Check for updates

Special Issue Article

Political Studies Association | BJPIR

The British Journal of Politics and International Relations
1–24
© The Author(s) 2023

Article reuse guidelines:
sagepub.com/journals-permissions
DOI: 10.1177/13691481231210382
journals.sagepub.com/home/bpi
Sage

One future to bind them all? Modern central banking and the limits of performative governability

Timo Walter

Abstract

In this article, I analyse the case of 'modern' central banking's dual failures in effectively containing financial fragilities and inflationary pressures as a cautionary tale about the intrinsic limitations and contradictions of 'governing through quantified futures'. I construct a genealogy of central banks' much-vaunted 'performative art' of governing the economy through the management of expectations in order to reveal a crucial tension between the control of expectations *about* the future and controlling the future *through* (present) expectations of it. I argue that social scientific analyses tend to operate with a truncated understanding of performativity that prevents them from developing sufficiently precise and discerning accounts of the mechanics of performative processes to reveal their (intrinsic) limitations and explain how and why they (may) fail. By dissecting the surprisingly complex mechanics of central banks' performative agency, I thus contribute towards a more precise theorisation of how governing through quantified futures operates.

Keywords

central banks, formalisation, future, futurity, governance, indicators, inflation targeting, monetary policy, performativity, science and technology studies

Introduction: What 'modern' central banking can tell us about governing (through) the future

Long before the recent flurry of social scientific interest in *futurity* as a distinct mode of social coordination (e.g. Andersson, 2018; Beckert, 2016; Esposito, 2011; Mische, 2009; Tavory and Eliasoph, 2013), central bank(er)s were already doing it. Since the 'rebirth of modern central banking' (Bordo and Orphanides, 2013) after the hard-fought victory over the Great Inflation in the 1980s, monetary policy has become both a forerunner and a leading example of what, in this special issue, we call 'governing through quantified futures'. Since the early 1990s, monetary policy has converged[1] on a state-of-the-art framework for the implementation and transmission of monetary policy. Dubbed 'Inflation

Université de Lausanne, Lausanne, Switzerland

Corresponding author:
Timo Walter, Université de Lausanne, 1015 Lausanne, Switzerland.
Email: timo.walter@unil.ch

Targeting' (Bernanke and Mishkin, 1997), this framework operates by manipulating key quantitative indicators that define a collectively[2] 'imagined *future*' (Beckert, 2016) *in the present* in such a way that it 'performatively' (Callon, 2007) will 'bring into being that of which it speaks' (MacKenzie, 2004: 305): namely, produce an actual future in which inflation corresponds to the outcome *targeted* by the central bank.

As social scientists have become interested in matters of futurity and performativity (since the late 2000s), they have quickly discovered monetary policy as a seemingly ideal-typical example of it (e.g. Beckert, 2016; Braun, 2015; Holmes, 2009, 2014; Walter, 2020; Wansleben, 2018). In general, such analyses of how monetary policy is implemented 'performatively' have tended to remain wary of central bankers' more ambitious claims that Inflation Targeting alone could provide effective macro-economic governance. However, they have by and large taken for granted central banks' underlying claim that inflation targeting equips them with a highly effective form of 'performative power' that *does* allow them to govern through quantified futures, even if imperfectly (see Walter, 2022; Wansleben, 2018).

Even the manifest 'misfire' (Callon, 2010) of central banks' performance of a stable, non-inflationary, balanced growth path during the 2007–2009 Global Financial Crisis (GFC) did little to shake the widespread faith (among both central bankers and social scientists) in the effectiveness of this 'performative art' (Holmes, 2009) of managing expectations. Central banks' failure to 'see' (Fligstein et al., 2017) or counter the build-up of financial fragility was decidedly *not* seen as indicative of any intrinsic limitations to the scope or nature of this modality of governing, but was attributed to their cultural or ideological capture by an unwarranted belief in market efficiency (e.g. Abolafia, 2020; Fligstein et al., 2017; Kwak, 2013). In this view, central banks' performative management of expectations in accordance with this belief had created a 'stability illusion' (Wansleben, 2023: 178f.) encouraging 'irrational exuberance' (Shiller, 2000) and the build-up of financial fragilities. Instead, the impressive range and seeming effectiveness of the 'unconventional' monetary policy measures (Bowdler and Radia, 2012) deployed to restore the 'governability' (Wansleben, 2018) of finance after the GFC have tended to be interpreted as testament to the fungibility and scope of central banks' power to submit even unruly markets and recalcitrant expectations to their performative control (a good synthesis is given by Bernanke, 2020). The failure of central banks' performative macro-economic management to anticipate or forestall the GFC could, with some plausibility, still be attributed to an ideological belief in market efficiency and 'the neglect of liquidity as a regulatory problem in formal task descriptions' (Wansleben, 2021: 909) of central banks. However, their palpable difficulties in dealing with the (global) rise of inflation since mid-2021 raises renewed questions about whether such problems may be structurally related or even intrinsic to the nature and operation of central banks' performative power itself. Despite having considerably augmented their toolbox over the preceding decade, and having amplified their ability to govern expectations by expanding their infrastructural power over financial markets, central banks now appear to be struggling to bring under performative control *precisely* the problem that inflation targeting had been celebrated for its efficiency in dealing with in the first place.

In this article, I want to use the curious case of central banks' apparent difficulties, *despite* the documented growth of both their 'performative' (Wansleben, 2018) and 'infrastructural' (Braun, 2020) powers, to deal effectively with two of the (traditionally) most pivotal tasks of monetary policy, as a prism for scrutinising the precise functioning and possible limitations of performatively 'governing through quantified futures'. I thus

contribute to the joint conversation of this special issue not by providing another empirical illustration of this phenomenon. Instead, by 'opening up the black box' (MacKenzie, 2005) of and 'de-scripting' (Akrich, 1994) central banks' *performative power*, I use a 'strong case' (of *apparently* successful, effective governing through quantified futures) as a prism for a theoretical investigation and clarification of the conditions under which quantified futures function, and fail to function, as effective instruments of governing 'at a distance' (Latour, 1987: 239ff.; Rose and Miller, 1992). I also do not suggest that monetary policy has become (or operates) exclusively *performative(ly)*, nor does my analysis deny that the institutional form of central banking may also be structurally conditioned by competing socio-economic interests (and the distribution of influence among them; for example, Franzese, 1999; Iversen, 1999; Iversen et al., 2000). Rather, I use the *performative dimension of* monetary policy as a case in point for accentuating and clarifying a number of common problematic assumptions guiding many analyses of cases of performative 'governing through quantified futures' which are exhibited particularly clearly by the evolution of the performative modalities used for the implementation (and transmission) of monetary policy over the past three decades.

To this end, I proceed in three steps. In the first section, I show how the *original* (linguistic) theoretical vocabulary of performativity theory offers ways to develop finer analyses of performative processes of 'governing through quantified futures', helps us distinguish the different dimensions of performative causality, and allows us to specify the (intrinsic) limitations and mechanics that determine the success or misfire of performative acts. In the second section, I develop a genealogy of the evolution of Inflation Targeting and central banks' performative power(s) that allows me to disentangle its 'illocutionary' and 'perlocutionary' dimensions, and to show how their (practical *and* theoretical) conflation obscures the scope and felicity conditions of governing through quantified futures. In the third section, I highlight that governing through quantified futures faces a crucial tradeoff between *illocutionary efficiency* and *perlocutionary effectivenenss*. I illustrate this problem through the corresponding tension between the implementation and transmission of 'performative' monetary policy to demonstrate that efficient *semantic* control over present semantic expectations of the future does not necessarily translate into effective *pragmatic* control over the actual futures eventually performed.

'Modern' monetary policy: The performative structure of expectation management

For any central banker worth their salt, the idea that modern monetary policy functions, to an important extent, 'performatively' will hardly come as a surprise. While social scientists have become interested in how modern monetary policy operates by managing expectations (e.g. Braun, 2015; Holmes, 2014; Walter, 2019; Wansleben, 2018) as an exemplar of the idea and concept of 'performativity' (Callon, 1998b; MacKenzie et al., 2007),[3] many of the insights they have to offer will (despite the distinct analytic vocabulary and objectives) evoke a sense of déjà vu in central bankers.

It is precisely this parallelism between the 'stylized facts' (Hirschman, 2016) through which central bankers and (monetary) economists narrate the rebirth of modern central banking since the 1980s and the analytics of performativity that I wish to exploit in this article. My goal is not to claim that all of contemporary monetary policy or central banking can entirely be reduced to the operation of performativity. Instead, I rely on the quite

well-documented and well-analysed case of the evolution of the Inflation Targeting framework (whose principles continue to inform the conduct and implementation of contemporary monetary policy, with regulation to secure financial stability having been added as an ancillary task to this core; see Levingston, 2021; Thiemann, 2019) to highlight and discuss analytic elisions in how social science research conceptually approaches and analyses the phenomenon that is the object of this special issue – namely, the performative 'governing (through) quantified futures'. To do so, it is crucial to (1) clarify what precisely I mean by the *performative structure* of modern monetary policy, in order to (2) clearly articulate the analytic or theoretical *elisions* in the analytics of performativity (as used in recent social science discussions) that I seek to problematise.

Although the stylised narrative developed by most standard accounts of the 'rebirth of modern central banking' (Bordo and Orphanides, 2013) simplifies a more variegated and complex set of historical trajectories into a homogeneous teleological process, it provides a helpful heuristic for our purposes. According to this narrative, the gradual 'hollowing out' of the institutional foundations of 'Keynesian' macro-economic management (Best, 2004) rendered 'hydraulic' monetary policy interventions seeking to cause economic actors to mechanically 'adapt' their expectations and conduct (Friedman, 2018) increasingly ineffective (see Wansleben, 2018). In an environment increasingly dominated by forward-looking or, in economics parlance 'rational' (Lucas, 1972; Muth, 1961; Sargent and Wallace, 1976) expectations, economic actors (especially financial markets) interpreted monetary policy signals against a moving horizon of the expected future development of the economy. As formally expressed in Kydland and Prescott's (1977) analysis of the problem of 'time (in-)consistency', this meant that ad hoc or 'discretionary' policy intervention would be ineffective in a context defined by 'Rational Expectations', which required that policy signals were credibly anchored in (and thus justified as a rational means towards) a plausible macro-economic future.

