), uncertainty (69), positive (19) and constraining terms (39) in the press release (see figure 1 & 2) (with similarly high negative word counts in Lagarde's blog) reveal that beneath the optimistic veneer, the ECB's language was dominated by legal caution and ambiguity, in other words, the communication appeared positive on the surface but was substantively defensive, reflecting the bank's institutional constraints(see Appendix B, Tables B1–B2) (Hutto & Gilbert, 2014; Kaminskas, et al., 2024; Loughran & McDonald, 2011). Additionally, Lagarde's shorter blog had shown a very similar result, with about 22 negatives versus only 5 positive words, along with numerous uncertainty terms, which had gone on to only underscore the ECB's rhetorical caution (see Appendix B, Tables B1–B2) (Loughran & McDonald, 2011; Jurkšas, et al., 2024).

Table 4.1. Sentiment analysis of ECB communications – March 2020 PEPP case.

Text	**VADER Compound**	**VADER Pos%**	**VADER Neu%**	**VADER Neg%**	**LM Negative**	**LM Uncertainty**	**LM Positive**	**LM Constraining**	**LM Litigious**
Press Release (18 Mar 2020)	**+1.000**	12.3%	81.4%	6.3%	94	69	19	39	24
Lagarde Blog (19 Mar 2020)	**+0.947**	10.0%	82.2%	7.8%	22	10	5	11	5

Source: Author's analysis using VADER (Hutto & Gilbert, 2014) and LM lexicon (Loughran & McDonald, 2011) applied to ECB (2020a) and Lagarde (2020) texts.

The high incidence of the negative and uncertainty language in March 2020 is reflective of a more legalistic framing that is consistent with the ECB's institutional constraints, as for example, the PEPP press release, which had explicitly stated that the ECB would do "everything necessary within its mandate" and that it would even go onto consider revising the "self-imposed limits" if it needed to do so (ECB, 2020a). From a HI perspective, this emphasis on mandates and limits is unsurprising, the ECB was bound by treaty rules and facing pending legal challenges, so its language openly acknowledged these structural constraints, discursively, this mix of strong promises with hedges indicates a market received muddled messaging (de Boer & van 't Klooster, 2020). This interpretation only becomes further reinforced by the contemporary comparisons, with for instance the FED's March 2020 statement which had pledged an open-ended asset purchase, which stated that it would use its tolls "as necessary" without any possible caveats (FED, 2020; Binder, 2020), additionally, the BoE had also similarly framed its QE measures in these straightforward terms (BoE, 2020). These contrasts highlight that under this study's dual lens, the ECB's downbeat tone was partly reflective of its unique institutional context (HI), whereas its later narrative adaptation (DI) would go on to move it closer to the much more direct styles of the FED and BoE (Ortmans & Tripier, 2020). From a DI viewpoint, the ECB's March 2020 communication was insufficient in crafting a compelling narrative, as according to Schmidt's framework, effective communicative discourse requires more than just content, but also a persuasive delivery, in this regard the ECB's wording was hesitant, with it using verbs such as "may act," "will consider" and passive constructions, such as "limits may be revised", which signalled caution rather than confidence (Schmidt, 2008; 2013). The absence of vivid metaphor or rallying narrative made the message highly technocratic. As Schmidt (2013) argues, discursive power stems not only from what is said but how it is said; in this regard, the ECB fell short of constructing a convincing crisis narrative. By contrast, the BoE's monetary policy summary in March 2020 avoided such legalistic hedging, stating simply that the Bank "stands ready to take all further necessary steps" to support the economy (BoE, 2020). A sentiment check of the BoE text yielded a VADER compound score of +0.15, with it using the forward-looking words, such as "confidence" and "robust" which had contributed to its positive framing, with this comparison having underscored just how the ECB's caution translated into a much more restrained tone that resulted in undercutting its discursive impact.

These market reactions underscore the cost of the ECB's cautious communication, with analysts having pointed out that by failing to announce a clear "backstop" for markets, the ECB's initial message sowed uncertainty, evidenced by the Euro's 2% drop and widening peripheral bond spreads immediately after the PEPP announcement (Koranyi & Canepa, 2020; Reuters, 2020). Madame Lagarde's follow-up blog struck a more empathetic tone (temporarily calming markets), investors remained jittery for days, as seen in persistently elevated Spanish and Greek yields, which implied a causal link, with the ECB's legally constrained, opaque messaging (born from its institutional mandate concerns) undercut market confidence at the worst moment, in theoretical terms, the ECB prioritised legality ("within its mandate") over clear reassurance, and this weakened its legitimacy performance, with the markets not fully believing the ECB would "do whatever it takes," precisely because the language was hedged (Ortmans & Tripier, 2020). This volatility would suggest that the ECB's overly cautious phrasing, most particularly its caveat emphasis on being "within its mandate" had resulted in it failing to swiftly reassure the markets (Valentin, 2022).

In summary, the March 2020 communications were heavy on both caution and uncertainty phrasing, as while the VADER had produced strongly positive compound scores for both texts (+1.000 for the press release and +0.947 for Lagarde's blog), this difference was largely reflective of the formal, neutral register of central bank prose, as is shown in Table 4.1 (see figure 2) (Author's analysis: Hutto & Gilbert, 2014; Loughran & McDonald, 2011). The LM lexicon analysis is much more revealing, as the press release had contained 94 negative words, 69 uncertainty terms, and 39 constraining references (versus only 19 positives), with these figures being suggestive of the fact that the substantive framing had gone on to prioritise legal defensiveness over reassurance, in effect, the ECB's language openly admitted its limits up front (Loughran & McDonald, 2011; ECB, 2020a). These quantitative findings align with contemporaneous commentary that the messaging was "opaque" and overly technical (Kokott & Sobotta, 2017). The VADER algorithm had classified that both the March texts as strongly positive (+1.000 and +0.947), but the LM results had exposed the rhetorical reality, that of a pronounced weight of negative, uncertain, and constraining language. Rather than reassurance, the dominant impression was that one of caution, which is revealing of the mismatch between the polarity scores and the substantive tone, only after the ECB had clarified its stance in the subsequent communications (Lagarde, 2020, as well as other follow ups) did the market begin to calm (Ortmans & Tripier, 2020). Around the 18–19 March 2020 announcements, Bunds rose +20/+11 bps (1d/3d), BTPs +10/–76 bps, Euro Stoxx 50 –5.7%/+0.7%, and VIX +0.5/–9.9 pts (Appendix C, Table C2).

4.2. September 2021 Tapering: Discursive Recalibration

By September 2021, the Euro area economy had already gone on to largely recover, although the inflation was still rising the ECB decided to go onto slow the pace of PEPP asset purchases, which signalled a "moderately lower pace" in the upcoming quarter, with this episode's sentiments metrics being markedly different from those in 2020 (ECB, 2021c; 2021d). Table 4.2 summarises that the VADER and LM results for the 9th of September 2021 monetary policy press release and Lagarde's corresponding press conference remarks, with the sentiment profile of ECB communications having shifted dramatically, with the press release's tone remained maximally positive (VADER ~ +0.994) but, crucially it almost eliminated the cautionary language seen in 2020 (only 7 negative and 1 uncertainty word, versus dozens the year prior) (see figure 1 & 2). Lagarde's spoken remarks, while also having been upbeat (VADER +1.000), still did include many more negative and uncertainty terms, which reflects a candid acknowledgment of risks (112 negative; 78 uncertainty) alongside its positive messaging (see figure 1 & 2). This split is suggestive of a deliberate strategy, as in 2021 the official written statement had been carefully sanitised of alarmist or legalistic wording, so as to project confidence, while the press release did allow for a nuanced discussion of risks. This adaptive shift, which is consistent with DI, shows that the ECB had actively managed its narrative, reducing ambiguity in its primary message, so as to preserve the markets trust, even as it still addressed uncertainties in accompanying remarks (Author's analysis: VADER on ECB, 2021c; 2021d). The September 2021 press release had contained just seven negative words and one uncertainty word, and at the same time essentially no litigious or "mandate" terms (see figure 1) (Author's analysis: the LM lexicon on ECB, 2021c). In the press release, the positive words were comparatively more frequent, with Lagarde's speech having being particularly more illustrative, with it containing (58) positive terms, but also having a much higher number of negative (112) and uncertainty (78) words and (24) constraining references, which is indicative of a risk-aware framing alongside a maximally positive VADER polarity (see figure 1 & 2) (Author's analysis based on LM categories applied to ECB, 2021d). This quantitative evidence supports a nuanced interpretation, that being by 2021 the press release had intentionally shed alarmist and legalistic language, while at the same time the speech had adopted a more risk-aware register even as its overall polarity had remained maximally positive. Instead of hedging with "as long as necessary" caveats, the communication emphasised continuity and reassurance (for example, repeatedly saying policy support "will continue" and that the ECB would "reinvest" for an extended period). In institutional terms, this shift reflects that earlier legal pressures had eased by late 2021 (the ECB's successful crisis measures and a new strategy review made rigid limits less salient) (ECB, 2021b). In discursive terms, it shows an adaptive strategy, with the ECB learning to speak the market's language, prioritising simple assurances, with the LM word count patterns aligning with this narrative in a nuanced way, as the constraint-related terms are low in the press release (2) but remain present in the speech (24) in 2021, which suggests that the confident formal messaging was complemented by a risk-aware elaboration during the press conference (see figure 1) (Loughran & McDonald, 2011; Schmidt, 2013).

Table 4.2. Sentiment analysis of ECB communications – September 2021 "tapering" case.

