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## **IRREPARABLE IGNORANCE, PROTEAN POWER, AND ECONOMICS**

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### **Introduction**

As economists we write as outsiders to the community of international relations scholars that is the primary audience for Katzenstein and Seybert's *Protean Power: Exploring the Uncertain and Unexpected in World Politics* (hereafter *Protean Power* or *PP* when referring to particular chapters). By our theoretical choices we have positioned ourselves as critics of the neoclassical paradigm. Mainstream economics is now showing signs of theoretical fissures, a crisis in confidence over first principles, and a new methodological open-mindedness. Not least, the presumption of "infinitely bright agents in rich information environments" is giving way to a vision of "reasonably bright individuals in information poor environments" (Colander 2003, 205). That change threatens the longstanding presumption in economics that the future could be modeled probabilistically. It opens the door to recognition of what Keynes, Knight, and Shackle theorized as true uncertainty. *Protean Power* promotes a similar shift in orientation in the field of international relations. Katzenstein and Seybert are therefore understandably critical of open economy politics (OEP) for its fidelity to twentieth-century neoclassical assumptions and its

associated failure to engage uncertainty. We share that skepticism.<sup>1</sup> The future of OEP may now be in doubt as its theoretical moorings in neoclassical theory are being destabilized.

*Protean Power* advances a framework to make sense of unexpected developments, strategies, and outcomes in a social world where too few causal relationships are adequately described with well-behaved probability distributions; where “uncertainty may be the rule and risk may be the exception” (Blyth 2009, 453). Katzenstein and Seybert’s approach to uncertainty foregrounds open-system thinking and complexity in international relations theory. The intervention opens the door to recognition of strategies by both weaker and more powerful actors that entail pragmatic problem solving, muddling through, sequential experimentation, innovation, and improvisation that escape the predictions of modelers tied to rational agents operating in known environments. Open-system thinking emphasizes the prevalence of feedback loops and the volatility of the socially constructed understandings of the world that drive agents’ behaviors and, in turn, very often generate unforeseeable outcomes. The approach reveals the false promise associated with the belief that experts in international relations or economics can adequately know, let alone reliably control, the social world.

Katzenstein and Seybert explore the intellectual sleight of hand involved in domesticating

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<sup>1</sup> For critical treatments of neoclassical envy in IPE, see Wade (2009) and Cohen (2009).

uncertainty by reducing it to risk. They note that “[r]isk-based thinking expresses a deep desire for and faith in control” (p. 29). We agree, and would argue only that in this regard they do not go quite far enough in displacing risk with uncertainty. Twentieth-century neoclassical economics (and the associated neoclassical-Keynesian synthesis) reflected the economist’s conceit that what Katzenstein and Seybert term “control power” was achievable given the right models and data, and sufficient deference to economic expertise in the policy domain. The fear of uncertainty is aptly characterized by Schultze, who argued that “When you dig deep down, economists are scared to death of being sociologists” (quoted in Katzenstein and Nelson 2013, 251). What may be thought of as the conceit associated with “knowing too much” (DeMartino 2013b) is reflected in an abiding faith in social engineering and in the economic profession’s commitment to what Colander (2003) aptly describes as the “economics of control” approach to theory and policy. Colander traces the control approach to the work of mid-century theorists such as Lerner (1944) who, ignoring the warnings of scholars such as J.N. Keynes and Lionel Robbins, believed the economist could infer policy interventions directly from blackboard proofs. No room here for uncertainty that could undermine the ambitions of the economics profession by calling into question its capacity to know the future effects of policy interventions. The uncertainty problem was simply repressed: uncertainty was reduced to calculable risk. The goal was to establish the technologies necessary for *time travel*—letting economists see tomorrow, today (DeMartino 2019). This was accomplished by a range of strategies, the listing of which provides a tour of twentieth-century modernist economics: the presumption of the Walrasian auctioneer and the associated ban on non-tâtonnement trading; comparative statics; computable general equilibrium, dynamic stochastic general equilibrium, and representative agent modeling; and, of course, the imputation of a narrowly circumscribed rationality and

omniscience to economic actors with the ability to form rational expectations about the future. Rationality in the latter sense entails the presumption that all agents use the uniquely correct economic model in forecasting.<sup>2</sup> In all these ways economists eradicated uncertainty from economics in pursuit of a dependable science of policy formation.

