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The New Regulation: From Command to Coordination in the Modern Administrative State

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THE NEW REGULATION:
FROM COMMAND TO COORDINATION IN THE MODERN ADMINISTRATIVE STATE

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Since its earliest days, the administrative state has been rationalized by a particular vision of the world. In the latter, public goods and free-rider problems, collective action and information failures, tragedies of the commons, and negative externalities constitute the “state of nature.” Regulation is the state’s response: command-and-control measures designed to alter the dominant incentives of individuals and institutions to defect from socially optimal equilibria. In environmental law, consumer protection, workplace safety regulation, and other domains of the modern administrative state, this Prisoner’s Dilemma is the motivating tale.

To a growing degree, however, the demands of the social and economic order in modern industrialized states go beyond this account. As to the basic structure of the financial markets and the resolution of financial crises – including the economic panic of 2008 and beyond – coercive regulation directed to the adjustment of private incentives has little to contribute. In the creation and evolution of networks – from the internet backbone and the electricity grid, to Facebook and other social networks, there is no dominant incentive for individuals to abandon the common weal. Likewise, in the emergence and evolution of standards for high-definition television and wireless communication.

It is high time, then, for a re-accounting of the project of the administrative state. To that end, this essay draws on a bit of game theory disregarded by the majority of legal scholars, to highlight the emergence of coordination as a central function of the modern regulatory state. Collective action problems, free-riding, negative externalities, and other Prisoner’s Dilemmas may justify prevailing paradigms of command-and-control regulation directed to individual incentives to defect from socially desirable equilibria. Where a dynamic of coordination is at work, however – in financial and internet regulation, network-building, telecommunications, standard-setting, and innovation, among other important areas of the modern social and economic order – a distinct story of the regulatory state becomes necessary. In both function and form, the emergence of a new regulation may be in order.

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Introduction

[Int] It is time to reconsider the theories under which new forms of wealth are regulated, and by which governmental power over them is measured... The challenge of the future will be to construct, for the society that is coming, institutions and laws to carry on this work... We must create a new property.¹

The modern administrative state is at a turning point.

Recent months paint the picture: In October 2008, the once-esteemed Alan Greenspan – acolyte of Ayn Rand and central planner in the late-twentieth century charge against the regulatory state – confessed to a “breakdown” in his assumptions about the market and its regulation.² Only months later, he became perhaps the most prominent commentator to embrace some nationalization of U.S. banks.³ Contemporaneously, George Bush presided over the acquisition of massive public stakes in corporate America, while Barack Obama followed suit with a stimulus package dramatically increasing public spending across the breadth and width of the U.S. economy. As Newsweek summed things up: “We Are All Socialists Now.”⁴

The transformation of the modern state, however, has been more than a few months in the making. Bill Clinton did, it is true, promise “the end of big government.” But by that he meant its “reinvention,” as much as anything else.⁵ Even before the federal government’s dramatic interventions on behalf of Bear Stearns, IndyMac Bank, AIG, Fannie Mae and Freddie Mac, Citibank, and other firms, meanwhile, President Bush had presided over the biggest

² See Testimony of Alan Greenspan before the House Committee on Government Oversight and Reform, Oct. 23, 2008 (explaining that he was in a “state of shocked disbelief” over the failure of his assumptions that shareholder equity would be protected by the self-interest of lending institutions).
⁴ John Meacham & Evan Thomas, We Are All Socialists Now, NEWSWEEK, Feb. 19, 2009, at 23.
expansions in federal entitlements and bureaucracy in decades – the addition of prescription benefits to the Medicare program and creation of the Department of Homeland Security. ⁶

What the recent financial crisis did do, however, was to transmute theoretical – even amorphous – questions about the nature of modern governance into a consensus that things had changed. In conjunction with the electorate’s embrace of President Obama’s “change” agenda, thus, the financial crisis dramatically undermined both the theories and the policies of deregulation that dominated our approach to the administrative state for decades. For all the talk of the end of big government, it turns out that it is deregulation that is dead.

Some might cast this as little more than (party) politics as usual – particularly coming, as it has – amidst a transition in presidential administrations. As the political affiliations of the relevant executives make clear, though, there is more going on than mere politics. President Bush has done as much to create the need for new theories of governance, as Presidents Clinton and Obama. ⁷ It would seem, then, that something fundamental is happening to the modern administrative state.

In this essay, I posit that important dimensions of our recent uncertainty about big versus small government, about the charms and dangers of deregulation and privatization, and about the changing nature of the regulatory state, can be traced to the declining relevance of traditional accounts of regulation, in the modern social and economic order. For much of the twentieth century, fear of public goods, free-rider, and tragedy of the commons problems in environmental protection and other fields, of negative externalities and collective action difficulties

⁶ See David Gratzer, Expanding Regret, NATIONAL REVIEW ONLINE, Nov. 24, 2003 (noting that Medicare Part D constitutes the “largest single expansion of a federal entitlement in three decades”); William Shughart II, George W. Bush and the Return to Deficit Finance, 118 PUBLIC CHOICE 223, 225 (2004) (reporting that proposed budget for Department of Homeland Security for fiscal year 2004 represented 64% increase over the combined pre-September 11 budgets of the programs and agencies within it, when they were housed elsewhere in the executive branch).
⁷ As Newsweek aptly put it: “Bush brought the Age of Reagan to a close; now Obama has gone further, reversing Bill Clinton’s end of big government.” Meacham & Thomas, supra note 4, at 23.
in ensuring the safety of products and working conditions, and of information asymmetries in the
sale of consumer goods, have been central to our understanding – and the defense – of the
modern administrative state.⁸

In the face of these phenomena, advocates of the administrative state have long argued, regulation offers a cure.⁹ Properly designed and enforced, command-and-control regulation can address the common inefficiency that stands behind each of these market failures: the dominant incentive of individuals and institutions to defect from socially optimal equilibria, in the pursuit of private gain. In the over-production and over-consumption of public goods, the creation of negative externalities, failures of information, and so on, it is this incentive to defect that is seen to characterize the Hobbesian “state of nature” – and that regulation seeks to address.

Complete as this account of the social and economic order may have been through the twentieth century – and important as it may remain – it now misses at least as much as it captures of the world in which we live. Of the breadth of demands placed on the modern administrative state, an ever-diminishing proportion arises from questions of individuals, incentives, and defection. Such concerns have not, to be sure, become irrelevant. Yet they miss a great deal of what is going on.

Consider, by way of example, the internet – as ubiquitous a feature of the U.S. social and economic order as one might imagine.¹⁰ The essential functionality of the internet turns on the extent of interconnection and interoperability among its users. There is, as such, no individual incentive to defect from prevailing file transfer protocols, data networks, or the like. If

⁹ See Breyer, supra note 8, at 30-33.
anything, the story might be just the opposite: inadequate incentives to abandon a sub-optimal, yet dominant, network.\footnote{See Christopher Ruebeck et al., \textit{Network Externalities and Standardization: A Classroom Demonstration}, 69 \textit{Southern Econ. J.} 1000, 1000 (2003).}

The “network” dimension of internet operability, in turn, suggests other areas in which a vision of the social and economic order as characterized by inefficient defection seems inapposite. Recent years have seen increasing concern with the need to update the United States’ electricity transmission network.\footnote{See Matthew L. Wald, \textit{Wind Energy Bumps Into Power Grid’s Limits}, \textit{N.Y. Times}, Aug. 18, 2008, at A1; see also Matthew Daly, \textit{Stimulus Bill Would Boost NW Power Grid}, \textit{Wind Energy}, \textit{Seattle Times}, Feb. 1, 2009.} In the construction and operation of the power grid, however, the prospect of defection is hardly a concern. No one is incentivized to abandon the existing network and build their own. The same might be said, if to a lesser degree, in the increasingly popular world of online social networks. If my friends are all on Facebook, I have little incentive to abandon it for MySpace.

A similar story might likewise be told in the growth in technologies that rely on common standards for their full functionality. In many of the most important areas of technological innovation today, interoperability is key.\footnote{See Saul Hansell, \textit{Connecting Gadgets is Theme at Annual Show}, \textit{N.Y. Times}, Jan. 7, 2009, at B7.} The benefits of high-definition television, for example, depend on effective compatibility between television units, data distribution networks, and relevant programming.\footnote{See Joel Johnson, \textit{HDTV Guidebook}, \textit{Popular Mechanics}, Jan. 2006.} Wireless communications is a similarly obvious example.\footnote{See T. G. Zimmerman, \textit{Wireless Network Digital Devices: A New Paradigm for Computing and Communication}, 38 \textit{IBM Systems J.} 1999, available at \url{http://www.research.ibm.com/journal/sj/384/zimmerman.html}.} The growing importance of standard-setting can likewise be seen in the increasing incidence of standards conflicts in recent years – including the extended battle
between Blu-ray and HD DVD standards for DVD’s,\textsuperscript{16} the International Organization for Standardization’s controversial adoption of Microsoft’s Open Office XML,\textsuperscript{17} and the geopolitical tensions surrounding China’s development of its own wireless services standard.\textsuperscript{18} As to these and other standard-setting conflicts, once again, there is no issue of potential defection from a socially optimal equilibrium.\textsuperscript{19}

