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# Uncertainty and the Dangers of Monocultures in Regulation, Analysis, and Practice

Richard Bronk and Wade Jacoby


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## Abstract

Uncertainty is endemic to innovative economies and complex societies, but policymakers underestimate how damaging this is for many of their guiding assumptions. In particular, the discourse of best practice, "global solutions for global problems," and regulatory harmonization becomes questionable when there is substantial uncertainty about the future. This uncertainty makes it impossible to know what best practice *will* be and increases the danger that harmonization will result in highly correlated errors and shared analytical blind spots. The transnational harmonization of regulation has well-known advantages, but – especially in technocratic policy areas – also creates vulnerability to unexpected challenges by constraining how we *think* as well as homogenizing how we *act*. Faced with uncertainty, policymakers should be wary of monocultures in regulation, analysis, and practice, and instead focus on *managing* policy diversity to limit its costs. This paper's theoretical argument is grounded in philosophy, the history of ideas, and even biology. However, we also present empirical examples and consider some implications for political theory.

## Zusammenfassung

In von Innovation geprägten Ökonomien und komplexen Gesellschaften ist Unsicherheit allgegenwärtig. Politische Akteure unterschätzen systematisch, wie sehr sie ihre Leitgedanken untergräbt. Fundamentale Unsicherheit über die Zukunft stellt insbesondere den *Best-Practice*-Gedanken, „globale Lösungen für globale Probleme" sowie das Leitbild regulatorischer Harmonisierung infrage. Unsicherheit macht es unmöglich, vorauszusagen, was in der Zukunft *Best Practice sein* wird, und erhöht die Gefahr, dass sich aus Harmonisierungsbemühungen hoch korrelierte Fehler und weitverbreitete analytische blinde Flecken ergeben. Harmonisierung von Regulierung auf transnationaler Ebene hat bekannte Vorteile, jedoch schafft sie – insbesondere in technokratischen Politikbereichen – Verletzbarkeit bei unerwarteten Anforderungen, weil sie dazu führt, dass wir eingeschränkter *denken* und ähnlicher *handeln*. Politische Akteure sollten Monokulturen in Regulierung, Analyse und Praxis mit Vorsicht gegenübertreten und die Kosten politischer Diversität regelnd eindämmen. Die theoretische Argumentation dieses Discussion Papers basiert auf Gedanken aus der Philosophie, der Ideengeschichte und selbst der Biologie. Es werden jedoch auch empirische Beispiele erläutert und Implikationen für die politische Theorie diskutiert.

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# Uncertainty and the Dangers of Monocultures in Regulation, Analysis, and Practice

## 1 Introduction and policy context

It is commonplace to assert that global problems need global solutions. The usual implication is that regulatory solutions should be global in nature, so as to avoid unilateral local actions that may be self-defeating at system level.[1] The extended post-2007 economic, financial, and social crisis has, for example, led to renewed efforts to agree a better framework of harmonized regulations in finance at the global level (Basel III), in trade at the interregional level (TTIP, TPP), and in the euro area through the banking, capital markets, and fiscal unions. Further, in policy and business circles, the need for rational players to converge on "best practice" often seems to be the grand narrative of our age.[2]

By contrast, in this paper, we argue that – given the prevalence of radical uncertainty in many areas – the discourse of best practice often rests on a false assumption that it is possible to know *ex ante* what best practice *will* be. We also argue that global (or regional) convergence on a regulatory and analytical "monoculture" – where *all* those operating in a policy or business area come to have their behavior and analysis structured by the *same* norms and conceptual grids – is dangerous in conditions of uncertainty; for the resulting high correlations in any unforeseen errors and analytical blind spots may,

We would like to acknowledge the many helpful suggestions received from participants in research seminars at the European Institute, LSE (October 2013), the Council for European Studies conference (March 2014), the Max Planck Institute for the Study of Societies (February 2016) and the MaxPo/Institut d'études avancées de Paris conference (March 2016), where earlier versions of this argument were presented. For their detailed comments, we are especially grateful to Nicholas Barr, Jens Beckert, Suzanne Berger, Mark Blyth, Timur Ergen, Peter A. Hall, Bob Hancké, Eva Heims, Abby Innes, Richard Locke, Mareike Kleine, Annabelle Lever, Damian Raess, Aidan Regan, Dennis J. Snower, and Waltraud Schelkle. Stubborn shortcomings remain entirely our own responsibility.

1 See, for example, *WTO Public Forum 2009: Global Problems, Global Solutions*; and ex-UK Prime Minister Gordon Brown's, "Let's Stick Together," *New York Times*, November 30, 2011 (www.nytimes.com/2012/11/30/opinion/global/gordon-brown-global-economic-problems-need-global-solutions.html?pagewanted=all&_r=1&).

2 At the multilateral level, see, for example, the *OECD Best Practice Principles on the Governance of Regulators* (www.oecd.org/gov/regulatory-policy/governance-regulators.htm); or, at the national level, see the *Australian Office of Best Practice Regulation* (www.dpmc.gov.au/regulation/best-practice-regulation).

in turn, cause systemic instability. Finally, we suggest that Mill ([1859]1991: 71) was right to privilege the liberty to conduct diverse "experiments in living" as the bedrock of social learning and progress.

It is, of course, important to learn from the past; but the discovery of new and viable ways of navigating the unknown future is more likely when societies embrace the "generative friction" (Stark 2009: 16f.) implied by keeping a number of different approaches to regulation in play. This can be achieved by belonging to multinational institutional structures like the EU that combine the mutual recognition of different national regulations with joint institutions allowing for "deliberative polyarchy" (Sabel/Zeitlin 2010);[3] or by having federal structures within a single nation, such as the USA, that permit constructive friction between diverse practices (Eagan 2015; Dorf/Sabel 1998).

In highlighting the dangers of "global solutions to global problems" in the "thick" sense of *homogenous* worldwide standards of best practice (or convergence on a *single* set of regulatory and analytical models in any particular policy area), we are not committed to the absurd view that there is no need for global (or regional) *coordination* of national policies. Rather, our point is that modern policy discourse too often confuses the paramount need for *coordination* with a need for *homogeneity* of practice or *synchronicity* of performance.[4] Coordination is undoubtedly necessary to reduce the negative spillovers and costs of policy diversity and to limit free riding by some countries on the efforts of others. However, we call for a nuanced approach of *managing* policy diversity across nations to ensure such coordination, rather than effacing the very diversity that (in conditions of uncertainty) is essential for system-level resilience and the avoidance of highly correlated errors.

It is important to qualify our enthusiasm for policy diversity. First, our provocative intervention is explicitly targeted against multinational harmonization of regulations (and analytical models) in the technocratic areas of trade, finance, and economic or environmental management and not, for example, against legal convergence in the area of basic human rights. Second, our intervention is designed to shift perceptions of the *balance of advantage* between harmonization and diversity of regulation rather than to argue for a wholesale rejection of regulatory convergence. We recognize that some degree of harmonization is a *sine qua non* for social stability and economic order – particularly *within* nation states. Even at the multinational level, we do not claim that harmonization is always a mistake. Instead, we argue that, when making *judgments* about

3 Sabel and Zeitlin (2010) show that many aspects of EU governance, including colleges of regulators and the Open Method of Coordination, lend themselves to deliberative learning from the diverse practices and analytical traditions of member states.

4 So, for example, we would argue that a fatal error in the construction of the euro area was to assume that a focus (in the Maastricht criteria and elsewhere) on convergence (or synchronicity) of inflation rates, budget deficits, and long-term interest rates was a substitute for the coordination of economic policy. Indeed, given system externalities, it may be beneficial for the area as a whole to have economies on different trajectories.

the relative merits of harmonization and diversity of regulatory regimes, policymakers should take account of the serious epistemic and system-stability costs we identify as implied by excessive harmonization of analysis and practice. We also argue that the balance is most likely to favor policy diversity in conditions of uncertainty and when policymakers have access to (or can create) the institutional capacity to manage effectively the costs of such diversity.