Despite the predominance of neoclassical thought in economics, a range of alternative perspectives exists and indeed continues to thrive. Some economic iconoclasts embrace epistemic commitments that are consistent with the concept of protean power. We are thinking in this connection of the Austrians, post-Keynesians, complexity theorists, post-structuralists, many feminist and social economists, and those drawing on the work of Albert O. Hirschman. All call into question the notion that economic agents and economists have adequate knowledge of what is to come. Fortunately, beyond economics the concept of uncertainty has fared somewhat better.<sup>3</sup>

### **Control Power, Protean Power**

The analytical distinction between control and protean power entails two dimensions, the ontological and the epistemic. The former concerns whether a particular conjuncture is marked by calculable risk, where agents' interventions generate probabilistically calculable effects, or by

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<sup>2</sup> The rational expectations hypothesis requires that agents view only those policies that are consistent with the uniquely correct model as 'credible' (see Grabel 2000). See DeMartino (2019) for an approach to these methods that views them as alternative means for confronting the intractable problem of counterfactual reasoning in causal analysis.

<sup>3</sup> For instance, see Guzzini (2016), Scoones (2019), and Stirling (2018).

true uncertainty, where they do not. The epistemic dimension hinges on how agents make sense of the conjuncture. Do agents recognize correctly that the terrain on which they operate is such that probabilities can or cannot be usefully assigned to the impacts of their own practice? Here we wish to raise a concern about an epistemic distinction in the book. We then explore how Katzenstein and Seybert theorize the connections between the ontological and epistemic dimensions of the control-protean power binary.

### *Operational vs. Radical Uncertainty*

There is what strikes us as a misplaced emphasis in the book on a particular epistemic distinction, between “operational” and “radical uncertainty.” Operational uncertainty “speaks to the complexity of the world,” which defeats an adequate mapping of “secondary and tertiary consequences of particular actions” (p. 276). Katzenstein and Seybert claim that these effects are in principle knowable and “lend themselves to probability calculations,” but in practice “they often do not” (ibid.). Radical uncertainty refers to “unknown unknowns” that are “not susceptible to any form of calculation” (ibid.).

Much hinges in the book on this distinction. But from the perspective of an agent who must act, the distinction is apt to be immaterial. A better way to cut into the epistemic condition facing agents, we submit, is to distinguish between what DeMartino (2019) calls “reparable” and “irreparable” ignorance. Reparable ignorance refers to what agents don’t know yet but can come to know, given existing resources, in the practically relevant time frame. The temporal element is key. Is the desired knowledge available *when it’s needed*?

Irreparable ignorance refers instead to three epistemic categories. The first is what agents don't know and might someday know, but only when that knowledge is no longer *useful*. This, we take it, is Katzenstein and Seybert's operational ignorance. This domain encompasses an enormous set of unknown, evolving parameters and relationships that are epistemically but not practically available. G.L.S. Shackle (1992, 86) described the problem this way:

the validity of knowledge of general principles is independent of the historical calendar, but the question: What is the best action? is wholly dependent on the unique historical situation; and any knowledge of that situation, which is lacking when it is needed, is effectively lacking for ever and is for ever too late.

The second category is defined by a cruel conundrum—it involves situations where the knowledge needed about how to act in consequential choice situations can only be achieved by making the choice. The knowledge therefore necessarily comes too late. The hiker lost in the woods asks herself, are these berries food, or are they poison? This is a  $N = 1$  domain, where prior experience does not generate the requisite knowledge. Here, acting is properly theorized as an experiment. The epistemic question, then, is how large is this domain in the social sciences? A closed-system, risk-based account of the social world presumes it is quite small. An open-system, uncertainty account presumes instead that historical development is, to rephrase the common adage, just one damn experiment after another! This is the domain facing Brigden and Andreas' migrants as they navigate uncertain pathways to and across the US border (*Protean Power, PP*, chap. 5). They learn whom they can trust, if anyone, only by *entrusting* themselves to the care of suspicious actors. They learn too late if they decided unwisely.