A myriad other examples of the inapplicability of conventional, defection-oriented accounts of the social order can be found throughout the “new economy.” In what follows, however, I emphasize one in particular: Perhaps recalling the role of the recent financial crisis in highlighting the need for a revised account of the project of the modern administrative state, a final case in point is the modern financial markets. At the heart of today’s financial system is an interconnection of dispersed markets – for credit, securities, derivatives, futures contracts, and the like.\textsuperscript{20} At the heart of the financial crisis, in turn, was a credit crunch grounded in analogous interconnections – in that case, of expectations.\textsuperscript{21} In the operation of the financial markets, as such – and in the resolution of financial crises – the operative challenge is not

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\item \textsuperscript{17} See Peter Sayer, \textit{ISO Confirms Approval of OOXML, Gives Two Months to Appeal}, COMPUTERWORLD, Apr. 2, 2008.
\item \textsuperscript{19} Related to the coordination dynamic at work in the emergence and evolution of standards-driven technologies, one might highlight the increased rates of patenting in recent years, as creating a further dynamic of coordination. As described below, with a myriad patents now applicable to any given technological, pharmaceutical, or other innovation, efforts to innovate have come to require significant coordination – among the wide universe of potentially relevant patent holders. \textit{See infra} notes 97-101 and accompanying text. In this setting, as above, there is little incentive to defect – at least once an innovation equilibrium has emerged.
\item \textsuperscript{20} Cf. Joe Nocera, \textit{Propping Up a House of Cards}, N.Y. TIMES, Feb. 28, 2009, at B1 (emphasizing need to continue providing funds to AIG, given intertwining of its books with banks and firms across the globe).
\item \textsuperscript{21} See Chrystia Freeland, \textit{The Credit Crunch According to Soros}, FIN. TIMES, Jan. 31, 2009.
\end{itemize}
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individual defection from efficiently functioning credit and investment markets, a strategy with little attraction to market participants, whether individually or collectively.

Rather, the issue is coordination. As in the internet, the construction of both physical and virtual networks, standard-setting, and elsewhere, the fundamental dynamic at work in the financial markets is not one of individual defection, but of group coordination. The source of both private and social utility in each of these areas is the coordinated participation of relevant private actors. There is, as such, little to be gained by defection. Consequently, there is little argument for command-and-control regulation to prevent it.

Yet a story of coordination should not be assumed to promise a happy ending. Even as it challenges existing theories of regulation, the rise of coordination cannot be equated with an argument for deregulation. With regard to the financial markets, the internet, high-tech innovation, and the like, a hands-off approach – the default paradigm of regulation in recent years – may not be the answer. There is no incentive to defect in these settings. But that does not mean there is no need for regulation. Echoing Charles Reich’s famous call for a new property, rather, we may today be in need of a “new regulation.”

Part I reviews our traditional accounting of the regulatory state, outlining the standard economic arguments for regulatory intervention in the market, and suggesting each to rely – at least in significant part – on a notion of individual defection from socially optimal equilibria as the operative “state of nature” against which regulation must act. This, of course, is the familiar

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23 See Reich, supra note 1.
world of the Prisoner’s Dilemma, in which co-conspirators’ individual pursuit of their interests yields worse sentences for both.24

Part II contrasts this account with the state of the world as we know it, highlighting the disconnect between the traditional account and critical aspects of the social and economic order of the twenty-first century.25 In these areas, I suggest, coordination is the operative dynamic, rather than defection. Identifying the financial markets, the internet, technological standard-setting, network-building, and other areas as defined by dynamics of coordination, Part II further highlights the publication of a flurry of recent works – by Michael Heller, Larry Lessig, Yochai Benkler, and Clay Shirky – each of which can be read to offer coordination accounts of the modern social and economic order.26 Given the evident importance of coordination, then, Part II concludes by highlighting the relevance of “coordination games” – patterns of strategic interaction largely neglected by legal scholars, in favor of the more familiar Prisoner’s Dilemma – to a modern-day understanding of the project of the administrative state.

If coordination is increasingly central to the social and economic order, thus, some significant implication might be expected, for both the function and form of regulation. Part III takes up this question, exploring the broad outlines of a regulatory regime directed to coordination. Highlighting three shifts attendant to a move from the Prisoner’s Dilemma to coordination games – from incentives to expectations, from dominant strategies to multiple equilibria, and from individuals to groups – Part III considers the implications of each for the nature of relevant regulation. It suggests, for example, the prospect of regulation that is less

24 For a concise description of the Prisoner’s Dilemma, see WILLIAM POUNDSTONE, PRISONER’S DILEMMA 103-105 (1992).
25 In part, this disconnect might be traced to the fairly dramatic displacement of public interest-oriented analyses of regulation, by public choice critiques of it – perhaps especially in the U.S. literature on regulation. Given the latter, our analysis of affirmative economic rationales for regulation may simply have been treading water, since the 1970s.
26 See infra Part II.B.
coercive in nature, is more oriented to information-production and to the facilitation of innovation, and is embracing of broader forms of both private regulation and reviewable state action. I conclude, finally, by considering the potential application of these principles – at least in rough terms – to the recent financial crisis.

By identifying and elaborating upon a coordination function of regulation in the modern social and economic order, some of the paralysis and confusion that has characterized our regulatory approach in areas including the internet, high-tech innovation, and – as has become abundantly clear – the financial markets, might well be alleviated. Some part of our inability to regulate effectively in these areas might thus be traced to our inattention to the true function and the consequently appropriate form of regulation in these and similar spheres.

More generally, an appreciation of the growing importance of coordination in the modern social and economic order may speak to some of the confusion in our positive accounts of the regulatory state: Is it expanding or shrinking? Is it stronger or weaker? Is the public sector becoming more private, or the private sector more public? Likewise, it may shed light on the normative questions that follow: When is regulatory intervention appropriate? What form should it take? And most broadly, what should the modern administrative state look like?

To move forward, this essay argues, we need to acknowledge the fundamentally distinct demands now faced by the modern administrative state. Increasingly, we may be moving from the modern administrative state to a modern coordination state. This is not a simple story of deregulation or small government. Neither, however, is it one of re-regulation or big government. Properly understood, the “question . . . is not whether government is too big or small, but whether it works.”

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27 See Barack Obama, Inaugural Address, Jan. 20, 2009, available at http://www.whitehouse.gov/blog/inaugural-address. Again, as Newsweek’s cover story characterized
I. THE DILEMMA OF DEFECTION AND THE MODERN ADMINISTRATIVE STATE

Since its inception a century ago, a now widely familiar series of market failures have been invoked in defense of the administrative state. Behind the varied assertion of public goods and free-rider problems, tragedies of the commons, collective action and information failures, negative externalities, and the like, however, there stands a common vision of the social and economic order. Across much of our conventional accounting of the administrative state, as such, it can be understood to respond to a particular conception of how the world works.

In this telling, individuals and institutions are often incentivized to abandon socially optimal agreements, arrangements, and other equilibria – in the pursuit of private gain. Given this shared incentive, however, the final results offer no such gain. Rather, they are both socially and privately sub-optimal. By comparison with the original equilibrium, all are worse off.28

In the face of this dismal state of affairs, however, the interventions of the administrative state offer a cure. By the selective imposition of (properly calibrated) command-and-control regulation, the state can alter individual incentives in such settings.29 In this way, the dominant incentive of individuals and institutions to defect from socially optimal equilibria disappears.

This basic vision of the world to which the modern administrative state seeks to respond becomes apparent when we consider each of the economic rationales for regulation that have

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28 See, e.g., Gideon Doron, Administrative Regulation of an Industry: The Cigarette Case, 39 PUBLIC ADMIN. REV. 163, 165-167 (1979); see also Kent Greenfield, Using Behavioral Economics to Show the Power and Efficiency of Corporate Law as a Regulatory Tool, 35 U.C. DAVIS L. REV. 581, 599 (2002). As I emphasize below, this is essentially the dynamic of the Prisoner’s Dilemma. My ultimate claim, as such, is that the world view that stands behind our traditional conceptions of the modern administrative state is fundamentally that of the Prisoner’s Dilemma.

commonly been offered. Each, I would argue, implicates some dimension of defection from optimal social or economic arrangements – if admittedly to varying degrees. Considered collectively, however, they make the centrality of defection to regulation theory’s vision of the world quite apparent.

Public goods arguments for regulation – and intertwined accounts of the so-called “tragedy of the commons” – highlight as much. In public goods settings, of course, we find a resource that is a “common or collective benefit[] provided by government[],” available regardless of one’s individual contribution to it.\(^{30}\) It is impossible – or at least difficult – to exclude its use by additional consumers. Such use, meanwhile, does not preclude consumption by others. In such settings, the argument goes, individuals can be expected to free-ride on the demand of others, and to over-consume the relevant resource.

This is precisely the dynamic of defection from optimal equilibria suggested above. If all contribute their share toward production of the relevant public good – be it police protection, public roadways, national defense, scientific research, or the proverbial lighthouse – social and private utility will both be enhanced. The incentives of individuals and institutions to free-ride on the demand of others, by understating their true demand, however, produces the opposite result. Writ large, such incentives dictate little or no production of public goods – with concomitant losses to both social and private utility.\(^{31}\)

The same dynamic can be observed in the tragedy of the commons, as first described by Garrett Hardin, who spoke of cattle grazing on a common plot.\(^{32}\) According to Hardin, the tragedy arises here because the herdsmen are each incentivized to maximize their individual


\(^{31}\) Free-rider dynamics at work in public goods settings are thus to similar effect. See David Schmidtz, Public Goods and Contracts, 10 HARV. J. LAW & PUB. POL’Y 475 475-482 (1987).

