

Beckert, Jens; Bronk, Richard

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## Uncertain futures: Imaginaries, narratives, and calculative technologies

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MPIfG Discussion Paper 19/10

**Uncertain Futures**

Imaginarities, Narratives, and Calculative Technologies

Jens Beckert and Richard Bronk



Jens Beckert and Richard Bronk  
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**About the authors**

Jens Beckert is a Director at the Max Planck Institute for the Study of Societies in Cologne, Germany.  
Email: [beckert@mpifg.de](mailto:beckert@mpifg.de)

Richard Bronk is a Visiting Senior Fellow at the European Institute of the London School of Economics and Political Science.  
Email: [r.bronk@lse.ac.uk](mailto:r.bronk@lse.ac.uk)

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Max-Planck-Institut für Gesellschaftsforschung  
Max Planck Institute for the Study of Societies  
Paulstr. 3 | 50676 Cologne | Germany

Tel. +49 221 2767-0

Fax +49 221 2767-555

[www.mpifg.de](http://www.mpifg.de)

[info@mpifg.de](mailto:info@mpifg.de)

## Abstract

Dynamic capitalist economies are characterised by relentless innovation and novelty and hence exhibit an indeterminacy that cannot be reduced to measurable risk. How then do economic actors form expectations and decide how to act despite this uncertainty? This paper focuses on the role played by imaginaries, narratives, and calculative technologies, and argues that the market impact of shared calculation devices, social narratives, and contingent imaginaries underlines the rationale for a new form of ‘narrative economics’ and a theory of fictional (rather than rational) expectations. When expectations cannot be anchored in objective probability functions, the future belongs to those with the market, political, or rhetorical power to make their models or stories count. The paper also explores the dangers of analytical monocultures and the discourse of best practice in conditions of uncertainty, and considers the link between uncertainty and some aspects of populism.

**Keywords:** calculation, fictional expectations, future, imaginaries, innovation, narrative economics, uncertainty

## Zusammenfassung

Kapitalistische Ökonomien sind durch unablässige Neuerung gekennzeichnet. Innovationen zeigen eine Unbestimmtheit, die nicht auf meßbares Risiko reduziert werden kann. Wie bilden Akteure in der Wirtschaft Erwartungen und legen ihre Handlungen im Angesicht dieser Ungewissheit fest? Der Beitrag befasst sich mit der Rolle von Vorstellungen, Narrativen und kalkulativen Techniken in der Wirtschaft und zeigt, dass die Bedeutung verwendeter kalkulativer Instrumente, sozial geteilter Narrative und kontingenter Vorstellungen eine neue Form „narrativer Wirtschaftswissenschaft“ und einer Theorie fiktionaler (anstelle von rationalen) Erwartungen notwendig macht. Wenn Erwartungen nicht in objektiven Wahrscheinlichkeitsfunktionen verankert werden können, gehört die Zukunft denjenigen, die über die marktliche, politische oder rhetorische Macht verfügen, ihren Erzählungen Geltung zu verschaffen. Der Beitrag befasst sich im letzten Teil mit den Gefahren analytischer Monokulturen und dem Diskurs zu „best practices“ in durch Ungewissheit gekennzeichneten Situationen und leitet daraus einige Schlussfolgerungen für das Verständnis von Populismus ab.

**Schlagwörter:** fiktionale Erwartungen, Innovation, Kalkulation, narrative Wirtschaftswissenschaften, Ungewissheit, Vorstellungen, Zukunft

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## Uncertain Futures: Imaginaries, Narratives, and Calculative Technologies

It is a great pleasure to speak at the Harvard Kennedy School. Our joint lecture is the product of an enjoyable collaboration with each other – and indeed with the other contributors to our new book, *Uncertain Futures*.<sup>1</sup>

When Professor Sheila Jasanoff invited us to speak in this Science and Democracy series, she challenged us to focus on implications of our argument for the science of economics and for politics. *Uncertain Futures* is an interdisciplinary project that examines how economic actors combine imaginaries and narratives with calculative technologies to structure their expectations and decisions in conditions of uncertainty. Our exploration of how entrepreneurs and policymakers in practice deal with the uncertainty at the heart of contemporary capitalism has a number of implications for the science of economics. In particular, the importance of fictional expectations – of imaginaries and narratives – implies the need to analyse the contingent interpretations that economic actors place on their uncertain predicament. At the same time, the indeterminacy of the future, and the performative impact of stories and calculative technologies in shaping that future, has implications for the nature of political power and for policy practice. In a nutshell, we argue that power belongs to those with the market, political, or rhetorical strength to make their models or narratives count; and, since no calculative technology can accurately predict uncertain futures, policymakers need to use a plurality of diverse models to help *diagnose* emerging patterns. We come back to these points later.