Central to this paper is the premise that in technocratic areas of policy, key players are constrained in how they *think* by the specialist conceptual grids or mental priors associated with their everyday *practices* and regulatory environment. While in Section 4 we derive this premise from the philosophy of Wittgenstein and Kuhn, Tett (2015: 44f.) derives a similar assumption from the social anthropology of Bourdieu, with its focus on the mutual reinforcement of habitual practices or social environment, on the one hand, and the semi-conscious cultural norms or mental maps that structure thought, on the other. Tett (2015, *passim*) uses this premise to underline the dangers inherent in the *fragmentation* of policymaking and corporate institutions into rigid cultural "silos" associated with disciplinary or functional specialization. Tett further calls for "joined-up" thinking and the imaginative "flipping" of perspectives to overcome the perils of "tunnel vision."

The focus of the present paper is quite different. We believe that the biggest danger at system level arises when desire for universal best practice or the removal of trade barriers leads to the adoption (in any particular specialist area) of globally or regionally homogenous regulations, modeling frameworks, and routine practices. Such global or regional monocultures actually compound the problematic tunnel vision caused by operating in a single cultural silo. Indeed, we argue that worldwide homogenization of regulatory, management, or policy analysis and practice *within* any technocratic area (such as risk management or central bank forecasting) represents as big a danger as the fragmentation of analysis and practice into these technocratic silos in the first place. In other words, it is as crucial to allow for pluralism *within* each analytical or functional silo as it is to encourage those in the various silos to understand the importance of seeing the world from the perspective of another silo entirely. Such pluralism, we argue, is best guaranteed by the mutual recognition at international (or federal) level of different forms of regulation or institutional structure and different modes of practice and analysis. This is particularly the case when there are also multilateral institutions promoting learning from the diversity safeguarded in this way.

The foundations of the argument outlined in the present paper are theoretical rather than empirical and rooted in concepts from philosophy, biology, portfolio theory, and the history of ideas. However, before we consider the nature and implications of uncertainty and the systemic case for regulatory and cognitive diversity, it is useful to refer to two practical examples from the academic literature – one relating to trade and financial regulation and the other to climate change – that help establish the salience of our argument across a broad swathe of socio-economic, financial, and environmental policies.

First, Rodrik argues that the GATT trade regime may have been so successful in promoting growth and stability after World War II precisely because it combined multilateralism with mechanisms (such as derogations and safeguards) that allowed for a high degree of local policy discretion. He then compares this Bretton Woods approach with the headlong rush in the last twenty years toward global financial standards (and harmonized trading regulations) that has coincided with greater economic and financial instability. Rodrik's point is not merely that these new regimes ride roughshod over important national differences in structure or preference. His more profound point is that by striving for a global regulatory regime, policymakers are always in danger of "converging on the wrong set of regulations" (Rodrik 2009). The recent financial crisis has shown just how wrong previously accepted regulatory best practice can turn out to be, and Rodrik (2011: 224) draws what is for us the key conclusion: "In the light of the great uncertainty about the merits of different regulatory approaches, it may be better to let a variety of regulatory models flourish side by side."

Secondly, Ostrom (2009) challenged the widespread view that it is necessary to tackle the quintessentially global problem of climate change with a single worldwide policy approach. She argued that such a gargantuan problem is more likely to be solved through experimentation and the trial and error learning that arises from different countries trying out diverse policies. As Ostrom (2009: 39) put it, "Given the complexity and changing nature of the problems involved in coping with climate change, there are no 'optimal' solutions;" and the advantage of a "polycentric approach" is that it "encourages experimental efforts at multiple levels." She even challenged the emphasis placed by many of those influenced by Olson's logic of collective action (Olson 1965) on the need for *global* incentives to prevent some free riding on the efforts of others, when she argued that the trust and knowledge required to avoid tragedies of the commons are usually much easier to engender at *local* level.

While these two examples do not provide knockout empirical evidence for our position, they nonetheless have disquieting implications for those who believe in global solutions and homogenous best practice regulation. Like Rodrik and Ostrom, we do not deny that harmonization around a single definition of best practice has advantages – advantages that are well rehearsed in the political economy literature (reducing transaction costs, avoiding beggar-thy-neighbor policies, removing barriers to trade, etc.).[5] Rather, our argument is that these undoubted benefits need to be balanced against the frequently overlooked costs of such global harmonization – costs that tend to be particularly high in conditions of uncertainty. As we will demonstrate, these costs include the system instability caused when a homogenous regulatory (and associated conceptual or modeling) framework leads to highly correlated analytical failures to spot newly emerging problems and a resulting synchronization of perverse behavioral responses. The costs also include a loss of policy diversification and a reduced cognitive capacity for adaptation and learning.[6]

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5 Useful reviews of this literature can be found in Levi-Faur (2011) and Dehouse (1997).

6 This paper's focus on the epistemic costs of global best practice and on the damage to the

## 2 Uncertainty back on center stage and attendant paradoxes

Uncertainty is the central scope condition for the warnings outlined in this paper about the dangers of analytical monocultures, harmonized regulations, and global definitions of best practice. Whenever there is a significant and irreducible element of uncertainty about the future, it follows as a matter of logic that it is impossible to know *ex ante* what best practice *will* be. Further, whenever the present is ambiguous or the future unforeseeable, diversity of outlook and practice may help protect against the possibility of highly correlated (and therefore destabilizing) errors and have significant adaptive value.

However, before exploring the implications of uncertainty for policy choices, we should examine whether the challenge posed by uncertainty (and related knowledge problems) is central to socio-economic life or instead – as modern economics largely assumes – an occasional feature that can be safely ignored. To help answer this question, it is useful to review relevant elements of economic theory and social context, before unpacking philosophical ideas that demonstrate how important the problems posed by uncertainty are likely to be for policy practice.

Modern economics emerged as a branch of "social physics" (Mirowski 1989), wedded to determinate and equilibrium based models, with agents assumed to be rationally optimizing within *known* constraints (Bronk 2009: 78f.). Economics is, of course, a sophisticated discipline with plenty of scope for epistemological nuance, and much attention has been given in recent years to the concepts of bounded rationality (Conlisk 1996), asymmetries of information (Akerlof 1970), and the bias implied by contingent frames (Kahneman/Tversky 2000). Nevertheless, while these concepts help address some key knowledge problems facing economic agents, they are usually presented as minor caveats to the assumed ability of agents in a competitive market to learn how to optimize their preferences; and, rather than placing uncertainty center stage, they represent a series of "bolt-on" amendments to determinate models designed to safeguard their ability to predict behavior (Bronk 2009: 80f.). As a result, any best practice rules informed by this body of theory are assumed to take into account the *predictable* frailties of knowing agents, and in many cases they are designed specifically to correct for these frailties.

The uncertainty and knowledge problems that concern us in this paper are altogether more pervasive and troubling than those addressed in these branches of behavioral and information economics. Instead of "asymmetric information," our focus is on the "symmetric ignorance" (Skidelsky 2009: 45) of the present and future facing all agents operating in complex and innovative societies or markets in the absence of systematic

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stability of the world economy caused by regulatory harmonization should be seen as complementary to other arguments in favor of policy diversity – notably the Varieties of Capitalism argument in favor of each nation exploiting its own area of comparative *institutional* advantage (Hall/Soskice 2001) and the democratic argument for respecting diverse electoral preferences, cultural norms, and national identities (e.g., Nicolaïdis 2013)

regularities. In this regard, we are influenced by economists from the generation after 1918 when radical uncertainty was a central preoccupation of many in the discipline. Knight (1921: 232f.), for example, famously distinguished between measurable or tractable "risk" (where probabilities can be calculated) and immeasurable or radical "uncertainty" (where no probabilities can be calculated because each case is unique). He was adamant that such uncertainty is central to economic life – indeed, the very basis of entrepreneurial profits (Knight 1921: 311), since profits would otherwise be quickly competed away in any well-functioning market (Bronk 2016).

Keynes agreed with Knight on the importance of uncertainty, saying: "The outstanding fact is the extreme precariousness of the basis of knowledge on which our estimates of prospective yield have to be made" (Keynes 1936: 149). Such pervasive uncertainty (together with stock market turmoil) led Keynes to question the wisdom imparted by market prices. By contrast, the same concern with uncertainty led his great rival, Hayek, to argue for the impossibility of socialist calculation. For Hayek, while markets never tend toward any kind of optimal equilibrium, they do at least have the unique ability to reflect the decentralized, tacit, and constantly evolving knowledge of all participants – knowledge that "never exists in concentrated or integrated form" (Hayek [1945]1948: 77). The ability to harness and reflect the cognitive diversity and dispersed information sources of myriad different actors was, Hayek thought, the great merit of markets, and one that can never be replicated by governments and their aggregate statistics (Bronk 2013a).