Text	VADER Compound	VADER Pos%	VADER Neu%	VADER Neg%	LM Negative	LM Uncertainty	LM Positive	LM Constraining	LM Litigious
Press Release (9 September 2021)	**+0.994**	10.8%	85.9%	3.3%	7	1	3	2	1
Lagarde Speech (9 September 2021)	**+1.000**	12.0%	84.3%	3.8%	112	78	58	24	1

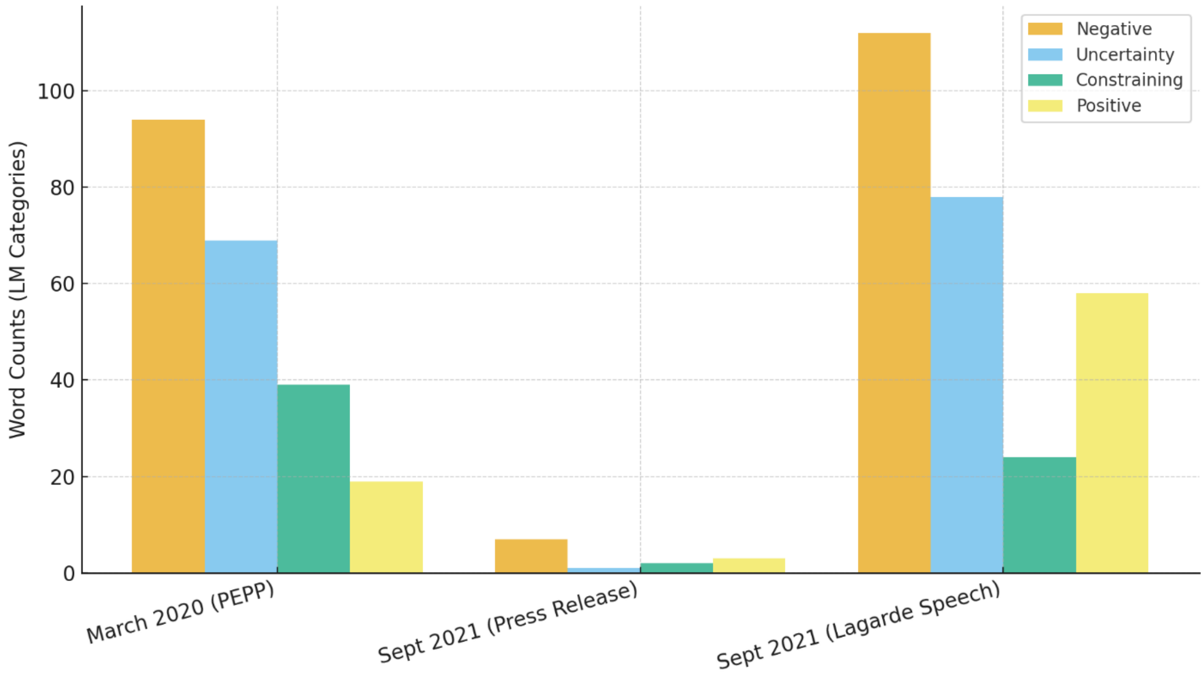
Source: Author's analysis using VADER (Hutto & Gilbert, 2014) and LM lexicon (Loughran & McDonald, 2011), applied to ECB (2021c; 2021d).

The LM results quantify the dramatic change in framing from early 2020 to late 2021. In March 2020, the PEPP press release included thirty-nine "constraining" terms (e.g. words like mandate or limit) and sixty-nine uncertainty words. By September 2021 those had virtually vanished: the press release had only two constraining words and one uncertainty word (Author's analysis: Loughran & McDonald, 2011; comparing ECB, 2020a vs. ECB, 2021c). Similarly, the number of positive words increased relative to negatives. In 2021, the press release intentionally avoided the caveats of 2020, with it having contained only 7 negative and 1 uncertainty word (vs. 94 and 69 in March 2020), with Lagarde's own speech having 58 positives, 112 negatives, 78 uncertainty and 24 constraining terms (see figure 1) (Author's analysis: Loughran & McDonald, 2011; Lagarde, 2020; ECB, 2021d). By comparison though, the March 2020 press release had 19 positive and 94 negative words with 69 uncertainties and 39 constraining terms, and the March 2020 blog had 5 positives, 22 negatives, 10 uncertainties and 11 constraining terms (see figure 1). These figures show that, although the 2021 speech had still included many negative/uncertainty words, the official messaging overall, including that of the press releases was still far more clearer and more reassuring than it had been in early 2020 (ECB, 2020c; 2021d). Within discursive terms this is evident of deliberate agency, with the ECB having exercised its narrative flexibility by reframing its messaging as being from a hesitant rule follower into that of a reassuring crisis manager (see Appendix B, Tables B1–B2) (Koranyi & Canepa, 2021; Treeck, 2021).

In practical terms, the ECB's September 2021 communications were much more measured and confidence inspiring, with for example, the phrasing "recalibrate the pace of our purchases… we have not discussed what comes next" which was used to explicitly downplay any policy change (Koranyi & Canepa, 2021). Strong modal declarations such as "will continue" and "will reinvest" reassure the markets of ongoing support, whilst the weak modals and uncertainty qualifiers were mostly absent, as was identified by the VADER and LM metrics for the texts. From a DI standpoint, this represents a more adaptive narrative strategy, as by 2021 the ECB was learning to speak "the market's language", which projected calm and flexibility in its messaging (Koranyi & Canepa, 2021; Treeck, 2021). The BoE's communications around the same time had gone on to follow a similar approach of reassurance, as for instance, the BoE's August 2021 policy update had noted that "the outlook remains uncertain" however, it simultaneously reaffirms a "gradual withdrawal" of stimulus within the plain language (BoE, 2021). Meanwhile the FED had begun to pre-announce its tapering plans, with it stating in late 2021 that asset purchases "may soon be moderated," as such beginning to set forward looking expectations, with these examples showing that by late 2021 the major central banks were normalising their narratives in order to avoid market disruption (FED, 2021).

The contrast with March 2020 is stark, as in the early phase of the pandemic, there was no shortage of dire terminology in the ECB's communications, with the LM lexicon recording very high counts of uncertainty (69) and constraining terms (39) in the PEPP press release, alongside the 94 negative words (see figure 1) (Loughran & McDonald, 2011; ECB, 2020a). This legalistic and defensive framing is reflected of the constraints of Article 127 TFEU and of the ongoing scrutiny of the PSPP ruling (BVerfG, 2020; Kokott & Sobotta, 2017). By September 2021, these categories had virtually disappeared in the press release (one uncertainty word; two constraining terms), whereas Lagarde's speech combined many positive expressions (58) with elevated negative (112) and uncertainty (78) counts and 24 constraining references (see figure 1) (ECB, 2021c; 2021d). The VADER polarity scores remained consistently positive across both episodes (+1.000 for the March press release and +0.947 for Lagarde's blog; +0.994 for the September press release and +1.000 for Lagarde's speech) (see figure 2). The crucial differences of the LM lie in how it captures the shift from heavy uncertainty and constraint in the 2020 towards a more confident and reassuring tone in 2021 (Hutto & Gilbert, 2014; Ortmans & Tripier, 2020; Koranyi & Canepa, 2021).

Figure 1. ECB Communication Tone: LM Lexicon Counts (2020 vs. 2021)

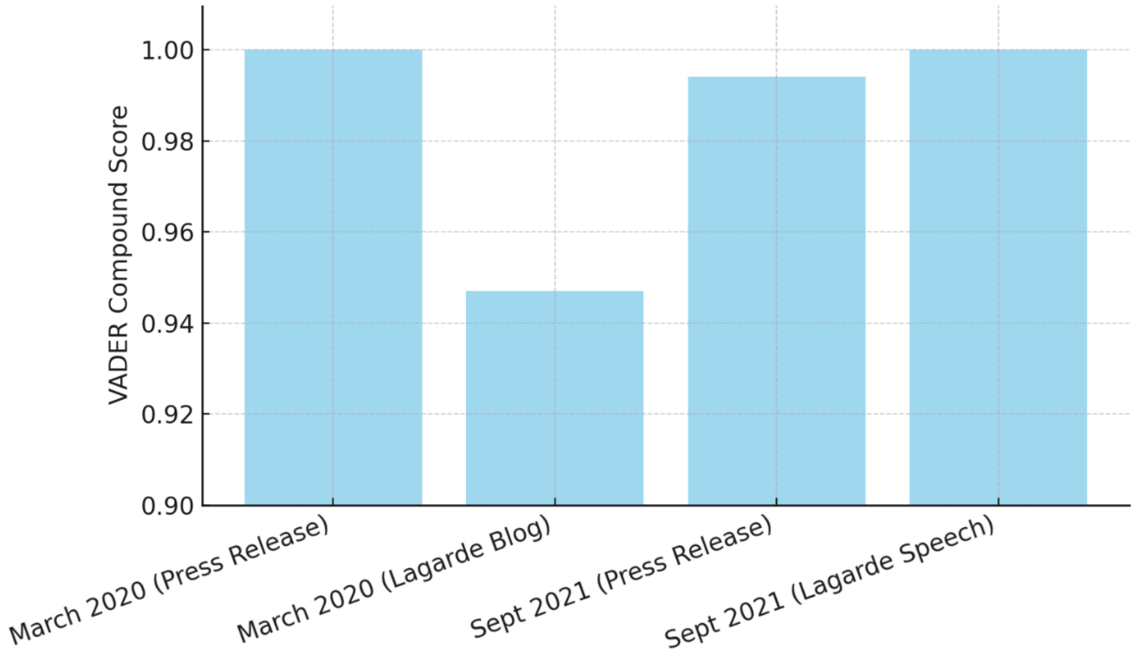


Source: Author's calculations using the LM Financial Lexicon (Loughran & McDonald, 2011) applied to ECB press releases and speeches (Lagarde, 2020; ECB, 2020a; 2021c; 2021d).

The subdued language of September 2021 was indeed reflected in remarkably calm market behaviour. Euro Area bond spreads narrowed modestly on the day of the announcement, and the Euro Stoxx 50 equity index was essentially flat (see fn. 3) (Author's analysis: Bloomberg, 2025). It was noted by analysts at ING and Goldman Sachs that the ECB carefully avoided the use of the word "tapering" and instead emphasised "recalibration" in order to help produce this more muted response, which helped to manage expectations and to avoid market reactions (Koranyi & Canepa, 2021). Market reactions were correspondingly restrained, as the German 10-year bond yields fell only about (−4 bps 1-day; −1 bps 3-day), the Italian yields though declined, and the Euro Stoxx 50 had remained flat, which indicated that the careful press-release framing achieved its objective (see fn. 3) (Author's analysis: Bloomberg, 2025). While the FED's gradual tapering plan had been largely anticipated by global markets by that point, with the ECB's measured phrasing having ensured that even a reduction in support would not end up shocking investors (Appendix C, Table C2) (FED, 2021; Treeck, 2021).

Additionally, the sentiment analysis of the other central banks communications also provide reinforce to this narrative, with the BoE's August 2021 Monetary Policy Committee minutes, having included phrases such as "the outlook remains uncertain" and "monetary stimulus will be gradually withdrawn," with there having also been a registered VADER compound score of +0.12 (see figure 2) (Author's analysis: BoE, 2021; Hutto & Gilbert, 2014). This reflects the BoE's credibility-oriented tapering communication, which had combined both transparency surrounding the uncertainty with reassurances about gradualism, which echoed just how the ECB's own rhetorically moderate approach was suggestive of a convergence in crisis communication strategies across the different central banks (BoE, 2021; Treeck, 2021). Around the 9th of September 2021, reactions were muted, with Bunds –4/–1 bps, BTPs –9/–5 bps, Euro Stoxx 50 0.0%/–0.2%, VIX +0.8/+3.0 pts (Appendix C, Table C2).