\(^{32}\) Garrett Hardin, The Tragedy of the Commons, 162 SCIENCE 1243, 1244 (1968).
gain, by having as many cattle on the pasture as possible – with the ultimate effect of over-grazing. Similar tragedies might arise from residents’ use of a public park, or the use of a local watershed for waste disposal. In each of these cases, individual defection from an optimal equilibrium of constrained consumption produces a net social and private loss. As Hardin eloquently put it: “Ruin is the destination toward which all men rush, each pursuing his own best interest in a society that believes in the freedom of the commons.”

Broadly, the entire universe of collective action problems – within which public goods and tragedy of the commons, as well as free-rider, problems might plausibly be encompassed – can be seen as stories of defection. As most famously highlighted by Mancur Olson, collective action problems arise from the limited return to any single individual, of addressing a relevant social dilemma. Climate change regulation may be the timeliest example. Notwithstanding the collective utility of adjustment in this setting, individuals may again seek to free-ride, producing a net reduction in both social and private utility. Again, individual defection – a failure to lend support to the common project – emerges as the operative challenge.

Related to collective action rationales are assertions of negative externalities as grounds for regulatory intervention. Such externalities, of course, are grounded in the notion that an efficient level of production and consumption of a good or service arises from the internalization of all relevant costs and benefits into the price of the applicable good or service. In certain circumstances, however, it is difficult – if not impossible – to achieve such

33 Id.
35 See OLSON, supra note 30, at 2.
internalization. In the contamination of air by large industrial enterprises, for example, costs may be imposed not only on the immediate neighbors of the relevant facility, but even distant ones – a significant negative externality. Individual and institutional failures to invest in computer security are to analogous effect, given the ability of corrupted computer systems to infect the equipment of others, however far afield. Ian Ayres and Joe Bankman even offer an account of insider trading as a source of negative externalities across firms. Because externalized costs in these settings are not incorporated into the unit price of the relevant good, we can expect it to the over-produced and over-consumed.

Once again, the relevant market failure can be understood as one of defection. In the presence of negative externalities, individual production and consumption detract from a socially optimal order. Optimal in what sense? Broadly stated, in its efficiency. Thus, if we understand a well-functioning market as a source of social utility, defection from it – by the imposition of externalities on other market participants – undermines that utility. Stating it differently, individual defection in the generation of negative externalities diminishes the efficiency of the markets as a mechanism of aggregation. Where individuals impose negative externalities on others, thus, the market fails to accurately aggregate consumer demand, and hence production.

Information failures, another conventional argument for regulation, can likewise be understood to rest on a vision of the economic order as characterized by defection. Here, the operative claim sees asymmetry in the information available to transacting parties as distortive

of efficient trade. In securities law, for example, an elaborate scheme of mandatory disclosure upon issuance and continuing disclosure thereafter has been in place for three-quarters of a century, motivated by a notion of thick information as critical to efficient securities markets.

To similar effect might be the disclosure requirements for food products, in place since 1938 and motivated by the potential for food consumption to be dramatically impacted by notorious food safety failures. Individual failure to disclose private information in such settings thus undermines – as with negative externalities – the efficient operation of the market.

Beyond general market efficiency, moreover, defections from the provision of full information may also be harmful, in generating Akerlof’s infamous “market for lemons.” Akerlof thus describes information asymmetries in the sale of cars, for example, as creating a market in which even sellers of good cars are forced to sell at a discount. Given potential asymmetry in buyers’ versus sellers’ information, all used cars end up being priced as lemons.

Finally, although furthest removed from a vision of the social and economic order as characterized by individual defection from socially optimal equilibria, even natural monopoly arguments for regulation – at least in part – can be understood in this light. Such monopolies arise, of course, in those industries characterized by diminishing marginal costs of production and distribution. Production and distribution of the ten thousandth gallon of water, for example, is dramatically less costly that the per unit production and distribution cost of the

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tenth – given the substantial fixed costs of the necessary facilities for production and distribution. Likewise, the production of one additional copy of a software program, the transport of yet another rail passenger, and the delivery of one further watt of electricity.

Monopoly production in such settings, however, creates the potential for significant inefficiencies. Relevant producers can be expected to abuse their monopoly power – including in their pricing, their failure to innovate, and the like. As above, in doing so, monopolist firms undermine the efficiency of relevant markets, generating deadweight social losses. Thus, in monopoly settings, the loss in consumer surplus – the promised benefit of efficient pricing – is greater than any gain to the monopolist. As above, then, the exercise of monopoly power – or, more precisely, its abuse – constitutes a kind of defection from socially optimal equilibria.

As this overview makes clear, our rationalization of regulation and the modern administrative state rests, in significant part, on a common vision of the world. Across our various economic arguments for regulation – public goods, free-rider, and collective action claims most clearly, negative externality and information problem arguments to a significant degree, and even natural monopoly claims, to some extent – we find a shared notion of how the social and economic order works. In it, individuals and institutions will often be incentivized to diverge, in their individual behavior, from socially optimal arrangements and equilibria. Given as much, the role of regulation is obvious: to alter individual incentives, so as to prevent defection.

46 It bears noting that the arguments for regulation I emphasize above do not exhaust the range of asserted grounds for regulatory intervention in the market economy. Various non-economic arguments might also be offered, including claims grounded in concerns of distribution. The claims of market failure that I emphasize are more widely accepted, however, and are the particular concern of the analysis herein.
Again this backdrop, it should come as little surprise that legal scholars – as Richard McAdams has recently highlighted\(^4\) – have developed a bit of an obsession with the so-called Prisoner’s Dilemma. For the latter, in essence, embraces precisely the vision of the social order suggested above.

In the familiar dynamic of the Prisoner’s Dilemma, of course, a pair of co-conspirators is faced with the question of whether to confess – given the prosecutor’s ability to convict on a minor offense (e.g., gun possession) without a confession, and her willingness to respectively reward or punish a single co-conspirator’s decision to confess or refuse to confess. In this setting, the Prisoner’s Dilemma teaches, both prisoners can be expected to confess, even though both would have been better off, had they held their respective tongues.\(^4\)

Thus, in its normal form, with payoffs to \{Row Player, Column Player\} indicated by years of incarceration, the Prisoner’s Dilemma can be captured as follows:

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<th>Do not cooperate</th>
<th>Confess</th>
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<tr>
<td><strong>Do not cooperate</strong></td>
<td>(1,1)</td>
<td>(10,0)</td>
</tr>
<tr>
<td><strong>Confess</strong></td>
<td>(0,10)</td>
<td>(5,5)</td>
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Here, of course, defection is the centerpiece of the story.\(^4\) While both social and private utility would be maximized if both players remained silent, the equilibrium in Prisoner’s Dilemma games is the sub-optimal result of \{Confess, Confess\}. Consider Row Player, thus, and her choice (on the vertical axis) between remaining silent and “defecting” by way of confession.


\(^4\) See Block-Lieb, supra note 34, at 813; see also Ronald J. Gilson & Robert H. Mnookin, Disputing Through Agents: Cooperation and Conflict Between Lawyers in Litigation, 94 COLUM. L. REV. 509 (1994).
If Column Player elects to remain silent, Row Player can eliminate even her minimal (one year) sentence, by confessing. If Column Player decides to confess, on the other hand, Row Player’s incentive to do so is even greater, given that it will cut her sentence in half. The same, of course, is true of Column Player’s incentives vis-à-vis Row Player’s choice of strategy. Even though both would be better off remaining silent, if left to their own devices, both will confess and be worse off.

In significant part, this is just the logic behind public goods, collective action, free-rider, negative externality, and other rationales for the administrative state, as suggested above. Scholars, in fact, have often characterized these arguments in precisely the terms of the Prisoner’s Dilemma. Most consistently, this can be seen in discussions of public goods, free-rider, collective action, and negative externality arguments for regulation.\footnote{See, e.g., ROBERT O. KEOHANE, AFTER HEGEMONY: COLLABORATION AND DISCORD IN THE WORLD POLITICAL ECONOMY 67-69 (1984); John K. Setear, An Iterative Perspective on Treaties: A Synthesis of International Relations Theory and International Law, 37 HARV. INT’L L. J. 139, 163 n.160 (1996).} A few examples are suggestive: Hanoch Dagan, to begin, describes commons property as “the axiomatic example of a prisoner’s dilemma.”\footnote{See Hanoch Dagan, The Liberal Commons, 110 YALE L.J. 549, 555 (2001); see also THOMAS C. SCHELLING, MICROMOTIVES AND MACROBEHAVIOR 110-15 (1978) (describing commons as Prisoner’s Dilemma).} Lee Anne Fennell’s analysis of “common interest tragedies” is to similar effect, while also linking the operation of negative externalities to Prisoner’s Dilemma dynamics.\footnote{See Fennell, supra note 38, at 944; see also Robert W. Hillman, Business Partners as Fiduciaries: Reflections on the Limits of Doctrine, 22 CARDOZO L. REV. 51, 74 n.65 (2000); Anatol Rapoport, Prisoner’s Dilemma, in THE NEW PALGRAVE: GAME THEORY 199, 204 (J. Eatwell et al. eds., 1989) (“Generalized to more than two participants [the Prisoner’s Dilemma] becomes a version of the so-called Tragedy of the Commons...”).} David Schmitz, meanwhile, identifies free-rider problems as being captured by half of the Prisoner’s Dilemma, along with collective action problems more generally.\footnote{See Schmitz, supra note 31, at 479-83; see also David W. Leebron, Games Corporations Play: A Theory of Tender Offers, 61 N.Y.U. L. REV. 153, 188-90 (1986).} In the setting of international securities regulation, finally, Amir Licht finds Prisoner’s Dilemma
dynamics in public goods, free-rider, and externality problems.\textsuperscript{54} Even the analysis of
information asymmetries and natural monopoly, however, has been seen to exhibit something
of a Prisoner’s Dilemma dynamic.