We are speaking in the home of the co-production<sup>2</sup> school of Science and Technology Studies, and much that we say in this lecture about the role of social imaginaries in economics is relevant to this approach. The co-production of scientific knowledge and

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This is an edited and expanded version of the transcript of a joint lecture given in the Science and Democracy Lecture Series at Harvard Kennedy School on October 23, 2019. Drawing on arguments from our recently published edited volume *Uncertain Futures: Imaginaries, Narratives, and Calculation in the Economy* (Oxford University Press, 2018), it considers implications for the science of economics and for policy and politics. The lecture was given at the kind invitation of Professor Sheila Jasanoff.

- 1 Jens Beckert and Richard Bronk, eds., *Uncertain Futures: Imaginaries, Narratives, and Calculation in the Economy* (Oxford University Press, 2018). The lecture and edited volume are the products of a research collaboration which started with a MaxPo-sponsored conference at the Institut d'études avancées de Paris in April 2016. This collaboration in turn draws on earlier books: Richard Bronk, *The Romantic Economist: Imagination in Economics* (Cambridge University Press, 2009); and Jens Beckert, *Imagined Futures: Fictional Expectations and Capitalist Dynamics* (Harvard University Press, 2016).
- 2 For a discussion of the 'co-production' of science and social order, see Jasanoff (2004).

social structures has a different quality in the case of economics than in, say, astronomy or biology: in all three cases, we are dealing with what Adam Smith ([1795] 1980) called ‘inventions of the imagination’<sup>3</sup> – scientific systems conjured up to make sense of the manifold chaos of brute reality in ways that are intimately bound up with socially embedded theoretical frames. But where economics (like all social science) differs from physical sciences is that it engages with a reality that is *pre-interpreted* by the actors enacting it. What is more, in modelling or forecasting an indeterminate future yet to be created by how social actors expect, model, or *will* it to be, the calculative devices of economics help shape the future. Increasingly, calculative technologies – like other technologies – are integral components of the social and market order, shaping and shaped by that order. It is in this deep sense that we can say that economic knowledge is ‘co-produced’ with social reality. Human imagination pervades both the science of economics and its socio-economic subject matter, enabling both to be constantly re-fashioned and reconceived in novel and mutually constitutive ways.

But let us return to *Uncertain Futures*. When we chose the book’s title in early 2016, it seemed quite brave, given the relative lack of interest in ‘Knightian’ or radical uncertainty<sup>4</sup> within the economics profession. Now – after the Brexit vote, Trump’s trade wars, and the populist challenge to neo-liberalism – the title may seem a rather obvious attempt to focus on the current turmoil facing Western political economies. In truth, though, our argument comes from many years of research we have undertaken to understand the role of imaginaries and narratives in driving the economy and the uncertainty they imply; and we explicitly build on the ideas of economic thinkers of the mid-twentieth century – Joseph Schumpeter, Frank Knight, John Maynard Keynes, Friedrich Hayek, and George Shackle – who wrote in the shadow of two world wars and the Great Depression.

*Uncertain Futures* draws on research in economic sociology, economics, history, anthropology, and psychology. While we provide the theoretical framework in the opening chapter, the rest of the book includes empirical case studies by thirteen authors including Robert Boyer, David Tuckett, Jenny Andersson, Andrew Haldane, Douglas Holmes, and Elena Esposito. They demonstrate how grand narratives, central bank forward guidance, calculative technologies, business plans, visions of the technological future, and new era stories shape expectations, influence behaviour, and become instruments of power.

In a nutshell, *Uncertain Futures* considers how economic actors visualise the future and decide how to act in conditions of radical uncertainty. We start from the premise that

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3 Smith ([1795] 1980) argued that scientific systems are ‘inventions of the imagination, to connect together the otherwise disjointed and discordant phenomena of nature’ – see discussion in Bronk (2009, 62) and Fleischacker (2004, 21).

4 For a discussion of Frank Knight’s famous distinction between radical ‘uncertainty’ and measurable ‘risk’, see Knight (1921).

dynamic capitalist economies are characterised by relentless innovation and novelty and hence exhibit an indeterminacy that cannot be reduced to measurable risk. In these circumstances, you can neither calculate the optimal course of action nor internalise the correct model of the economy – as standard rational expectations theory assumes. To put it simply, when the world is uncertain, you cannot know what the best model *will* be, and the past may not be a good guide to the future. The organising question for us is then: How do you form expectations and decide how to act *despite* this uncertainty?