Figure 2. ECB Communication Tone: VADER Polarity Scores (2020 vs. 2021)



Source: Author's calculations using VADER Sentiment Analysis (Hutto & Gilbert, 2014) applied to ECB press releases and speeches (Lagarde, 2020; ECB, 2020a; 2021c; 2021d).

4.3. Theoretical Interpretation: Institutional Constraints and Discursive Adaptation

In comparing the two episodes (March 2020 vs. September 2021) it is possible to yield important insights that are consistent with the dual-theoretical lens of HI and DI. In March 2020 the sentiment data had captured the ECB's narrative under duress, with many uncertainty and negative LM terms and heavy legal references, as although the VADER polarity scores were strongly positive, it was incomplete as an indicator, with the LM categories having revealed that the substantive tone was defensive and legalistic, which was very much reflective of a downbeat communicative posture (Author's analysis: ECB, 2020a; 2020b; Hutto & Gilbert, 2014; Loughran & McDonald, 2011). By September 2021, the sentiment metrics had only reinforced the earlier strongly positive VADER polarity, but it had now also aligned with the low LM negativity and uncertainty, meaning that the narrative finally matched with the policy intentions and as such had coincided with the calmer markets, muted market reactions (Author's analysis: ECB, 2021c; 2021d; Bloomberg, 2025). Across both cases, the event-windows had confirmed that March 2020 had generated pronounced volatility, while the September 2021 reactions had remained muted, which highlighted the ECB's shift toward a greater communicative effectiveness (Author's analysis: Bloomberg, 2025).[3]

HI explains part of this contrast. Initially, pre-existing rules and legal fears kept the ECB on a cautious script. This was evident in March 2020's legalistic wording and the high count of "mandate" terms (BVerfG, 2020; ECB, 2020a; Kokott & Sobotta, 2017). By 2021 the constraints had loosened, with the ECB strategy review demonstrating success of the PEPP meaning it no longer had to emphasis strict limits, thus the institutional context had changed to favour greater communicative flexibility, which allowed for a far freer narrative (Schnabel, 2021; ECB, 2021c; Böninghausen et al., 2022).

DI accounts for the rest of the change, with the ECB's narrative having shifted deliberately, and the sentiment analysis having captures this quantitatively (Author's analysis: VADER and the LM lexicon). By September 2021, the press release had featured almost no uncertainty wording (1 occurrence, down from the 69 in March 2020) and had emphasised just how positive the framing was (e.g. 3 positives vs. 7 negative words in the release, compared to the 19 vs. the 94 in 2020), (see figure 1) with this indicating the deliberate pivot there was towards reassurance in the official statement, even though the accompanying speech had still only contained a much higher level of risk-related language (see Table 4.2; ECB, 2021d). Lagarde's choice of rhetoric such as "the lady isn't tapering" and her stressing that the ECB gave "no signal" of any sudden change, which exemplified the intentional framing that was designed in order to shape expectations. Within DI terms the ECB had exercised agency by retelling its story, which had evolved from a hesitant rule bound tone, into a more confident reassuring narrative of crisis management (Koranyi & Canepa, 2021; Treeck, 2021).

This pattern is also observable when comparing the ECB to its peers, as in March 2020, both the FED and the BoE delivered communications characterised by directness and decisiveness (FED, 2020; BoE, 2020). The FED's statement had pledged for example to utilise a "full range of tools" without

[3] Author's event-study analysis: Bloomberg daily closing data show that March 2020, Bund yields rose (+20 bps 1-day; +11 bps 3-day), BTP yields increased initially (+10 bps 1-day) before narrowing (−76 bps 3-day), spreads briefly compressed then further narrowed (≈−10 bps to −86 bps), EuroStoxx 50 fell (−5.7% 1-day; +0.7% 3-day), and VIX spiked slightly (+0.5 pts) before easing (−9.9 pts). By contrast, September 2021, market reactions were muted: Bunds (−4 bps; −1bps), BTPs (−9 bps; −5 bps), spreads stable (−5 bps; −4 bps), EuroStoxx 50 flat (0% then −0.2%), and VIX up slightly (+0.8 pts; +3.0 pts) (see Appendix C, Table C1).

any legal hedging, with the FED Chair Jerome Powell publicly committing to "going in strong"[4] with stimulus (FED, 2020). Similarly, though the BoE had paired its own large-scale interventions with clear, plain language messaging which had underscored the institutional readiness[5] (BoE, 2020). Within DI terms, these central banks have sought to establish the legitimacy by performance, which was based upon communicative clarity, which had minimised the ambiguity within their crisis narratives, in contrast though, the ECB's March 2020 language, had emphasised the legal constraints, which signalled a kind of discursive path dependency (Ortmans & Tripier, 2020). However, by September 2021 all three central banks have gone on to move to a more calibrated forward-looking narrative, with for example the FED having gone on to note that a tapering of asset purchases which "may soon be warranted," and the BoE acknowledged that the "case for higher interest rates had strengthened" (FED, 2021; BoE, 2021). Although cautious these forward leaning signals were all suggestive of a discursive evolution across all the institutions, additionally, the ECB's transition from going from an opaque legalism to a more controlled optimism mirrored this broader trend within central banking practice, even though it had still remained largely uniquely shaped by the ECB's own institutional architecture (Koranyi & Canepa, 2021; Treeck, 2021).

The BoE's August 2021 Monetary Policy Report reinforces this comparative trend, with it having phrases such as "firmly anchored expectations" as well as "smooth transition" that were all included in the report that had been analysed by VADER, with it having produced a compound score of +0.12, which reflects the strategy of the BoE's gradualism as well as the credibility building, and with it demonstrating its commitment to transparency and to steady guidance, which is similar to the ECB's own 2021 approach (see figure 2) (Author's analysis: VADER on BoE, 2021). However, since the 2008 financial crisis communicative strategies have become much more central to monetary governance, with Gabor (2021) having observed that central banking had become more reliant upon narrative management so as to sustain market confidence amidst unconventional policies. This had been similarly argued by Tucker (2018) who posited that post-crisis central bank legitimacy hinges upon clear communication that balances independence with public accountability, as was illustrated with the ECB's shift from an opaque legalistic language in 2020 to a more controlled optimism in 2021. The ECB in aligning more closely with the FED and BoE had indicated that the institutional learning had extended to not only the policy tools, but also to its rhetorical repertoires (Schmidt, 2013; Schonhardt-Bailey, 2013).

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[4] Jerome Powell stated in March 2020: "We will not hesitate to use our full range of tools to support the flow of credit," underscoring decisive intent. (Federal Reserve Press Conference, 15 March 2020)

[5] Andrew Bailey, in a BoE speech that same month, said: "We will take all necessary steps to protect financial stability," framing institutional readiness in clear, direct terms. (BoE Press Conference, 19 March 2020)

Table 4.3. Comparative Central Bank Sentiment and Institutional Framing (2020–2021)

Central Bank	Period	Sentiment Description	Institutional Notes
FED	Mar 2020	Strongly supportive, decisive tone	Clear agency, low legal constraint
BoE	Mar 2020	Plain language, high reassurance	Communicative legitimacy via clarity
ECB	Mar 2020	Legalistic, cautious (many "mandate" terms)	Constrained by EU treaty/courts
FED	Sep 2021	Forward guidance begins, still supportive	Transitioning narrative
BoE	Sep 2021	Inflation focused, cautious taper signal	Scenario based framing
ECB	Sep 2021	"Recalibration, not tapering," minimal uncertainty	More narrative control, fewer constraints

Author's comparative summary based on ECB (2020a; 2021c; 2021d), FED (2020; 2021), BoE (2020; 2021). Sentiment classifications combine VADER polarity scores (consistently positive across cases) with LM lexicon categories (capturing substantive differences in legalistic vs. reassuring tone).

The evolution in the ECB's communication aligns more broadly with the theories of crisis communication, with Blinder et al. (2008) contending that central banking communication having to be timely, clear, and credible. The FED's 2020 actions follow this logic, with officials having made unambiguous statements, avoided hedging and stressing their determination in order to act swiftly, for example Powell March 2020 commitment to use "our tools" signalling a full spectrum of intervention without referencing institutional constraints, however in contrast to this the ECB's messaging at the time had been hesitant and internally focused within its mandate and legal limits (FED, 2020; Powell, 2020; ECB, 2020a). From the Habermasian perspective it could be argued that the FED had sought to legitimacy through performance-based credibility, whereas the ECB had initially leaned on legal rational authority, which was an approach that had appeared insufficient under the crisis conditions (Habermas, 1984; Schmidt, 2013). Likewise, with the BoE's communication strategy was grounded in transparency and scenario-based reasoning, which offers another instructive contrast, with the BoE's Monetary Policy Committee minutes are known for their plain language and for their thorough explanation of the risks and rationales, due to clearly communicating its uncertainties, the BoE legitimises its actions through what Habermas (1984) would call communicative action, which is policy justification achieved via understandable, reasoned public discourse (BoE, 2021). The ECB constrained by their legal and institutional norms in 2020, which struggled to meet their ideal of open, engaging communication, with the ECB 2021 only adopting a more communicatively effective style, which was closer to what Blinder et al. (2008) describing as the best practice in clarity.

The comparative sentiment trendlines for the ECB support the notion that the institution learned and adapted mid-crisis. The sharp decline in LM negativity, uncertainty, and constraint-related words, alongside the already high VADER polarity scores remaining at maximum levels, are the linguistic footprints of this evolution, with the LM analysis therefore providing the best indicator of this discursive shift, from a defensive caution in 2020 to a confident reassurance in 2021 (Author's analysis: VADER and LM on ECB texts from 2020 and 2021). Importantly, this shift was not just a passive result of better economic conditions, but a proactive adjustment of communication style, which was indicative of intra crisis learning, and with this when institutions moved from opacity to clarity, from emphasising constraints to providing narrative reassurances, they in effect re-legitimise themselves (Coenen et al., 2022; Blinder et al., 2008; Habermas, 1984).

Ultimately, the findings of this analysis confirmed the thesis of this study, with the communication performance having improved markedly through the shift in both structure and agency, which was in line with Schmidt's (2013) notion of institutional context (HI) and discursive strategy on producing outcomes. The examples of the FED and BoE illustrate that alternative, clearer approaches were possible, and the ECB's own NLP sentiment metrics make its shift observable and quantifiable. In essence the institutional evolution and deliberate narrative adaption, which combined to create a new communicative competence for the ECB, which arguably did help to restore credibility and to stabilise market expectations later in the pandemic (Coenen et al., 2022; Gabor, 2021; Blinder et al., 2008).