A dynamic of individual defection from socially optimal equilibria – the Prisoner’s
Dilemma – can thus be understood to capture much of the motivating story behind the modern
administrative state. Standard arguments for regulatory intervention in the marketplace see
regulation as the remedy to a particular condition of the social and economic order. Fear of
public goods and free-rider problems, tragedies of the commons, collective action problems,
externalities, information failures, and even natural monopolies all assume a world in which
individuals and institutions are incentivized to deviate from optimal equilibria. In our
conventional accounts of the modern administrative state, thus, we live in a world of the
Prisoner’s Dilemma.

II. FROM DEFECTION TO COORDINATION IN THE NEW ECONOMY

Prevailing accounts of the administrative state, then, rely on a particular vision of the
world – one in which individuals and institutions are incentivized to defect from socially
optimal equilibria. But there is a problem. In significant and growing ways, this is the not the
world in which we are living. Central – even foundational – dimensions of the modern social
and economic order are not defined by individual incentives to defect. Rather, they are defined
by the need for effective and efficient coordination.

\textsuperscript{54} See Amir N. Licht, \textit{Games Commissions Play: 2X2 Games of International Securities Regulation}, 24 YALE J.
INT’L L. 61, 88-89 (1999). Even patterns of information asymmetry and natural monopoly have been cast
by some as species of Prisoner’s Dilemmas. \textit{See, e.g.}, Adler & Silverstein, \textit{supra} note 39, at 68 (describing
Prisoner’s Dilemma dynamic in information disclosure); John Shepard Wiley Jr., \textit{Reciprocal Altruism as a
work in monopoly settings to Prisoner’s Dilemma); John Simpson & Abraham L. Wickelgren, \textit{Bundled
To appreciate this distinct dynamic, it is useful to begin by emphasizing those areas in which it can most vividly be observed. To that end, what follows highlights the particularly timely case of the financial markets – and especially the recent financial crisis – by way of example. I likewise highlight the centrality of coordination dynamics as to internet, however, among other areas. Beyond these examples, a series of recent books – each of which has received substantial attention – helps to further emphasize the centrality of coordination. In significant respects, I will suggest, each can be understood to offer a coordination account of the modern social and economic order.

A. The Coordination Economy

Let me begin with coordination in the financial markets. In at least two respects, I would suggest, coordination is central to our understanding of, and our engagement with, the modern financial markets. First, there is the question of the infrastructure of the markets – market microstructure, as it is more formally characterized. Here, we find the universe of questions arising from the wave of recent mergers, partnerships, and other linkages among securities exchanges – the New York Stock Exchange’s merger with Euronext, and NASDAQ’s acquisition of the American Stock Exchange and substantial stake in the London Stock Exchange, among myriad other examples. Perhaps more immediate, as I will emphasize, is the still-ongoing financial market crisis, which has – at its heart – a dynamic of coordination.

Significant dimensions of the intermittent inertia, confusion, and missteps in our regulation of these areas might thus be explained by insufficient attention to the central role that

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coordination plays in them. Once we appreciate as much, we may find both more and less that needs to be done by regulators of the financial markets. At a minimum, the function and hence the form of regulation come to look quite different.

The infrastructure of the financial markets, to begin, should be understood as a massive exercise in coordination. The core functions of the financial markets are the provision of liquidity and the facilitation of efficient price discovery. As to each of these functions, in turn, significant network effects are present. The utility of a given market as a mechanism of liquidity – as well as the quality of price information generated by that market – directly depend on the number of relevant market participants. More traders, more market makers, and more listings thus generate improved liquidity and improved price discovery. At least on the financial markets, size matters.

In both the creation and the evolution of financial markets infrastructure, consequently, a significant dynamic of coordination emerges. Specifically, any such shift in equilibrium requires a coordination of market participants’ expectations of one another. A change in trading standards, the introduction of an electronic network across exchanges, or the emergence of an alternative trading system is only likely to occur, as such, if there is some coordination of traders’ expectations as to the prospect that any such change or innovation will take hold. Given the network effects at work in financial market liquidity and price discovery, only coordinated shifts are likely to be viable.

58 See id. at 286-89.
Recent debates over the wave of linkages among exchanges and securities trading systems, as well as some incidents of full-fledged merger, should be understood in this light. Likewise, discussions of the growing practice of the dual listing of stocks on multiple exchanges. Even the heated response to the Securities and Exchange Commission’s moves toward harmonization of disclosure standards can be understood to implicate this coordination dynamic at work in securities market structure.

More immediately, one might focus on the financial crisis that got underway in 2008, and ultimately wreaked havoc on the global economy, as a coordination failure of dramatic proportions. There are, to be sure, dimensions of the recent financial crisis that fit within a vision of the economic order as characterized by individual defections from socially optimal equilibria. Failures of disclosure, excessive investment in bonuses and executive compensation, and cases of outright fraud all fit this bill. One might even see some among these defections as laying at the foundation of the crisis. In broad terms, thus, high-risk lending, securitization and the explosion in derivatives, and distortions generated by the credit ratings industry – given their now obvious negative externalities for the global economy – might well be understood as firms’ abandonment of socially optimal practices, in the (ultimately self-destructive) pursuit of abnormal returns.

60 See, e.g., Ioannis Kokkoris & Rodrigo Olivares-Caminal, Lessons From the Recent Stock Exchange Merger Activity, 4 J. COMPETITION L. & ECON. 837 (2008).
At the heart of the crisis as it developed, however, was a very different dynamic. The critical challenges facing the global economy by 2009 were not incidents of fraud, extravagant executive bonuses, or even high-risk lending or securitization. For all the attention to the latter in the popular press, the essence of the crisis had little to do with them.

The reality of financial crisis, instead, can be distilled down to related failures of lending, and of spending and investment. As to each of these, however, the operative challenge did not lay in individual choices to deviate from otherwise efficient equilibria. Rather, it lay in a failure of coordination.

The operation of modern credit markets thus relies on a critical mass of lending. At the most obvious level, this is true of banks’ commercial lending to individuals and institutions. More critical, however, is the investment that stands behind such lending, arising from banks’ securitization of relevant debt and the sale of resulting securities to hedge fund and private equity investors. It is here, of course, that the recent credit crunch has its origins. For it is this market that progressively shut down over the course of 2008, depriving banks of the ability to move existing loans off their books, and hence to issue new loans.

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64 See Barack Obama, Address at George Mason University, Jan. 8, 2009, available at http://www.washingtonpost.com/wp-dyn/content/article/2009/01/08/AR2009010801975.html?sid=ST2009010801880&es_pos= (“Only government can break the cycle that is crippling our economy, where a lack of spending leads to lost jobs, which leads to even less spending; where an inability to lend and borrow stops growth and leads to even less credit.”).


66 See Carrick Mollencamp, Brown Warns Global Economy Is Slipping Into Financial Protectionism, WALL ST. J., Feb. 2, 2009 (describing British Prime Minister Gordon Brown’s concerns with lack of lending); Bianna Golodrga, Financial Crisis, Bailout Has Ripples Past Wall Street, GOOD MORNING AMERICA, ABC NEWS, Sept. 28, 2008 (quoting Bush Administration spokesperson Dana Perino: “If no one in the financial community trusts each other to lend money, then we’re going to have a complete and total financial collapse.”).


68 See id.
The prospect of such investment, however, depends integrally on the willingness of others to invest as well. When it comes to the credit markets, as such, only coordinated entry and coordinated participation are viable. Unprofitable as withholding credit and investment may be for the banking industry, and for the hedge funds and private equity firms that stand behind them, it is preferable to the alternative of unilateral lending and investment.

To appreciate as much, it is useful to begin with the basic dynamic of a bank run, in which depositors’ simultaneous attempts to withdraw funds bankrupts the relevant institution, given the practice of fractional reserve banking, in which available reserves cover only a subset of outstanding liabilities.69 As modeled by Diamond and Dybvig, the critical characteristic of modern banking – and bank runs – is multiple equilibria.70 In the superior equilibrium, depositors place their funds with the bank, confident in their ability to withdraw at whatever future date they can make optimal use of said funds. This allows others to withdraw at earlier optimal dates, thereby generating an efficient distribution of risk. In the alternative, inferior equilibrium, by contrast, confidence is undermined, causing all depositors to seek immediate (and sub-optimal) withdrawal of their assets, and thereby breaking the bank. The essential dynamic of modern banking, then, is one in which coordination of depositors around the superior equilibrium generates maximum returns.