The problem that central banks faced as they adapted to this new environment (over the course of the 1970s and 1980s) was thus essentially *performative* in nature (see Beckert, 2016: 35–60 for a succinct presentation of the performative attributes of futurity as a mode of social coordination). With the 'rise of finance' and the spread of financialised capitalism since the 1980s, central banks faced an erosion of their traditional institutional channels for implementing monetary policy, and instead turned to financial markets as an alternative medium or infrastructure for doing so (Krippner, 2011). However, they quickly discovered that the transmission of for monetary policy through financial markets increasingly depended on whether markets considered these policies sufficiently *credible*. As the *actual* effects of their policies depended increasingly on and were mediated by the forward-looking *expectations* that financial markets formed of these effects, the implementation of monetary policy increasingly depended on central banks' ability to 'frame' financial markets' expectations effectively (e.g. Braun, 2015; Holmes, 2014; Walter and Wansleben, 2020).

Faced with uncertainty about the future, the very possibility of intervening effectively *in the present* came to depend on creating a conventional 'focal point' (Dupuy, 1989; Lewis, 2011) or 'frame' (Callon, 1998a) to ensure the convergence of these expectations towards a 'credible future'. Monetary policy thus becomes a performative exercise of seeking to use the tools and instruments at its disposal to generate signals to influence the form and content of such 'fictional' or 'imagined' futures and *anchor* economic expectations in them so as to 'frame' and guide their conduct towards the intended outcome (Beckert, 2016: 113ff.). To borrow Niklas Luhmann's (1976) helpful terminology,

'modern' monetary policy seeks to set up a *present future* (a future state of the world as it is presently imagined) which, if deemed credible by economic actors, will become the conventional premise for the formation of 'Rational Expectations'. These then function as a 'performative transmission belt' that guides the conduct of economic actors towards performing a *future present* (a future state of the world that is actually realised, thus becoming the actual present at a later point in time) in which the intended value of the target variable ('price stability', for the most part) is realised. The plausibility of the future present, and the credibility of central banks' commitment to bringing it about, thus comes to determine whether monetary policy succeeds in performing a corresponding future present.

While the performative nature of modern monetary policy as such is quite evident, it is crucial to carefully specify a distinction between two empirically entangled but analytically distinct dimensions of performativity – namely, *illocution* and *perlocution* (Austin, 1962: 99–131). Integral to Austin's (1962) initial formulation of the idea of performativity, this distinction has largely been ignored or neglected by recent social scientific appropriations of the concept (see the critique by Butler, 2010; Callon, 2010). While the distinction is both subtle and complex, its gist can be stated quite succinctly for the purposes of this article. Its basic intuition boils down to the insight that every performative (act/enunciation) can be broken down into two distinct dimensions or operations: first, it must construct and convey the *intended meaning* to be brought into being by the performative act ('illocution'); second, it must elicit (from/within the domain it seeks to performatively alter) the specific effects that 'bring into being that of which it speaks' (MacKenzie, 2004: 305), thus making the domain *verisimilar* to the intended meaning ('perlocution'). Successful illocution thus primarily hinges on whether one succeeds in *framing* the intended meaning effectively – and thus on the existence of robust and determinate semiotic conventions that can be manipulated to produce the intended meaning (what Callon, 1998a refers to as a 'calculative frame'). In contrast, the success of perlocution depends on how this meaning is translated into *practice* (by the actors which constitute the targeted domain or context) allowing it to 'alter an ongoing situation' (Butler, 2010: 151). Successful illocution is what provides the intended performative act with what Austin calls 'illocutionary force'. While illocutionary force is required for producing the (intended) perlocutionary effect, it does not *suffice* for producing it – its effect consists in binding the addressee(s) of the performative act to the intended meaning thus ensuring that it is 'understood' and becomes a premise of the addressee's expectations without *semantic* ambiguity. Illocution, however, does *not* on its own govern or conduct the conduct of others: such effective perlocutionary performativity depends on the *pragmatic* translation of the meaning into concrete, contextual social practice(s).

This distinction is quite unproblematic, and to some extent empirically inconsequential, when, as in Austin's preferred examples of *speech acts*, illocution and perlocution are directly contiguous – indeed, they normally coincide in any successful performative. However, the distinction does become crucially important (1) for analysing how and why performatives *fail*, and (2) when illocution and perlocution are (temporally, socially, spatially) *non-contiguous.* This is, notably, the case with monetary policy, whose *implementation* (the signalling of the intended meaning) needs to be carefully distinguished from the *transmission* of this signal (the production of the intended macro-economic effects) through a system of socially (Knorr Cetina and Bruegger, 2002) and temporally (Knorr Cetina and Preda, 2007) dispersed financial markets. Successfully 'performing' an intended effect thus involves 'teasing out causal pathways in complex sequences of

events [which] is not straightforward' (MacKenzie and Bamford, 2018: 101), raising the thorny question of whether and to what extent financial markets really performatively transmit central banks' intended futures?

What makes the distinction important is that, as social scientific analysis commonly 'imputes a certain sovereign agency to the operation of performativity that foregrounds the illocutionary over the perlocutionary' (Butler, 2010: 153), the theory and practice of Inflation Targeting have long tended to foreground *signal implementation* over the question of how these signals became *transmitted* and translated into macro-economic effects. Fine-tuning and deepening the operative entanglements of monetary policy with financial markets helped central banks not only construct a distinct source of infrastructural power to fortify their independence. It also encouraged an institutionally thin and dis-embedded focalisation on shaping *financial markets*' imaginations of the future, assumed to function as an empirical surrogate to the role performed by 'Rational Expectations' in economic models[4] for transmitting policy signals to the broader economy. Failure to distinguish both dimensions makes it exceedingly difficult to explain the (intrinsic) limitations of particular forms of performative power, such as when and why they 'misfire' (Austin, 1962: 16; Callon, 2010), or to account (with any theoretical precision) for *why and how* seemingly successful performativity sometimes fails or suddenly may turn 'counter-performative'[5] (e.g. MacKenzie, 2003). This parallelism thus allows me to use central banks' *practical* neglect of this distinction in order to highlight the consequences of a *theoretical or analytic* failure to distinguish illocutionary and perlocutionary performativity in social scientific analyses of instances of governing through quantified futures.

Inflation targeting and the construction of a disentangled 'calculative frame'

Central banks' 'institutional work'[6] (Zietsma and Lawrence, 2010) in building up a framework for the performative management of inflation expectations provides us with an ideal case for illustrating the problems that result from foregrounding the illocutionary over the perlocutionary. Tracing the genealogy and evolution of 'performative' monetary policy implementation thus helps us reveal the precise mechanics of this case of governing through futures as well as its limitations and potential dysfunctions. I will focus on the case of US Federal Reserve's (Fed) transition from monetary to inflation targeting (during the 1980s, in the United States), whose particular experience and institutional work have been co-articulated with the (US-dominated) research in economics seeking to theorise this same evolution. In this way, the Fed's experience has become a prototype for other central banks' efforts to develop performative tools for implementing monetary policy through market-based finance (Wansleben, 2018, 2023). The purpose of this article and the following exposition is thus not to develop a historically comprehensive account or explanation of the Fed's path of institutional evolution, or of the conduct of modern monetary policy 'as such'. Instead, I synthesise from existing accounts (to which I have contributed elsewhere myself) a stylised genealogy aimed at 'de-scripting' (Akrich, 1994) the 'technical rationality' (Abolafia, 2012) and mechanics of central banks' performative power to manage expectations.

At the beginning of the 1980s, the Fed faced a structural environment shaped by two interrelated macro-trends (see Krippner, 2011: 58ff.). On one hand, 'Keynesian' macro-economic management (essentially, varying the aggregate supply of credit to the economy) had created an environment of persistent, and high, inflation. On the other hand,

policy-makers had gradually begun to dis-mantle the system of New Deal Financial regulation based on sectorally segregated credit and interest rate controls (first to facilitate 'aggregate' macro-economic management, and subsequently in the hope that letting market forces show through would de-politicise the allocation of capital, and potentially attenuate inflation; Krippner, 2011: 58ff.; Özgöde, 2022). Instead of curbing inflation, however, this had the effect of accelerating the growth of endogenous credit, thus contributing to the inflation it was supposed to control (Krippner, 2011: 63ff.; Özgöde, 2022: 2051f.). Under Paul Volcker (1979–1987), the Fed therefore shifted from attempting to shape monetary growth indirectly through discretionary variations of the interest rate to a novel strategy of more direct 'monetary targeting', committing monetary policy to a rule-based growth path for the money supply prescribed (well) into the future (Volcker, 1978). Whether or not, as Krippner (2007: 482f.) argues, and to what extent this and subsequent adaptations 'reflect a logic of obfuscation, allowing policymakers to construct their actions as the product of "market forces" rather than deliberate policy decisions' is secondary for the purpose of developing a genealogy of the technical rationality of the performative targeting of inflation through financial market expectations. Functionally, it was certainly designed to let markets do the Fed's work in the sense of robustly *anchoring* the endogenous creation of credit to the Fed's intended target. In theory, this would remove the need for the discretionary 'constant (and counterproductive) tinkering' (Krippner, 2007: 488) that had fuelled inflation expectations (see Clift, 2020: 294f. on how Volcker's monetary targeting was aimed at anchoring inflation, not precise control over quantities), and that (when the supply of reserves did not keep up with the expectations implicit in the endogenous expansion of credit) threatened to produce financial market instabilities (a growing concern for the Fed since the 1960s; Özgöde, 2022).

This initial, tentative step towards enrolling market expectations in performing a projective future revealed some technical difficulties though (see Krippner, 2007: 490f.). Much like discretionary tinkering, attempting to hold steady the projected *global path* of bank reserves against deviations (entailed by oscillations of endogenous credit creation) still produced violent jumps in the market interest rate (the market price of reserves). This, in turn, undermined the legibility of the Fed's policy signals – thus destabilising rather than managing market expectations towards the intended outcome. In the short run, these gyrations triggered the 'Volcker shock' which plunged the economy in a deep recession which broke both inflation and inflation expectations for good. In the longer run, it led the Fed to shift from targeting non-borrowed reserves to borrowed reserves targeting: where the former aimed at establishing direct control over the aggregate money supply (as a condition for anchoring expectations), the latter uses reserves borrowed at the discount window (at a fixed rate – thus functioning as a safety valve for market liquidity) as an indirect *indicator* of the firmness of monetary policy. With this shift, the Fed hoped to avoid destabilising markets' liquidity (expressed through spikes in the interest rate), which in turn would increase the ambiguity and reduce the precision of the Fed's guidance of market expectations (which gradually moved to the foreground of the technical rationality; Krippner, 2007: 494).