However, it is important to acknowledge the potential confounding factors and the limitations in interpreting these results, with financial markets in March 2020 and September 2021 being influenced by more than just the ECB communications. In March 2020 global volatility was exceptionally high, and simultaneous to this policy actions conducted by governments and central banks had the power to move markets independently to the ECB's words, likewise in September 2021 the markets had already been anticipating policy normalisation, with the FED's clear telegraphing of tapering intentions being most likely to contribute to the calm reception of the ECB's announcement, thus it is observed that the markets reactions might have occurred due to the broader conditions or expectations rather than the

ECB's communication alone. Furthermore, this analysis is descriptive in nature, as with only two case events, no formal statistical significance tests were conducted on the market reactions, with the correlations that were identified between sentiment tone and market stability aligning with the theoretical expectations, however they are not sufficient proof of causation, and whilst compelling they should be interpreted with caution as suggestive evidence.

4.4. Summary

In summary, the ECB's COVID-19 communication illustrates the dual institutionalism framework in action, with the initial PEPP announcements in March 2020 being bound by "legalese" language, which reflects HI constraints, and having lacked a convincing narrative, which is a shortfall from a DI perspective. This pattern is reflected in the sentiment metrics, as although the VADER analysis had gone on to produce a very positive compound score (+1.000 and +0.947), the LM counts had instead gone onto show a much more strongly defensive, legalistic, and uncertain tone, which just goes onto show the gap that is present between the surface-level polarity and the rhetorical framing (Author's analysis: VADER and LM on ECB, 2020a; Lagarde, 2020). Over time, as institutional constraints had eased, the ECB began to adapt its discourse, which is evident of an intra crisis learning process, and which had conveyed greater confidence (by September 2021, with the tone having had a maximally positive compound score of +0.994 for the press release and +1.000 for Lagarde's speech, with virtually no legal hedging) (Author's analysis: VADER and LM on ECB, 2021c; Lagarde, 2021). The comparison of the FED and BoE underscores that the ECB's own communication had been indeed shaped by its own structural context, with the contrast between the ECB's cautious phrasing and the FED/BoE direct messaging having gone onto indicate just how the ECB's unique legal framework had resulted in impeding its clarity (Blinder et al., 2008; FED, 2020; BoE, 2020). The integration of analysis in the textual sentiment and market reactions had shown that a clearer more optimistic language was indeed correlated with a much greater market stability (Author's analysis: Bloomberg, 2025; see also Blinder et al., 2008; Coenen et al., 2022).

5. Discussion and Conclusion

This closing chapter goes onto draw together this thesis findings and reflect upon their much broader significance, with it also recapping the research question and the methodology, as well as outlining the study's contributions to the theory and practice and in highlighting any of the possible directions for future inquiry. It additionally evaluates what the evolution of the ECB's crisis communication reveals about institutional constraints as well as rhetorical agency, and it also considers the possible implications for legitimacy, communicative strategy, and for monetary governance. The discussion also goes on to situate the results in relation to the wider debates in regard to the central bank communication, whilst also outlining the study's limitations, and with it also identifying the avenues for future research, whilst also going on to provide a concise summary of what this thesis has demonstrated and why this matters for both academic and policy audiences.

The chapter proceeds as first, in Section 5.1 re-examines the empirical results through the HI and DI frameworks; then in Sections 5.2 and 5.3 consider broader implications for central-bank legitimacy and policy communication; Section 5.4 sets out the study's original contributions; Sections 5.5 and 5.6 present limitations and avenues for future research; and Section 5.7 concludes with a final reflection, linking the empirical analysis to the theoretical claims and clarifying the significance of the findings for policy and scholarship.

5.1. Interpreting the Findings

This thesis has focused in on just two pivotal moments of the March 2020 PEPP announcement and the September 2021 tapering signal, with it also additionally employing a dual-method approach as well as a dual theoretical lens, with the analysis of this combined sentiment score using both VADER and the LM financial lexicon, with it also using event driven financial data in order to evaluate the communicative tone, the legal framing, and the corresponding market reactions. Overall, ECB communication was initially ineffective in March 2020, legalistic, uncertainty-laden phrasing coincided with elevated volatility, but became more effective by September 2021 as clearer, coherent messaging coincided with muted market reactions, consistent with intra-crisis learning under institutional constraints.

These findings do provide a clear understanding of the evolution of the ECB's communication, with the VADER polarity scores remaining as positive across both of the case periods, whilst the LM lexicon results have instead highlighted the substantive change, with the ECB going onto shift from a legalistic cautious tone in March 2020 to instead a more coherent and reassuring tone by September 2021. In summary the ECB's communication strategies had a profound influence in its crisis management performance, with the overly cautious, opaque messaging in March 2020 having gone on to hinder the effectiveness of its own crisis response, however though by September 2021 a much clearer and more confident narrative had ended up going on to enhance the ECB's credibility and its market stability.

These findings reveal not just a contrast in tone and content between the March 2020 and September 2021 periods, but also what this contrast goes on to mean for understanding the ECB's institutional constraints, but also for its evolving use of rhetoric. Additionally, the March 2020 PEPP press release had contained mostly cautious and legalistic framing, with it also having contained a plurality of uncertainty language, and although VADER sentiment scores suggested superficially positive polarity. The LM counts had also been revealing of the much higher presence of uncertainty, constraining, and of litigious terms, with these contrasts suggesting that the language had appeared as being superficially positive, with its framing having instead been conveyed as being defensive and legally cautious, this combination indicates that the ECB's words "sounded" positive but "read" defensive and legally cautious. From a HI standpoint, this linguistic configuration is a reflection of the ECB's embedded legal mandate of Article 127 TFEU, this is also seen with the influence of the recent judicial pressures of the German Constitutional Court's preliminary scrutiny over the PSPP ruling, with these constraints creating a discursive climate in which maximal legal compliance, which took precedence over reassurances.

This stark contrast between March 2020 and September 2021 had signalled more than just a change in tone; it had also illustrated the institutional learning and a shift in the ECB's approach to legitimacy during the crisis. In 2020, the dominance of legalistic and uncertain language (despite a superficially positive tone) had shown that the ECB had fallen back on its rule-bound communication (a hallmark of HI) at the expense of a more clear reassurance, with the defensive posture, having been rooted in concern for the mandate compliance, which had ultimately undermined the persuasive impact of its messaging. By 2021, however, we see a deliberate reframing, the near absence of constraining or uncertainty terms in the press release suggests the ECB recognised the need for a confident, unambiguous narrative to maintain market trust. DI helps to interpret this transformation, with the ECB actors using rhetoric strategically in order to navigate audience expectations and institutional ambiguity, most particularly through avoiding loaded terminology, such as "tapering" and instead utilising euphemistic framing such as "recalibration," moving from a cautious, internally focused stance to a more assertive and externally reassuring one.

By contrast, the September 2021 period' communications had represented a rhetorical evolution, where in September 2021, the press release had gone on to exhibit dramatically fewer legal and uncertainty words, for example, only 2 constraining (mandate) and 1 uncertainty word compared to 39 and 69 in the March 2020 period. The VADER sentiment remained to be very positive (+0.994 and +1.00), and this time the tone had gone on to align with less defensive language in the official statement, with Lagarde's press-conference remarks still having contained risk-related terms, but these had been balanced by positive language, which resulted in both an overall assertive and reassuring tone. The VADER compound scores again had reached the maximum positive values (+0.994 to +1.000), but this time they had been much more aligned with the LM evidence of a reduced defensiveness, which indicates that the messaging had been both positive in tone and had been substantively reassuring in its wording, with this indicating a deliberate reframing, which had presented the ECB's messaging as being assertive and stabilising. The broader point is that effective crisis communication is not about positivity alone, but about aligning tone with substantive reassurance. The ECB's evolution here can be interpreted as having been a shift from legitimacy by legal adherence (2020) to legitimacy by performance and persuasion (2021), which reinforces just how important narrative clarity and audience-oriented framing are in a crisis context. The empirical results, provide indicative support this study's main claim, the ECB crisis communication evolving from a defensive constraint signalling posture to a more confident agency exercising a narrative over time.

The 2021 improvement suggests intra-crisis learning, though it may also reflect a changed external environment, with the nature of the crisis itself having changed, as seen in March 2020, where policymakers had confronted an unprecedented shock with no clear roadmap, whereas by September 2021, the recovery was more established, and audiences may have been as a result easier to reassure. Thus, the improved reception could partly be reflective of the evolving external environment, not solely communicative adaptation, such as the March 2020, statements of "do everything necessary within its mandate" and "we are not here to close spreads" underscored defensiveness and legal constraint. By September 2021, however, language such as "favourable financing conditions can be maintained with a moderately lower pace of net asset purchases" and even Lagarde's quip that "the lady isn't tapering" exemplified deliberate rhetorical reframing, nonetheless though, the pattern of reduced uncertainty language, strategic reframing, and muted market reactions suggests that institutional learning was also at play. Event-window analysis confirms this pattern, with the March 2020 announcements going on to produce a marked volatility, whereas the September 2021 reactions had been muted, which underscores the ECB's evolving communicative effectiveness (see fn. 3) (Author's analysis; Bloomberg, 2025).

Taken together, these findings show that the ECB's communicative effectiveness during COVID-19 cannot be reduced to sentiment scores, or word counts alone. They illustrate how institutional constraints initially narrowed its rhetorical options, but also how discursive adaptation allowed it to recover legitimacy and stabilise expectations, a broader trajectory of intra-crisis learning that sets the stage for the following sections on legitimacy and policy implications.

5.2. Academic Implications

In regard to reasons for ineffectiveness, institutional and legal constraints, particularly the need to signal strict Treaty compliance, appears to have driven the opacity of early pandemic messaging, additionally in a comparative perspective, the ECB faced communicative challenges greater than those of the FED and BoE, largely because its supranational mandate imposed unique legal and political constraints on its discourse. However, beyond these specific findings it is important to consider what this implies for the ECB's overall legitimacy and communication strategy, with the findings suggesting the ECB's communication was not just an adjunct to monetary policy, but a performative enactment. In 2020, the ECB had leaned heavily towards legal rational legitimacy, foregrounding its Treaty derived mandate and emphasising that all actions taken are within its mandate. This mode of legitimacy, whilst technically robust failed to generate the confidence of a moment of heightened systematic risk, as such the narrative was internally consistent, but externally ineffective. It is also plausible that internal decision-making dynamics, notably consensus-seeking within the Governing Council and a new presidency, having all contributed to the guarded tone in March 2020, which had gone onto indicate that the institutional culture, not only the legal constraints, had gone on to shape overall the ECB's crisis communication.