By 1945, the debate in economics appeared finely balanced between those, like Keynes, who argued that markets were vitiated by radical uncertainty (and therefore needed stabilization by government intervention) and those, like Hayek, who argued that governments could never have sufficient knowledge to intervene usefully in markets. Uncertainty was a key feature of both sides of the argument.

In the 60 years that followed World War II, the focus on uncertainty among academics and policymakers waned.[7] Initially, this reflected the post-war success of Keynesian policies and the apparent stability created by Bretton Woods institutions. When both broke down in the 1970s, the resurgence of neoclassical economics promulgated a faith in the stabilizing effect of unfettered markets. Crucially, however, this new faith in markets was not – as in Hayek's work – because markets were seen as a way of helping to navigate endemic and irreducible uncertainty. Rather, the new faith in markets was rooted in models assuming rational expectations, optimizing agents, and efficient markets. Lucas may have acknowledged that "in cases of uncertainty, economic reasoning will be of no value" (Fontana 2010: 590); but his Chicago school simply assumed this problem away. Uncertainty became defined as (Knightian) risk, with any error value in probability forecasts assumed to be essentially random.

7 See, for example, Hodgson (2011: 161), on how the concept of uncertainty was largely missing from mainstream economics journals after the 1980s.

Rational-expectations-theory and efficient-market-hypothesis based models came to dominate large areas of monetary policy and finance theory; and these models only make sense if we assume that there is (in any particular situation) a correct model of the future (usually based on systematic regularities in the past) on which actors will converge in competitive markets (Frydman/Goldberg 2001: 64f.). At the same time, financial markets and their regulators fell under the spell of what Power has called a "world-level grand narrative of risk management" (Power 2007: viii). This narrative included the framing assumption that the probability of future losses is calculable on the basis of past data, and that users of risk models can therefore achieve higher returns for any given level of risk (Haldane 2009a). In fact, as we have learned since the post-2007 crash, Value at Risk (VaR) and other such models fatally confused measurable risk with the sort of radical uncertainty necessarily implied by widespread innovation (Bronk 2011). The expectations of most market actors in the run-up to the crisis (as schooled by the *ex ante* risk-modeling monoculture) are revealed to have been delusional, and the events that followed were almost literally unimaginable before the crisis.

Radical uncertainty is back with a vengeance. Yet, despite this, there has to date been relatively little change in basic risk management and economic modeling assumptions and policy practice. Indeed, Schmidt and Thatcher (2013) have documented the surprising resilience of neo-liberal economic ideas in general as the main driver of trends in market regulation and economic policy, even in the face of the evident failure of these ideas to forestall (or cope effectively with) the huge uncertainties revealed (and unleashed) by the post-2007 crisis.

To this conundrum of unwarranted intellectual continuity in the face of disaster, we add the related paradox that policymakers still pay lip service to the idea of global best practice and still attempt (whether in Basel III, TPP/TTIP or the euro area reforms) to speed up the adoption of harmonized rules and homogenous practices, despite all the recent evidence of uncertainties faced in designing rules to address rapidly evolving policy challenges, and despite the highly correlated failures associated with pre-crisis efforts to converge on a uniform set of best practice regulatory models.[8] The constant threat of further financial panic continues to result in more hastily conceived global rules and homogenized standards rather than deepening recognition of how much harm such homogeneity can cause.

In this paper, we suggest that four closely related intellectual tendencies can help explain this conundrum and paradox. Our explanations complement, rather than replace, those given by Schmidt and Thatcher for the resilience of neo-liberal ideas (theory mending, vested interests, power asymmetries, and the rhetorical power of ideas promoted by

8 See discussion in Haldane (2009b: 18f.) on the massive rise in correlations of market returns in 2004–7 caused by both "financial imitation" and the "prescriptive rulebook of Basel II" designed to ensure a "level playing field." Haldane writes: "The level playing field resulted in everyone playing the same game at the same time, often with the same ball."

elite epistemic communities), as well as those given by political economists more generally to explain the push to harmonize rules and regulations (reducing transaction costs, solving coordination problems, and preventing free riding). Our hypothesis is that attempts to harmonize policy and practice (according to predominantly neo-liberal definitions of best practice) remain prevalent partly because of four widespread intellectual failures:

1. *Underestimating uncertainty:* a continued misunderstanding about the nature and prevalence of uncertainty, and refusal to acknowledge the implications of this uncertainty for the possibility of optimizing policy according to best practice;

2. *Forgetting framing effects:* a failure to understand the inevitable framing effect of theories and conceptual frameworks embedded in regulatory practice, or to appreciate the shared analytical blind spots therefore caused by any deeply entrenched regulatory monoculture;

3. *Ignoring correlation dangers:* a failure (despite the analogous lessons of biology and portfolio theory) to appreciate that high correlations in analysis and practice – as well as the interdependence generated by homogenous regulations and models – can themselves cause systemic instability;

4. *Undervaluing diversity's contribution:* insufficient attention paid to the positive role of regulatory diversity – and of diverse experiments in living more generally – in allowing for successful adaptation to new developments.

By unpacking and seeking to counter these intellectual failures in remaining sections of this article, we help explain why policymakers have clung to an outmoded faith in efficient markets, and we underline the dangers of monocultures in regulation, analysis, and practice and the value of diversity of thought and behavior. We also provide a basis for theorizing about the kind of multilateral institutions required to cope with uncertainty – those that sustain rather than suppress diversity of regulation and practice; those that harness the benefits of diverse experiments in living; and those that can, nevertheless, help avoid some of the costs of diversity of regulation that have made such diversity unfashionable in recent years.

## 3 Understanding the ubiquity and implications of radical uncertainty

The first intellectual failure we examine is the tendency to underestimate uncertainty. The uncertainty facing economic actors is normally reduced to a series of more or less tractable *epistemological* problems resulting from contingent or necessary shortcomings of human beings as knowing agents or of the market or social institutions in which

they are embedded. These shortcomings may include the inability of agents to compute quickly all the relevant factors or information in complex settings – *bounded rationality*; pockets of debilitating ignorance caused by institutional or market structures that privilege certain actors over others in terms of access to information – *information asymmetries*; or a failure on the part of agents to assess evidence in a fully rational manner owing to certain biases of affect or linguistic framing – *framing biases*.

These knowledge problems are important. But we can only fully appreciate the pervasive and irreducible nature of uncertainty if we also consider the *ontological* aspects of uncertainty – the degree to which the underlying reality that agents are attempting to understand is itself ambiguous or even radically indeterminate. As Dequech (2001: 915, 920) argues, uncertainty has "both an ontological and an epistemological dimension," and there is a close connection between the ontological features of reality (such as its complexity) and the epistemological attributes of socio-economic agents (such as their bounded rationality). Nevertheless, it is helpful analytically to differentiate between the ontological and epistemological aspects of uncertainty, since this helps us to understand better the causal interactions between them.

So, for example, the ontology of a modern economy identified by complexity economists – that is, prone to increasing returns and threshold effects – makes it epistemologically inevitable that economic agents will often be unable to make precise predictions. This is because tiny differences in initial conditions (or in the interpretation of those conditions by different actors) may snowball into radically divergent outcomes (Arthur 2015). Similarly, the fact that social reality is irremediably multifaceted (comprising, among other aspects, physical constraints, the normative and political interpretations of social actors, institutions, power dynamics, and monetary weightings) creates considerable barriers to knowledge. Moreover, physical reality is, prior to contingent interpretations of it, "brute and nameless" (Murdoch [1953]1999: 42) and does not come pre-packaged in unambiguous categories (Blyth 2011: 83–86). Together, this implies that social actors never have unambiguous and unmediated access to reality. Instead, all actors are reliant on the limited and often incommensurable conceptual frames that their minds (and social contexts) supply. No single model or conceptual framework can give an all-encompassing perspective on multifaceted reality.