The third category refers to the in-principle unknowable—to the ultimate limits of knowledge. This category captures what lies beyond the domain of expertise. This is Katzenstein and Seybert’s radical uncertainty. This category of irreparable ignorance presumes that there are *epistemically unavailable* parameters and relationships that could not be known even were we to have at our disposal boundless time and resources dedicated to knowing them. Part of the reason is that attempts to know the unknowable—such as via forecasting—change the course of human affairs, in unpredictable ways. For Knight, Keynes, and Shackle, the future course of economic affairs falls into this category. Knight (1971[1921], 199) put it this way:

It is a world of change in which we live, and a world of uncertainty. We live only by knowing something about the future; while the problems of life, or of conduct at least, arise from the fact that we know so little.

Keynes spoke of future events such as “the prospect of a European war” or “the price of copper...twenty years hence”(Keynes 1937, 213-4). Of these, he said, famously: “About these matters there is no scientific basis on which to form any calculable probability whatever. *We simply do not know...* (ibid., p. 213, emphasis added). Shackle (1992[1972], XI) was equally explicit. He spoke of the future as “the void of unknowledge.”

The distinction between the three categories of irreparable ignorance is theoretically interesting and important for some purposes. Katzenstein and Seybert emphasize the distinction between the first and third category—they map onto their distinction between operational and radical uncertainty. But we suggest that this is not the primary distinction when it comes to theorizing agents’ behavior and the emergence of protean power. For agents needing to act, the salient

distinction is between reparable and irreparable ignorance. Is the knowledge necessary to overcome ignorance available given existing resources at the time when it is advantageous or necessary for the agent to act? *Relative to that decision*, it is of little consequence whether the unknown is in-principle knowable. The problem is that the decision must be taken absent the knowledge. The ignorance is irreparable in the practical sense; the agent must act in the face of uncertainty. And it is that fact that, sometimes, gives rise to protean power.<sup>4</sup>

*Control Power, Protean Power: The ontological and epistemic dimensions*

In some places it is easy to mis-read Katzenstein and Seybert as treating the ontological and epistemic dimensions of power as largely independent variables, but with primacy given to the ontological moment. First, the context in which agents must act is or is not uncertain; second, agents do or do not recognize this fact. What happens next then depends on the interaction of these two dimensions. We think that reading is mistaken. The more general and satisfying approach on offer here is of mutual determination between the two dimensions with no *a priori* presumption regarding which is the essential driver of power. Yes, how the world *is* bears on the

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<sup>4</sup> Returning to the case of migrants, we take issue with the categorization of their uncertainty as operational in a concluding chapter by Katzenstein and Seybert (p. 279, e.g., table 13.2). Indeed, if Keynes, Knight, and Shackle are right in claiming that the future is fundamentally unknowable, then *all* the cases presented in the book entail irreparable ignorance. The question then becomes how, how well, and with what effects, do the institutions and individuals operating on these terrains manage that condition through some constellation of control and protean power strategies.



effects of agents' actions; but how agents *perceive* their world drives their behaviors, narratives and justifications, which in turn bear on the predictability of the effects of their actions and the actions of other agents. Agents' perceptions can effect a transformation from a domesticated, risky world, to an undomesticated, uncertain world—sometimes intentionally, often not. In this reading, there is no causal primacy. Instead, Katzenstein and Seybert invite researchers to explore particular contexts to ferret out just how the ontological and epistemic moments interact so as to generate risky situations that permit the efficacious exertion of control power, or uncertain situations in which protean power destabilizes established relations of control power.