70 See Douglas W. Diamond & Phillip H. Dybvig, Bank Runs, Deposit Insurance, and Liquidity, 91 J. Pol. Econ. 401, 402 (“This vulnerability occurs because there are multiple equilibria with differing levels of confidence.”) (1983); see also id. at 404 (describing “full-information optimal risk-sharing” equilibrium and bank run equilibrium, in which “all agents [are] panicking and trying to withdraw their deposits at $T = 1$”).
The recent financial crisis, of course, saw significant examples of this basic dynamic of coordination, including in the cases of Northern Rock and Bear Stearns.\textsuperscript{71} The heart of the recent crisis, however, has been a “credit crunch,” in which the credit markets freeze up, reducing access to necessary cash for both individuals and institutions.\textsuperscript{72} In such circumstances, as suggested above, lenders resist lending and investors resist investing, absent some expectation that others are ready to lend and invest.

Some have thus characterized financial crises to arise out from “strategic complementarities” – a dynamic of positive feedback, in which payoffs arise from making choices that match those of other market participants.\textsuperscript{73} As John Maynard Keynes vividly put it, this is the essential economy of a beauty contest, in which each observer’s assessment is shaped by that of her counterparts.\textsuperscript{74} To distinct, but related, effect is an account of financial crises as grounded in non-rational “herd” effects, by which markets move up and down dramatically, based on small movements that are irrationally mimicked by others.\textsuperscript{75} Whether it is the rational dynamic of strategic complementarity or irrational patterns of herd behavior, however, in these cases we find a dynamic in which markets returns depend on the coordination of investors around one equilibrium or another.

\begin{footnotesize}
\begin{enumerate}
\item See Daniel Indiviglio, \textit{Another Shot at the Credit Crunch}, FORBES, Mar. 3, 2009.
\item See Russell Cooper & Andrew John, \textit{Coordinating Coordination Failures in Keynesian Models}, 103 Q. J. ECON. 441, 447 (1988); see also Jeremy Bulow et al., \textit{Multimarket Oligopoly: Strategic Substitutes and Strategic Complements}, 93 J. POL. ECON. 488 (1985). This is precisely the domain, of course, of network externalities. See Michael L. Katz & Carl Shapiro, \textit{Network Externalities, Competition, and Compatibility}, 75 AM. ECON. REV. 424 (1985); see also Ahdieh, supra note 59, at 223-25.
\item See \textit{John Maynard Keynes, The General Theory of Employment} 156 (1936).
\end{enumerate}
\end{footnotesize}
Fundamentally, then, the various accounts of financial crises can be reduced to the dynamic of multiple equilibria most clearly evidenced in the familiar bank run. As with the latter, market participants may coordinate on either a shared strategy of investment, or one of non-investment (and even divestment). Likewise, depending on relevant expectations, they may coordinate around a policy of lending or one of withholding funds. In a sense, then, financial crises might be understood as simply the supply-side corollary of the demand-side coordination failure that arises in a bank run.

These patterns of lending and spending/investment in the financial markets should not be confused with the public goods, free-rider, and externality problems described above. There, individuals might imagine the possibility of superior returns, were they to decline participation in the market, even while deriving the full benefits of participation – because others were doing so. The dynamic at work in the financial markets is quite different. Here, participation is the *sine qua non* of any return. Declining to participate may avoid losses, as such, but it is not a viable strategy for securing gains. Rational as it may be to sit back amidst a crisis, thus, lenders and investors are no more enthusiastic about tight credit markets than potential creditors and government regulators.

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76 See Cooper & John, *supra* note 73, at 447 (“highlight[ing] the connection between strategic complementarity and multiplicity of equilibria”); Paul R. Masson, *Multiple Equilibria, Contagion, and the Emerging Market Crises*, at 5 (Nov. 1999) (IMF Working Paper WP/99/164) (identifying distinct accounts of multiple equilibria in financial markets); *see also id.* at 3 (“models with multiple equilibria . . . can introduce volatility into financial markets that substantially exceeds that of the macroeconomic fundamentals, and as a result square better with the stylized facts of global financial markets”).

77 See Masson, *supra* note 76, at 6 (“if each bank believes that all other banks will stop lending, all banks will stop lending”) (quoting Jeffrey Sachs, *Theoretical Issues in International Borrowing*, Princeton Studies in International Finance, No. 54 (July 1984)).

78 Maurice Obstfeld, by way of example, has modeled currency crises as exhibiting bank run-style multiple equilibria, in which speculators do or do not attack a currency, depending on their expectations of other speculators’ likely behavior. *See Maurice Obstfeld, Models of Currency Crises With Self-Fulfilling Features*, 40 EUR. ECON. REV. 1037 (1996).
Issues of coordination thus stand at the heart of financial crises – not questions of individual deviation from socially optimal equilibria. The story of the recent financial crisis is not one in which individual lenders “defected,” by refusing to lend when the economy was strong, or by doing so when others refused. Instead, the issue was the market’s inefficient coordination around a decision not to lend amidst the crisis, and its perhaps inefficient coordination around an equilibrium of excess lending in the past.

When we appreciate this coordination dynamic, some of our haphazard regulatory approach to questions of both market structure and the financial crisis might well be addressed. Consider, for example, the Securities and Exchange Commission’s decades-long struggle over its appropriate role in facilitating market linkages and best execution, including under the rubric of the National Market System.79 Likewise, one might argue, its halting recent approach to the choice between U.S. Generally Accepted Accounting Practices and international financial regulatory standards.80 As to the financial crisis, meanwhile, our haphazard approach to stimulating the credit markets – from the purchase of toxic assets, to direct loans to relevant banks, to stress tests and direct investment – is surely Exhibit A in a story of regulatory chaos.

Emphasis on the coordination dynamic at work in the financial markets might thus hold significant implications for the role of state action in facilitating economic recovery. Bluntly stated, for all the attention they received, Bernie Madoff, Allen Stanford, and various other runaway financiers were largely irrelevant to the crisis. Likewise, the much-discussed payment of bonuses to Merrill Lynch and other firms’ executives. Even debates over whether banks in receipt of Troubled Asset Relief Program funds should be required to increase lending prove

80 See RESPONSE, supra note 62.
something of a chimera – for all the popularity of proposals to that effect.81 A shift from a
defection account of the social and economic order to one of coordination, then, could not be more
consequential.82

For all their recent salience, moreover, the financial markets are far from unique in their
definitional dependence on coordination. To the contrary, it is in a number of other areas that
we might find the greatest sources of growth in the importance of coordination to modern social
and economic life. Consider, by way of example, the dramatically transformative institution
that is the internet.

Even as the reach, complexity, and social and economic impact of the internet has
exploded over the last twenty years, its regulation has been characterized by a striking dynamic
of inertia and confusion.83 By most accounts, the administrative state – most particularly, the
Federal Communications Commission – has shown a notable reticence to engage questions of
internet regulation.84 Once again, however, this resistance might be explained by an inattention
to the very distinct strategic dynamic – and hence regulatory demands – presented by the
internet.

82 Even more basic accounts of coordination in the financial markets might also be offered. Hayek’s
theory of the function of prices is fundamentally a story of economic coordination. See FRIEDRICH A.
HAYEK, THE CONSTITUTION OF LIBERTY 93 (1960). The Austrian School’s account of money is likewise an
account of coordination at its foundation. See MURRAY N. ROTHBARD, THE LOGIC OF ACTION: METHOD,
MONEY, AND THE AUSTRIAN SCHOOL 211-12 (1997). The effective valuation of money thus necessitates
some dynamic of coordination.
83 See Timothy S. Wu, Cyberspace Sovereignty? – The Internet and the International System, 10 HARV. J. L.
& TECH. 647, 649-56 (1997) (discussing and responding to scholars who question ability to regulate the
internet); see also Leonard J. Kennedy & Heather A. Purcell, Wandering Along the Road to Competition and
Convergence—the Changing CMRS Roadmap, 56 FED. COMM. L.J. 489, 536 n.219 (2004); Andrew Sinclair,
Regulation of Paid Listings in Internet Search Engines: A Proposal for FTC Action, 10 B.U. J. SCI. & TECH. L. 353,
362-63 (2004); Philip J. Weiser, Internet Policy, Institutional Design, and FCC Reform (unpublished
manuscript, on file with author).
84 See John Dunbar, FCC Chairman Says No Need for New Regulation of the Internet, U.S.A. TODAY, Apr. 22,
As in the financial markets, there is no lack of fraud, misappropriation, and similar self-dealing on the internet. As above, much of this can be understood to exemplify the self-interested deviations from socially optimal equilibria that motivate our traditional accounts of the administrative state. At its core, however, the operation of the internet—like the modern financial markets—is a massive exercise in coordination.

The functionality of the internet, as such, with its dependence on common standards for file sharing, interoperable and consistent search tools, and an effective network for interconnection, involves coordination on numerous levels. Among alternative file transfer protocols, for example, it has been essential that some common standard emerge. Hence the importance of the Internet Engineering Task Force (IETF), in facilitating the emergence of such standards. No less important is the ongoing role of the IETF, however, in facilitating the constant updating and evolution of these protocols and other standards.