Behind the economist's notion of optimization – or the regulator's notion of best practice – lies a comforting (but frequently inappropriate) ontology: the world is assumed to be stable (and knowable) in the sense that the future is a systematic function of parameters and probabilistic regularities already "out there" (which can in principle be known and calculated). As Davidson (1996: 479–486) puts it, "future outcomes are merely the statistical shadow of past and current market signals;" and while agents may not always have a good handle on these probabilities, they assume them to exist *ex ante* as part of an "immutable" or "ergodic" reality. The reassuring implication of this ontology is that competitive forces will ensure that expectations converge on this objective reality (including the predetermined future) as systematic errors in forecasting are eliminated in

the race to succeed (Bronk 2016). If the world were genuinely like this, it would indeed be plausible that agents could learn what is, and will be, best practice.

Central to our doubts about the wisdom of convergence on homogenous rules based on established best practice is the prevalence, by contrast, of "non-ergodic" and "transmutable" elements of social reality that are not pre-determined by antecedent conditions – where the future is genuinely unknowable until critical choices and creative inventions have been made (Davidson 1996: 479–486). The reason agents cannot learn what best practice *will* be is that so much of the future is ontologically *indeterminate*.

To understand why, we need to turn to Shackle, who first noted the central link between uncertainty and the innovation or novelty that is central to all dynamic capitalist economies. Shackle (1979: 52f.) wrote of "our own original, ungoverned novelties of imagination … injecting, in some respect *ex nihilo*, the unforeknowable arrangement of elements." In other words, innovative ideas and the novel choices made by entrepreneurs (and others) introduce breaks in previously stable regularities of behavior, and hence constitute a barrier to their ability to forecast the future. For Shackle ([1972]1992: 3), "What does not yet exist cannot now be known."

Equally important, the first-order uncertainty implied by any particular innovation is "compounded by uncertainty about the second-order creative reactions of others" (Bronk 2011: 9). Instead of a world of stable and knowable parameters, economic agents are now faced with a dynamic world of constant change and novelty – a world that is indeterminate or uncertain. It is this ontological indeterminacy that "implies, as its epistemological counterpart, a lack of knowledge," which Dequech (2011: 200) calls "fundamental uncertainty;" and it is this same indeterminacy that renders economic agents unable to make optimal choices and prevents markets from tending toward a predictable and efficient equilibrium. In such a world, there is no stable best practice, and no way of forecasting the future with any precision. People are left to adapt and spot emerging trends as best they can.

This link between innovation and radical uncertainty has crucial yet widely ignored implications for policymakers. Paradoxically, international trade and finance and macro-economic policy – areas where we see the highest incidence of radical product and policy innovation – have recently seen the greatest impetus towards EU-wide or globally homogenous regulatory standards. Perhaps the vertiginous degree of uncertainty and indeterminacy caused by rampant innovation triggers an anxious attempt to construct certainty by agreeing to converge on an *ex ante* definition of best practice.[9] But

9 It is often argued that early convergence on common standards is essential to stabilize expectations and encourage investment in innovative markets (DeLisle/Grissom/Högberg 2013). However, any such standardization (e.g., in derivative markets) improves market stability and visibility in the short run at the potential cost of widespread instability in the long term if the standards are later found wanting.

such policy closure is often premature. As we have seen, innovation inevitably implies changes to the parameters of life and calls into question earlier lessons from experience about the nature of best practice. As a result, policymakers would be well advised to exercise more caution about putting all their regulatory and policy eggs in one basket and demonstrate more willingness to use diverse models as a source of ongoing adaptation to novelty.

Consider, for example, how little that passed less than a decade ago for received wisdom in the area of monetary policy or banking regulation in the EU has survived the global financial and euro area crisis intact. Huge uncertainties were generated by rampant financial product innovation prior to 2007 and by the virtually unprecedented policy experiment that was Economic and Monetary Union. Had euro area policymakers tied their hands more completely than they did to an *ex ante* definition of best practice standards of banking regulation and monetary policy, their ability to adapt to emerging challenges would likely have been even weaker than it has proven to be. Those in the euro area now intent on forcing through a *single* rulebook under the auspices of the EU's Banking Union, or enforcing the increasingly rigid and harmonized set of rules contained in the EU's Fiscal Compact, might want to consider how wrong the pre-crisis shibboleths of banking regulation and monetary policy have turned out to be. Best practice is often abruptly overturned in a world of constant novelty in policy and market practice. Taking uncertainty more seriously ought to lessen the rush toward any single regulatory or policy framework.

## 4 Framing effects and the dangers of regulatory monocultures

Uncertainty about the future yet to be created is only one aspect of the knowledge problems that concern us. Equally important is the partial nature of any single theoretical perspective or conceptual frame used to make sense of reality. Monocultures – involving the widespread use of *one* cognitive frame – are tolerated, indeed encouraged, because of a naïve empiricism that assumes an unproblematic interface between knowing agents and the external world of objects. In fact, though, people never have unmediated access to the "world-as-it-really-is." Instead, data and evidence are the product, in part at least, of the necessarily limited theoretical frames actors have internalized. This means that when they only have access to a single theory or set of organizing concepts – that is, when they operate in a monoculture – their ability to test (and update) this same theory (to ensure it is indeed the "best") is compromised. This is because the facts at their disposal are partly constituted by the very theory those facts are being used to test.

To doubt that we can access reality without prejudice or use it objectively to guide our interpretations is not some postmodern fetish. Instead, it can be traced back to the insight of Kant, who argued that we never have unmediated access to the "world-as-it-really-is."

The world we experience, Kant argued, is necessarily structured by certain *a priori* interpretive principles and learned empirical concepts that our minds supply. If, for example, our minds did not supply a notion of time and causation as necessary conditions of experience, and did not project onto the world of experience a set of learned conceptual grids, we would not be able to make sense of that world. The implications of this Kantian insight are enormous: it implies that any order we see in the world is something we read *into* it rather than infer *from* it (Bronk 2009: 104f., 257; Tarnas 1991: 344f.).

The Romantic philosophers and poets that followed Kant insisted that all knowledge is dependent on the perspectives and languages we use rather than being a mirror-like reflection of objective reality (Abrams 1953). To use Wordsworth's famous phrase ([1798]1998: 268), we "half-create" the world of experience: it is the "joint product of the objects impinging on our senses" and the framework of interpretations our minds supply (Bronk 2009: 258). Coleridge ([1835]1985: 596) made this point beautifully, by likening to a lantern the principles of selection we must supply if we are to see any meaningful order in the facts before us: "You must have a lantern in your hand to give light, otherwise all the materials in the world are useless, for you cannot find them, and if you could, you could not arrange them."

It has now become generally accepted that experience is necessarily a product of interpretation and that perception and analysis of the world is grounded in ways of seeing that are either biologically inherited or historically and culturally contingent.[10] However, the far-reaching implications of this consensus are much less widely appreciated and well worth articulating. First, as Abrams (1953: 31) noted, Romantic (and later postmodern and constructivist) epistemology implies that facts (as their Latin derivation from *facta* implies) are "things made as much as things found, and made in part by the analogies through which we look at the world as through a lens." In other words, facts are not some objective touchstone for assessing the truth-value of a theory or best practice; they are part-creations of theory and metaphor.

More troubling still, as Wittgenstein ([1953]2001: 165–168) illustrated with his famous example of the ambiguous duck-rabbit drawing, we are not normally aware that we are *interpreting* what we see *as* a duck or *as* a rabbit; instead, we may actually *see* a duck or a rabbit. In other words, most of the relevant priors and conceptual grids that structure how we see the world and construct evidence are unconsciously applied, and the interpretive nature of perception is not something of which we are normally aware. Further,

10 Postmodern philosophers, sociologists, and anthropologists usually replace Kant's notion of certain necessary ways in which all human experience is structured with a focus on historically-conditioned or power-determined mental priors (as in Foucault) or largely unconscious conceptual frameworks ingrained by social environment or status (as in Bourdieu). In biology, there is a parallel debate about how far our cognition is hard-wired and how far it is learned thanks to the brain plasticity that allows social experience to influence the very structure of our brains. A full theory of monocultures (and their framing effects) would consider how far they are historically and culturally path dependent, and also their relationship with power.

since any theoretical framework or conceptual grid has limitations as a way of parsing reality and making sense of it, reliance on any *one* such framework implies an inevitable bias or limitation in our vision and analysis.