The indeterminacy of the relationship between the two dimensions of power opens the door to productive investigations that trace how the performance of one kind of power may reproduce conditions for it to flourish or, alternatively and perhaps at the same time, to establish the conditions for the proliferation of the other kind. The extension and deepening of control power across particular landscapes can open up space for and call forth protean strategies (as Seybert and Katzenstein's discussion of scientific and technological advances and bitcoin suggest, *PP*, chap. 6); while the successful enactment of protean power establishes the ground for control power (p. 14). Moreover, uncertainty may catalyze the exercise of control power and/or protean power, which may in turn increase the degree of uncertainty and/or give agents the sense that certainty has been restored (as indicated by the cases explored in the contribution by Lockwood and Nelson, *PP*, chap. 8). All of this will be familiar to Marxian political economists working, for instance, in the tradition of social structures of accumulation (SSA) theory (Kotz, McDonough, and Michael Reich (eds.) 1994). In these approaches, a regime of accumulation stabilizes a mode of production over decades, but the particular patterns of control power

associated with each SSA or mode of regulation ultimately generates the conditions for a crisis of accumulation, at which point the outcome of protean strategies of antagonistic agents effects a shift to a new SSA, or a new mode of production altogether.

Katzenstein and Seybert's treatment of the relationship between the ontological and the epistemic determinants is nuanced. The case studies illustrate some of the many possibilities. One concerns the dialectic in which the expansion of control power promotes the exercise of protean power. The dynamic is illustrated particularly well in the case of over-the-counter derivative and sovereign debt markets by Lockwood and Nelson (*PP*, chap. 8) and especially in the chapter on immigration by Brigden and Andreas (*PP*, chap. 5).

The approach on offer prompts us to think of institutions, in part, in epistemic terms. Institutions seek to convert the unforeseeable to the foreseeable, the unpredictable to the predictable. They do this by establishing and securing rules, norms, narratives, and expectations among institutional insiders and outsiders with the intent of regulating behaviors that the institution can then, it hopes, take as given datum so as to devise and pursue efficacious strategies (Best 2008, Taleb 2007). Institutions attempt to press against the frontier separating the known from the unknown, diminishing the terrain of irreparable ignorance. Expanded knowledge is a principal institutional means for exerting control power. Enhanced knowledge overcomes reparable ignorance, converting uncertainty to calculable risk. It achieves this in part by pursuing practices that banish the uncertain from the relevant landscape—the landscape on which the institution operates. The conceit, too often, is that knowledge can at the same time shrink the terrain of irreparable ignorance, so that institutions can carry out their projects at least most of the time on

the presumption that its existence—though undeniable in principle—will be marginal in its effects.

Our sense is that there is a widely held view in the social sciences that increasing knowledge correlates with diminished uncertainty and with greater control power, just as institutional actors hope. Closed-system thinking. But is that assumption warranted? What if “increasing” knowledge does not necessarily increase the domain of control power at the expense of protean power? What if, at least some of the time, new, more extensive, or deeper knowledge threatens control power by shifting the epistemic boundary in the opposite direction—expanding the domain of uncertainty and diminishing the domain of calculable risk? We think that in the economic domain this outcome is not just plausible, but fairly common. What is the warrant, after all, for presuming that there exists, necessarily and always, a monotonically increasing relationship between knowledge acquisition and control? Knowing more may permit the proliferation of new strategies the outcome of which are entirely uncertain. Think in this connection of new technologies that involve genetic engineering. Or in terms of innovations in currencies, debt contracts, and in risk models and ratings of financial instruments (on the first, see Seybert and Katzenstein *PP*, chap. 6, on the second and third, see Lockwood and Nelson *PP*, chap. 8). The new knowledge implicit in new technology often enables what appear to be control strategies that open the window to new domains of uncertainty. We suggest that much new knowledge has this character, enabling novel control strategies the full effects of which cannot be known in advance of their implementation.<sup>5</sup>

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<sup>5</sup> We therefore see linkages between protean power and Schumpeterian creative destruction.