By 2021, the ECB's legitimacy performance had changed, rather than citing formal constraints, the ECB's leadership had invoked continuity, commitment, and macroeconomic stability, with this shift towards a communicative legitimacy corresponding with what Blinder et al. (2008) described as "clarity with content", a messaging that is not just transparent, but also aligned with the observable intent. From the perspective of DI, this had also represented throughput legitimacy, with the ECB having improved not just its substantive policy but also the process and tone by which it had been explained to the public. Notably, the contrast with the FED and BoE during these episodes had highlighted the ECB's unique situation, with neither the FED nor the BoE having gone on to face the same level of legal framing within their COVID-19 communications, which had as a result underscored the fact that the ECB initially had an opacity that had been only partly a product of its supranational and legal constraints. In a period of unconventional policy tools and structurally low interest rates, central banks are not capable of just solely relying on rate changes or on balance sheet shifts, they must now be able to contrast coherent crisis narratives, with the ECB's evolution over the pandemic period exemplifying this.

5.3. Policy Relevance

The ECB's discursive trajectory illustrates this shifting in boundaries between ambiguity and clarity, such as in March 2020, ambiguity was reactive, as an effect of institutional constraints and legal anxiety, with phrases, such as “within our mandate” and “as necessary” signalling indecision rather than a resolve, with the financial markets interpreting this as indecisiveness and as such responding to this with volatility. As Alan Blinder (2011) cautioned, when ambiguity stems from institutional fragility (as it did in March 2020) rather than from a deliberate strategy, it can undermine credibility.

By contrast, though the communications from September 2021 were suggestive of a controlled use of ambiguity, such as with the deliberate omission of “tapering” and the emphasis on “recalibration” being reflective of a pragmatic attempt of avoiding market overreaction, whilst still guiding expectations. As has been argued by Riles (2018) central banks sometimes require an air of ambiguity to retain policy space, in this regard, ambiguity was forward looking and instrumentally used to enhance communicative effectiveness. Such a distinction matters, as not all ambiguity is equal, such as with the example of reactive vagueness in 2020 which reflected legal defensiveness, whereas the intentional ambiguity of 2021 had conveyed instead strategic nuance.

For policy maker the findings suggest that legalistic opacity, whilst institutionally safe, it may not be sufficient within the moments of public anxiety or market instability, as such effective central bank messaging requires not just a formal compliance, but also narrative coherence, clarity, and adaptability. This finding underscores the need for transparency even within legal boundaries, with communication needing to be understandable in order to maintain public trust, so by proactively refining its messaging strategy the ECB is better able to meet its democratic accountability, without compromising on its mandate. Additionally, it can be assessed whether the ECB’s mandate or communication policies require minor adjustments so as to facilitate clearer crisis messaging, this however is a topic beyond this thesis’ scope, but still worth consideration by policymakers.

The ECB should institutionalise clear crisis-communication protocols that avoid the legal jargon in initial public statements and that use plain, directive phrasing, so as to anchor any expectations, with detailed legal qualifications moving to support documents. Key phrases should be pre-tested for any public interpretation so as to ensure necessary caveats do not dilute reassurance, additionally a single narrative spine that is repeated across press releases, speeches, and Q&As can reduce the ambiguity while having remained within mandate-safe bounds.

As the ECB continues to face scrutiny due to its transparency and as it will have to prepare for future potential crisis these insights serve as a useful guide for communication strategies that balances legal credibility with public reassurances and provides practical recommendations. These would as such provide greater flexible ambiguity for policy, whilst maintaining the overall narrative consistency so as to avoid confusion, as was seen in early 2020, as such this study offers a conceptual model in which to evaluate future ECB statements, which links discursive form to policy effectiveness in a structured, evidence-based way.

5.4. Original Contributions

This thesis offers two primary contributions, the first being on a methodological level, with it bridging sentiment analysis with short-horizon financial event studies so as to produce a novel way of evaluating central bank communication effectiveness, which helps to bridge the gap between the discourse analysis and the market outcome studies in the literature. Unlike the many studies that examine the discourse or market outcomes in isolation, this approach enables a more direct empirical linkage between the narrative tone and investor reaction. Secondly, on a theoretical level, it applies and integrates HI and DI frameworks to a central bank messaging, which is an underexplored combination within the literature of ECB governance. In doing so this study indicates how the structural constraints and rhetorical agency interact within the production of legitimacy during the crisis. This combined lens helps to provide a richer understanding of central bank behaviour by linking institutional constraints to communication tactics, which is an approach that has been largely absent in any previous ECB studies.

5.5. Limitations

Whilst the study's mixed methods design allows for a more robust empirical assessment, limitations still remain, as whilst the NLP tools, VADER and LM lexicon offer replicable sentiments scores they do struggle with rhetorical devices, with irony, metaphor, implicit tone and shifting subjectivity, most especially common in legal financial discourse, often escaping lexicon-based tools. In regard to this future research could deploy context aware models, such as BERT or FinBERT to improve the nuance detection. The event-study design whilst standard for financial research, does capture only the short-run reactions, with it however, not modelling how central bank communications influence medium- or long-term market expectations, most especially in relation to forward guidance or inflation anchoring. Additionally, the reliance on public English language texts limits the interpretive depth, with ECB messaging often being consumed via translation, and their rhetorical reception differing possibly across linguistic and national discourse.

Another limitation is the use of the FED and BoE as contextual comparators, with these banks being chosen not as a full case, but rather as illustrative benchmarks, with their institutional independence, legal frameworks and political environments differing substantially from the ECB's supranational structure, however, whilst these contrasts are analytically useful, they should not be overgeneralised. Another one of the key limitations of this study is the narrow sample of the two crisis episodes, as while these were key pivotal moments, the reliance on just two case studies may pose a limit to the generalisability of the findings, meaning that such results should only be interpreted cautiously, with the broader patterns requiring validation across even more events. Furthermore, whilst the event study design had linked communication to the short-run market reactions, it is not necessarily capable of conclusively proving any causation is not able to rule out any other possible influences. Additionally, while this study focuses on the ECB, the analytical framework developed here could be applied to other central banks or crisis contexts

5.6. Avenues for Future Research

These reflections build upon the thesis's core findings, which directly addresses its central research question, that being to identify just how institutional constraints and discursive strategies shaped ECB crisis communication, and how this contributed to crisis management effectiveness. Building upon the existing study several additions are possible to improve the depth of the research, such as a deeper comparative discourse analysis across the ECB, FED, and BoE, perhaps using a larger set of crisis episodes which could reveal structural patterns within central banking's communication strategy. The incorporation of multilingual sentiment analysis would address how rhetorical style and clarity travel across language contexts, particularly so in a multilingual union like the Eurozone. Future studies could test whether or not the discursive patterns and market impacts observed here also occur within other institutions or during different crises. Qualitative interviews with central bankers, market analysis or EU officials could enrich the interpretation of sentiment data and offer an insight into the behind the scenes messaging formation and from a methodological point of view, machine learning models that are trained upon financial communication (e.g. FinBERT) which could better capture the subtle shifts in tone, framing and metaphor usage.

Finally, there is also room to expand into the behavioural finance implications of central bank messaging, such as how do retail and institutional investors react to differently to technical vs. narrative heavy communication? How can central banks tailor messaging more effectively to segmented audiences? These questions help to bridge the gap between communication effectiveness and democratic accountability, with this becoming an increasingly salient issue with topic of EU governance. These future research avenues build directly upon the unique contribution of this thesis, as by combining discourse and market impact analysis, this study opens up new possibilities for examining just how institutional communication shaped financial stability across different contexts, with the framework and materials documented in this thesis provide a foundation for future research. The ECB communications listed in Appendix A, the sentiment outputs in Appendix B, and the methodological code excerpts in Appendix C together offer a transparent basis on which similar studies can build.

5.7. Final Reflection

Ultimately, the ECB's experience during the COVID-19 crisis had only exemplified this as a broader shift in central banking, coming from an era of silent, technocratic authority to one of a much more active, narrative driven engagement. Within a policy environment marked by great uncertainty, low interest rates and fragmented mandates, a central banks legitimacy had no longer become derived solely from its legal compliance or from its economic outcomes, but rather having increasingly become more dependent upon its communicative performance. Central banks today must act not only as technocratic stabilisers but also as narrative 'storytellers,' shaping expectations through discourse as much as through balance-sheet tools.

6. Bibliography

- Akkaya, Y., Bitter, L., Brand, C. & Fonseca, L., 2024. ‘A statistical approach to identifying ECB monetary policy’, ECB Working Paper Series, No. 2994. Available at: https://www.ecb.europa.eu/pub/pdf/scpwps/ecb.wp2994~6c2bcefa86.en.pdf [Accessed 11 June 2025].
- Altavilla, C., Brugnolini, L., Gürkaynak, R.S., Motto, R. & Ragusa, G., 2019. ‘Measuring euro area monetary policy’, Journal of Monetary Economics, 108, pp. 162–179. doi: https://doi.org/10.1016/j.jmoneco.2019.08.016 [Accessed 21 April 2025].
- Altavilla, C., Giannone, D. & Lenza, M., 2014. ‘The financial and macroeconomic effects of OMT announcements’, ECB Working Paper Series, No. 1707, August. Available at: https://www.ecb.europa.eu/pub/pdf/scpwps/ecbwp1707.pdf [Accessed 11 June 2025].
- Altavilla, C., Gürkaynak, R.S., Motto, R. & Ragusa, G., 2020. How do financial markets react to monetary policy signals? Research Bulletin No. 73, European Central Bank, 22 July. Available at: https://www.ecb.europa.eu/press/research-publications/resbull/2020/html/ecb.rb200722~528ea64f0d.en.html [Accessed 11 June 2025].
- Amato, G., 2023. Judicial review and central bank activities. Journal of Financial Regulation, 9(2), pp.151–170. [online] Available at: https://doi.org/10.1093/jfr/fjad002 [Accessed 21 April 2025].
- Apergis, N., Mustafa, G. & Malik, S., 2023. The role of the COVID-19 pandemic in US market volatility: Evidence from the VIX index. The Quarterly Review of Economics and Finance, 89, pp.27–35. Available at: https://doi.org/10.1016/j.qref.2023.03.004 [Accessed 21 April 2025].
- Bank for International Settlements (BIS), 2020. Central banks’ response to COVID-19 in advanced economies. BIS Bulletin No. 21. [online] Bank for International Settlements. Available at: https://www.bis.org/publ/bisbull21.html [Accessed 23 April 2025].
- Bank of England (BoE), 2020. Monetary Policy Summary and Minutes of the Monetary Policy Committee Meeting ending on 19 March 2020. [Online] Available at: https://www.bankofengland.co.uk/monetary-policy-summary-and-minutes/2020/march-2020 [Accessed 11 June 2025].
- Bank of England (BoE), 2021. Monetary Policy Summary and Minutes of the Monetary Policy Committee Meeting ending on 23 September 2021. [Online] Available at: https://www.bankofengland.co.uk/monetary-policy-summary-and-minutes/2021/september-2021 [Accessed 11 June 2025].
- Barbaglia, L., Consoli, S., Manzan, S., Tiozzo Pezzoli, L. & Tosetti, E., 2024. ‘Sentiment analysis of economic text: A lexicon-based approach’, Economic Inquiry, pp. 1–19. doi: https://doi.org/10.1111/ecin.13264 [Accessed 21 April 2025].