In time, this indirect way of tracking and guiding expectations, initially in support of and closely entangled with the attempt to steadying monetary growth (which undiluted monetarist doctrine had considered the key structural causal factor for inflation) by guiding the quantity of reserve borrowing, gave way to a more direct form of *expectation* targeting, for two interrelated reasons. First, the continuous processes of financial innovation enabled by de-regulation destabilised and uncoupled monetary growth from the path

of reserves (Goodhart, 1986), making the latter essentially ambiguous both as an indicator and a guidepost for expectations. Another problem emerged during the market crash of October 1987: with market liquidity in question, even the slight ambiguities as to the conditions and possibility of refinancing (access to reserves/liquidity) created by borrowed reserve targeting eventually forced the Fed to shift to an explicit *interest rate* target – meaning, effectively, that monetary policy would (fully) satisfy the liquidity needs of financial markets as required to keep the price of liquidity (the interest rate) steady (see Krippner, 2007: 495).

Over the course of the 1980s, the 'institutional logic' (Thornton and Ocasio, 1999: 804) of the Fed's monetary policy thus underwent a gradual, and impalpable shift. Rather than a deliberate paradigm shift, this is perhaps better characterised as a form of *pragmatic* organisational learning driven by a series of confluent factors: foregrounding the stability of markets was conditioned simultaneously by the Fed's growing concern with the dangers of (systemic) fragilities (Özgöde, 2022), a desire to minimise the noise that resulted when the policy signal was not clearly differentiated from the means through which it was generated (see Walter, 2019; Walter and Wansleben, 2020), and (as Krippner highlights) by the Fed's concern with minimising the public contestability of its monetary policy decisions. Volcker's original experiment had targeted expectations as an intermediary instrument for improving the efficacy of the structural transmission of policy through monetary quantities.[7] As of the mid 1980s, the Fed instead slipped into foregrounding the illocutionary (focusing on improving the implementation of its policy signals and control over 'market expectations') over the perlocutionary (worrying over the perlocutionary transmission into structural macro-economic effects). Concerned with improving performative control over expectations, the Fed gradually shifted from seeking to control (increasingly unstable) monetary quantities towards a strategy of 'unfettering' financial markets and the endogenous credit they created (Walter and Wansleben, 2020) in order to *stabilise* financial markets' reactions to monetary policy.

As expectations took the place of monetary quantities in (first technical, and only later public) discussions of how monetary policy operated and what it was, in fact, targeting, the Fed also came to focus (as it had during the 1970s) on the *interest rate* as its key control variable (Krippner, 2007: 493ff.). After more than a decade of struggling with the so-called 'Instrument-Target Problem' (Friedman, 1976; Poole, 1970), it offered a golden opportunity to free monetary policy from its conceptual and practical imprisonment of operating within a frame conceived in terms of hydraulically manipulating aggregate macro-economic statistical regularities that kept breaking down (Lucas, 1976). The interest rate had the advantage of functioning as a serviceable composite 'index'[8] through which market stress/fragility, the stability of expectations, and (at the beginning, and indirectly) the success of borrowed reserves monetary targeting could be observed. Thus, instead of struggling, and failing, to achieve robust and effective perlocutionary control over macro-economic aggregates *directly*, monetary policy could abandon this 'relatively complex and uncertain object of knowledge' (Abolafia, 2012: 169) and instead return to targeting the *interest-rate* which would serve as a 'proximate object of knowledge . . . chosen for its immediate efficacy in having an influence on the latter, less accessible goal' (Abolafia, 2012: 169) of inflation *expectations*. On the downside, assuring robust and precise control over the interest rate to use as a signalling device for manipulating and observing inflation expectations *also* implied abandoning any effective control over endogenous credit creation (Walter and Wansleben, 2020), thus effectively de-coupling illocution (implementation of a signal) from perlocution without much of an alternative

to replace the now abandoned means of structural transmission (perlocution) through monetary quantities.

Since about the mid to late 1980s (for an approximate chronology, see Krippner, 2007: 496ff.), the Fed thus engaged in a process of path-dependent organisational learning and evolution that has quite thoroughly institutionalised this (initially incidental) foregrounding of the illocutionary, finally ushering into the codification of an explicit framework of expectation management labelled 'Inflation Targeting' (Bernanke and Woodford, 2006; Woodford, 2003). Much as the Fed had improvised in the 1980s, monetary policy thus 'manages' expectations by establishing a 'calculative frame' (modelled after formal economic models supposedly approximating the 'true' model of the economy according to which Rational Expectations are assumed to be formed) that 'disentangles' the process of forming economic expectations from endogenous and exogenous noise and interferences (Callon, 1998b; Callon and Muniesa, 2005). This frame not only allows the central bank to generate precise policy signals but also ensures their performative translation into corresponding expectations, and makes these expectations visible and legible for the central bank in turn (Braun, 2015; see also Zaloom, 2009).

The formal models developed based on the theoretical assumption of 'Rational Expectations' provided just what was needed to justify and operationalised such a proximate object: under the assumption of RE, long-term interest rates are simply the addition (the weighted average) of the present and expected short-term rates over the period in question. Although its empirical adequacy and robustness are questionable, this 'expectations theory of the term structure' thus suggests that market expectations of future interest rates are reflected in (and thus can be read off of) the yield curve of a risk-free asset (US Treasuries, for instance; Culbertson, 1957; Sargent, 1972; Shiller and Huston McCulloch, 1990). This means that it becomes, through this yield curve as a proximate object (and with some basic economic arithmetic), possible to observe market expectations of future inflation, as well as of the future interest rates a central bank is expected to set. It is possible not only to 'read the future' (see Zaloom, 2009) from the yield curve but also to observe with numerical precision how monetary policy signals *performatively* influence the conventional *present future* in which market expectations are anchored (market reactions become expressed through variations in the shape of the yield curve).[9] Full-fledged Inflation Targeting thus does not target, strictly speaking, *future* inflation so much as it targets the *present* expectations of the future. These present expectations are decoded by feeding quantitative indicators of expected future prices into formal economic models to produce scenarios and *forecasts* of future inflation that are then fed back into and guide policy decisions ('present futures'; leading some to dub it 'inflation forecast targeting': Svensson, 2010; see also Abolafia, 2010; Smart, 1999).

The 'technocratic euphoria' (Wansleben, 2018: 777) of central banks at having discovered a source of performative and infrastructural power seemingly 'dis-embedding' the conduct of monetary policy from (being directly or openly implicated in) macroeconomic bargaining games (see Iversen, 1999; Krippner, 2011 portrays this depoliticisation strategy as a key driver behind elite support for financialisation processes) has been echoed in how social scientific analyses have tended to analytically dis-embed central banks' expectation management from structural context, and take its illocutionary efficiency as proof of perlocutionary effectiveness. Most social scientific analyses have thus taken at face value the idea that their precise illocutionary control over the formation of specific targeted indicators of 'Rational Expectations' in financial markets provide central banks with unprecedented performative 'governability' (Braun, 2015) of

the economy – without, however, unpacking the nature and *limitations* of this governability and the performative power supposedly making it possible (Wansleben, 2018: 477). Instead, they replicate the teleological conception of expectations management underlying Inflation Targeting practice by *extrapolating* perlocutionary effectivenness from the efficiency of illocutionary control. In other words, they assume that once a particular 'imagined future' has been encoded within the calculative frame,[10] expectations of this future will translate into perlocutionary effects that will eventually perform it. The perlocutionary translation or transmission of the policy signal into corresponding structural effects thus becomes effectively analytically 'black boxed' (Latour, 1987: 2) as a performative matter of course.

Performatively speaking, however, the illocutionary production of a well-defined 'imagined future' (made possible by the 'disentangled', Callon, 1998b, communicative frame) does not entail effective perlocutionary translation into a corresponding *actual* future-reality. Whether 'imagined' qualitatively or quantitatively, such a *present future* constitutes a 'sign' or 'signifier' (see Kockelman, 2005 for the following explication) that refers to a *potential* future outcome. To perform that future, it is necessary but evidently not enough to illocutionarily *encode* a (semantically unambiguous) sign: the sign must also be taken up and translated into pragmatic conduct appropriate to bringing about the intended future present. To borrow a formula from the father of semiotics, Charles Sanders Peirce, the sign must 'make the interpretant [its audience] stand in the same relation to its object [the intended future] as its own relation to the object' (Kockelman, 2005: 233). The performative agency to accomplish this is, however, not intrinsic to the sign (however, semantically well specified), but depends on whether the sign 'indexes' (Kockelman, 2005: 254f.) or anchors the pragmatic conduct in the future towards it seeks to orient it – in other words, it must create not only a belief in the future itself but impose a pragmatic constraint (a 'context': Austin, 1962: 14ff.) that binds future conduct effectively to the intended future outcome. As an illustration, whereas the Volcker experiment had (in theory, at least) anchored the future macro-economic states of the world to a (fixed) monetary growth path (so that financial markets would *reduce* credit provision to the economy, dampening aggregated demand, growth and eventually inflation), Inflation Targeting actively *disentangled* its performative guidance from any durable structural parameters that could have *effectively constrained* financial markets' credit expansion and thus aggregate demand[11] (see Krippner, 2011: 109–114 for how the credit mechanism is key for the transmission of monetary policy).