We note, following Katzenstein and Seybert, that uncertainty-induced protean power can be either destructive, constructive, or both at the same time (p. 26).<sup>6</sup> The cases in the book illustrate this point well: Seybert and Katzenstein (*PP*, chap. 6) identify constructive aspects of protean power in Silicon Valley start ups; Lockwood and Nelson (*PP*, chap. 8) identify destructive aspects of innovative financial products and practices, and Mendelsohn (*PP*, chap. 9) traces the protean power of terrorist groups. In addition, protean power can coexist with control power and the two forms of power can reinforce one another. This point is illustrated in Seybert, Nelson, and Katzenstein's (*PP*, chap. 10) discussion of Hollywood and diaspora-driven film industries that both feed off of and bypass Hollywood; and in Brigden and Andreas' (*PP*, chap. 5) examination of the protean practice of border security agents in the context of expanded control strategies.

### **Uncertainty, Protean Power, and Economic Theory**

We are particularly interested in the implications of uncertainty and the limitations to control power for the practice of economists. Adam Smith understood the link between epistemic arrogance and the control fantasies of social planners. He ridiculed “the man of system,” as he called him, who

is apt to be very wise in his own conceit; and is often so enamoured with the supposed beauty of his own ideal plan of government, that he cannot suffer the smallest deviation from any part of it... He seems to imagine that he can arrange the different members of a

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<sup>6</sup> A parallel argument appears in Best (2005) on the constructive consequences of ambiguity within institutions.

great society with as much ease as the hand arranges the different pieces upon a chess-board (Smith 1976[1759], 233-34).

Against the man of system Smith praised the responsible reformer who “will accommodate, as well as he can, his public arrangements to the confirmed habits and prejudices of the people; and will remedy as well as he can, the ‘inconveniences’ which may flow from the want of those regulations which the people are averse to submit to” (ibid, p. 233). While that message was finding some traction outside economics (see Scott 1998), it was certainly lost on Jeffrey Sachs and the many other neoliberal men of system of the late 20<sup>th</sup> and early twenty-first centuries (DeMartino 2011, chap. 1).

Today, however, there are indications of growing awareness within the profession—across the political spectrum—of the error or epistemic arrogance and associated professional conceits.<sup>7</sup> Hayek and Hirschman have proven to be influential in this connection. Hayek understood better than most of his contemporaries that in complex societies no agent could possibly have more than localized, tacit knowledge. In his view, even that knowledge is imperfect. Hayekian agents operate under what we are calling irreparable ignorance. Based on this insight Hayek concluded that the liberal market economy is the uniquely optimal economic institution that permits innumerable localized economic experiments. Most are destined to fail, but some succeed—and those (unpredictable) successes promote economic betterment. In Hayek’s view, no other institutional arrangement could match the performance of the liberal market economy in this

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<sup>7</sup> See e.g., Colander (2016) DeMartino (2011, 9-11,17,fns1,5,141-50, 2018), Easterly (2008), Ellerman (2005), Grabel (2017, 2018), McCloskey 1990), Nelson (2004), Rodrik (2007 ), and Taleb (2012).

regard. For his part, Hirschman refused to make the leap from recognition of true uncertainty to any particular economic model (for an extensive treatment of Hirschman, see Grabel 2017, especially chap. 2). He pressed the profession to reject “isms” of all sorts. If Hayek was the unrepentant liberal ideologue, Hirschman was the inveterate pragmatist. He, too, thought agents should be allowed to pursue localized experimentation. He just didn't agree that the liberal market was the only arrangement that could do the job. If Hayek wanted to reserve economic experimentation for private actors, and viewed most state initiatives as coercive interferences, Hirschman recognized that state actors, too, could be innovators that incubated social and economic experimentation. Hirschman also emphasized the *productive value* of irreparable ignorance.<sup>8</sup> He explored the virtue of ignorance with his concept of the “hiding hand” (a concept that Katzenstein and Seybert draw on favorably, e.g., p. 38). Like Keynes’ animal spirits, the hiding hand induces agents to undertake projects that they very well might not were they to know at the outset just how rough the road would be. In Hirschman’s view even those projects that ultimately fail can and often do generate useful knowledge that inform future innovations.