Our headline answer is that, in conditions of uncertainty, economic actors combine calculation with imaginaries and narratives to form ‘fictional’ expectations that coordinate action, express power, and provide the confidence to act. Indeed, we argue that the market impact of shared calculation devices, social narratives, and contingent imaginaries underlines the need for a new form of ‘narrative economics’ and a theory of fictional (rather than rational) expectations. This approach takes seriously the social construction and contingency of expectations and therefore market prices; and it recognises that, in cases where expectations cannot be anchored in objective probability functions, the imaginaries and narratives that guide our behaviour are partly a function of market or political power.

## 1 Fictional expectations and other working fictions

To avoid misunderstanding at the outset: when we talk about ‘fictional expectations’ we do *not* mean that economic agents engage in wilful *fantasies* instead of trying to act in their best interests. What we allude to instead is that, in conditions of radical uncertainty, agents act at the boundary between current reality and what *may* yet happen. This implies that statements regarding uncertain futures – and how to reach or avoid such futures – necessarily entail assumptions that cannot be based solely on observable truths. Intentionally rational decisions must be based on how we imagine the future – on the kind of “*as-if*” thinking central to fictional texts.

The fictional element envisaged here is complementary to – and more radical than – the constructive and contingent fictions that Hans Vaihinger (1924) and others (working in the Kantian tradition) argue are necessarily a feature of any attempt to make sense of brute reality. We all act *as if* the world-as-it-really-is resembles the world-as-it-appears-to-us when constructed according to contingent categories and linguistic frames our minds supply. As the poet William Wordsworth put it: ‘In weakness we create distinctions, then / Believe that all our puny boundaries are things / Which we perceive and not which we have made.’<sup>5</sup> In other words, all rational analysis – indeed all perception

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5 Wordsworth, William, ‘Fragment’, dated by E. de Selincourt to 1798–1800. Reproduced and discussed in Bronk (2009, 285).



– is to some extent fictional in the sense of being a necessarily contingent construction of reality-as-it-appears-to-us.

To this primary element of *constructive fiction* in all human understanding of the world, we can add a second – one that builds on our earlier observation that, when you try to make sense of societies and economies, you are interpreting a *social* reality that is *pre-interpreted* by the actors enacting it. This means that – as economic actor or social scientist – you must interpret the fictional constructions that others place on their predicament because these contingent fictions structure social reality by influencing behaviour. Social analysis is thereby a sort of *reflexive fiction* – a fictional narrative about guiding fictions.

To these necessary and reflexive types of working fictions by which we all live our lives, we add a third. When dealing with the indeterminate and uncertain future, our expectations are fictional in a more radical sense: it is not just that – epistemologically speaking – we are always deprived of unmediated access both to the world-as-it-really-is and to the contingent and socially performative interpretations of others; it is that in an ontological sense there is no socio-economic future-as-it-really-will-be ‘out there’ ahead of its creation by how we and others imagine and will it to be. Our *fictional expectations* can have no anchor in – or uniquely rational relation to – underlying future reality for the simple reason that the future does not yet exist. We will come back to this point later.

## 2 Radical uncertainty and the implications for economics

Let us first return to our central premise: that uncertainty – radical uncertainty – is a core feature of modern economies. Given the ubiquity in modern capitalism of calculative technologies dedicated to forecasting and planning economic futures and measuring the risks faced, it might seem strange to insist that the future is open and indeterminate. But, as an individual or firm, you often imagine and plan for an array of possible futures and choose between a number of options without fully predictable outcomes. And this freedom to invent new possibilities comes in the context of an economic system that is continually generating novelty. It was Schumpeter ([1943] 1976, 84) who first pointed out that the competition that counts comes from ‘the new commodity, the new technology ... the new type of organization.’ The consequent ‘process of industrial mutation’, he argued, ‘incessantly revolutionizes the economic structure *from within*’; and this ‘process of Creative Destruction is the essential fact about capitalism’ (ibid., 83). In other words, the innovations that upset previously stable regularities are not occasional external shocks (as most standard economics assumes); instead they lie at the heart of market systems.