- Bholat, D., Hansen, S., Santos, P. & Schonhardt-Bailey, C., 2015. Text mining for central banks. Centre for Central Banking Studies Handbook. Available at: https://www.bankofengland.co.uk/-/media/boe/files/ccbs/resources/text-mining-for-central-banks.pdf [Accessed 18 June 2025].
- Binder, C., 2018. Political pressure on central banks. SSRN Electronic Journal. [online] Available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3244148 [Accessed 26 April 2025].
- Binder, C., 2017. 'Measuring uncertainty based on rounding: New method and application to inflation expectations', Journal of Monetary Economics, 90(C), pp. 1–12. doi: https://doi.org/10.1016/j.jmoneco.2017.06.001 [Accessed 21 April 2025].
- Blinder, A.S., 2001. What central bankers could learn from academics—and vice versa. Journal of Economic Perspectives, 15(2), pp.3–19. [online] Available at: https://doi.org/10.1257/jep.15.2.3 [Accessed 21 April 2025].
- Blinder, A.S., Ehrmann, M., Fratzscher, M., De Haan, J. & Jansen, D.J., 2008. 'Central bank communication and monetary policy: A survey of theory and evidence', Journal of Economic Literature, 46(4), pp. 910–945. doi: https://doi.org/10.1257/jel.46.4.910 [Accessed 21 April 2025].
- Bloomberg, 2025. Bloomberg Terminal [database]. Daily closing prices: German 10-year Bund yields, Italian 10-year BTP yields, EuroStoxx 50 index, and VIX volatility index, 18 March 2020 and 9 September 2021 event windows. [Accessed 11 June 2025].
- Bonatti, L., Fracasso, A., Tamborini, R., Dabrowski, M., Blot, C., Bozou, C., Creel, J., Benigno, P., Canofari, P., Di Bartolomeo, G. and Messori, M., 2021. Recalibrated Monetary Policy Instruments to Address the Economic Fallout from COVID-19. Policy Department for Economic, Scientific and Quality of Life Policies, Directorate-General for Internal Policies, European Parliament. [online] Available at: https://www.europarl.europa.eu/RegData/etudes/STUD/2021/662899/IPOL_STU(2021)662899_EN.pdf [Accessed 21 April 2025].
- Böninghausen, B. & Hartmann, F., 2025. 'Reading the market's pulse: monitoring investors' risk appetite', The ECB Blog, 10 June. Available at: https://www.ecb.europa.eu/press/blog/date/2025/html/ecb.blog20250610~f10b8a9a5e.en.html [Accessed 11 June 2025].
- Böninghausen, B., Brennan, L., McCabe, L. and Schumacher, J., 2022. The pandemic emergency purchase programme – an initial review. [Online] Available at: https://www.ecb.europa.eu/press/economic-bulletin/articles/2023/html/ecb.ebart202208_01~bf0907fa1f.en.html [Accessed 11 June 2025].

- Born, B., Ehrmann, M., & Fratzscher, M. (2019). Communicating monetary policy during crisis times. Journal of International Economics, 118, pp. 26–43.
- Buechel, S., Junker, S., Schlaak, T., Michelsen, C. & Hahn, U., 2019. ‘A Time Series Analysis of Emotional Loading in Central Bank Statements’, Proceedings of the Second Workshop on Economics and Natural Language Processing, Hong Kong, November, pp. 16–21. Available at: https://doi.org/10.18653/v1/D19-5103 [Accessed 21 April 2025].
- BVerfG (Federal Constitutional Court of Germany), 2020. Judgment of the Second Senate of 5 May 2020 – 2 BvR 859/15 – PSPP Ruling. [online] Available at: https://www.bundesverfassungsgericht.de/SharedDocs/Entscheidungen/EN/2020/05/rs20200505_2bvr085915en.html [Accessed 23 April 2025].
- Campbell, J. Y., Lo, A. W., & MacKinlay, A. C., 1997. The Econometrics of Financial Markets. Princeton University Press. https://doi.org/10.2307/j.ctt7skm5 [Accessed 21 April 2025].
- Capoccia, G., 2016. ‘When do institutions “bite”? Historical institutionalism and the politics of institutional change’, Comparative Political Studies, 49(8), pp. 1095–1127. doi: https://doi.org/10.1177/0010414015626449 [Accessed 21 April 2025].
- Chen, G., Kim, K.A., Nofsinger, J.R. & Rui, O.M., 2007. ‘Trading performance, disposition effect, overconfidence, representativeness bias, and experience of emerging market investors’, Journal of Behavioral Decision Making, 20(4), pp. 425–451. doi: https://doi.org/10.1002/bdm.561 [Accessed 21 April 2025].
- Claeys, G. and Demertzis, M., 2017. How should the European Central Bank ‘normalise’ its monetary policy? Bruegel Policy Contribution, 2017/31. [online] Available at: https://www.bruegel.org/policy-brief/how-should-european-central-bank-normalise-its-monetary-policy [Accessed 21 April 2025].
- Clinch, M., 2020. ‘ECB’s Lagarde walks back comments which caused Italian bond yields to spike’, CNBC, 12 March. Available at: https://www.cnbc.com/2020/03/12/ecbs-lagarde-walks-back-comments-which-caused-italian-bond-yields-to-spike.html [Accessed 11 June 2025].
- Cochrane, J.H., 2011. Understanding policy in the great recession: Fiscal policy, monetary policy and financial frictions. European Economic Review, 55(1), pp.2–30. [online] Available at: https://doi.org/10.1016/j.euroecorev.2010.11.002 [Accessed 21 April 2025].
- Coenen, G., Gardt, M., Angina, S., Mee, S. & Glöckler, G., 2022. ECB communication with the wider public. ECB Economic Bulletin, Issue 8/2022. [online] Available at: https://www.ecb.europa.eu/press/economic-bulletin/articles/2022/html/ecb.ebart202108_02~5c1e5a116d.en.html [Accessed 21 April 2025].

- Coombs, T., 2007. Ongoing crisis communication: planning, managing, and responding 2nd ed. [online] Available at: https://archive.org/details/ongoingcrisiscom0000coom/page/n5/mode/2up [Accessed 12 June 2025]
- Corradin, S., Grimm, N. & Schwaab, B., 2021. Euro area sovereign bond risk premia during the Covid-19 pandemic. ECB Working Paper Series, No. 2561, May. Available at: https://doi.org/10.2866/316219 [Accessed 21 April 2025].
- de Boer, N. and van ’t Klooster, J., 2020. The ECB, the courts and the issue of democratic legitimacy after the financial crisis. Common Market Law Review, 57(6), pp.1675–1706. [online] Available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3712579 [Accessed 21 April 2025].
- Ehrmann, M. & Fratzscher, M., 2005. ‘Communication and decision-making by central bank committees: different strategies, same effectiveness?’, ECB Working Paper Series, No. 488, May. Available at: https://www.ecb.europa.eu/pub/pdf/scpwps/ecbwp488.pdf [Accessed 11 June 2025].
- Ehrmann, M. & Fratzscher, M., 2007. ‘The timing of central bank communication’, European Journal of Political Economy, 23(1), pp. 124–145. doi: https://doi.org/10.1016/j.ejpoleco.2006.09.015 [Accessed 21 April 2025].
- European Central Bank (ECB), 2020a. ECB announces €750 billion Pandemic Emergency Purchase Programme (PEPP). European Central Bank – Press Release, 18 March. [online] Available at: https://www.ecb.europa.eu/press/pr/date/2020/html/ecb.pr200318_1~3949d6f266.en.html [Accessed 23 April 2025].
- European Central Bank (ECB), 2020b. Account of the monetary policy meeting of the Governing Council of the European Central Bank held by means of a teleconference on Wednesday, 18 March 2020. [Online] Available at: https://www.ecb.europa.eu/press/accounts/2020/html/ecb.mg200409_1~baf4b2ad06.en.html [Accessed 11 June 2025].
- European Central Bank (ECB), 2021a. Clear, consistent and engaging: ECB monetary policy communication in a changing world. ECB Occasional Paper Series No. 274. Frankfurt: European Central Bank. [online] Available at: https://www.ecb.europa.eu/pub/pdf/scpops/ecb.op274~9aca14e6f6.en.pdf [Accessed 21 April 2025].
- European Central Bank (ECB), 2021b. The ECB’s monetary policy strategy statement. ECB Strategic Review, 8 July. [online] Available at: https://www.ecb.europa.eu/home/search/review/html/index.en.html [Accessed 23 April 2025].

- European Central Bank (ECB), 2021c. Monetary policy Statement – 9 September 2021. [Online] Available at: https://www.ecb.europa.eu/press/press_conference/monetary-policy-statement/2021/html/ecb.is210909~b2d882f724.en.html [Accessed 11 June 2025].
- European Central Bank (ECB), 2021d. Press Release Monetary Policy Decisions. [Online] Available at: https://www.ecb.europa.eu/press/pr/date/2021/html/ecb.mp210909~2c94b35639.en.html [Accessed 11 June 2025].
- European Central Bank (ECB), 2021e. Unconventional fiscal and monetary policy at the zero lower bound. [Online] Available at: https://www.ecb.europa.eu/press/key/date/2021/html/ecb.sp210226~ff6ad267d4.en.html [Accessed 11 June 2025].
- European Union, 1992. Treaty on European Union (Maastricht Treaty). Official Journal of the European Communities, C 191, 29.07.1992. [online] Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A11992M%2FTXT [Accessed 23 April 2025].
- European Union, 2012. Consolidated version of the Treaty on the Functioning of the European Union. Official Journal of the European Union, C 326, 26.10.2012. Art. 127. [online] Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:12012E/TXT [Accessed 23 April 2025].
- Fama, E.F., Fisher, L., Jensen, M.C. & Roll, R., 1969. ‘The adjustment of stock prices to new information’, International Economic Review, 10(1), pp. 1–21. Available at: https://EconPapers.repec.org/RePEc:ier:iecrev:v:10:y:1969:i:1:p:1-21 [Accessed 11 June 2025].
- Federal Reserve (FED), 2020. Federal Reserve issues FOMC statement – March 15, 2020. [Online] Available at: https://www.FEDeralreserve.gov/newsevents/pressreleases/monetary20200315a.html [Accessed 11 June 2025].
- Federal Reserve (FED), 2021. Federal Reserve issues FOMC statement – September 22, 2021. [Online] Available at: https://www.FEDeralreserve.gov/newsevents/pressreleases/monetary20210922a.html [Accessed 11 June 2025].
- Financial Stability Board (FSB), 2020. Holistic review of the March market turmoil. 17 November. Available at: https://www.fsb.org/uploads/P171120-2.pdf [Accessed 11 June 2025].