Instead, Inflation Targeting 'unfettered' financial markets from liquidity constraints that (as they did under Volcker) interfered with the illocutionary performance of stable present futures (Walter and Wansleben, 2020). However, as financial markets did not have to worry about refinancing and liquidity, these illocutionarily performed present futures did not translate into any effective (binding and durable) *pragmatic* constraints on their conduct, meaning that illocutionary success did not translate into effective perlocution. By dis-entangling illocution from perlocution, Inflation Targeting 'transform[s] local uncertainties [about whether one can refinance] into global certainty' (Star, 1985: 391). This *frees* markets' pragmatic uptake of monetary policy signals from extraneous pragmatic connotations associated with their respective Minskyan 'survival constraints' (see Mehrling, 1999), creating a 'stability illusion' (Wansleben, 2023: 178f.) as central banks continuously stabilise this illocutionary frame and future. While this greatly increases the illocutionary force of expectation management, it also un-ties expectations from the contexts of their perlocutionary uptake: the interactive co-construction of

expectations, which central banks have come to interpret as evidence for their effective performative control over (future) inflation, in fact *is taking place within a* 'credible surrogate system' (Mäki, 2009) that substitutes *illocutionary* interactions between indicators within a simulated 'world in the model' (Morgan, 2012) for the *actual* causal transmission of its signals onto the real-world domain to be governed – a problem to which we shall return in depth in the next section.

Since the end of the 1980s, central banks have increased their 'investment in [the institutional] forms' (Thévenot, 1984) that underwrite their performative power for expectation management – thus deepening and reinforcing the operative foregrounding of the illocutionary that emerged as they phased out monetary targeting. Upon discovering how transparency can, in fact, help clarify monetary policy's intentions and help 'enrol' (Callon and Law, 1982) financial markets in the illocutionary production of present futures, central bank(er)s began elaborating explicit strategies for providing a communicative framing of their policy signals to help normalise how financial markets interpret them (Abolafia, 2004; Abolafia and Hatmaker, 2013; Blinder et al., 2008; Braun, 2015; Guthrie and Wright, 2000; Holmes, 2009, 2014; Velthuis, 2015). They also invested heavily in their own 'scientisation' (Marcussen, 2006), allowing them to align their internal sense-making to the semiotic principles of state-of-the-art economic science (Abolafia, 2010; Smart, 2006; Walter, 2019), thus simultaneously acquiring scientific legitimacy for their decisions and a serviceable 'syntax of imagination' enabling them to align policy signals with the language and terms in which financial markets articulated their expectations about the future. Finally, central banks (especially those embedded in major financial markets) have become increasingly involved in efforts to fashion market-based financial structures into serviceable infrastructures to support their expectation management (see Braun, 2020; Walter and Wansleben, 2020; Wansleben, 2018), condoning the use of derivatives for managing risks (Özgöde, 2022: 2061) and even 'actively promoting shadow banking as a vehicle for monetary policy transmission' (Braun and Gabor, 2021; Coombs and Thiemann, 2022: 537; Gabor, 2016; Gabor and Ban, 2016). This market-building helped further loosen the liquidity constraints weighing in on the definition of pragmatic local futures, 'disentangling' the calculative frame for defining global present futures in semantically stable, robust and unambiguous terms.

However, while these measures have undoubtedly helped improve the *illocutionary efficiency* of expectation management, they also have continuously and further disembedded it from the very pragmatics of local futures whose polysemous meanings monetary policy would need to conduct in order to effectively perform the future present it intends – thus laying the groundwork for the eventual 'overflowing' of this frame during the 'counter-performative' GFC of 2007–2009.

Endogenising the future and the problem of polysemy

Up until the 2007–2009 GFC, Inflation Targeting appeared to be a spectacular success story for central banks. They successfully claimed the macro-economic stability during the so-called Great Moderation (Bernanke, 2004) as a result of their dextrous 'illocutionary' management of financial market expectation, resulting in the spectacular 'rise of central banks' to becoming the preeminent players in macro-economic governance (Wansleben, 2023). Even at the height of its popularity in the early 2000s, however, Inflation Targeting was not without critics: both mainstream and heterodox economic analyses did cast doubt on whether it was really monetary policy's expectation management, rather than *exogenous*

structural 'felicity conditions' (Austin, 1962: 14ff.) that accounted for low inflation during that period (e.g. Angeriz and Arestis, 2006; Ball and Sheridan, 2005; Orphanides, 2004; Samarina et al., 2014; a debate that has recently been rekindled Goodhart and Pradhan, 2020); others presciently highlighted the sidelining of financial (in-)stability (Borio and White, 2004), or pointed to the shakiness of the theoretical foundations of the emerging consensus theoretical framework of monetary policy (e.g. Arestis and Sawyer, 2008) as well as the socio-economic, distributional consequences of a narrow focus on price stability (see the contributions assembled in Epstein and Yeldan, 2009; see also Rochon and Rossi, 2006).

None of these critiques, though, managed to gain sufficient (institutional and political) traction to counteract central banks' growing organisational autonomy and influence as guardians of price stability within the emerging institutional division of labour of 'regulatory capitalism' (Wansleben, 2021). Despite the various practical omissions, functional limitations and representational inaccuracies of the quantified futures through which Inflation Targeting operated, it provided a highly 'serviceable' (see Millo and MacKenzie, 2009 for an analysis of the institutional 'usefulness of inaccurate models') 'system of abstractions' (Stinchcombe, 2001: 7) for conducting monetary policy. By the early 2000s, Inflation Targeting 'achieved an almost taken for granted quality . . . with little questioning of its logic or effectiveness' (McNamara, 2002: 47). Even after the GFC had debunked the myth that securing macro-economic stability would take care of financial stability, too (e.g. Mehrling, 2011; Minsky, 2001; Nesvetailova, 2007; Tymoigne, 2009), critiques of modern monetary policy have tended to problematise towards which ends and problems central banks' infrastructural and performative powers have been deployed, rather than attribute the dysfunctions that have emerged from wielding them to their nature, scope and institutional foundations (two prototypical examples of how blame is laid on cognition and decision-making, while the effective capacity to counteract financial instabilities is presupposed are Abolafia, 2020; Fligstein et al., 2017). In other words, the failure(s) of the performative monetary policy framework are seen as not as intrinsic but as *ancillary* to the modalities and operation of the power(s) which it deploys.

In contrast, analysing the performative power undergirding Inflation Targeting as having emerged from an incremental 'foregrounding of the illocutionary over the perlocutionary' allows me to argue that the difficulties central banks faced first in relation to financial (in-)stability and, more recently, in forestalling the inflationary surge since mid 2021, are not accidental but, at least partially, constitutively built into the very foundation of and intrinsic to this performative logic of operating. If the vocabulary of performativity is rarely used for this purpose, and if I have taken the unusual step of switching analogously between empirical accounts of monetary policy and theoretical exposition of the problem of performative control, it is because it allows me to convey a point that is exceedingly difficult to articulate both within the textbook accounts of Inflation Targeting itself (which conceptually *foreground* illocution and analytically bury the problem) and dominant modes of analysis of monetary policy in Political Science (which black box the concrete practice(s) of policy *implementation* and transmission).

Despite these problems, a number of concerns that have been articulated provide crucial clues for piecing together this particular jigsaw puzzle. Specifically, there have been long-standing doubts about whether the system of abstractions through which monetary policy illocutionarily manages expectations actually does its perlocutionary job of conducting economic conduct towards the intended future(s) – and, if so, *how* this perlocutionary transmission could actually be theoretically be accounted for? Although Inflation Targeting has proven largely immune to challenges to its legitimacy and practical

conduct, it is something of an open, slightly embarrassing secret that in actual theoretical fact, 'there is no consensus on why the framework is successful, why and how expectations become anchored by virtue of these targeting protocols'[12] (Holmes, 2009: 403; see also Tarullo, 2017). As Alan Blinder (2004: 77), an éminence grise of the US monetary policy establishment has pointed out, empirically 'the implied interest rate forecasts (expectations) that can be deduced from the yield curve bear little resemblance to what future interest rates actually turn out to be'. Thus, although the *perlocutionary* inaccuracy (even: failure) of the system of abstractions on which Inflation Targeting rests is widely known, it continues to function as a 'serviceable' framework for *illocutionary* purposes:

> The theory's abject failure is not some deep, dark secret that we professors know about but have somehow kept from the rest of the world. Central bankers realize that the expectations theory does not work. So do market participants, who nonetheless appear to use it to guide billion-dollar interest rate bets each day. Yet, in what appears to be a stunning example of pretending that the emperor is still fully dressed, academic economists, central banked, and market participants alike all proceed as if the expectations, theory really underpins the term structure. It's a curious case of mutually agreed self-delusion, and the question is how and why it persists. (Blinder, 2004: 80)

Even more than a decade *after* the GFC, and despite considerable and growing doubts as to whether the eventually realised quantified *future presents* quite systematically fail to correspond (or, using the term proposed by Austin, 'become verisimilar') to the *present futures* supposedly performed through them (Werning, 2022), the assumption that central banks *performatively* manage macro-economic outcomes by framing (financial market) expectations remains largely unchallenged in practice (see Rudd, 2021). The question raised by Blinder and others entails quite fundamental questions about the nature and extent of the performative power of monetary policy. It suggests that the ascription of 'performative power' to central banks' expectation management may be a case of what might usefully be called a *metonymic fallacy* – metonymic[13] (I borrow the term from Ertürk et al., 2022) in the sense that efficient (semantic) control over a representation (illocution) is conflated or equated with effective (pragmatic) control over its referent object (perlocution; a similar case where a 'metonymic' formal discourse fails to achieve effective performative control over a domain of polysemous meanings is analysed by Ertürk et al., 2022).

To clarify what this problem of a metonymic conflation of illocutionary and perlocutionary performativity entails for the analysis of governing through (quantified) futures, it is useful to switch back to a more theoretical exposition. Within performativity theory, it was John Searle who stumbled upon this problem as he attempted to *analytically* differentiate illocution from perlocution more 'clearly' than Austin had done. Searle (1969) attempted to explain successful performativity as resulting from the *competent performance* of intended meanings – so that performative agency would be *intrinsic to* (competent) performances. In other words, (formal) correspondence of a performance with socially accepted *conventions* (i.e. appropriately 'framed') would secure the *acceptance* of the intended meaning by others and induce them to act 'in accordance' with it. Faced with a series of critiques demonstrating that a speech act might be *illocutionarily successful*, but fail to elicit the intended *perlocutionary effect*(s) from its audience(s), Searle was forced to acknowledge (Austin's original insight) that performative (perlocutionary) *effects* were not determined by successful illocution(s) and the meanings they performed.