Novel technologies and organisations are not the only source of indeterminacy in the economy. Global financial markets are highly interdependent networks with all the classic properties of *complex adaptive systems*: this means that instead of responding to shocks by returning to some pre-ordained equilibrium, they frequently display threshold effects and increasing returns, so that small changes in initial conditions snowball into radically new outcomes and long periods of disequilibrium.<sup>6</sup> What is more, in the neo-liberal policy paradigm, markets are subject to a continual process of deregulation and policy reform – freeing them from institutional constraints that previously channelled ‘the sources of contingency’ (Offe 1998, 682), and contributing to what Zygmunt Bauman (2000) memorably dubbed ‘liquid modernity’. Finally, as Karl Polanyi ([1944] 1957) observed, attempts to sustain market capitalism frequently lead to counter-movements of social and political protest; and the Brexit vote and the election of Trump serve to remind us how unpredictable and far-reaching the political, social, and economic crises associated with these counter-movements can become.

So, what are the implications of this indeterminacy at the heart of modern capitalism? One is that the future cannot be understood as a statistical shadow of the past: you cannot simply project past regularities into the future and use statistics based on past data to provide probabilistic predictions. Nor can the past tell you what the correct model of the indeterminate future *will* be. For example, many models that appeared to hold for monetary policy before the policy innovation of quantitative easing do not work now. What is more, the first-order uncertainty implied by any particular innovation is compounded by uncertainty about the second-order creative reactions and contingent interpretations of others. Not only are you unable to know what the direct impact of an innovative move will be, you also cannot know how others will react. Your expectations and your expectations of the expectations of others cannot be anchored in an agreed future because, as Shackle ([1972] 1992, 3) put it, ‘What does not yet exist cannot now be known.’ In such circumstances, you can neither calculate the optimal outcome nor predict the future. Your expectations are indeterminate.

Part of the motivation for our project was that standard economics fails to explain how expectations are formed and decisions made when this sort of uncertainty prevails. It largely ignores the radical uncertainty caused when innovation – the imagining of new options – breaks the predictable links between the past and the future; or it conflates such uncertainty with what Knight (1921) called measurable ‘risk’. In other words, standard economics assumes that the future is always a statistical shadow of the past and – except for random events – can be predicted in probability terms with the help of sufficient data. Indeed, it generally assumes that – once you have allowed for the predictable distortions of framing biases and information asymmetries – economic agents will converge on rational expectations: they will internalise the correct model of the economy, and avoid systematic errors in forecasting, because they would otherwise lose out in competitive markets to those with more rational expectations.

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6 See the discussion in Arthur (2015) and Haldane (2018).

These assumptions may be valid in a world of stable parameters. But our point is that in conditions of radical uncertainty – where the set of possible states of the world is unknowable – you have no choice but to rely on imaginaries and narratives about the future. Think of tech start-ups whose value is sustained by little else but narratives of future profits. Such contingent imaginaries serve two purposes: they structure expectations; and they reshape the future by motivating behaviour. In this way, imagination is a root cause of novelty and uncertainty, as well as our best tool for coping with both.

Our focus on this role of contingent narratives and imaginaries goes beyond the critique of standard economics seen in behavioural economics. Behavioural economists argue that, faced with ambiguity, you resort to predictable heuristics and cognitive frames to make decisions. While this is certainly true on many occasions, it provides only a partial explanation of decision-making. If you think of the innovative ventures central to capitalist dynamics over the last 200 years, they would be poorly explained by cognitive regularities. Rather, their hallmark was that entrepreneurs, investors, and consumers were attracted by imagined futures that were novel.

Our focus on imaginaries and contingent narratives bears more similarity to the ‘narrative economics’ that Robert Shiller (2019) outlines in his new book of the same name. But, while Shiller takes seriously the role of narratives in explaining key changes in the economy, his theoretical focus is largely on the role of epidemiology models in capturing the *contagion* dynamics underlying the diffusion of influential stories. By contrast, our theoretical focus is on how uncertainty can explain why and under what conditions narratives become important.

### 3 Expectations in conditions of uncertainty

But let us return to how we characterise the nature of expectations in conditions of uncertainty. We argue that you should see expectations as fictional rather than rational. When the future is not already ‘given’; when it cannot be assumed to exist as an objective shadow of the past; when there is no fixed anchor in underlying reality for expectations because the future does not yet exist and cannot now be known, then your expectations must be fictional in the sense of going beyond observable truths. What is more, in conditions of uncertainty, your expectations tend to be fluid and experimental and involve imaginative play with different images of the possible future – as John Dewey ([1922] 1957) has explained. Crucially, your expectations do not normally take the form of probability forecasts; rather, they adopt a narrative structure and rely on the rhetorical power of language for the degree of conviction they excite.

Fictional expectations differ from literary fictions, of course, in their impact and in the critical scrutiny to which they are exposed: if they appear desirable and feasible, they

inspire you to act in ways designed to bring about that imagined future; if, on the other hand, they fill you with anxiety or disgust, they incite action designed to foil the imagined future. But the point remains that your expectations are contingent products of how you happen to imagine the future.