- Financial Times, 2020. Lagarde warns of threats to recovery as ECB leaves policy on hold. [online] Financial Times, 30 July. Available at: https://www.ft.com/content/c671e795-138a-4f45-a40f-012f5bbc4ccc [Accessed 20 April 2025].
- Fioretos, O., Falleti, T.G. and Sheingate, A., eds., 2016. The Oxford Handbook of Historical Institutionalism. Oxford: Oxford University Press. [online] Available at: https://global.oup.com/academic/product/the-oxford-handbook-of-historical-institutionalism-9780199662814 [Accessed 21 April 2025].
- Fontan, C., 2018. Frankfurt’s double standard: The politics of the European Central Bank during the eurozone crisis. Cambridge Review of International Affairs, 31(2), pp.162–182. [online] Available at: https://doi.org/10.1080/09557571.2018.1495692 [Accessed 21 April 2025].
- Gabor, D., 2021. ‘The Wall Street Consensus’, Development and Change, 52(3), pp.429–459. doi: https://doi.org/10.1111/dech.12645 [Accessed 21 April 2025].
- Gentzkow, M., Kelly, B. & Taddy, M., 2019. ‘Text as data’, Journal of Economic Literature, 57(3), pp. 535–574. doi: https://doi.org/10.1257/jel.20181020 [Accessed 21 April 2025].
- Gürkaynak, R.S., Sack, B. and Swanson, E.T., 2005. Do actions speak louder than words? The response of asset prices to monetary policy actions and statements. International Journal of Central Banking, 1(1), pp.55–93. [online] Available at: https://www.ijcb.org/journal/ijcb05q2a2.html [Accessed 21 April 2025].
- Habermas, J., 1984. The theory of communicative action. Vol. 1: Reason and the rationalization of society. Translated by T. McCarthy. Boston: Beacon Press.
- Haitsma, R., Unalmis, D. and de Haan, J., 2016. ‘The impact of the ECB’s conventional and unconventional monetary policies on stock markets’, Journal of Macroeconomics, 48, pp. 101–116. doi: https://doi.org/10.1016/j.jmacro.2016.02.004 [Accessed 21 April 2025].
- Hall, P.A. and Taylor, R.C.R., 1996. Political science and the three new institutionalisms. Political Studies, 44(5), pp.936–957. [online] Available at: https://doi.org/10.1111/j.1467-9248.1996.tb00343.x [Accessed 21 April 2025].
- Hansen, S. and McMahon, M., 2016. Shocking language: Understanding the macroeconomic effects of central bank communication. Journal of International Economics, 99, pp.S114–S129. [online] Available at: https://www.sciencedirect.com/science/article/pii/S0022199615001828 [Accessed 21 April 2025].
- Hansen, S., McMahon, M. & Prat, A., 2018. ‘Transparency and deliberation within the FOMC: A computational linguistics approach’, The Quarterly Journal of Economics, 133(2), pp. 801–870. doi: https://doi.org/10.1093/qje/qjx045 [Accessed 21 April 2025].

- Harmon, D. & Mariani, M., 2024. ‘Divergent market reactions to abstract language: A multicountry event study of European Central Bank communications’, Academy of Management Journal, 67(6). doi: https://doi.org/10.5465/amj.2022.0814 [Accessed 21 April 2025].
- Hay, C., 2002. Political Analysis: A Critical Introduction. Basingstoke: Palgrave Macmillan. [online] Available at: https://doi.org/10.1007/978-0-230-62911-0 [Accessed 21 April 2025].
- Hubert, P. & Labondance, F., 2021. ‘The signaling effects of central bank tone’, European Economic Review, 133, p. 103684. doi: https://doi.org/10.1016/j.euroecorev.2021.103684 [Accessed 21 April 2025].
- Hutto, C.J. and Gilbert, E., 2014. VADER: A parsimonious rule-based model for sentiment analysis of social media text. Proceedings of the Eighth International AAAI Conference on Weblogs and Social Media, pp.216–225. [online] Available at: https://doi.org/10.1609/icwsm.v8i1.14550 [Accessed 21 April 2025].
- Hvitfeldt, E., n.d.. Loughran–McDonald sentiment lexicon. textdata R package documentation. [Online] Available at: https://emilhvitfeldt.github.io/textdata/reference/lexicon_loughran.html [Accessed: 11 June 2025].
- International Monetary Fund (IMF), 2020. The Central Bank Transparency Code. Washington, D.C.: IMF Publications. [online] Available at: https://www.imf.org/en/Publications/Policy-Papers/Issues/2020/07/29/The-Central-Bank-Transparency-Code-49619 [Accessed 21 April 2025].
- Jurkšas, L., Kaminskas, R. & Vasiliauskaitė, D., 2024. ‘ECB monetary policy communication events: Do they move euro area yields?’, Bulletin of Economic Research, 76(2), pp. 596–625. doi: https://doi.org/10.1111/boer.12439 [Accessed 21 April 2025].
- Kalyani, A., 2025. ‘Measuring fear: What the VIX reveals about market uncertainty’, FRED Blog, 13 February. Available at: https://fredblog.stlouisFed.org/2025/02/measuring-fear-what-the-vix-reveals-about-market-uncertainty/ [Accessed 11 June 2025].
- Kaminskas, R., Stukas, M. & Jurkšas, L., 2024. ECB Communication: What Is It Telling Us? Review of Economic Analysis, 16(2), 243–285. doi: https://doi.org/10.15353/rea.v16i2.5330 [Accessed 21 April 2025].
- Kokott, J. and Sobotta, C., 2017. Judicial review and institutional balance with regard to European monetary policy. In: European Central Bank, ECB Legal Conference 2017: Shaping a New Legal Order for Europe – A Tale of Crises and Opportunities. [online] Frankfurt am Main: European Central Bank, pp.107–114. Available at: https://www.ecb.europa.eu/pub/pdf/other/ecblegalconferenceproceedings2017.en.pdf [Accessed 20 April 2025].

- Koranyi, B. & Canepa, F., 2020. 'ECB on back foot as Lagarde bungles virus message', Reuters, 13 March. Available at: https://www.reuters.com/article/economy/ecb-on-back-foot-as-lagarde-bungles-virus-message-idUSKBN2101OT/ [Accessed 11 June 2025].
- Koranyi, B. & Canepa, F., 2021. ECB trims emergency support - but don't call it tapering. [Online] Available at: https://www.reuters.com/business/finance/ecb-may-dial-back-support-wont-take-it-away-just-yet-2021-09-08/#:~:text=purchases%20over%20the%20coming%20quarter%2C,economy%20during%20the%20coronavirus%20pandemic [Accessed 11 June 20205].
- Lagarde, C., 2020. Our response to the coronavirus emergency. [Online] Available at: https://www.ecb.europa.eu/press/blog/date/2020/html/ecb.blog200319~11f421e25e.en.html [Accessed 11 June 2025].
- Loughran, T. & McDonald, B., 2011. 'When is a liability not a liability? Textual analysis, dictionaries, and 10-Ks', The Journal of Finance, 66(1), pp. 35–65. doi: https://doi.org/10.1111/j.1540-6261.2010.01625.x [Accessed 21 April 2025].
- Loughran, T. & McDonald, B., 2016. 'Textual analysis in accounting and finance: A survey', Journal of Accounting Research, 54(4), pp. 1187–1230. doi: https://doi.org/10.1111/1475-679X.12123 [Accessed 21 April 2025].
- MacKinlay, C., 1997. Event Studies in Economics and Finance. Journal of Economic Literature, 35(1), 13–39. http://www.jstor.org/stable/2729691 [Accessed 11 June 2025].
- Mahoney, J. and Thelen, K., 2010. Explaining institutional change: Ambiguity, agency, and power. Cambridge: Cambridge University Press. [online] Available at: https://www.cambridge.org/core/books/explaining-institutional-change/A5B2439A1AA6BF1A327C5FB4300EB150 [Accessed 21 April 2025].
- Möller, R. & Reichmann, D., 2021. 'ECB language and stock returns – A textual analysis of ECB press conferences', The Quarterly Review of Economics and Finance, 80(1), pp. 80–91. doi: https://doi.org/10.1016/j.qref.2021.04.003 [Accessed 21 April 2025].
- Ortmans, A. & Tripier, F., 2020. 'COVID-Induced Sovereign Risk in the Euro Area: When Did the ECB Stop the Spread?', CEPII Working Paper, No. 2020-11, October. Available at: https://www.cepii.fr/PDF_PUB/wp/2020/wp2020-11.pdf [Accessed 11 June 2025].
- Pierson, P., 2000. Increasing returns, path dependence, and the study of politics. American Political Science Review, 94(2), pp.251–267. [online] Available at: https://doi.org/10.2307/2586011 [Accessed 21 April 2025]
- Quaglia, L. and Verdun, A., 2022. Explaining the response of the ECB to the COVID-19 related economic crisis: inter-crisis and intra-crisis learning. Journal of European Public Policy, 30(4), pp.635–654. [online] Available at:

https://www.tandfonline.com/doi/full/10.1080/13501763.2022.2141300 [Accessed 21 April 2025].