Instead, the (semantic) performative intention was mediated and modified by its (pragmatic) 'uptake' by audiences and thus only *indirectly* determined the perlocutionary effect (Searle, 1979; see also Butler, 2010).

For the case of (performative) monetary policy, this means that even if an audience treats a particular imagined future as credible, in translating the 'illocutionarily shared' semantic intention or meaning into practical conduct it becomes pragmatically 'diffracted' as it is enriched with situated, contextual, indexical meaning(s). Unless there is an effective structural constraint[14] in place that continuously binds pragmatic conduct to a specific and determinate outcome at each moment, the initial performative intention becomes continuously diffracted by feedback from local, pragmatic futures and conduct (concretely encoded in economic actors' balance sheets), which introduce unwanted 'connotations' and thus polysemous meanings into it (see Ertürk et al., 2022: 33f. for a helpful elaboration of the relation between denotation, connotation and polysemy). Over time, the 'dis-entangling' of calculative frames which permit the efficient *illocutionary performance* of precise (if abstract and formal) 'shared imagined futures' from the situated contexts in which these futures are pragmatically taken up thus tends to produce what Callon (1998a), in somewhat figurative language, has called an 'overflowing' of performativity. Dis-entangling a calculative frame from the context(s) through which (its) perlocutionary effects are to be produced will initially facilitate the illocutionary performance of shared, often formal, 'imagined futures' – by severing semiotic associations or feedback loops with situated pragmatic conduct that might introduce connotative meanings into the operation of illocution. However, in stabilising illocution in this way, one *also* loosens or removes effective (performative) constraint on pragmatic conduct, allowing polysemous meaning to accumulate 'under the semiotic surface', so to speak.[15] Eventually, if the accumulated weight of divergent meanings becomes too great, it can feed back into and trigger a performative 'misfire' of the illocutionary operation itself (Callon, 2010).

Despite the abstract sound of the idea of performative 'overflowing', directly analogous phenomena have been documented and described in sociological analyses. For instance, Meyer and Rowan (1977) have famously analysed how organisations' 'formal structure' exercises merely 'ceremonial' control over their actual operational practice: although the shared governing abstractions are continuously 'ritualistically' reasserted in and through practice (illocution), they fail to perform substantively corresponding (perlocutionary) effects. A similar 'ceremonial' (Meyer and Rowan, 1977) form of (performative) control has been analysed in Michael Power's (1997, 2007) accounts of audit and risk management as modes of social control that ritualistically document formal conformity ('verisimilitude') of local practices with abstract prescriptions while absorbing and invisibilising the pragmatic heterogeneities in the social practices they are supposed to make conform to formal structure. While, as Power's analysis in particular demonstrates, (performative) overflowing can go unnoticed for a long time (since the calculative frame through which ritualistic conformity is asserted is *disentangled* from local pragmatics and conduct), it imperceptibly 'frays out' performative control and erodes its felicity conditions. This can go on until the continuously appearing, but minor discrepancies between the initial 'present future' and ongoing practices open a crack and reveal the divergence that has built up between illocution and perlocution. The result is a sudden misfire or breakdown of verisimilitude as the illocutionary force (or the *credibility*) of the performance itself dissipates,[16] much as has (arguably) happened to Inflation Targeting Monetary Policy during the GFC.

A full account of the messy realities and the complex bundle of immediate and intermediate causes of the GFC is beyond the scope of this article. What is clear, however, is that central banks' continuous efforts to improve the efficiency of their management of *illocutionary expectations*, or 'present futures', have helped create the very conditions for a performative 'overflowing' and, eventually, the counterperformative 'misfire' of the macro-economic governability they hoped to accomplish. In order to improve their ability to elicit market reactions that procedurally and formally re-affirmed the present futures central banks hoped to perform, they cultivated a stability illusion (effectively guaranteeing market liquidity to remove disruptions to their illocutionary control) by allowing the unfettered build-up of endogenous, market-based credit and by giving continuous regulatory and logistical support to building a more integrated (thus more semiotically reactive) market-based finance (Walter and Wansleben, 2020). As they eventually pushed up interest rates leading up to the GFC, they effectively undid the 'global certainty' (Star, 1985: 391) of refinancing (the implicit liquidity guarantee given to unfettered markets), thus triggering the worst possible 'misfire' of performative macro-economic management up to date, as financial actors were confronted with a looming Minskyan 'survival constraint' of having to secure liquidity in the face of growing uncertainty about balance sheet and asset valuations.[17]

Clearly, problems such as cultural capture (Kwak, 2013) by the idea of efficient markets, as well as epistemic and organisational blind spots due to the forms of expertise employed by central banks (e.g. Fligstein et al., 2017), have contributed to the failure to 'see' the build-up of financial fragility. However, a closer analysis of the mechanisms of central banks' *performative* modalities of governing through quantified futures reveals that the difficulties that expectation management as a mode of monetary policy has encountered are not entirely exogenous to, but emerge *endogenously* and are thus intrinsic to through the very operation of central banks' performative power(s). Although the practice and theoretical reflection of monetary policy have evolved and in certain ways improved since the GFC, its evolutionary trajectory seems to have committed central banks even more firmly to the very same contradictions I have attempted to highlight here (Wansleben, 2023: 212ff.). The tendency of foregrounding of illocution seems unbroken, even hardwired into the contemporary evolution of monetary policy as central banks seek to protect and shore up their predominant position in contemporary macro-economic governance.

This interpretation is supported by the fact that during and after the GFC, central banks have continued to build both their 'unconventional' monetary policy (Borio et al., 2018) as well as their new mission of 'macro-prudential regulation' (e.g. Baker, 2013; Goodhart, 2015) *around* the hard-core of expectation management as the key operative paradigm of monetary policy (e.g. Levingston, 2021; Musthaq, 2021; Thiemann, 2019). In the direct aftermath of the crisis, implicit guarantees of market liquidity were quickly transformed into a massive, structural injection of market liquidity through direct asset purchases and quantitative easing, seeking to restore stability in financial markets by re-establishing global certainty that local balance sheets (and the pragmatic futures encoded in them) could be refinanced. As the crisis progressed, however, what initially were introduced as emergency measures gradually were brought under the discursive and operational logic of performative expectation management. Increasingly faced with 'institutional pressure to both sustain and not sustain [unconventional monetary policy] as a regular practice', as it continued to be needed to prop up jittery markets but marked a clear departure from the pre-crisis vision of 'good' monetary policy practice (Ronkainen and Sorsa, 2018: 711), unconventional monetary policy was increasingly justified with the need to maintain 'orderly conditions' (Mehrling, 2011: 48) in markets to permit 'conventional' monetary

policy to operate efficiently. The two principal types of unconventional monetary policy, quantitative easing and forward guidance, were employed by central banks to 'serve monetary policy in two ways: (1) addressing disruptions in the monetary policy transmission channel; and (2) providing additional monetary stimulus once rates reach the lower bound[18]' (Musthaq, 2021: 15). In other words, central banks provided another (massive) injection of liquidity to smooth over the polysemy that emerged between the financial futures to which markets had committed and the (global) constraints monetary policy attempted to impose on the macro-economic allocation of credit. Essentially, unconventional monetary policy (forward guidance more explicitly so) seeks to redirect credit into real instead of further financial investment to stimulate economic growth, *removing* uncertainty about (future) refinancing conditions by firmly committing to long-term, low interest rates – thus basically *overriding* connotative meanings that might blur the intended present future (in this sense, see Abreu and Lopes, 2022: 17f.). As earlier, the price for re-directing *some* investment towards the real economy was another overall loosening of liquidity constraints – thus validating the polysemous meanings whose overflowing of the frame had caused the problem to be solved in the first place.

Macro-prudential policy, initially celebrated as a 'paradigm shift' of central banking away from the support of largely unfettered markets (see Baker, 2013), has similarly undergone a process of 'performative domestication'. Interestingly, from a functional perspective, it can be understood as an attempt to 're-entangle' monetary policy with the production of local (pragmatic) futures encoded in balance sheets, imposing (much as attempted by capital requirements regulation, see Thiemann, 2014) particular (formal) parameters on the construction of balance sheets (pragmatic futures), but also providing central banks with additional epistemic tools for decoding the implicit topography of pragmatically incurred futures (see Erturk, 2017 for an interesting analysis of the representational challenges of surveilling this hidden futurity) and some discretionary grounds for 'semiotic' intervention (see Coombs, 2020; Thiemann et al., 2021). At the same time, the ability to impose binding constraints on how local pragmatic futures are constructed is severely curtailed by the very attempts to restore 'global certainty' in financial markets by propping up market liquidity with both explicit and implicit means (but see Coombs, 2022 for an argument that suggests that some combination of performative and infrastructural control might allow macro-prudential policy to become more effective). As a result, macro-prudential policy is effectively reduced to an attempt to build *resilience to* rather than remove the underlying problem of unfettered credit cycles (Thiemann, 2019; see also Birk and Thiemann, 2020).

What these developments suggest, and what the recent difficulties of monetary policy in suppressing the inflationary credit cycle they have themselves helped build up by their attempts to stabilise macro-economic conditions (and secure financial stability) during the COVID pandemic seems to confirm, is that central banks are effectively *pushing on a performative string*: the more they seek to enhance their *illocutionary* efficiency (mistaking it for a more general, fungible 'performative power'), the more they dilute their *perlocutionary* effectiveness in controlling the structural conditions that produce *both* inflationary pressures *and* financial instability.

Conclusion: Governing through quantified futures – performative power or ritual performances?

In this article, I have analysed how 'performative' monetary policy has evolved towards structurally foregrounding illocutionary over perlocutionary performativity in both its

practice and theory. In doing so, my goal has been to use the case of central banks' supposed 'performative power' to govern macro-economic outcomes in order to highlight the limits and contradictions of the performative governing through (quantified) futures we examine in this special issue more generally. To do so, my argument has proceeded in two (interrelated) steps:

First, I have 'de-scripted' (Akrich, 1994) central banks' much-vaunted 'performative art' of securing macro-economic stability by governing through quantified futures. This allows me to demonstrate how the difficulties 'modern' central banking has faced in dealing, first, with financial (in-)stability and, over the past 2 years, returning inflation (the, traditionally, two core tasks of central banking) are not accidental but *intrinsic* to the nature and functioning of the performative power central banks have constructed since the 1980s. Through a (stylised) genealogy of central banks' framework for governing through quantified futures, I have shown how these misfires or counter-performativities are linked to a pragmatic and operational foregrounding of illocutionary efficiency over *present expectations* at the expense of effective perlocutionary control over actual *macro-economic future(s)*.