Such imaginaries are not entirely individually formed. Like Sheila Jasanoff and Sang-Hyun Kim's notion of sociotechnical imaginaries (Jasanoff and Kim 2013), fictional expectations are the product of social narratives and historically anchored public images conjured up by powerful opinion-formers. As a result, market prices and behaviour reflect the contingent and socially constructed visions that influence decisions. This explains why, as Keynes (1936) observed, market traders are highly attentive to dominant narratives.

Now this is all very well you may say; but do we not see traders, investors, and policy-makers ever more reliant on mathematical models and algorithms that appear to calculate the very macroeconomic futures we insist are radically uncertain? How is such calculation being used if the expectations they give rise to are fictional? It is certainly true that fictional expectations make explicit use of calculative technologies. The future we imagine is shaped by models and predictive instruments. Indeed, these technologies should be seen as 'instruments of the imagination' (Beckert 2016). Imaginaries, as Jasanoff (2015, 5) puts it, are 'intimately linked to science and technology'.

Several chapters in our book analyse how calculative devices organise and subject to rigorous analysis visions of the future that have their origin in imaginaries, or make visible possible futures that would otherwise not have been imagined: the business plan is used to demonstrate the feasibility of capturing an imagined new market in the light of known constraints (Giraudeau 2018); and the discounted cash flow model helps agents experimentally visualise and value options they might not otherwise have articulated (Doganova 2018). Likewise, a variety of forecasting technologies are used as diagnostic tools for teasing out systematic regularities and spotting emerging patterns, and they act as scientific 'props' for fictional expectations by elucidating key causal mechanisms. This is a perfect example of what William Hazlitt ([1805] 1998, 21) called 'reasoning imagination': models stress-test imaginaries for plausibility in the light of such knowledge as we have about emerging patterns and stable constraints, and they help flesh out different possibilities.

This brings us to a crucial point: just because the future is uncertain does not mean that you have no clue about the future. Being unable to calculate future probabilities objectively does not mean that you are dependent on uninformed fantasies. Any situation is structured by past investments, institutions, and the structures of social networks which channel what can be reasonably expected. The key to success in uncertain markets is to use analytical techniques to provide you with an understanding of the situation and the multiple possibilities and factors impacting on outcomes. In this sense, imaginaries are informed and enable you to make better judgments of how to act when you cannot know for certain what the best course of action will be.

Think, for example, about macroeconomic forecasts. Such forecasts are notoriously unreliable at predicting the future with precision – with outcomes often well outside the statistical ranges covered by the predictions of almost all prestigious forecasters. But if forecasting is so unreliable, why do governments and firms spend millions on it? Part of the answer lies in the underappreciated role of the forecasting process as a *diagnostic tool* for teasing out emerging patterns. As Werner Reichmann (2018) and Douglas Holmes (2018) argue in our book, the ‘foretalking’ and ‘conversation’ with a variety of economic actors that forecasters undertake while preparing their forecasts help identify emerging trends and new scenarios that would otherwise not have been considered. At the same time, their forecasts highlight causal mechanisms likely to be relevant even if the point forecasts are almost inevitably adrift.

Forecasts also perform important social roles in conditions of uncertainty: first, they help coordinate your beliefs with others. When you operate in a complex and innovative economic system, you are not only uncertain about the situation itself, you are also uncertain about the contingent expectations and beliefs of other actors. And it is this self-reinforcing uncertainty problem that makes it difficult to coordinate action. Here forecasts can help: they act as a reference point by creating shared expectations that allow you to act *as if* the future were knowable. Without working assumptions provided by shared forecasts, there would be very little investment.

Perhaps the most important social role played by forecasts is to justify and legitimise decisions *despite* the uncertainty faced. Calculative technologies justify decisions by providing reasons for action and evidence of due diligence. This legitimising role of models and forecasts may be benign so long as their status as generators of informed imaginaries is remembered. But, if they are used to *pretend* that it is actually possible to turn uncertainty into measurable risk, then this pretence can pose a threat to stability. Modern managers and policymakers like using calculative technologies as props for decision-making because they meet the requirements of what Michael Power (2007, 197) calls the ‘logic of auditability’, with its ‘cultural ideals of precision, proof and calculability’. But this institutional incentive for unwarranted precision can lead to the sort of ‘scientism’ that Hayek ([1952] 2010, 80) warned about, where decision makers engage in a ‘slavish imitation of the method and language’ of the mechanical sciences and apply them in ways that are simply inappropriate for the indeterminate and complex socio-economic subject matter of markets. The result is a dangerous illusion of control over the unknowable future.