This gets to the heart of the epistemological problem with monocultures. We need theories and conceptual structures to make sense of the chaos around us, in the same way that we need a lantern to see in the dark. Yet when we only have access to *one* theoretical or conceptual structure – one source of light – then our field of vision is likely to be severely limited and our analysis biased.[11] It is for this reason that a monoculture – which involves the widespread internalization of *one* mental framework or model – is so dangerous. Even when a shared mental model is apparently the best available, reliance on this single model or framework implies that we will keep stumbling on aspects of reality we earlier missed, simply because these aspects lie outside the area illuminated by the framework or model we used (Bronk 2010: 103).

The behavioral consequences of relying on a single set of framing ideas or conceptual priors can be debilitating enough. Even more pernicious can be the self-reinforcing feedback loops between practices and the intellectual ideas or cultural priors that structure them. Indeed, in the philosophical tradition of Wittgenstein – who saw conceptual structures and languages as intimately bound up with practice (Grayling 1996: 97) – we argue that the normal *practices* of socio-economic agents and the *conceptual structures* framing their analysis or vision are mutually constituted. This is crucial to our argument against regulatory monocultures and over-reliance on best practice in modeling: we argue that, especially in highly technical areas of finance and business, enforcement of homogenous practice is internalized, over time, into widely shared operating and analytical routines that lead insidiously to a dangerous homogenization of analysis and thought. Our contention is that a generalized notion of best practice or insistence on a single global (or EU-wide) regulatory approach homogenizes how agents *think* about issues, construct data, and analyze problems as well as how they *act*. The result is not only high correlations in behavior but also widely shared cognitive blind spots that may reinforce and entrench the behavioral correlations in a dangerous feedback loop.

This inability to separate analysis from embedded practice may help explain the striking resilience of neo-liberal ideas that intrigues Schmidt and Thatcher (2013). It certainly seems to explain why, in the run up to the 2007 crisis, key players in central banks, regulation, and financial markets nearly all missed early warning signs that, in retrospect, seem obvious. For example, there were undoubtedly some talented economists questioning the dynamic stochastic general equilibrium (DSGE) models being used by

11 So, for example, as Fligstein/Brundage/Schultz (2014: 14) argue in relation to the Federal Open Market Committee (FOMC) at the US Federal Reserve, sense-making "requires a theory of 'how the world works'" in order that relevant actors can "decide which facts to collect" and how to interpret them. However, as they also show, the FOMC's reliance in recent years on a particular model kept it "in the dark" in the sense that its members could not imagine how problems evident in the housing sector could possibly spill over into the rest of the economy.

all the main central banks; yet the banks' dominant forecasting practices were (and remain) structured by these models. Further, since these models assume rational expectations and the tendency for markets to be in equilibrium and, most extraordinarily of all, simply ignore the financial sector and the possibility of default (Backhouse 2010: 133; Goodhart/Tsomocos/Shubik 2013), it is not surprising that the central bankers relying on them mostly failed to spot problems emerging from the shadow banking system.[12]

Similarly, some regulators understood the limitations of VaR models, but most key operators in both regulation and the trading houses simply internalized the structuring assumptions implicit in the risk models they used to structure their daily activities.[13] Given homogenous daily routines and shared modes of practice, almost everyone constructed data or analyzed events in similar ways. As a result, they were not predisposed to notice developments that their shared conceptual frameworks had no place for (Bronk 2011: 15). For example, leading investment bankers at the time were reported as saying that even the events of August 2007 – a full year before the Lehman Brothers collapse – measured in their models as 25 standard deviation events (Haldane 2009a: 2). In other words, what they were now being forced to acknowledge was happening was simply outside the range previously considered remotely plausible. Practice (and thereby analysis) had become homogenized according to what was then considered best practice in risk management (a tendency encouraged by the global Basel II regulatory regime), and consequently nearly all the key players were blindsided by unexpected developments.

Analytical monocultures may, of course, initially be the product of the superior rhetorical power of certain ideas promoted by elite epistemic communities or the overwhelming political and market power of certain advocacy coalitions (Schmidt/Thatcher 2013: 32f.). We argue, however, that analytical monocultures tend to become particularly entrenched (and impervious to criticism) when embedded in widely shared technocratic practices, models, and data collection methods shaped by these same ideational frameworks. The global homogenization of business practices and regulatory models represents a key stage in the emergence of global groupthink because it serves as the basis of an epistemic feedback loop between ideas and the empirical data framed (or behavior structured) by the regulatory, modeling, and practical manifestations of these ideas.[14]

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12 In the same vein, Fligstein/Brundage/Schultz (2014: 49f.) point out that, while there has been substantial emphasis in recent academic literature (e.g., Mackenzie 2008) on the extent to which economic models are performative – creating markets "in their own image"– the real importance of these models in recent central banking history has been to constrain the ability of economists to understand and influence markets.

13 See Mugge (Schmidt/Thatcher 2013: 211) on "the use of bank-internal risk-models for regulatory purposes in Basel II." The problem was not just that these models turned out to be misleading, but that there was a disastrous "elision between the previously distinct perspectives and cognitive frames of regulator and regulated" (Bronk 2011: 15).

14 See Bronk (2013b: 345) on "performative" reflexivity (belief-behavior-belief feedback loops) and concomitant "epistemic" reflexivity (theory-data-theory feedback loops).

Our theory of regulatory and analytical monocultures bears an initial resemblance to the theory of scientific paradigms in Kuhn (1996) and policy paradigms in Hall (1993). Kuhn (1996: 11, 24) argued that those engaged in "normal" science are strongly embedded in paradigms that involve a commitment to sharing "the same rules and standards for scientific practice" – a sort of scientific monoculture. Crucially, the vision of researchers is restricted and focused on the questions their methods and conceptual frameworks are well suited to answer. Indeed, at times, normal science seems to be little more than an "attempt to force nature into the preformed and relatively inflexible box that the paradigm supplies" (Kuhn 1996: 52). The reason for this restriction of focus is clear: paradigms provide scientists with a cognitive map they could not do without and help them spot significant patterns in what might otherwise be mere empirical noise (Kuhn 1996: 109; Bronk 2009: 268).

While Kuhn was clear about the benefits of paradigms, he was equally explicit about the cognitive losses they imply: all too often, anomalies that are later obvious are initially resisted or explained away by theory mending; and novel discoveries emerge "only with difficulty, manifested by resistance, against a background provided by expectation" (Kuhn 1996: 64). As a result, anomalies tend to build up until the dominant paradigm faces a *crisis* that is resolved only by a sudden shift to a completely new paradigm. This new paradigm helps scientists resolve some of the most pressing anomalies (although crucially this may be at the cost of losing other insights). Moreover, the scientific revolution involved in a switch to a novel paradigm does not entail simply a consciously new interpretation of the facts. Rather, it implies a "change in visual gestalt" – a change in unconscious priors – that actually causes scientists to see the world differently. In a clear reference to Wittgenstein, Kuhn (1996: 85, 111) wrote: "What were ducks in the scientist's world before the revolution are rabbits afterwards."

In one crucial respect, though, our theory differs from that of Kuhn. We argue that the pattern he posits – of cognitive lock-in caused by standardized practice, punctuated by occasional gestalt shifts – is more a pathology generated by certain states of policymaking (or science) than a necessary or normal feature of socio-economic (or scientific) life. There is, in fact, a ready and reliable antidote to cognitive lock-in and the need for traumatic crisis shifts in practice and vision, and to the market instability these may cause. Political economies can, and should, be structured in such a way as to allow for the disruptive influence of alternative models and theories (Bronk 2013b: 348); for, as Feyerabend ([1975]2010: 20) puts it, there "exist facts which cannot be unearthed except with the help of alternatives to the theory" being tested. Unless agents learn to hover between different conceptual frameworks, they will remain unable to detect unconscious interpretive biases in their perception and analysis.[15] This is the reason we

15 See the discussion in Tett (2015: 42f., 46) on the importance of "flipping" perspectives and "insider-outsider" vision; and in Bronk (2009: 280, 282f.) on engineering fluidity in the characterization of situations by "an organized exercise of imagination in switching between different cognitive spectacles" – by "disciplined eclecticism."

argue for multinational regimes that allow for different regulatory (and associated analytical) regimes to coexist, while managing the negative side effects of that diversity and exploiting its learning potential.