Second, I have used this genealogical and theory-guided analysis as a magnifying lens to demonstrate how the failure (typical of social scientific adaptations of the concept) to carefully differentiate illocutionary and perlocutionary performativity (and to clarify their interaction) prevents us from understanding the precise mechanics of governing through (quantified) futures and, crucially, from specifying the sources of its limitations and the conditions under which they may lead to misfires of performative control. I contribute to the conversation in this special issue by pointing out that this problem becomes particularly acute when faced with (temporally, spatially or socio-technically) *complex environments* and dispersed or de-centred cases of performative agency – such as is typically the case when 'governing through quantified futures'.

My analysis and argument suggest that there is an intrinsic trade-off between illocutionary efficiency and perlocutionary effectiveness that becomes particularly acute in the case of governing through *quantified* futures. The 'metonymic' (Ertürk et al., 2022: 34) qualities of the quantification of *present conditions* facilitate their insertion into increasingly 'virtual' (Linstead and Thanem, 2007) illocutionary frames in which 'surrogate' (Mäki, 2009) meanings are performed whose 'false precision' (Jasanoff, 1991: 31) allows highly persuasive 'ceremonial' or 'ritual' performances of control that buttress institutional legitimacy (see Meyer and Rowan, 1977; for the case of CBs, see Walter, 2022; Wansleben, 2021), but which are effectively disentangled or de-coupled from the substantive social practice(s) they are meant to govern.

This analysis suggests that we need to refine our analytic tools to distinguish cases of *effectively* governing *through* quantified futures from instances of where *present uncertainty* is reduced by ritual (in the sense that, 'as long the procedure is followed, the result obtained belongs to a sphere that is . . . the unfalsifiable'; Salais, 2016: 121) illocutionary performances of present futures, but which do not involve substantive *performative* control over future outcomes (see Power, 1997, 2007 for an analogous analysis of financial auditing/risk management). Quantified futures such as those through which CBs 'govern' may thus best not be understood as conventions through which actual perlocutionary control is exercised (see Beckert, 2016), but rather as a sort of 'boundary objects' (Star and Griesemer, 1989) that underwrite rather loose, illocutionary forms of coordination that extend over partially overlapping and interdependent, but multiple and heterogeneous social worlds. Boundary objects function as focal points or mediators which 'transform local uncertainties into global certainty'

(Star, 1985: 391) since their 'structure is common enough to more than one world to make them recognizable, a means of translation' that can take on 'different meanings in different social worlds' while providing a joint global reference point for all of them (Star and Griesemer, 1989: 393). Instantiated through artefacts such as the yield curve or the theorem of the term structure, they can be read (slightly) differently by different local actors depending on their informational needs; while their essentially quantified, hence decontextualised nature makes them 'plastic enough to adapt to local needs and the constraints of the several parties employing them, yet robust enough to maintain a common identity across sites' (Star and Griesemer, 1989: 393).

Understanding present futures as boundary objects allows us to explain why they remove ambiguity about the future, but do not actually normalise or unify the heterogeneous (locally enacted) futures they allegedly are governing through towards convergence on a unitary future present. If the experience of the past decade of monetary policy is any guide, it may well be that what appears at first glance as effective governing through quantified futures may, on closer inspection, turn out to be an example of how, rather than using 'reality as rationality control, our society . . . [uses] rationality as reality control' (Luhmann, 1976: 142) – until, that is, reality *overflows* its control by (formal) rationality.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

ORCID iD

Timo Walter https://orcid.org/0000-0003-3727-3080

Notes

1. See Maman and Rosenhek (2008) and Mukherjee and Singer (2008) for analyses that emphasise the role of local factors (rather than global institutional isomorphism) for the adoption of Inflation Targeting.
2. Discussions of Inflation Targeting often refer generically to 'Rational Actors' or 'Rational Expectations' as transmission mechanism for such imagined futures. In practice (and in the theoretical small print), it is however *financial markets*' expectations and conduct that are managed and assumed to transmit the intended effect to the wider economy.
3. For the original formulation in linguistic philosophy, and its subsequent introduction into social theory, see Austin, 1962; Butler, 2007; Searle, 1969.
4. I have to thank one of the anonymous reviewers for having pushed me to clarify this problem of the separation of implementation and transmission, and the analogy to the illocution or perlocution distinction.
5. Or, for that matter, to distinguish empirically between the case of 'strong' or 'Austinian' performativity, in which a 'performative utterance brings into being that of which it speaks' and cases of merely 'effective' performativity in which the utterance produces *some* effect but which does not 'correspond' to the intention (see MacKenzie, 2004).
6. Institutional work refers to reflexive efforts, usually by an organisation, to re-organise the institutional field(s) (and their boundaries) in which it is embedded in order to increase the effectiveness and/or legitimacy of its activities (Zietsma and Lawrence, 2010: 189–196).
7. As a result of this 'formalisation' of performative governing through expectations (Walter, 2019), monetary policy thus increasingly shifted into a technocratic, institutionally thin idiom for describing the operation of monetary policy that omitted or, as Krippner (2007: 482) suggests, obfuscated its socio-economic embeddedness and distributive implications.
8. Following Silverstein's (1976: 27) elaboration of Peirce's typology of signs, an index is a sign whose 'occurrence . . . bears a connection of understood spatio-temporal contiguity to the occurrence of the entity signaled'.
9. As an added benefit, the yield curve (normally, of the key financial asset used in open-market operations) is also used by market actors as an interpretive frame to help them interpret monetary policy intentions and signals (Christophers, 2017: 66), thus facilitating the interpretive guidance of markets by CBs.

10. A frame thus essentially operates as a 'functional simplification' of an 'operational domain within which the complexity of the world is reconstructed as a simplified set of tight cause-and-effect couplings' (Kallinikos, 2014: 9), thus achieving a reduction of complexity (Luhmann, 1976: 142) that enables more precise expectation management.
11. Meaning that (perlocutionary) *transmission* essentially would come to depend on the ghost in the machine in the form of 'Rational Expectations' – shared 'belief' in the *present futures* performed by central banks that each economic actor translated into corresponding practical conduct in his or her particular situation.
12. In other words, as pointed out in the previous section, it is unclear how *durable* the effects of signalling really are, and whether they produce time-consistent pragmatic conduct.
13. A metonymy is a trope or figure of speech in which a term is used to refer to an object of which it is an attribute or with which it is closely conventionally associated (e.g. 'the crown' standing in for monarchy/a monarch).
14. For instance, a monetary growth path; in the case of the initial economic *theory* of Inflation Targeting/Rational Expectations, this role is fulfilled by the (invariant) 'true model' of the economy shared by all actors that ensures the time-consistency of their conduct.
15. The tradeoff between the formalisation of social relations as a means of allowing their (performative) governing through abstractions (such as 'quantified futures') and achieving actual (pragmatic) control over the effects produced by local, situated conduct has been beautifully dissected by Arthur Stinchcombe (2001).
16. While I do not have the space to elaborate on the mechanism, MacKenzie's (2003) analysis of the failure of Long-Term Capital Management provides a useful approximation (minus the crucial distinction between illocution and perlocution) of how intersecting particular futures can come to depend on and eventually disrupt a more abstract future due to a build up of polysemy.
17. The main dynamic of the crisis can be described as a return of fundamental uncertainty, which vastly increased risks premiums and thus made the risk-based pricing of asset entirely incalculable, thus leading to a general market freeze (Nelson and Katzenstein, 2014).
18. Essentially, this means that if general uncertainty (or specific risk perception) about the future is so high that the long-term interest rate becomes negative, monetary policy will find it exceedingly difficult to undo these expectations and conduct them back towards an 'equilibrium' position.

References

Abolafia M (2020) *Stewards of the Market: How the Federal Reserve Made Sense of the Financial Crisis*. Cambridge, MA: Harvard University Press.

Abolafia MY (2004) Framing moves: Interpretive politics at the federal reserve. *Journal of Public Administration Research and Theory* 14(3): 349–370.

Abolafia MY (2010) Narrative construction as sensemaking: How a central bank thinks. *Organization Studies* 31(3): 349–367.

Abolafia MY (2012) Central banking and the triumph of technical rationality. In: Knorr Cetina K and Preda A (eds) *The Oxford Handbook of the Sociology of Finance*. Oxford: Oxford University Press, pp.158–185.

Abolafia MY and Hatmaker DM (2013) Fine-tuning the signal: Image and identity at the federal reserve. *International Public Management Journal* 16(4): 532–556.

Abreu A and Lopes DS (2022) Forward guidance and the semiotic turn of the European Central Bank. *Journal of Cultural Economy* 15(1): 14–29.

Akrich M (1994) The de-scription of technical objects. In: Bijker WE and Law J (eds) *Shaping Technology/Building Society*. Cambridge, MA: The MIT Press, pp.205–224.

Andersson J (2018) *The Future of the World: Futurology, Futurists, and the Struggle for the Post Cold War Imagination*. New York: Oxford University Press.

Angeriz A and Arestis P (2006) Has inflation targeting had any impact on inflation? *Journal of Post Keynesian Economics* 28(4): 559–571.

Arestis P and Sawyer M (2008) A critical reconsideration of the foundations of monetary policy in the new consensus macroeconomics framework. *Cambridge Journal of Economics* 32(5): 761–779.

Austin JL (1962) *How to Do Things With Words: The William James Lectures 1955*. Oxford: Clarendon Press.

Baker A (2013) The new political economy of the macroprudential ideational shift. *New Political Economy* 18(1): 112–139.

Ball L and Sheridan N (2005) Does inflation targeting matter? In: Bernanke BS and Woodford M (eds) *The Inflation Targeting Debate*. Chicago, IL; London: University of Chicago Press, pp.249–282.

Beckert J (2016) *Imagined Futures: Fictional Expectations and Capitalist Dynamics*. Cambridge, MA: Harvard University Press.