Take, for example, investment banks before the financial crisis, whose risk models indicated that a crash of the sort seen after August 2008 would be something like a 25-standard deviation event (Haldane 2009); these models enabled the banks to act *as if* such an outcome was almost impossibly unlikely. And the problem runs deeper than that: the assumptions and modelling practices used constituted the very grammar or internal

logic for structured finance markets.<sup>7</sup> As Donald MacKenzie (2006) puts it, a finance model is not so much a ‘camera’ recording current pointers to the future as an ‘engine’ structuring the future by creating the possibility of markets. In other words, the models used create market practices in their own image. Suffice it to say, when the models providing the internal logic for structured finance markets involve an underlying confusion between measurable risk and the radical uncertainty implied by innovation, then these highly innovative markets may lead to uncontrollable volatility. As Elena Esposito (2018, 228, 233) argues in our book: ‘Like all fictions, financial models about the future are extremely controlled constructions’; but, since ‘they are not accurate representations of a future reality’, they can end up ‘reproducing’ the very uncertainty they claim to control.

#### 4 Narratives

Fictional expectations are usually anchored in narratives and stories. Narratives help make sense of the world: they give meaning to your actions and create the commitment to act. Narratives convey an imagined future to others. They may take the form of new era stories, promised fortunes, or dystopias that must be avoided. They may be influential in their own right, or become embedded in the assumptions of algorithms or other calculative technologies. As Harro van Lente and Arie Rip (1998) from the Sociology of Expectations school demonstrate in empirical studies of innovation processes, narratives assign roles to actors and technological objects and develop a ‘plot’ – a storyline of how an imagined future may unfold. Stories motivate by delineating an emotionally charged vision of the future. They provide a road map that helps counter anxiety in the face of uncertainty by simulating possible outcomes and making them feel tangible. In short, narratives provide a logic of action and populate the future with imaginaries that seem worth investing in. Aptly, David Tuckett (2018) speaks, in our book, of ‘conviction narratives’. And since narratives, if internalised by sufficient numbers, tend to influence outcomes, they inevitably become instruments of political or market power. The future is shaped by political battles to establish the dominance of particular narratives.

An economic example of these battles is the increasing use by central banks of ‘forward guidance’ to cajole expectations in the desired direction. As Douglas Holmes (2018, 174, 178) argues in our volume, by communicating a picture of the future evolution of the economy, a central bank can enlist the public’s help in reaching macroeconomic targets with rhetoric alone. In this way, communication becomes the ‘decisive means to achieve’ the goals of policy; or, in the words of Ben Bernanke, the former governor of the US

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7 For a discussion of how certain ‘technical’ risk measurement practices (in particular cardinal measures of credit risk) enable ‘the creation of structured finance securities in the first place’, see Besedovsky (2018).

Federal Reserve: ‘monetary policy is 98% talk and only 2% action’ (Bernanke 2015). Perhaps the most famous example of the power of central bank rhetoric was the enormous market effectiveness of the simple statement by Mario Draghi in 2012 that the European Central Bank would do ‘whatever it takes’ to rescue the euro (Draghi 2012). These three words are generally credited with turning the corner in the euro crisis and bringing stability back to market expectations. The direction of capitalist economies then increasingly appears to be the outcome of a struggle between different state and market actors to establish their narratives as the most credible.

Let us return to the crucial problem of managing expectations in innovative sectors of the economy. It is of course in radically innovative sectors that uncertainty about the future is most extreme, and yet it is precisely in these sectors that some stabilisation of expectations is required for investment to be made in new products or processes. If innovative ideas are to corner the resources needed to make them a reality, they require promissory stories that help coordinate investment. Such blueprints, technology roadmaps, and business plans are instruments of coordination in a field of multiple possible futures: they determine which development paths are followed and which remain unexplored, thereby reducing the indeterminacy of the future. The Research and Development trajectories of whole industries are often determined by competition to establish the dominance of one new era story over another.

But herein lies a paradox: it is well understood that innovative ideas are the product of cognitive dissonance, the clash of competing narratives, and constant trial and error. Any innovator must avoid becoming locked into one way of analysing problems and be willing to engage in constant ‘narrative shifting’ (Lane and Maxfield 2005, 16) to make sense of fast changing trends. So, there is a trade-off here between the advantages of shared expectations and the dangers of an analytical monoculture that leads to widely shared cognitive blind spots and a consequent failure to spot new trends or opportunities.<sup>8</sup> Indeed, throughout policy and business, there is a trade-off between the positive coordination effects of stabilising and homogenising expectations to reduce uncertainty (on the one hand) and the value of retaining a diversity of expectation-guiding models and narratives – the better to cope with uncertainty (on the other). Perhaps this is the central conundrum of modern life. Do we attempt to reduce uncertainty by choosing one dominant narrative or calculative technology in the hope of building a world in its image? Or do we navigate and exploit uncertainty better by remaining flexible in how we envisage the unfolding future?