Similar dynamics of coordination apply to the internet backbone—the uber-network of “trunk” linkages, by which local access networks are connected to one another. In recent years, the construction, expansion, and control of the backbone have raised hotly contested issues. As to each of these, we face questions of coordination: Most basically, operation of the internet depends on coordination across an array of data networks and core routers, and hence

87 See id.
88 See id. (describing IETF’s role in developing internet protocols and standardizing existing practices, particularly as to interoperability questions, including “IP, the routing protocols that work with it, the domain naming utilities that translate names into IP addresses, the mappings between IP and different physical infrastructures (e.g., how to run IP over ATM, mobile networks, or dial-up lines), etc.”).
90 See generally id. (discussing centralization/decentralization debate surrounding internet backbone).
among the various governmental, commercial, and academic institutions that own or control those systems.\textsuperscript{91} More fundamentally, given the internet network’s reliance on a non-centralized system of processing – at network endpoints, rather than within the network itself – the internet turns out to be a verb, as much as a noun.\textsuperscript{92} It is coordination.

As to each of these exemplary aspects of the internet’s operation, the prevailing concern is not the possibility of defection. There is relatively little worry that the internet’s commercial operators or individual users will defect, to create their own transfer protocol or construct their own network. There is little to be gained from such defection. Instead, the worries – to which we will return in Part III – can be understood as two-fold: On the front-end, a potential inability to coalesce around a common standard or operating system, and on the back-end, a status quo bias of sorts, in which a shift away from a sub-optimal standard proves difficult to coordinate.

As will become evident from a review of recent works that highlight coordination dynamics in the modern social and economic order – to which we now turn – the financial markets and the internet are far from unique in their dependence on coordination. To the contrary, their basic features point to an array of other coordination dynamics as well.

Both the financial markets and the internet, for example, highlight the increasing importance of standard-setting issues – with the definition of disclosure standard and file transfer protocols mere examples of the trend. The growing influence of the International Organization for Standardization (ISO) emphasizes as much.\textsuperscript{93} Likewise, the growth in new technologies whose functionality is directly tied to their interoperability with other electronic goods – my mobile phone and my computer, my computer and my television, my television

\textsuperscript{91} See Judith A. Endejan, Cable’s “Other Hat” – Providing Telecommunications Services, 551 PLI/PAT 291, 339-47 (1999).

\textsuperscript{92} See id.

and my DVD-R system, and so on. For such technologies, standardization – and hence coordination – is the critical issue.

The network nature of both the financial markets and the internet also points to the entire universe of network industries, as settings in which coordination dynamics are key. Most tangibly, in this vein, one might note recent discussions of high-speed rail networks and a modernized power transmission grid, following the February 2009 stimulus bill’s provision of federal seed money for these projects. In the construction of such networks, as in the linkage of securities trading systems and development of the internet backbone, coordination is the critical need. Likewise, if in necessarily different ways, in the development and evolution of online social networks, from Facebook to Twitter.

B. The Implicit Literature of Coordination

If the financial markets and the internet – and the broader questions of standard-setting and network-building they implicate – give us a window into the rise of coordination as a central feature of the modern social and economic order, a series of recent scholarly works that attempt to account for the world as we see it, helps to drive the point home. In widely acclaimed books published over the last several years, thus, Michael Heller, Larry Lessig, Yochai Benkler, and Clay Shirky explore distinct aspects of the modern economic order – patents and innovation, virtual networks, property rights, consumer interface with media goods, mass participation in social pursuits, and others. At the heart of each author’s analysis, however, one can find a tale of coordination, rather than the traditional story of defection.

94 See Hansell, supra note 13, at B7.
Consider, to begin, Michael Heller’s *The Gridlock Economy: How Too Much Ownership Wrecks Markets, Stops Innovation, and Costs Lives*. In *The Gridlock Economy*, Heller builds on the seminal insight he offered and explored in prior work on property law: the presence of what he termed a “tragedy of the anticommons.” As framed by Heller, this tragedy is the inverse of the tragedy of the commons described above, in which inadequate property rights foster over-consumption of some resource. In the tragedy of the anticommons, by contrast, excess property rights foster under-utilization of relevant resources. Why? Because of ambiguity in identifying pertinent ownership rights, and transaction costs attendant to securing authorization from all relevant rights-holders, for use of the resource.

On this foundation, *The Gridlock Economy* identifies such excess ownership – and resulting tragedies of the anticommons – as widespread in modern industrial economies. Perhaps most dramatically, he highlights the seeming lack of innovation in the pharmaceutical industry – a striking state of affairs, given the early promise of the biotech revolution. This result can be understood, however, by the dispersal of potentially applicable patent rights among widely dispersed – and sometimes difficult to identify – rights holders. Caught between the high costs of coordination among this group, and the risk of costly litigation should any member be inadvertently left out, potential innovations are left on the shelf. Heller highlights other examples as well, however, including in transportation, where dispersed ownership once prevented efficient movement along the Rhine River, and now stands in the way of efficient air

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99 See Heller, supra note 97, at 49-78.
travel. Likewise, in telecommunications, power transmission, air traffic control systems, and elsewhere.

The operative tragedy in these settings, then, is quite different than in the familiar tragedy of the commons. Rather than sub-optimal action by individual owners, market failure here arises from inaction by the owners collectively. The critical issue, as such, is not potential defection from a socially preferred equilibrium. Sitting out promises no utility to relevant rights holders. Nor is free-riding an option. Rather than defection, as such, the operative challenge is the failure to coordinate around an efficient equilibrium of consumption or use. As in the financial markets and the internet, the operative need in pharmaceutical innovation amidst a dense thicket of patents, in efficient land use notwithstanding fragmented property rights, and in use of the largely underutilized broadcast spectrum, is to effectively coordinate dispersed owners, and thereby capitalize on an under-utilized resource.

As above, Heller’s reference to the underdeveloped electricity transmission grid highlights other network settings in which coordination constitutes the central dynamic at work, including in telecommunications and elsewhere. Most expansively, though, Heller’s emphasis on patent-driven coordination barriers in the development of pharmaceutical products highlights the possibility of more general coordination failures in processes of innovation.

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100 See id. at 3-4, 8-9.
101 A species of defection might be seen in the ability of a single rights holder to hold out, demanding side payments for her participation. This dynamic will only arise in certain anticommons settings. More generally, it varies significantly from the conventional account, in that there is no independent utility to defection/non-participation in this setting. A holdout is not motivated by any incentive to withdraw, but by the potential to secure more than her pro rata share of the surplus attendant to participation.  
102 See, e.g., Valdis Krebs, Posting to Network Weaving,  
Innovation has been a significant source of growth in industrialized economies. With the technology boom of recent decades, in fact, this may be even more true today than it once was. Of late, however, much concern has been raised about the future of innovation and entrepreneurship, and whether the vibrancy of modern economies is under threat. Important sources of this threat may lie in dynamics of coordination. Heller highlights one of the most significant, arising from modern patent practices. The explosion of patenting in recent years has produced a landscape littered with patent thickets, from which necessary rights for innovation are increasingly difficult to extract – be it in the pharmaceutical industry, in the development of computer software, or elsewhere.

Beyond patents, coordination dynamics in the structure of innovation finance may also be worth noting. Over the last several decades, thus, a growing proportion of the financing of entrepreneurial activity, particularly in the high-tech sector, comes from complex investment schemes, among multiple investors, organized across multiple venture capital funds. Here again, coordination represents the critical dynamic at work. As in the financial markets generally, non-participation – the relevant species of defection – promises no return to potential investors. Nor is free-riding a relevant strategic choice. Any challenge, rather, lies in effective coordination.

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104 See Jonathan Huebner, A Possible Declining Trend for Worldwide Innovation, 72 TECH. FORECASTING & SOCIAL CHANGE 980, 981-85 (2005) (suggesting increasing innovation in the twentieth century given technology, notwithstanding decline in proportional rate of innovation).
105 See id. at 985; see also Judith Estrin, Closing the Innovation Gap: Reigniting the Spark of Creativity in a Global Economy (2008).
106 See Heller, supra note 97, at 6; see also Michael A. Heller & Rebecca Eisenberg, Can Patents Deter Innovation?: The Anticommons in Biomedical Research, 280 SCIENCE 698 (1998).
These and other coordination dynamics at the heart of modern schemes of innovation bring us to Larry Lessig’s work of recent years, culminating in his recently published *Remix: Making Art and Commerce Thrive in the Hybrid Economy*. In the latter, Lessig advocates a return to a “remix” approach to intellectual property, in which wealth is generated through sharing economies, rather than the aggressive protection of copyright. In a “read/write culture” – by contrast with a “read only culture” – derivative works that integrate, improve upon, and change existing works are embraced. For Lessig, this is the universe of Harry Potter fansites, Lostpedia, and the sampling practices in hip-hop music.

Here too, in a sense, we find a dynamic of coordination. Relevant value and wealth arise in Lessig’s remix culture from the ability to draw on multiple sources of innovation and insight. Individuals in Lessig’s proposed world thus remix inputs from various sources to create something new. Others, in turn, draw on those creations, to create further value. Commercial entities, by embracing and facilitating these patterns, can likewise thrive in an emerging “hybrid economy.” Any given actor is free to exclude herself from this dynamic of value generation, of course. By contrast with the traditional settings described above, however, she has no particular incentive to do so.