## 5 The dangers of monocropping and high correlations of behavior

The argument for diversity of regulation developed so far in this paper is based on the dangers (in conditions of uncertainty) of the generalized epistemic lock-in implied when analysis is embedded in globally homogenous theoretical narratives, cultural frames, and "best practice" routines. But our case against institutional and regulatory monocultures is also supported by an older argument in favor of institutional diversity – one based on the biological (rather than cultural) analogy of "monocropping."

In modern biology, genetic diversity is seen as key to the long-term survival of species facing constantly emerging threats. Since potentially helpful mutations are essentially random, the larger the gene pool of a species the higher the chances of an adaptation emerging that is well-suited to a novel environmental challenge (Taleb 2014: 65–70). Moreover, there is plenty of evidence that whole ecosystems, such as those found in the oceans, are more robust and resilient if they comprise a diversity of species. For example, data from global fisheries reveals that the degree of local marine biodiversity has been a major factor in determining how prone any particular fishery is to sudden collapse (Worm et al. 2008: 787; Haldane 2009b: 17).

When Michael Hannan (1986: 85) sought to establish the contribution of *organizational* diversity to the robustness of institutional frameworks facing radical uncertainty, he did so by analogy with the well-established importance of *genetic* diversity to the resilience of crop yields, noting that: "The spread of single strains of crops implies a great reduction in genetic diversity, which may prove problematic if new kinds of pests arise to which the 'miracle' crops are vulnerable." Hannan (1986: 85) argued that the suppression of organizational diversity may also leave social systems more vulnerable to novel threats, since: "A system with greater organizational diversity has a higher probability of having in hand some solution that is satisfactory under changed environmental conditions." Evans (2004: 34) made a similar point, arguing that "institutional monocropping" reduces the adaptive potential of the international system as a whole to cope with unexpected developments.

The implications for our argument of this biological analogy are as clear as they are often ignored: whenever institutional settings and regulations are harmonized across national markets, the international (or, in the EU case, regional) system may lose some of its resilience in the face of unknown shocks because of a reduction in the diversity of its institutional "gene pool." At the same time, regulatory monocropping results in a loss

of institutional "genetic material" that might otherwise play a vital role in producing helpful institutional mutations.

Before we explore further how safeguarding the diversity of regulatory frameworks can help trigger such institutional innovations, it is useful to consider another analogous argument for the merits of diversification – this time from portfolio theory. The most basic protection against uncertainty in investment portfolios is provided by diversification across different types of investments so as to avoid having all your proverbial eggs in one basket. Even if one stock or asset category is judged likely to produce the highest average returns, the chances of unwelcome volatility in the face of unforeseen shocks are much lower if the portfolio is diversified across a number of investments or asset types. Crucially, though, it has been understood at least since Markowitz (1952) that diversification only succeeds in reducing the variability of returns (and the danger of an investment wipeout in the face of unexpected shocks) if the investments across which managers diversify are weakly, or better still negatively, correlated with one another in performance terms.

By analogy, portfolio theory has two implications for our argument. First, it suggests that the international system as a whole may be less prone to excessive economic and financial market volatility or instability when governed by a diversified set of regulatory frameworks – provided that these frameworks are sufficiently differentiated that failure in one is weakly correlated with failure in another. Since regulatory frameworks are not neutral settings but strongly constitutive of analysis and practice, and since we cannot know *ex ante* which regulatory framework will be most negatively challenged by unforeseen shocks, it makes sense at the global or regional level to have a diversified portfolio of differentiated regulatory frameworks.[16] Second, the analogy with portfolio theory suggests that moves to harmonize national regulatory frameworks with each other, and thereby increase the co-variance of performance between them, may serve to increase the volatility of performance of the global system as a whole when it is hit by unexpected shocks. It is clear, for example, that the post-2007 crisis would have been even more acute had the monetary policies and banking regulation of the Canadian and Asian economies been fully aligned with those of the US and Europe. In actual fact, these economies weathered the storm relatively well, affording some stability to the global economy (Isgut 2014).

16 Another feature of portfolio theory that, by analogy, is relevant to the argument presented in this paper is that most of the gains from diversification can be achieved by having a relatively modest number of weakly (or negatively) correlated investments. The protective effect of diversification increases very little beyond a certain threshold. This suggests that the system-level benefits of regulatory and cognitive diversity may also accrue with a fairly low number of (weakly correlated) policy regimes. It is not necessary for every city or even every nation to have their own regulatory regimes.

The harmonization of regulatory standards is, of course, often advocated as a way of removing barriers to trade and investment and creating a fully integrated market. Yet here, too, analogies from biology and agriculture suggest the need for caution by improving our understanding of non-linear dynamics in complex and highly interconnected systems. The study of disease transmission, for example, reveals how important it can be to limit the interconnections between different segments of a population. In a similar vein, the management of forest fires has shown the importance of firebreaks to slow the spread of fire from one part of a forest to another. A more modular system is very often a more robust system.

May et al. (2008: 894) and Haldane (2009b) make these analogies between the study of epidemics (or forest fires) and financial contagion explicit: just as it makes sense to vaccinate "super-spreaders" of disease and exercise some control over the movement of peoples from areas with a high incidence of disease to areas still free from it, so they argue it makes sense to concentrate regulatory efforts on the most interconnected financial institutions and champion some compartmentalization or modularity in financial markets. While too much compartmentalization may reduce the diversification available to each segment and undermine their ability to withstand shocks, too little modularity at system level can greatly increase the chances of destabilizing financial contagion.

Such studies raise doubts, for example, as to whether EU policymakers are justified in prioritizing the perfection of a single "Capital Markets Union" over the preservation of local differences in regulation where they have hitherto proven useful.[17] Perhaps it is no coincidence that the relatively homogenous and highly interconnected financial markets seen in the last two decades have proven less stable than their more compartmentalized Bretton Woods predecessors, and more susceptible to destabilizing financial contagion.

## 6 The value of diverse "experiments in living" for successful adaptation

In the prior section, the analogies with biology and portfolio theory strongly suggested that institutional and cognitive diversity plays a role in fostering resilience and a capacity for adaption in international financial and economic systems. In this section, we examine how diversity of regulation and analytical method can actually contribute to solving novel problems and fostering innovation.

17 See Anderson/Brooke/Kustosiova (2015) for discussion of how increasing financial integration within the EU through a Capital Markets Union may "increase risks to financial stability" if there is capital flight in a crisis – especially where the cross-border holdings are in bank deposits or bonds rather than long-term equity stakes.

It is often noted that prediction markets involving many people with diverse capabilities are better at predicting uncertain outcomes than the best so-called "experts;" and Page (2007: xvi, 7f., 159f., and *passim*) argues that it is diversity in perspectives, interpretations, heuristics, and models – in short, diversity in the "cognitive toolboxes" used – that is crucial to the success of such "distributed problem-solving." Even the single most successful approach to problem-solving rarely outperforms the aggregate of diverse and reasonably smart approaches, since each approach looks at the problem from a different angle and brings different conceptual grids to bear. Nor is it the sheer number of decision-makers that matters but rather their diversity. Crowds are not wise when they all copy a particular way of thinking from one another – when they fall prey, for example, to a monoculture discourse of best practice. The wisdom of crowds only pertains when they contain individuals who exercise their own judgment, rely on their own cognitive resources, and see things from their own local perspective.[18]

Our discussion of uncertainty helps explain why such diversity of perspective is more important to regulators and policymakers than they often realize. When innovation and novelty abound, and the future is therefore radically indeterminate, accumulated wisdom about previously stable regularities in how the world works (as reproduced in best practice models) tends to become obsolete. Instead, what matters is the ability to develop innovative responses to novelty and spot newly emerging patterns. Here diversity is key. Imaginative thinking is typically the product of the repeated juxtaposition of alternative ways of thinking and acting, which can then trigger new mental connections and new insights. Similarly, the ability to scan for emerging trends and new developments is fostered by the flexible use of different perspectives – different cognitive spectacles (Bronk 2009: 2, 203). It is for this reason that Lane and Maxfield (1996: 223, 228) argue that heterogeneity of agents is key to the "generative relationships" behind innovative thinking.