Bernanke B (2004) *The great moderation. Remarks by the governor of the federal reserve*. Washington, DC. Available at: http://www.federalreserve.gov/boarddocs/speeches/2004/20040220/ (accessed 11 February 2015).

Bernanke B and Mishkin FS (1997) *Inflation Targeting: A New Framework for Monetary Policy?* (NBER Working Paper 5893). Cambridge, MA: National Bureau of Economic Research.

Bernanke B and Woodford M (eds) (2006) *The Inflation-Targeting Debate* (National Bureau of Economic Research studies in Business Cycles 32). Chicago, IL: University of Chicago Press.

Bernanke BS (2020) The new tools of monetary policy. *American Economic Review* 110(4): 943–983.

Best J (2004) Hollowing out Keynesian norms: How the search for a technical fix undermined the Bretton Woods regime. *Review of International Studies* 30: 383–404.

Birk M and Thiemann M (2020) Open for business: Entrepreneurial central banks and the cultivation of market liquidity. *New Political Economy* 25(2): 267–283.

Blinder A (2004) *The Quiet Revolution: Central Banking Goes Modern*. New Haven, CT: Yale University Press.

Blinder AS, Ehrmann M, Fratzscher M, et al. (2008) Central bank communication and monetary policy: A survey of theory and evidence. *Journal of Economic Literature* 46(4): 910–945.

Bordo MD and Orphanides A (eds) (2013) *The Great Inflation: The Rebirth of Modern Central Banking* (A National Bureau of Economic Research Conference Report). Chicago, IL: University of Chicago Press.

Borio C and White WR (2004) *Whither monetary and financial stability? The implications of evolving policy regimes*. BIS Working Papers no. 147. Basel: Bank for International Settlements.

Borio C, Zabai A, Conti-Brown P, et al. (2018) Unconventional monetary policies: A re-appraisal. In: Conti-Brown P and Lastra RM (eds) *Research Handbook on Central Banking*. Cheltenham; Northampton, MA: Edward Elgar Publishing, pp.398–444.

Bowdler C and Radia A (2012) Unconventional monetary policy: The assessment. *Oxford Review of Economic Policy* 28(4): 603–621.

Braun B (2015) Governing the future: The European Central Bank's expectation management during the great moderation. *Economy and Society* 44(3): 367–391.

Braun B (2020) Central banking and the infrastructural power of finance: The case of ECB support for repo and securitization markets. *Socio-Economic Review* 18(2): 395–418.

Braun B and Gabor D (2021) Central banking, shadow banking, and infrastructural power. In: Mader P, Mertens D and Van der Zwan N (eds) *The Routledge International Handbook of Financialization*. London: Routledge, pp.241–252.

Butler J (2007) *Gender Trouble Feminism and the Subversion of Identity*. New York: Routledge.

Butler J (2010) Performative agency. *Journal of Cultural Economy* 3(2): 147–161.

Callon M (1998a) An essay on framing and overflowing: Economic externalities revisited by sociology. *The Sociological Review* 46(Suppl. 1): 244–269.

Callon M (1998b) Introduction: The embeddedness of economic markets in economics. *The Sociological Review* 46(Suppl. 1): 1–57.

Callon M (2007) What does it mean to say that economics is performative? In: MacKenzie D, Muniesa F and Siu L (eds) *Do Economists Make Markets? On the Performativity of Economics*. Princeton, NJ: Princeton University Press, pp.311–357.

Callon M (2010) Performativity, misfires and politics. *Journal of Cultural Economy* 3(2): 163–169.

Callon M and Law J (1982) On interests and their transformation: Enrolment and counter-enrolment. *Social Studies of Science* 12(4): 615–625.

Callon M and Muniesa F (2005) Peripheral vision: Economic markets as calculative collective devices. *Organization Studies* 26(8): 1229–1250.

Christophers B (2017) The performativity of the yield curve. *Journal of Cultural Economy* 10(1): 63–80.

Clift B (2020) The hollowing out of monetarism: The rise of rules-based monetary policy-making in the UK and USA and problems with the paradigm change framework. *Comparative European Politics* 18(3): 281–308.

Coombs N (2020) What do stress tests test? Experimentation, demonstration, and the sociotechnical performance of regulatory science. *The British Journal of Sociology* 71(3): 520–536.

Coombs N (2022) Narrating imagined crises: How central bank storytelling exerts infrastructural power. *Economy and Society* 51: 679–702.

Coombs N and Thiemann M (2022) Recentering central banks: Theorizing state-economy boundaries as central bank effects. *Economy and Society* 51(4): 535–558.

Culbertson JM (1957) The term structure of interest rates. *The Quarterly Journal of Economics* 71(4): 485–517.
Dupuy J-P (1989) Convention et common knowledge. *Révue économique* 40(2): 361–400.
Epstein GA and Yeldan E (eds) (2009) *Beyond Inflation Targeting: Assessing the Impacts and Policy Alternatives*. Cheltenham; Northampton, MA: Edward Elgar.
Erturk I (2017) Shadow banking: A story of the Doppelgänger (the double) in science of finance. *Journal of Cultural Economy* 10(4): 377–392.
Ertürk I, Ghosh I and Shah K (2022) Financial untouchability: A polysemic narrative of digital financial inclusion in Modi's India. *Journal of Cultural Economy* 15(1): 30–51.
Esposito E (2011) *The Future of Futures: The Time of Money in Financing and Society*. Cheltenham; Northampton, MA: Edward Elgar.
Fligstein N, Stuart Brundage J and Schultz M (2017) Seeing like the fed: Culture, cognition, and framing in the failure to anticipate the financial crisis of 2008. *American Sociological Review* 82(5): 879–909.
Franzese RJ (1999) Partially independent central banks, politically responsive governments, and inflation. *American Journal of Political Science* 43(3): 681–706.
Friedman BM (1976) Targets, instruments, and indicators of monetary policy. *Journal of Monetary Economics* 1(4): 443–473.
Friedman M (2018) *Theory of the Consumption Function*. Princeton, NJ: Princeton University Press.
Gabor D (2016) The (impossible) repo trinity: The political economy of repo markets. *Review of International Political Economy* 23(6): 967–1000.
Gabor D and Ban C (2016) Banking on bonds: The new links between states and markets. *JCMS: Journal of Common Market Studies* 54: 617–635.
Goodhart C (1986) Financial innovation and monetary control. *Oxford Review of Economic Policy* 2(4): 79–102.
Goodhart CAE and Pradhan M (2020) *The Great Demographic Reversal: Ageing Societies, Waning Inequality, and an Inflation Revival*. Cham: Palgrave Macmillan.
Goodhart LM (2015) Brave new world? Macro-prudential policy and the new political economy of the federal reserve. *Review of International Political Economy* 22: 280–310.
Guthrie G and Wright J (2000) Open mouth operations. *Journal of Monetary Economics* 46(2): 489–516.
Hirschman D (2016) Stylized facts in the social sciences. *Sociological Science* 3: 604–626.
Holmes DR (2009) Economy of words. *Cultural Anthropology* 24(3): 381–419.
Holmes DR (2014) *Economy of Words: Communicative Imperatives in Central Banks*. Chicago, IL; London: University of Chicago Press.
Iversen T (1999) The political economy of inflation: Bargaining structure or central bank independence? *Public Choice* 101(3/4): 285–306.
Iversen T, Pontusson J and Soskice DW (eds) (2000) *Unions, Employers, and Central Banks: Macroeconomic Coordination and Institutional Change in Social Market Economies* (Cambridge Studies in Comparative Politics). Cambridge and New York: Cambridge University Press.
Jasanoff S (1991) Acceptable evidence in a pluralistic society. In: Mayo DG and Hollander RD (eds) *Acceptable Evidence: Science and Values in Risk Management*. New York and Oxford: Oxford University Press, pp.29–47.
Kallinikos J (2014) *Governing Through Technology: Information Artefacts and Social Practice* (Place of Publication Not Identified). London: Palgrave Macmillan.
Knorr Cetina K and Bruegger U (2002) Inhabiting technology: The global lifeform of financial markets. *Current Sociology* 50(3): 389–405.
Knorr Cetina K and Preda A (2007) The temporalization of financial markets: From network to flow. *Theory, Culture & Society* 24(7–8): 116–138.
Kockelman P (2005) The semiotic stance. *Semiotica* 2005(157): 233–304.
Krippner G (2007) The making of US monetary policy: Central bank transparency and the neoliberal dilemma. *Theory & Society* 36(6): 477–513.
Krippner G (2011) *Capitalizing on Crisis: The Political Origins of the Rise of Finance*. Cambridge, MA: Harvard University Press.
Kwak J (2013) Cultural capture and the financial crisis. In: Carpenter D and Moss DA (eds) *Preventing Regulatory Capture: Special Interest Influence and How to Limit It*. Cambridge: Cambridge University Press, pp.71–98.
Kydland FE and Prescott EC (1977) Journal of political economy rules rather than discretion: The inconsistency of optimal plans. *Journal of Political Economy* 85(3): 473–492.
Latour B (1987) *Science in Action: How to Follow Scientists and Engineers Through Society*. Cambridge, MA: Harvard University Press.