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8 See the discussion of this trade-off in innovative industries in Ergen (2018).

## 5 The dangers of analytical monocultures

To help answer this, it is worth exploring further the danger of ‘analytical monocultures’ (Bronk 2013). It is a truism of post-Kantian thought that the world you see – the evidence you collate – is partly constructed by the conceptual grids your mind supplies. In other words, the facts or data you use are necessarily framed and selected by the theories and narratives you internalise. And because all narratives and models are incomplete – they are simplifications<sup>9</sup> – if everyone relies on one and the same story or model, everyone tends to share the same analytical blind spots.

At least since Wittgenstein ([1953] 2001) and Bourdieu ([1972] 1977), it has also been understood that these semi-conscious mental maps are embedded in habitual social and technological practices – that our shared *practices* and the *conceptual structures* framing our analysis and vision are *mutually constituted*. As Wade Jacoby and Richard Bronk argue in a paper, this makes it crucial for businesses, regulators, and academic researchers to avoid being trapped in analytical monocultures implied by the discourse of *best practice* (Bronk and Jacoby 2016). In conditions of uncertainty, you cannot know what the best practice *will* be, and any set of practices entails blind spots. Total harmonisation of practice around the ‘best’ model available is equivalent to relying in agriculture on a single crop strain when you do not know whether the chosen strain will be resistant to the next new pest. If everyone shares the same policy practice or calculative technology and thereby internalises the same framing assumptions and conceptual grid, they interpret events in the same way and share the same cognitive blind spots.

One cause of the financial crisis, for example, was that the major banks and regulators fell under the spell of what Michael Power (2007, viii) calls the ‘grand narrative of risk management’ promising an illusion of control over the unknowable future. In particular, they relied in everyday practice on a type of value-at-risk model that assumed uncertainty could be turned into probabilistic risk. When this shared assumption proved deeply mistaken, nearly everyone in the market was wrong-footed at the same time. The result was a highly correlated correction to market prices – in other words, a crash. More generally, as Robert Boyer (2018) argues in our book, modern financial markets and global capitalism – precisely because they are prone to uncertainty – tend to converge on a series of beguiling grand narratives that each serves for a time to coordinate investment and increase confidence. But when each one in turn is found wanting, the consequent shift to a new grand narrative is associated with a rapid reset of expectations and market prices. Indeed, the only antidote to such destabilising market dislocations caused by ‘groupthink’ – or ‘*groupfeel*’ (Tuckett 2018, 76) – may be to encourage a greater pluralism in narratives, models, and institutional regimes, and to refrain from privileging regulatory harmonisation around best practice as a policy goal. Markets are more stable when driven by a diverse range of practices and associated structuring assumptions.

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9 As Peter Diamond (2011, 1045–46) puts it, ‘It is worth remembering that models are incomplete – indeed, that is what it means to be a model.’



## 6 Re-imagining economics

This has implications for the discipline of applied economics. It suggests the need for ‘disciplined eclecticism’, where the choice of model is driven by a ‘pre-analytical audit’ of the problem being analysed from multiple perspectives; and where research results are subject to a ‘post-analytical audit’ by those in different disciplines using diverse models (Bronk 2009, 276–87). In other words, researchers and policymakers must combine the conviction necessary for analysis or action with what the poet John Keats ([1817] 1998, 1019) calls ‘negative capability’ – the capacity to be in ‘uncertainties, mysteries, doubts, without any irritable reaching after fact and reason.’ You can only spot emerging patterns and create new solutions if you are receptive to new pointers and flexible in how you see the world.

More generally, economists and policymakers need to *interpret* the contingent and diverse ways in which economic actors visualise and imagine uncertain futures. This puts a premium on what the co-founder of the LSE Beatrice Webb ([1883] 1958) called ‘analytical imagination’ – the ability to project yourself into the contingent mindset of others and understand how they see the world. At a discipline level, it also implies the need for rigorous *discourse analysis* of the narratives motivating actors in indeterminate circumstances; such discourse analysis forms a key part of our approach.