This, in turn, calls to mind the striking story of social and economic ordering that emerges from Yochai Benkler’s acclaimed work, *The Wealth of Networks*. In the latter, Benkler – a renowned expert on the intersection of information technology and social processes – highlights the increasing generation of social and economic wealth through network structures.

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110 *See id.* at 104, 212-13, 258-59.
By way of the internet, thus, patterns of “commons-based peer production” have become viable and significant sources of innovation and wealth.\textsuperscript{112}

Most familiar among Benkler’s examples may be Wikipedia. Under the rubric of the latter, a group of dispersed, loosely organized internet users have generated a free, readily accessible information resource – with accuracy levels roughly comparable to traditional information resources such as the \textit{Encyclopedia Britannica}.\textsuperscript{113} Only slightly less familiar may be the open source Linux operating system, use of which has exploded over the last decade.\textsuperscript{114} Developed – and constantly improved upon – through the efforts of dispersed software developers around the world, Linux is freely available for consumer use, under the provision of an open public license.\textsuperscript{115} Other examples might also be identified, meanwhile, including social networks such as Facebook and Twitter, and the Flickr network for photo distribution.

In these cases, once again, the critical dynamic is one of coordination. The relevant source of “wealth” identified by Benkler arises from individual participation in prevailing networks. In this way, both individual and social utility are enhanced. By contrast, defection from a prevailing network – be it Facebook, Linux, or otherwise – diminishes individual welfare. Given as much, there is little incentive to do so. Instead, the operative dynamic is again one of coordination: How do we maximize network participation? How do we avoid inertia – as well as other forms of lock-in – in network design?

\textsuperscript{112} See id. at 153.
\textsuperscript{113} See Jim Giles, Internet Encyclopedias Go Head to Head, NATURE, Dec. 15, 2005, at 900-01.
\textsuperscript{114} See generally H. Maura Lendon, The Linux Revolution, 15 INTELL. PROP. J. 143 (2000) (noting that development of Linux as Open Source product was intended to take advantage of “hundreds of users providing feedback, suggestions for improvement and new code to fix bugs and enhance the program, within days of each new release,” id. at 148, and thus to use “continual ‘peer review’” to improve the quality of the program, id. at 157).
Finally, confirming the rise of coordination in the social order, consider a recent work of a very different sort. Though the product of neither an economist nor a legal scholar, Clay Shirky’s much-discussed recent book – *Here Comes Everybody* – might be read to offer an even broader accounting of coordination in modern social life. In Shirky’s telling, the operative dynamic of coordination is not one among a universe of common owners, or participants in some identifiable network. Rather, it incorporates, as he puts it, “everybody.”

To this effect, Shirky describes the striking use of so-called “flash mobs” in anti-authoritarian protests against the government of Belarus. Using text messaging, such protests are quickly brought together, with little or no advance planning. In this way, they permit protest, while allowing organizers to more easily avoid detection. Less politically sensitive, but similarly suggestive of growing opportunities for mass participation, have been patterns of user modification of internet relay channels, by which participants otherwise unknown are able to engage one another closely, on questions of common interests. Exploring these and similar cases – including examples studied by Benkler as well – Shirky highlights the internet’s dramatically reduction in the costs of social coordination. Given as much, he suggests, mass mobilization – whether political or otherwise – has been dramatically democratized.

As is already evident, this too can be understood as a story of coordination. It is a story in which important – and perhaps increasingly important – aspects of our modern social life arise out of, and necessitate, effective coordination. Here, even more so than in the cases above, it becomes obvious that any potential demands on the state arise not from individual decisions to deviate from prevailing group norms, but from the potential failure of such norms to emerge, and perhaps from their failure to evolve in an efficient fashion.

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117 See id. at 166-71.
118 See id. at 225-28.
A stark disconnect emerges, then, between the vision of the world on which traditional accounts of the administrative state rely, and the emerging realities of the modern social and economic order. Public goods, free-rider, collective action, negative externality, and other rationales for the regulatory state see a world in which the state must intervene, to coerce changes in individual and institutional incentives to defect from socially optimal equilibria. Critical aspects of the modern economic order, however – including aspects of the financial markets, the operation of internet, the encouragement of innovation, standard-setting, the social production of wealth, network-building, and the like – are not readily captured within this vision. Rather, these are stories of coordination.

C. The Game of Coordination

If dynamics of coordination underpin central dimensions of the world we live in, our reliance on Prisoner’s Dilemma accounts of the social and economic order – notwithstanding its long pedigree – will no longer do. Something more is necessary. Under-appreciated as it has been among legal scholars, game theory offers an alternative: the distinct dynamic at work in so-called “coordination games.” Here – as in the dynamic of the financial markets, the internet, standard-setting, network-building, and innovation – the heart of the story is no longer defection. Rather, it is effective and efficient coordination.

The basic framework of coordination games is hardly unfamiliar. Perhaps most commonly, coordination game dynamics have been exemplified by the choice of driving on the right or the left side of the road.119 Here, drivers in a standard, two-player game face multiple, pure strategy Nash equilibria – either both drive on the right or both drive on the left. Assuming drivers equally comfortable with both possibilities, either equilibrium is efficient.

Critically, as we will see, it is also stable. Neither driver is motivated to defect from whatever equilibrium emerges.

Only slightly less familiar have been iterations of the so-called Meeting Place game. Here, a pair of players must locate a companion – whether a friend in New York City, or a spouse in a department store, as in Thomas Schelling’s original telling – from whom they have been separated. \(^\text{120}\) Having failed to arrange a meeting place in advance, and lacking the ability to communicate with one another, the dynamic that emerges is one of coordination. To locate one another, each player must rely on their expectations of the likely strategy to be played by the other. More precisely, they must develop expectations of what their counterpart will expect of them. \(^\text{121}\)

One can appreciate as much by considering the normal form representation of the basic Meeting Place game – a pure coordination game. \(^\text{122}\)

<table>
<thead>
<tr>
<th></th>
<th>Penn Station</th>
<th>Grand Central</th>
</tr>
</thead>
<tbody>
<tr>
<td>Penn Station</td>
<td>(5,5)</td>
<td>(0,0)</td>
</tr>
<tr>
<td>Grand Central</td>
<td>(0,0)</td>
<td>(5,5)</td>
</tr>
</tbody>
</table>

As with the choice between driving on the right or left, we find two Nash equilibria here – meeting at Penn Station or meeting at Grand Central Station. \(^\text{123}\) Each location offers identical payoffs, meanwhile, both as between one another, and as to both players. Further, as noted above, each strategy is stable. Efficient coordination, in such a circumstance, turns on each

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\(^\text{120}\) See THOMAS C. SCHELLING, THE STRATEGY OF CONFLICT 54, 56 (1960).

\(^\text{121}\) See id. at 54; see also Diamond & Dybvig, supra note 70, at 402 ("In contrast, a bank run in our model is caused by a shift in expectations . . .").

\(^\text{122}\) Throughout this essay, I state the operative payoffs as \(\text{\{Row Player, Column Player\}}\), with Row Player’s choices demarcated on the vertical axis and Column Player’s choices on the horizontal axis.

\(^\text{123}\) The pure coordination game of which side of the road to drive on, is captured by this normal form representation as well.
player developing an accurate expectation of whether their counterpart is likely to go to one station or the other. In doing so, the necessary inquiry for each is where their counterpart is likely to expect them to go.

This is necessary, of course, to avoid a complete coordination failure, in which each goes to a different station. The need to develop accurate expectations is even more acute, however, where one coordination point is preferable to the other. A Pareto rank ordering of the relevant coordination equilibria thus introduces a further variable in achieving efficient coordination.

<table>
<thead>
<tr>
<th></th>
<th>Penn Station</th>
<th>Grand Central</th>
</tr>
</thead>
<tbody>
<tr>
<td>Penn Station</td>
<td>(3,3)</td>
<td>(0,0)</td>
</tr>
<tr>
<td>Grand Central</td>
<td>(0,0)</td>
<td>(6,6)</td>
</tr>
</tbody>
</table>

Here, our friends continue to be separated in New York, but both are on the East Side, in the vicinity of Grand Central Station. We continue to have multiple Nash equilibria, as a meeting at either location would be a stable coordination point, from which neither would deviate. Given their proximity to Grand Central Station, however, meeting there is a dramatically superior choice.124

As in the coordination setting of the financial markets and elsewhere, there is no issue of defection in coordination games, by contrast with the Prisoner’s Dilemma. This remains true, as I will emphasize below, even as we shift to more realistic coordination game settings, in which players’ preferences conflict – sometimes dramatically.125 The irrelevance of defection, however, does not eliminate the potential for inefficiencies in coordination games. In place of defection, coordination games simply present a different set of potential market failures.

124 Grand Central Station, of course, figured prominently in Schelling’s early experimental studies of coordination.
125 See infra Part III.A.
As I will describe in greater detail below, this begins with the possibility of non-coordination – the failure to find one’s friend in New York, to embrace a common standard, to establish an interoperable network, and the like. In the limited scope of the National Market System, recurrent failures to alleviate the recent credit crunch, stickiness in the evolution of the architecture of the internet, and sub-optimal pharmaceutical innovation, one might find examples of such non-coordination. Here, coordination failure lies in paralysis and persistence of the status quo.