David Stark (2009: xvi, and *passim*) has extensively mapped ways in which entrepreneurial organizations successfully exploit the dissonance of diverse competing conceptual and evaluative frameworks to generate new ideas and help "navigate through uncharted territory." In his account, the dissonance created by contending frameworks can have three positive effects: it helps disrupt established interpretations and dominant ways of looking at problems; it increases the chances of novel discoveries through an innovative recombination of existing ideas; and it generates new ways of looking at the world. As Stark (2009: 16f.) puts it: "Organizations that keep multiple evaluative principles in play … foster a generative friction that disrupts received categories of business as usual and makes possible an ongoing recombination of resources." The result of such organized diversity is a "cognitive ecology in which the friction among competing principles … generates new ways of recognizing opportunities" (Stark 2009: 16).

18 For a discussion about the dangers of information cascades when diversity and independence of thinking are absent, see Surowiecki (2004: 40–65). See also a related argument that the "wisdom of prices" in markets only holds when agents are cognitively diverse in Bronk (2013a: 101).

As Stark (2009: 159f.) observes, the willingness to maintain a "*generative redundancy*" of different approaches represents an implicit acceptance of the need to sacrifice short-run "allocative efficiency" to the requirement for "dynamic adaptability" in the face of radical uncertainty. This is crucial to our argument: given massive uncertainty about what *will* constitute best practice in future, a policy of concentrating solely on established best practice sacrifices long run adaptability (or dynamic efficiency) on the altar of short-term static definitions of efficiency. The cult of best practice – and the related advice to maximize efficiency by harmonizing regulations on a single model – often involves psychological denial in the face of uncertainty. Instead, we need to engage constantly with different perspectives (and the practices with which they are intertwined); only then can we challenge existing implicit frameworks of interpretation, and have a good chance of identifying new challenges and their possible solutions.

It is for this reason that we argue for multilateral institutions at the global or EU level that combine tolerance of diverse regulatory practices with deliberative capacity to learn from the multiple analytical perspectives implied. This is not some utopian dream. As Sabel and Zeitlin (2010: 4–6) argue, many aspects of EU policymaking, for example, already constitute a form of governance they call "deliberative polyarchy" that – by using multipolar inputs from policymakers from diverse regulatory and analytical traditions – is "a machine for learning from diversity." The challenge, though, is to ensure such multilateral deliberative spaces do not become a wasting asset under the constant pressure for them to be used to develop new harmonized and unified forms of governance (Bronk/Jacoby 2013: 15).

The merits of diversity in thought and practice do not, of course, represent a novel discovery. It is often forgotten that Mill grounded much of his defense of individual liberty on the need for diverse "experiments in living." The need for diversity of opinion and for varied experiments in living is, he argued, a necessary corollary of the fallibility of mankind and our inability to recognize "all sides of the truth" (Mill [1859]1991: 63). Only cognitive diversity and varied experiments in living can guarantee social progress, and ensure that we neither become slaves to custom nor fall foul of the "tendency in the best beliefs and practices to degenerate into the mechanical" (Mill [1859]1991: 71–72).

Mill's work is equally important to our argument for another reason, however. He always qualified his championing of liberty – the freedom to be different and engage in one's own experiments in living – with the caveat that this liberty should pertain only so long as it does not cause injury to others. This reminds us that diversity (and the freedom to be different) must always be managed. Diversity of practice (and even sometimes diversity of opinion) may cause serious damage to others unless it is carefully managed. Indeed, diversity of practice and regulation can often lead to discord and stalemate rather than productive friction, unless a *modus vivendi* is devised to allow for the peaceful coexistence of diverse ways of thinking and acting. Moreover, even the productive aspects of dissonance can only be realized in institutional frameworks that allow for mutual engagement between – and learning from – diverse outlooks and experiments in living. This is not something that is easy to arrange.

## 7 Conclusion: Institutional prerequisites for managing and exploiting policy diversity

Western democracies have long experience in attempting to manage policy diversity. After all, since the rise of the Westphalian state, national diversity has been the default condition for most regulatory domains. Arguments in favor of each nation living according to its own organically evolved rhythm go back at least to Herder and German reactions to French Enlightenment universalism (Bronk 2009). Yet the impetus towards homogenizing integration according to best-practice templates designed on rational principles has remained strong.

Our paper raises epistemic and system-stability objections to this homogenizing impulse, centered principally on the implied dangers of highly correlated policy errors and shared analytical blind spots. These objections complement those made by Nicolaïdis (2013) on democratic legitimacy grounds (the need to respect diverse voter preferences) and those emanating from the Varieties of Capitalism literature, with its focus on the need to safeguard each nation's distinct area of comparative *institutional* advantage (Hall/Soskice 2001). Nevertheless, a vast and influential literature continues to presume that diversity in national regulatory and policy frameworks undermines economic efficiency, limits market integration, and serves primarily to protect vested interests (e.g., Büthe/Mattli 2011); and these assumptions underpin much of the current enthusiasm for regulatory homogenization.

This paper does not claim to provide a definitive mechanism for deciding when the system-stability and epistemic advantages of regulatory diversity that we identify will trump the well-known static efficiency gains that may flow from regulatory convergence. Rather we argue that when policymakers are making difficult judgment calls about the desirable degree of regulatory diversity versus cross-border harmonization, they should be guided by three factors:

– The degree to which they are facing widespread *uncertainty* resulting from dynamic product or policy innovation;
– The degree to which they are operating in highly *technical* areas, where analysis as well as practice is heavily constrained by the framing effect of specialist models or conceptual frameworks;
– The degree to which there are robust institutional mechanisms in place that can *manage*, and thereby reduce the costs that would otherwise flow from, policy diversity.

Whenever uncertainty is prevalent in highly technocratic areas of policy, and whenever cross-border mechanisms exist that can manage the costs of diversity, the balance is more likely to be in favor of regulatory diversity among nation states.

In this final section, we examine some broad principles that are central to the effective *management* of regulatory diversity, and we further explore how to make *judgments*

about the relative merits of policy diversity and homogeneity. In particular, we examine the institutional prerequisites for sustaining diversity and harnessing its benefits, while simultaneously managing its costs. These principles are explained with reference to the European Union (as the most notable institutional example of managed diversity at the multinational level).

For diversity to provide benefits, it must first be sustained – no easy trick in the "age of globalization" (Sassen 2013): institutions must allow different national regulatory regimes and associated analytical approaches to *coexist* in such a way that the diversity does not represent a serious impediment to trade or market integration. The most widely used mechanism for achieving regulatory diversity *and* market integration is the mutual recognition regime, which allows products or services produced in one regulatory environment to be recognized as legal for sale in another jurisdiction.[19] Such regimes have characterized the European Single Market since the 1980s and have been extended to US-EU agreements in certain sectors such as airline safety.

Mutual recognition has helped to preserve regulatory diversity in many areas in the EU (Nicolaïdis 2007). However, it is far from being a panacea. Indeed, mutual recognition is often resisted, especially in the area of services, for fear that ensuing competition between regulatory regimes will lead to a race to the bottom or severe regulatory arbitrage where only a single lax model of regulation will ultimately survive. Such fears can be allayed to some extent by introducing subtle mechanisms that balance the principle of open competition between diverse regimes with an element of minimum ("equivalent") standards or "jurisdictional reciprocity."[20] These measures to manage, and indeed

19 "Comply or explain" regimes are intermediate between mutual recognition and the full harmonization of differences.