We are persuaded by Hirschmanian pragmatism (DeMartino 2011, Grabel 2017). But there is an insight in Hayek that bears attention in connection with the relationship between control and protean power. Hayek presents what could be taken as an *entropy* model of control power. In open systems efforts by institutional agents to extend control power so as protect themselves against instability and uncertainty should be understood not to *diminish* instability and

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<sup>8</sup> Hayek, too, realized the value of ignorance. The Rule of Law he advocates requires the construction of a legal framework that is unbiased in the sense that the legislator cannot know who specifically will be its beneficiaries (Hayek 2014[1944], chap. 6).

uncertainty, but instead to *concentrate* and *amplify* their effects among those agents who do not enjoy control power.<sup>9</sup> Speaking of open systems, Katzenstein and Seybert make a similar point: “more or better information, as in the squeezing of a balloon, simply pushes radical uncertainty into some other, unrecognized part of the political context” (p. 41). The Hayekian insight leads us to recognize, for instance, the ways in which the illicit security of hedge fund managers, who could count on financial rescue, induced extraordinary levels of insecurity for highly-leveraged homeowners who bore the brunt of the financial crisis. The key point, it bears repeating, is that the extension of the domain of the knowable and the controllable should not be taken to diminish the terrain of the unknowable and the uncontrollable. Instead, the extension exacerbates the effects of the unknowable and uncontrollable through concentration and amplification. And that mechanism suggests that control power can be threatened dialectically, by the ruptures its extension induces. The ruptures might be episodic, taking the form of infrequent crises that disrupt business as usual and bewilder those who took control power to be dependable, secure. But the periodic spasms may be intense and even epoch shifting, with uncertain effects. The ruptures are likely to be emancipatory and empowering for some—those that are have the capacity and/or the luck to achieve protean power. But they are apt to be very dangerous for those who lack the capacity for protean power, or who are so situated such that their protean efforts are overwhelmed by forces beyond their control.<sup>10</sup>

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<sup>9</sup> See Taleb’s related discussion (2008, 329) of the fragility caused by efforts to “manufacture stability.”

<sup>10</sup> It bears emphasis: protean power does not generate identical effects across actors, and it does not level the playing field. While protean power may solidify in new control power for some actors, protean power may fail to generate that effect among relatively disadvantaged agents.

We offer the entropy model as but one of innumerable explanatory frameworks that are provoked by the productive theoretical intervention that places protean power before us. It should be clear that we are persuaded that adding protean power to the conceptual catalogue of the social sciences represents an immensely important contribution. If we are correct that the expansion of knowledge and of control power often go hand in hand with the expansion of irreparable ignorance and protean power, then the project should mark a turn in emphasis and focus so as to better position social scientists to make sense of an unknowable—and uncontrollable—world.

### **Implications for Economists' Practice**

The simple diachronic account sketched above, in which control power can induce increased uncertainty and protean strategies with uncertain effects, helps to underscore the naiveté of those economists who look to the maturation of their science for resolution of the epistemic problem to which Katzenstein and Seybert direct our attention. In the recent past, the modernist hope for an adequate mapping of social affairs in economics manifested in abstract, deductive models which were thought to cut through the apparent complexity of the social world so as to reveal its underlying simplicity (Ruccio and Amariglio 2003). The grand neoclassical project stands as the best exemplar of this hope; orthodox Marxism arguably shares the aspiration. Today the faith in abstract modeling is eroding at a startling rate, especially among recent entrants to the economics profession. The predominant mode of inquiry in many branches of economics today is rigorous

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Instances where the disadvantaged ultimately secure control power via protean power should not lead to the conclusion that protean power is necessarily democratic or emancipatory (cf. Brigden and Andreas, *PP*, chap. 5)



empirical investigation (Economist 2018, Rodrik 2015). A new empiricism is driving a hope that secure knowledge can be generated through better data and better empirical methods, applied pragmatically by open-minded economists unburdened by twentieth-century ideological alignments that required fealty to the liberal market ideal. Economic randomized controlled trials (RCTs) are now claimed to be the gold standard of economic investigation. Clinical equipoise rather than theoretical fidelity is the new norm.