- Refinitiv, 2025. *Market commentary referenced from secondary sources (e.g. financial news aggregators). No direct terminal access.* [Accessed 11 June 2025].
- Reuters, 2020. Italy furious at ECB's Lagarde 'not here to close spreads' comment. [Online] Available at: https://www.reuters.com/article/business/italy-furious-at-ecbs-lagarde-not-here-to-close-spreads-comment-idUSKBN20Z3VM/#:~:text=Lagarde%20told%20the%20ECB%27s%20monthly,impact%20of%20the%20coronavirus%20outbreak [Accessed 11 June 2025].
- Riles, A., 2018. Financial citizenship: Experts, publics, and the politics of central banking. Ithaca: Cornell University Press. [online] Available at: https://cornellpress.manifoldapp.org/projects/financial-citizenship [Accessed 21 April 2025].
- Rutkowska, A., & Szyszko, M., 2024. Dictionary-based sentiment analysis of monetary policy communication: on the applicability of lexicons. Qual Quant 58, 5421–5444 (2024). https://doi.org/10.1007/s11135-024-01896-9 [Accessed 21 April 2025]
- Samuel, J., Rozzi, G. & Palle, R., 2022. 'The dark side of sentiment analysis: An exploratory analysis using lexicons, dictionaries, and a statistical monkey and chimp', SSRN Preprint. doi: https://doi.org/10.2139/ssrn.4000087 [Accessed 21 April 2025]
- Schmeling, M. & Wagner, C., 2023. 'Does central bank tone move asset prices?', SSRN Electronic Journal, 24 July. doi: https://ssrn.com/abstract=2629978 [Accessed 18 June 2025].
- Schmidt, V.A., 2008. 'Discursive institutionalism: The explanatory power of ideas and discourse', Annual Review of Political Science, 11, pp. 303–326. doi: https://doi.org/10.1146/annurev.polisci.11.060606.135342 [Accessed 21 April 2025]
- Schmidt, V.A., 2010. Taking ideas and discourse seriously: Explaining change through discursive institutionalism as the fourth 'new institutionalism'. European Political Science Review, 2(1), pp.1–25. [online] Available at: https://www.cambridge.org/core/journals/european-political-science-review/article/taking-ideas-and-discourse-seriously-explaining-change-through-discursive-institutionalism-as-the-fourth-new-institutionalism/52E2EB2B9A70D72CEB63CAA0E3B9F516 [Accessed 21 April 2025].
- Schmidt, V.A., 2013. Democracy and legitimacy in the European Union revisited: input, output and 'throughput'. Political Studies, 61(1), pp.2–22. [online] Available at: https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1467-9248.2012.00962.x [Accessed 21 April 2025]

- Schmidt, V.A., 2019. ‘Politicization in the EU: between national politics and EU political dynamics’, Journal of European Public Policy, 26(7), pp. 1018–1036. doi: https://doi.org/10.1080/13501763.2019.1619189 [Accessed 11 June 2025].
- Schnabel, I., 2021. ‘Unconventional fiscal and monetary policy at the zero lower bound’, ECB Speech, 26 February. [Online] Available at: https://www.ecb.europa.eu [Accessed 12 June 2025].
- Schonhardt-Bailey, C., 2013. Deliberating American monetary policy: A textual analysis. Cambridge, MA: MIT Press. Available at: https://mitpress.mit.edu/9780262019576/deliberating-american-monetary-policy/ [Accessed 23 April 2025].
- SIFMA, 2020. The VIX’s Wild Ride: A comparison of today’s volatility vs. historical levels, 23 April. [online] Available at: SIFMA “The VIX’s Wild Ride” (2020) [Accessed 19 Jun 2025].
- Treeck, J., 2021. ECB to scale back bond buying as economy recovers. [Online] Available at: https://www.politico.eu/article/ecb-to-scale-back-bond-buying-as-economy-recovers/#:~:text=,rush%20into%20a%20premature%20exit [Accessed 11 June 2025].
- Tucker, P., 2019. Unelected Power: The Quest for Legitimacy in Central Banking and the Regulatory State. Princeton: Princeton University Press.
- Ulmer, R., Sellnow, T. and Seeger, M., 2018. Effective Crisis Communication: Moving from Crisis to Opportunity. 4th ed. [online] Available at: https://e-biblos.berjaya.edu.my/content/bcom/Effective%20Crisis%20Communication%20Moving%20From%20Crisis%20to%20Opportunity%20by%20Ulmer,%20Robert%20R.,%20Sellnow,%20Timothy%20L.,%20Seeger,%20Matthew%20W.pdf [Accessed: 12 June 2025]
- Valentin, A., 2022. The Post-ECB Announcement Drift, May. Available at: https://wp.lancs.ac.uk/fofi2022/files/2022/08/FoFI-2022-103-Alexander-Valentin.pdf [Accessed 11 June 2025].
- Verdun, A., 2017. Political leadership of the European Central Bank. Journal of European Integration, 39(2), pp.207–221. [online] Available at: https://www.tandfonline.com/doi/full/10.1080/07036337.2016.1277715 [Accessed 21 April 2025]
- Wang, G., 2019. ‘The effects of quantitative easing announcements on the mortgage market: An event study approach’, International Journal of Financial Studies, 7(1), p. 9. doi: https://doi.org/10.3390/ijfs7010009 [Accessed 21 April 2025]
- Whaley, R.E., 2009. ‘Understanding the VIX’, The Journal of Portfolio Management, 35(3), pp. 98–105. doi: https://doi.org/10.3905/JPM.2009.35.3.098 [Accessed 21 April 2025]

- Wodak, R. & Fairclough, N., 2010. ‘Recontextualizing European higher education policies: the cases of Austria and Romania’, Critical Discourse Studies, 7(1), pp.19–40. doi: https://doi.org/10.1080/17405900903453922 [Accessed 21 April 2025]
- Woodford, M., 2003. Interest and prices: Foundations of a theory of monetary policy. Princeton: Princeton University Press. [online] Available at: https://press.princeton.edu/books/hardcover/9780691010496/interest-and-prices [Accessed 23 April 2025].
- Zhang, C., 2025. Dynamic Asset Pricing: Integrating FinBERT-Based Sentiment Quantification with the Fama–French Five-Factor Model. arXiv preprint arXiv:2505.01432v1. [Online] Available at: https://arxiv.org/abs/2505.01432 [Accessed: 11 June 2025].

7. Appendices

7.1. Appendix A: ECB Communications Analysed

This appendix lists the ECB communications that were selected for textual and market-based analysis.

Case Study 1: March 2020 PEPP

- **The ECB Press Release**: The ECB announces €750 Pandemic Emergency Purchase Programme (PEPP) – 18th of March 2020.
- **The Christine Lagarde Blog Post**: My blog post on the ECB's policy response to COVID-19 – 19th of March 2020.

Case Study 2: September 2021 Recalibration Communication

- **The ECB Press Release**: Monetary policy decisions – 9th of September 2021.
- **The Christine Lagarde Speech**: Introductory statement at ECB press conference following Governing Council monetary policy meeting – 9th of September 2021.

7.2. Appendix B: Sentiment Analysis Outputs

This appendix presents the VADER sentiment analysis results and Loughran–McDonald (LM) lexical counts for the selected communications.

Table B1. VADER Sentiment Scores

Text	Compound	Positive %	Neutral %	Negative %
March 2020 Press Release	1.000	12.3	81.4	6.3
March 2020 Lagarde Blog	0.947	10.0	82.2	7.8
September 2021 Press Release	0.994	10.8	85.9	3.3
September 2021 Lagarde Speech	1.000	12.0	84.3	3.8

Table B2. LM Lexicon Counts

Text	Negative	Positive	Uncertainty	Constraining	Litigious
March 2020 Press Release	94	19	69	39	24
March 2020 Lagarde Blog	22	5	10	11	5
September 2021 Policy Decision	7	3	1	2	1
September 2021 Lagarde Statement	112	58	78	24	1

Notes

- VADER scores range from –1 (very negative) to +1 (very positive). The percentages indicate the distribution of sentiment across each document.
- The LM counts show the frequency of words within each category, which help to provide insight into the legalistic or uncertain tone of the ECB's communication.
- These tables have indicated just how the textual analysis quantified discursive changes between March 2020 and September 2021.

7.3. Appendix C: Event-Study Supplement

Sources: Bloomberg daily closing prices (Bund 10Y; BTP 10Y; EuroStoxx 50; VIX).

Windows: 1-day = pre-close → next-day close; 3-day = announcement day (D0) → D+3.

Announcements: 18th –19th Mar 2020 (PEPP); 9th Sep 2021 ("recalibration" signal).

Table C1. Short-window market reactions

Indicator	1-day (Mar 2020)	3-day (Mar 2020)	1-day (Sep 2021)	3-day (Sep 2021)
Bund 10Y (bps)	+20	+11	–4	–1
BTP 10Y (bps)	+10	–76	–9	–5
BTP–Bund spread (bps)	–10	–86	–5	–4
EuroStoxx 50 (%)	–5.7	+0.7	0.0	–0.2
VIX (pts)	+0.5	–9.9	+0.8	+3.0

7.4. Appendix D: Code Excerpts (Sentiment Analysis Tools)

This appendix provides an excerpt of the code that was used to implement the sentiment analysis, with the full scripts being available upon request.

Loughran–McDonald (LM) Lexicon Function

```
# Appendix C – Sample function for the LM lexicon analysis
from collections import Counter


def lm_lexicon_count(text, lm_dict):
    """
    Counts LM sentiment categories in a given ECB text.


    Args:
        text (str): ECB press release or speech.
        lm_dict (dict): Dictionary mapping words to LM categories
                        (e.g., 'positive', 'negative', 'uncertainty').


    Returns:
```

```
        dict: Frequency of each LM category in the text.
    """
    words = text.lower().split()
    counts = Counter()

    for word in words:
        if word in lm_dict:
            category = lm_dict[word]
            counts[category] += 1

    return dict(counts)

# Example usage:
sample_text = "The ECB will do everything necessary within its mandate."
lm_counts = lm_lexicon_count(sample_text, lm_dict)
print(lm_counts)
```

VADER Sentiment Analysis Example

```
# Appendix C – Example of VADER sentiment analysis
from vaderSentiment.vaderSentiment import SentimentIntensityAnalyzer

# Initialise VADER
analyser = SentimentIntensityAnalyzer()

def vader_sentiment(text):
    """
```

```
    Applies VADER sentiment analysis to a given ECB text.

    Args:
        text (str): ECB communication (press release or speech).

    Returns:
        dict: Compound, positive, neutral, and negative sentiment scores.
    """
    return analyser.polarity_scores(text)

# Example usage:
sample_text = "The ECB will do everything necessary within its mandate."
vader_scores = vader_sentiment(sample_text)
print(vader_scores)
```

Notes:

- The compound scores in the analysis ranged from –1 that being ‘very negative’ to +1 that being ‘very positive’.
- The positive, neutral, and negative scores in the analysis represent the percentage of sentiment present in each category.
- The outputs generated from this function were all aggregated and then reported within Appendix B, in Table B1.