Another facet of our approach that differs from standard economics mirrors Sheila Jasanoff’s emphasis on the scrambling together of micro and macro (Jasanoff 2004). In one sense, our book provides an alternative set of *micro*-foundations for economics – with agents combining rational calculation with imaginaries. But the fictional expectations motivating *individual* behaviour are heavily dependent on *social* narratives and shared scripts at the macro level. The indeterminacy of economic futures is partially constrained by this social construction of expectations, but it is not eliminated. Indeed, social structures and framing narratives are frequently re-interpreted by narrative-entrepreneurs intent on re-imagining the future and convincing others of their novel visions.

One response to our explanatory focus on contingent imaginaries and narratives is to wonder if they are epiphenomenal – or essentially superfluous – to a standard economics focus on *interests* or a political science focus on *power*. If the narratives and imaginaries that count and help perform the future are sorted according to dominant interests, or if their salience is a function of market or political power, does an analytical focus on them change as much as we claim? Our answer is that the very interests that actors pursue are constituted by how they imagine the future; their interests are defined by the shared imaginaries through which they make sense of their predicament. So, for example, Jenny Andersson (2018, 85) demonstrates in our book how the interests that states pursue in the Arctic are formed through ‘a repertoire of future-making’ including forecasts, narratives, and normative images. Likewise, power is increasingly a function of the ability to craft narratives or public images that engage citizens’ imaginations. In both cases, the

determining factors – interests and power – are contingent creations of how we individually and collectively imagine, or are coerced into imagining, the uncertain future.

## 7 The politics of uncertain futures

Our argument has focused on how *economic* actors make decisions despite radical uncertainty and the implications for policy and the science of economics. But let us turn briefly to the *political* significance of the argument. When the future is indeterminate and the expectations motivating behaviour cannot be anchored in some pre-existing future reality, expectations have an important role in *creating* the future. In this sense, there is something inherently *political* about economies built on fictional expectations: the choice of which imaginaries, stories, or calculative devices structure beliefs and behaviour becomes a legitimate object of political challenge and debate. And it goes without saying that there is an unequal distribution of the market, political, or rhetorical power to ensure that any particular imaginary, narrative, or calculative technology counts.

The analogies with the world of contemporary politics are clear: at a time of economic uncertainty and social turmoil, *voters'* expectations are also cast adrift from their traditional or socially embedded moorings. In this environment, political power rests with those able to fashion and disseminate simple narratives promising to banish insecurities and build an appealing future. Indeed, at times politics seems reduced to a battle of warring narratives – where nostalgic visions of ‘taking back control’ or ‘making America great again’ trump careful analysis, or where dystopian visions of chaos caused by immigration change the course of history. This makes it imperative for political systems to rediscover ways in which different visions of the future can be calmly debated, and trade-offs between different normative goals can be made in the light of known facts or environmental constraints.

Let us end with four pointers to why this task may be challenging in our uncertain times:

First, political systems rely as much on their ‘promissory legitimacy’ as on their established success (Beckert 2019). In particular, many of the changes implied by the neo-liberal economic agenda have relied for their legitimacy on the promise – the imaginary – of greater prosperity and liberty for all in the wake of increased liberalisation, deregulation, and globalisation. When this imaginary was crushed in the eyes of many by the financial crisis and years of median-wage stagnation, voters became increasingly disillusioned with the blueprints being advocated by those in authority.

Secondly, one of the inherent promises of capitalist systems is that the uncertainty implied by Schumpeter’s ‘creative destruction’ – or Ulrich Beck’s ‘whirlpool of change’ (Beck 1992) – is merely the unwelcome flipside of a cherished freedom to choose among

newly imagined options and transcend the shackles of the past. But the benefits of this freedom to innovate and create new worlds increasingly seem to accrue largely to an elite, while the costs of associated rapid social dislocation fall most heavily on those with few educational or financial resources.

Thirdly, uncertain futures call for expert *judgement* to tease out ambiguous pointers to emerging trends and compare the findings of diverse models. But our uncertain times have weakened the credibility of experts especially where they have made forecasts of unwarranted precision. And, sometimes even where their analysis and judgement were flawless, they are accused of crying wolf, because their scary pre-mortems of possible disasters ahead ensured that action was taken in time to avoid the outcome feared. This was the case when the ozone hole was mended by the precautionary outlawing of CFCs.

Finally, there is a paradox in much political action designed to avert negative scenarios and assuage voter anxiety. Like all innovation, new policy solutions break predictable links between past and future and have unforeseen and indeterminate consequences. However much we seek to limit the impact of uncertainty – or pretend it does not exist – it is an unavoidable feature of modernity.

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