The empirical turn in economics is a welcome development, especially to the degree that it shakes the profession from unwarranted confidence in blackboard proofs. Twenty-first century economics is moving in a Hirschmanian direction (Gabel 2017).<sup>11</sup> But it cannot provide a solution to what is, after all, the irresolvable epistemic problem that Katzenstein and Seybert elucidate in the book. The extension of knowledge in service of control power, whether that knowledge is derived axiomatically or empirically, can create the conditions for the eruption of crises of control in which uncertainty rears its head and protean power exerts its force.

Uncertainty entails profound ethical implications for economists which we have explored extensively elsewhere (DeMartino 2011, Gabel 2017) and can reframe here in terms of control

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<sup>11</sup> That said, we think that Hirschman would have been dismissive of the epistemic and ethical underpinnings of economic RCTs, especially to the degree that such experiments are thought to reveal generalizable policy strategies and to the extent that they rely on power imbalances between the researcher and the research subject (Gabel 2017, 32-3,44-6). We read Hirschman as an advocate of experimentation *with*, not experimentation *on*, vulnerable communities. (see critique of RCTs in Deaton and Cartwright 2018).

and protean power. First, in their applied work economists reflexively seek to expand control power, and most certainly ignore the unsettling effects of protean power. They therefore too often lose sight of the fact that at best economists exert enormous influence, but little control. Influence without control is a very dangerous mix, which can harm those whom economists purport to serve (DeMartino 2013a).<sup>12</sup> Rather than grapple with the ethical entailments of this condition, the profession has sought, simply, to extend its influence (DeMartino 2011). Second, even the best economic research does not permit time-travel. Economists cannot know tomorrow, today. We suggest, fully aware of the self-contradiction, that tomorrow's economists will be equally unable to pierce the opacity of the future. About key aspects of tomorrow both economists and the economic agents they study are irreparably ignorant. Third, these two facts imply that economists should look to abandon point estimates and confidence intervals in forecasting, and optimization in policy work. Optimality is an appropriate goal in a secure, closed-system, control-power world. In our world, the pursuit of optimality is far too dangerous. Our world would be far better served by robust policy decisions, policies that have a chance to do well enough and to prevent deep hardships under a wide range of possible futures, where we cannot assign probability distributions to those possible futures. Fourth, open systems are best confronted by muddling through (as per Hirschman and Lindblom 1971[1962], Lindblom 1959, Colander 2003), an appropriately humble approach to policy formation.

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<sup>12</sup> Scott's (1998) concept of *mētis* relates directly to the distinction between control and protean power, as Katzenstein and Seybert, and Lockwood and Nelson (*PP*, chap. 8) acknowledge, but also to the dangers associated with losing sight of the limits to economic expertise.

Fortunately, what have been professionally marginalized traditions in economics are trending in these directions. We take note of an increasing emphasis on policy autonomy to permit experiments in economic development (Grabel 2017, Rodrik 2015, 2009), scenario analysis (El-Erian 2019), complexity analysis (Elsner 2017), and “robust decision making” and other strategies that are reflected in the general framework called “decision making under deep uncertainty” (Marchau et al. 2019). For some time these approaches have been embraced by climate scientists, security and terrorism specialists, urban planners, water resource managers, and other experts who understood that decisions must be taken today the achievements of which will be battered by unknowable future events. Economists are now joining the effort to embrace fundamental uncertainty and think through what it implies for responsible professional practice. In our view, the most important aspect of the empirical turn in economics is the contribution new empirical research can make, potentially at least, toward uncertainty-driven economic practice and policy design. Katzenstein and Seybert’s powerful and nuanced conceptual framework represents an important contribution to that effort.

### **Author Bios**

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