Levingston O (2021) Minsky's moment? The rise of depoliticised Keynesianism and ideational change at the federal reserve after the financial crisis of 2007/08. *Review of International Political Economy* 28(6): 1459–1486.
Lewis DK (2011) *Convention: A Philosophical Study* (NACHDR). Oxford: Blackwell.
Linstead S and Thanem T (2007) Multiplicity, virtuality and organization: The contribution of Gilles Deleuze. *Organization Studies* 28(10): 1483–1501.
Lucas RE (1972) Expectations and the neutrality of money. *Journal of Economic Theory* 4(2): 103–124.
Lucas RE (1976) Econometric policy evaluation: A critique. *Carnegie-Rochester Conference Series on Public Policy* 1: 19–46.
Luhmann N (1976) The future cannot begin: Temporal structures in modern society. *Social Research* 43(1): 130–152.
MacKenzie D (2003) Long-term capital management and the sociology of arbitrage. *Economy and Society* 32(3): 349–380.
MacKenzie D (2004) The big, bad wolf and the rational market: Portfolio insurance, the 1987 crash and the performativity of economics. *Economy and Society* 33(3): 303–334.
MacKenzie D (2005) Opening the black boxes of global finance. *Review of International Political Economy* 12(4): 555–576.
MacKenzie D and Bamford A (2018) Counterperformativity. *New Left Review* 113: 97–121.
MacKenzie D, Muniesa F and Siu L (eds) (2007) *Do Economists Make Markets? On the Performativity of Economics*. Princeton, NJ: Princeton University Press.
Mäki U (2009) Missing the world. Models as isolations and credible surrogate systems. *Erkenntnis* 70(1): 29–43.
Maman D and Rosenhek Z (2008) The contested institutionalization of policy paradigm shifts: The adoption of inflation targeting in Israel. *Socio-Economic Review* 7(2): 217–243.
Marcussen M (2006) Institutional transformation? The scientization of central banking as a case study. In: Christensen T and Laegreid P (eds) *Autonomy and Regulation: Coping with Agencies in the Modern State*. Cheltenham: Edward Elgar Publishing, pp.81–109.
McNamara K (2002) Rational fictions: Central bank independence and the social logic of delegation. *West European Politics* 25(1): 47–76.
Mehrling P (1999) The vision of Hyman P. Minsky. *Journal of Economic Behavior and Organization* 39(2): 129–158.
Mehrling P (2011) *The New Lombard Street: How the Fed Became the Dealer of Last Resort*. Princeton, NJ: Princeton University Press.
Meyer JW and Rowan B (1977) Institutionalized organizations: Formal structure as myth and ceremony. *American Journal of Sociology* 83(2): 340–363.
Millo Y and MacKenzie D (2009) The usefulness of inaccurate models: Towards an understanding of the emergence of financial risk management. *Accounting, Organizations and Society* 34(5): 638–653.
Minsky HP (2001) *Financial Keynesianism and Market Instability* (ed. Bellofiore R and Ferri P) (The Economic Legacy of Hyman Minsky), vol. 1. Cheltenham; Northampton, MA: Edward Elgar Publishing.
Mische A (2009) Projects and possibilities: Researching futures in action. *Sociological Forum* 24(3): 694–704.
Morgan MS (2012) *The World in the Model: How Economists Work and Think*. Cambridge and New York: Cambridge University Press.
Mukherjee B and Singer DA (2008) Monetary institutions, partisanship, and inflation targeting. *International Organization* 62(2): 323–358.
Musthaq F (2023) Unconventional central banking and the politics of liquidity. *Review of International Political Economy* 30: 281–306.
Muth JF (1961) Rational expectations and the theory of price movements. *Econometrica* 29(3): 315–335.
Nelson SC and Katzenstein PJ (2014) Uncertainty, risk, and the financial crisis of 2008. *International Organization* 68(2): 361–392.
Nesvetailova A (2007) *Fragile Finance: Debt, Speculation and Crisis in the Age of Global Credit*. Basingstoke and New York: Palgrave Macmillan.
Orphanides A (2004) Monetary policy rules, macroeconomic stability, and inflation: A view from the trenches. *Journal of Money, Credit and Banking* 36(2): 151–175.
Özgöde O (2022) The emergence of systemic risk: The Federal Reserve, bailouts, and monetary government at the limits. *Socio-Economic Review* 20(4): 2041–2071.
Poole W (1970) Optimal choice of monetary policy instruments in a simple stochastic macro model. *The Quarterly Journal of Economics* 84(2): 197–216.

Power M (1997) *The Audit Society: Rituals of Verification*. Oxford and New York: Oxford University Press.
Power M (2007) *Organized Uncertainty: Designing a World of Risk Management*. Oxford and New York: Oxford University Press.
Rochon L-P and Rossi S (2006) Inflation targeting, economic performance, and income distribution: A monetary macroeconomics analysis. *Journal of Post Keynesian Economics* 28(4): 615–638.
Ronkainen A and Sorsa V-P (2018) Quantitative easing forever? Financialisation and the institutional legitimacy of the federal reserve's unconventional monetary policy. *New Political Economy* 23(6): 711–727.
Rose N and Miller P (1992) Political power beyond the state: Problematics of government. *The British Journal of Sociology* 43(2): 173–205.
Rudd JB (2021) *Why Do We Think That Inflation Expectations Matter for Inflation? (And Should We?)* (Finance and Economics Discussion Series 2021–060). Washington, DC: Board of Governors of the Federal Reserve System.
Salais R (2016) Quantification and objectivity. From statistical conventions to social conventions. *Historical Social Research / Historische Sozialforschung* 41(2): 118–134.
Samarina A, Terpstra M and De Haan J (2014) Inflation targeting and inflation performance: A comparative analysis. *Applied Economics* 46(1): 41–56.
Sargent TJ (1972) Rational expectations and the term structure of interest rates. *Journal of Money, Credit and Banking* 4(1): 74–97.
Sargent TJ and Wallace N (1976) Rational expectations and the theory of economic policy. *Journal of Monetary Economics* 2(2): 169–183.
Searle JR (1969) *Speech Acts: An Essay in the Philosophy of Language*. London: Cambridge University Press.
Searle JR (1979) Indirect speech acts. In: Searle JR (ed.) *Expression and Meaning*. Cambridge: Cambridge University Press, pp.30–57.
Shiller RJ (2000) *Irrational Exuberance*. Princeton, NJ: Princeton University Press.
Shiller RJ and Huston McCulloch J (1990) The term structure of interest rates In: Friedman BM and Hahn FH (eds) *Handbook of Monetary Economics*. Amsterdam: Elsevier, pp.627–722.
Silverstein M (1976) Shifters, linguistic categories, and cultural description. In: Basso KH and Shelby HA (eds) *Meaning in Anthropology*. Albuquerque, NM: University of New Mexico Press, pp.11–56.
Smart G (1999) Storytelling in a central bank: The role of narrative in the creation and use of specialized economic knowledge. *Journal of Business and Technical Communication* 13(3): 249–273.
Smart G (2006) *Writing the Economy: Activity, Genre, and Technology in the World of Banking* (Studies in Language and Communication). London; Oakville, CT: Equinox.
Star SL (1985) Scientific work and uncertainty. *Social Studies of Science* 15(3): 391–427.
Star SL and Griesemer JR (1989) Institutional ecology, 'translations' and boundary objects: Amateurs and professionals in Berkeley's museum of vertebrate zoology, 1907–39. *Social Studies of Science* 19(3): 387–420.
Stinchcombe AL (2001) *When Formality Works: Authority and Abstraction in Law and Organizations*. Chicago, IL: University of Chicago Press.
Svensson LEO (2010) Inflation targeting. In: Friedman BM and Hahn FH (eds) *Handbook of Monetary Economics*. Amsterdam: Elsevier, pp.1237–1302.
Tarullo DK (2017) *Monetary policy without a working theory of inflation*. Hutchins Center Working Paper 33. Washington, DC: Hutchins Center on Fiscal & Monetary Policy, The Brookings Institution.
Tavory I and Eliasoph N (2013) Coordinating futures: Toward a theory of anticipation. *American Journal of Sociology* 118(4): 908–942.
Thévenot L (1984) Rules and implements: Investment in forms. *Social Science Information* 23(1): 1–45.
Thiemann M (2014) In the shadow of Basel: How competitive politics bred the crisis. *Review of International Political Economy* 21: 1203–1239.
Thiemann M (2019) Is resilience enough? The macroprudential reform agenda and the lack of smoothing of the cycle. *Public Administration* 97(3): 561–575.
Thiemann M, Melches CR and Ibrocevic E (2021) Measuring and mitigating systemic risks: How the forging of new alliances between central bank and academic economists legitimize the transnational macroprudential agenda. *Review of International Political Economy* 28(6): 1433–1458.
Thornton PH and Ocasio W (1999) Institutional logics and the historical contingency of power in organizations: Executive succession in the higher education publishing industry, 1958–1990. *American Journal of Sociology* 105(3): 801–843.
Tymoigne E (2009) *Central Banking, Asset Prices and Financial Fragility* (Routledge International Studies in Money and Banking 51). London and New York: Routledge.

Velthuis O (2015) Making monetary markets transparent: The European Central Bank's communication policy and its interactions with the media. *Economy and Society* 44(2): 316–340.

Volcker PA (1978) The role of monetary targets in an age of inflation. *Journal of Monetary Economics* 4(2): 329–339.

Walter T (2019) Formalizing the future: How central banks set out to govern expectations but ended up (en-) trapped in indicators. *Historical Social Research / Historische Sozialforschung* 44(2): 103–130.

Walter T (2020) The Janus face of inflation targeting: How governing market expectations of the future imprisons monetary policy in a normalized present. In: Fritsche U, Köster R and Lenel L (eds) *Futures Past: Economic Forecasting in the 20th and 21st Century*. Berlin: Peter Lang, pp.105–138.

Walter T (2022) The social sources of unelected power: How central banks became entrapped by infrastructural power and what this can tell us about how (not) to democratize them. In: Vallet G, Kappes S and Rochon L-P (eds) *Central Banking, Monetary Policy and Social Responsibility*. Cheltenham; Northampton, MA: Edward Elgar Publishing, pp.195–218.

Walter T and Wansleben L (2020) How central bankers learned to love financialization: The fed, the bank, and the enlisting of unfettered markets in the conduct of monetary policy. *Socio-Economic Review* 18(3): 625–653.

Wansleben L (2018) How expectations became governable: Institutional change and the performative power of central banks. *Theory & Society* 47(6): 773–803.

Wansleben L (2021) Divisions of regulatory labor, institutional closure, and structural secrecy in new regulatory states: The case of neglected liquidity risks in market-based banking. *Regulation & Governance* 15(3): 909–932.

Wansleben L (2023) *The Rise of Central Banks: State Power in Financial Capitalism*. Cambridge, MA: Harvard University Press.

Werning I (2022) *Expectations and the Rate of Inflation* (w30260, July). Cambridge, MA: National Bureau of Economic Research.

Woodford M (2003) *Interest and Prices Foundations of a Theory of Monetary Policy*. Princeton, NJ; Oxford: Princeton University Press.

Zaloom C (2009) How to read the future: The yield curve, affect, and financial prediction. *Public Culture* 21(2): 245–268.

Zietsma C and Lawrence TB (2010) Institutional work in the transformation of an organizational field: The interplay of boundary work and practice work. *Administrative Science Quarterly* 55(2): 189–221.