20 When discussing "regulatory arbitrage," it is important to distinguish between (a) activities designed to undermine the integrity of a country's specific local regulations or policies by rebooking business (whose end-users are still located in that country) through entities regulated by other jurisdictions with looser requirements; and (b) the normal tendency in competitive capitalism for a clustering of specialist activities in locations with institutional frameworks supportive of that activity. We view tendency (b) as generally benign: it leads to countries specializing in their areas of comparative *institutional* advantage and ensures they have distinctive cycles and exposures, thereby increasing the modularity and variety of the system as a whole. By contrast, there is clearly some need (as part of managing diversity) for multinational coordination to limit tendency (a), which (if left unchecked) undermines the ability of a country to implement distinctive policies, thereby reducing regulatory heterogeneity and system resilience. A good example of careful management of such deleterious regulatory arbitrage is the imposition of "jurisdictional reciprocity" for countercyclical capital buffers (CCBs) under Basel III (Basel Committee on Banking Supervision 2015; Reinhardt/Sowerbutts 2015). The aim here is not to harmonize the application of CCBs across countries, but to ensure that, if a country employs a certain rate, it will apply to all lending in that jurisdiction regardless of whether it is carried out by a domestic bank, local subsidiary, or branch of a foreign bank. Such jurisdictional reciprocity is a limited suspension of the principle of mutual recognition to ensure the integrity of local policy discretion.

qualify, mutual recognition help prevent market abuses that might otherwise lead to market-enforced harmonization (including a race-to-the-bottom dynamic) that would itself threaten the stability and vitality of the system.

A core *cognitive* challenge to the principle of mutual recognition is that regulatory differences are frequently seen as deviations from stylized best practice rather than as functional contributions to distinctive (often national) systems of production or to the long-term stability and dynamic efficiency of the larger system. Particularly at times of crisis there is an understandable tendency to converge on what is currently seen as best practice. So, for example, hopes of avoiding another euro area crisis are being pinned on the proposed banking and capital markets unions, which seek to unify European financial markets under a single rulebook, central supervision, and centralized counterparties. Our argument suggests, though, that these moves may paradoxically run the risk of heightening (rather than reducing) the chances of systemic failure by increasing the likelihood of high correlations in regulatory failure.

Other conditions are also needed to ensure sustained regulatory diversity in the long run. In particular, the multinational mechanisms that police cross-border trade and investment (or indeed a monetary union) need to avoid the sort of power asymmetries that allow any one state to impose its regulatory practices on others. This is a very real issue in the euro area. While the Maastricht and Nice Treaties intentionally balanced the power of large and small member states (Fabbrini 2015), the post-2009 period has seen an increasing power imbalance favoring Germany. Policy, regulatory and indeed cognitive diversity has been damaged by the entrenching of what we call the "German consensus" through the EU's Fiscal Compact and the conditionality involved in ESM bailouts (Bronk/Jacoby 2013). In the areas of fiscal policy and financial market regulation, it is much harder now to recognize within the euro area even the outlines of what Sabel and Zeitlin call "deliberative polyarchy." For better or worse, in large areas of policy, the writ of Germany now dominates.

A further requirement for sustaining analytical and policy diversity is to ensure the survival of "minority traditions" – that is, institutional practices that are currently less fashionable – within unitary authorities at EU or global level. Without sophisticated governance techniques to help keep diversity alive and multiple models viable (Jacoby 2006), homogenization of analysis and practice may become inevitable. The ECB is an example of a multinational institution where the diversity of intellectual and monetary policy traditions may be a wasting asset. Starting with personnel from a variety of national traditions, it is now evolving an increasingly monolithic and *sui generis* approach to monetary policy and banking regulation in the wake of the eurocrisis (Majone 2014).

Even if analytical and policy diversity can be sustainably secured, institutions are also required to harness the cognitive benefits of that diversity by providing fora where different countries can learn from experiments elsewhere. Such fora must challenge policymakers with the disruptive influence of alternative intellectual and regulatory frame-

works into both avoiding epistemic lock-in and developing novel permutations. This is a demanding task. The experimental "deliberative polyarchy" within the EU analyzed by Sabel and Zeitlin (2010) explicitly leverages such differences. Problems remain, however: for one, there is a difference between the desirable deployment of dissonant perspectives as a productive irritant that may generate novel pearls of wisdom – what Puetter (2014) calls "deliberative intergovernmentalism" – and the more mundane benchmarking of good practice as a method of choosing between policy options. Moreover, it is not clear in Sabel and Zeitlin's account what process replenishes the institutional diversity from which "good" solutions are winnowed and shared.

If multinational institutions are to sustain diversity and harness it for the foregoing purposes, they must also mitigate the well-known potential costs of diversity. Some of the disadvantages of policy diversity can be greatly reduced by encouraging *coordination* (without excessive harmonization) and *managing* the negative externalities of individual country behavior – particularly by preventing some countries free riding on the prudence of others. This can be achieved through a combination of shared minimum standards (or basic norms) and joint institutions (such as the European Commission and Council) that are able to negotiate mutually acceptable outcomes and compensatory side-payments for harm caused by individual country behavior, without markedly infringing on the degree of policy diversity.

It would, of course, be disingenuous to claim that all the costs of policy diversity can be avoided by careful coordination. Some costs are an inevitable consequence of policy diversity. Three classes of such costs stand out: first, cases where there are particularly strong spillover effects of policy experiments in one country on another; second, cases where policy diversity itself diminishes the performance of the system as a whole in the long run – for example, due to high transaction costs generated by regulatory diversity for cross-border trade; and third, instances where diversity taxes individual polities with poor regulatory processes that lead to poor performance over multiple business cycles that could be ameliorated by convergence. There remains, therefore, a need for institutional capacity to make difficult *judgments* about where the inevitable costs of regulatory diversity outweigh the benefits and how to distinguish "permanently failing organizations" (Meyer/Zucker 1989, *passim*) from those that are simply temporarily less successful.

When making such policy judgments, the costs of diversity must always be weighed against the potential epistemic and market costs of policy monocultures highlighted in this paper – that is, against the dangers of shared analytical blind spots and market instability caused by highly correlated policy errors. Our analysis suggests that these cognitive and systemic costs of policy and regulatory harmonization are likely to be much higher in conditions of uncertainty resulting from widespread innovation – arguably the new normal in many areas of finance and business. The analogy with portfolio theory also suggests that the costs of harmonization will rise steeply when policy and epistemic diversity falls below a certain threshold (and tends towards complete harmo-

nization), whereas partial regulatory convergence may incur few costs provided that sufficient residual policy diversity remains at global or system level. Most of the gains from portfolio diversification (in terms of reduced volatility) come when moving away from very concentrated asset holdings – and further gains diminish quite quickly as the number of stocks rises. Similarly, most of the gains from regulatory diversification in terms of the stability of the global financial and economic system may also be achieved with moderate regulatory diversification. In other words, there is no need for every small country to retain its own regulatory regime, but the global system is much stronger if a moderate number of weakly or negatively correlated regimes remain.

The benefits of cognitive diversity are similarly non-linear: while analytical monocultures lead (as we have seen) to severe cognitive myopia, and moderate cognitive diversity supports greater levels of insight and adaptability, a cacophony of countless disparate ways of thinking may lead merely to confusion and serious coordination difficulties. Ours is not an argument for maximum regulatory and analytical diversity but for sufficient diversity to help avoid systemic crises and widespread epistemic lock-in.

Finally, our intervention maintains that analytical monocultures rooted in policy doctrines of global best practice are particularly dangerous in *technocratic* areas of multilateral governance and global business, where thought and analysis are highly structured by the language and mechanics of specialist practice and therefore beyond the reach of normal political debate. Even more than at the national level, supranational regulation tends to be delegated to specialist technocracies largely isolated from other facets of (mostly national) policymaking (Mugge 2013). If such technocracies are not to fall prey to monoculture thinking, they must, we argue, remain fully exposed to epistemological (as well as normative) challenge from dispersed and diverse market and political actors.

Some delegation to technical experts able to exercise judgment is, of course, necessary in complex areas of policy; but the frequent desire to render the judgment makers independent of voter preferences (and protect them from political pressure) can engender an unhealthy insulation from the wisdom of crowds. Similarly, when technocracies such as the ECB try to manage markets by engineering certain outcomes that deliberately interfere with the price mechanism (such as homogenous collateral in repo markets (Gabor/Ban 2015) or stable long term rates engineered via quantitative easing), they may cut themselves off from the wisdom Hayek ascribed to the price mechanism so long as it reflects genuinely decentralized cognition (Bronk 2013a). When designing regulatory institutions and other policy instruments, everything must be done to ensure that policymakers remain open to epistemic challenge, decentralized information, and multiple perspectives. Only then will they have a good chance of avoiding the correlated errors and shared blind spots that frequently threaten the health and stability of both markets and societies when they fall prey to homogenous narratives of best practice.

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