Even where such inertia is overcome at the front-end, further risks of coordination failures arise in the broad universe of settings in which one coordination point is – or comes to be – superior to the other. Given potential lock-in effects in coordination games, even an inefficient equilibrium may well persist. In the Pareto-ranked Meeting Place game outlined above, if I expect you to go to Penn Station, I will go there as well – even if Grand Central Station is closer. In the real world, thus, even promising new technologies – on the financial markets, the internet, and elsewhere – may fail to gain traction, given the lock-in of existing norms, standards, and technologies.

* * *

Coordination games may better capture important dimensions of the modern social and economic order, then, than the familiar Prisoner’s Dilemma. An emphasis on coordination games is more than an interesting analytical exercise, however. In the translation from one account to the other, rather, we arrive at a dramatically different vision of both the function and the form of regulation.126

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126 As I will describe below, see infra Part III.C.5, besides the coordination settings described in Part II, coordination-oriented regulatory approach may also have application in those settings in which the Prisoner’s Dilemma is played in indefinite repeat plays. In the latter circumstances, the Prisoner’s
Where coordination is the operative demand on the regulatory state, the design and implementation of regulation should be keyed to that need. Our halting and muddled approach to areas including the financial markets, the internet, standard-setting, network industries, and even innovation might thus be explained more by a failure to appreciate the underlying dynamic at work, than by any failure of regulation as such.127

III. THE NEW REGULATION

Forty-five years ago, Charles Reich famously wrote of the emergence of the “new property.”128 The ubiquity of the modern administrative state – in the far-reaching tentacles of the welfare system, substantial government contracting and employment, important state licensing requirements, and the like – had made the state a significant source of wealth, he suggested, and hence of property entitlements. With the growing importance of dynamics of coordination in the social and economic order of modern industrialized states, one might consider whether some similar transformation is as work in the nature of regulation. If the fundamental demands on the administrative state are increasingly grounded in coordination, a “new regulation” may be in order as well.

Simplifying as it is, the basic game theory analysis outlined above offers a useful window into this possibility. Traditional conceptions of the social and economic order to which regulation is directed emphasize the potential for Prisoner’s Dilemma-like patterns of defection. By contrast, the nature of modern financial markets, the rise of the internet, the acceleration in technological growth, and the like, give rise to coordination games. Attention to the differences


128 Reich, supra note 1.
in these games might therefore be a fruitful source of insight. Given our conventional accounting for the administrative state by reference to the characteristic features of the Prisoner’s Dilemma, we might well locate a distinct account of it in the shifts in those features, as we move to a coordination game.

After a brief exploration of legal scholars’ traditional disregard of the role of regulation in coordination settings, thus, what follows successively considers three important differences in the nature – and resolution – of Prisoner’s Dilemma versus coordination games: (1) the shift from incentives to expectations as the fulcrum for achieving efficient results, (2) the related change in the central characteristic of the game, from dominant strategies to multiple equilibria, and (3) a consequent shift in our orientation from individuals to groups. From each of these, I extrapolate potentially relevant features of a regulatory regime directed to the effective pursuit of coordination. On this foundation, we might begin to paint a picture of a new regulation, better suited to the coordination dynamics outlined above.

A. The Reality of Conflict and the Limits of Communication in Coordination

The rise of coordination described above might, on its face, be construed as a manifesto for the contraction of the modern administrative state. Aspects of deregulation, the privatization of traditionally public functions, “the end of big government,” tax cuts, welfare reform, and the like might all be argued to follow from a shift from defection to coordination. If coordination captures growing dimensions of the modern social and economic order, then regulation is arguably unnecessary. It may even be detrimental.

More important than any explicit argument to this effect, however, might be the implication of it, in the legal literature. Legal scholars have focused extraordinary attention on

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129 These three shifts are, of course, integrally related to one another. For purposes of analysis, however, it is useful to separate them out.
the Prisoner’s Dilemma in both positive and normative accounts of the regulatory state. Coordination games, by contrast, have received far less attention.\textsuperscript{130} In significant part, this might be traced to an understanding of coordination along the above lines. If coordination games capture the dynamic at work, the argument goes, law and regulation have little to add. Efficient coordination simply happens.\textsuperscript{131}

This conclusion rests on a pair of assumptions, each of which proves to be false, upon closer examination. The first is the notion that coordination dynamics are inherently non-confictual.\textsuperscript{132} The world of coordination, in this commonplace view, is limited to the patterns of pure coordination noted above – which side of the road to drive on, where we can find one other in New York, etc. The second assumption, in turn, is that communication is a panacea in coordination settings – that it is both viable and effective in generating efficient coordination results.\textsuperscript{133}

Notwithstanding common references in discussions of coordination games to driving on the right versus left, and to finding a friend in New York, the literature of coordination games is actually far broader. To appreciate as much, it is useful to recall the core characteristic of coordination games: the presence of multiple Nash equilibria.\textsuperscript{134} In the Meeting Place game, thus, friends separated in New York can meet at either Penn Station or Grand Central Station. Once they have determined to meet at one or the other, meanwhile, the choice is quite stable. As Nash equilibria, neither can gain by unilaterally “defecting” from the relevant coordination

\textsuperscript{130} See McAdams, supra note 47, at 256-57; see also Robert B. Ahdieh, From Federalism to Intersystemic Governance: The Changing Nature of Modern Jurisdiction, 57 EMORY L.J. 1, 18 (2007).
\textsuperscript{132} See Russell Cooper et al., Communication in Coordination Games, 107 Q. J. ECON. 739, 766 (1992).
\textsuperscript{133} See id. at 765; see also SCHELLING, supra note 120, at 109.
\textsuperscript{134} See Vincent P. Crawford & Hans Haller, Learning How to Cooperate: Optimal Play in Repeated Coordination Games, 58 ECONOMETRICA 571, 572 (1990).
point – going to Penn Station, when I expect you to go to Grand Central, or switching to the left, when I suspect you will to be driving toward me on the right.

Such multiplicity of equilibria, however, is not unique to non-conflictual settings of pure coordination. Rather, it exists in settings of conflict as well. Thus did Thomas Schelling – recipient of the Nobel Prize for his study of coordination games – offer much of that insight in a volume entitled *The Strategy of Conflict.*135 Two standard coordination game patterns – one familiar enough to be a popular staple of the movies – help to highlight as much.

In each of these settings, a dominant preference for coordination takes precedence over players’ conflicting interests.136 As explored by game theorists, this is most directly captured in the anachronistically named Battle of the Sexes. In this game, wife and husband have decided to spend an evening together, but respectively prefer to go to the ballet, and to a boxing match.137 In normal form, with the wife as the Row Player, on the vertical axis, this account yields the following payoffs:

<table>
<thead>
<tr>
<th></th>
<th>Ballet</th>
<th>Boxing Match</th>
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</thead>
<tbody>
<tr>
<td><strong>Ballet</strong></td>
<td>(10,5)</td>
<td>(2,2)</td>
</tr>
<tr>
<td><strong>Boxing Match</strong></td>
<td>(-5,-5)</td>
<td>(5,10)</td>
</tr>
</tbody>
</table>

Self-evidently, the parties’ preferences in this case are misaligned, with the wife receiving a far higher payoff where both attend the ballet, and the husband doing so, if they go

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135 See SCHELLING, supra note 120.
136 The Hawk-Dove game, described *infra*, has sometimes been mischaracterized as not being a coordination game, given the emergence of Nash equilibria where players choose opposing, rather than identical, strategies. But the core structure of a coordination game does not turn on players’ choice of identical strategies – as in Meeting Place and Battle of the Sexes games. Rather, it depends on the presence of multiple Nash equilibria.
137 One might alternatively conceive of this pattern as a modified Meeting Place game. Imagine, thus, the same separation of players in New York City described above, but with one player starting in the vicinity of Penn Station, while the other is near Grand Central Station.
to the boxing match instead. Multiple equilibria remain, however, with stable – and
dramatically Pareto superior – coordination points (i.e., evenings spent together) at either the
ballet or the boxing match. Notwithstanding the couple’s conflicting preferences, thus, their
decision-making plays out within a framework of coordination. The dominant preference of
both spouses is thus to be together; each simply prefers a different venue for doing so.

This becomes even more evident when we incorporate yet a further degree of conflict.
In Hawk-Dove games,138 each player must choose between an aggressive pattern of engagement
(i.e., playing Hawk) or a deferential strategy (i.e., playing Dove), with higher payoffs to playing
Hawk to the other player’s Dove, but a dramatically negative payoff to the conflict scenario of a
{Hawk-Hawk} strategy.139 Hence, the following payoffs:

<table>
<thead>
<tr>
<th></th>
<th>Dove</th>
<th>Hawk</th>
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</thead>
<tbody>
<tr>
<td>Dove</td>
<td>(5,5)</td>
<td>(0,10)</td>
</tr>
<tr>
<td>Hawk</td>
<td>(10,0)</td>
<td>(-5,-5)</td>
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</table>

Even here, contrary to many observers’ first reaction, we continue to find a dynamic of
coordination. Notwithstanding the sharp degree of conflict – and even the countervailing
nature of the parties’ strategy choices in equilibrium – those who play Hawk-Dove, including
the proverbial teenagers racing their cars at one another in the game of Chicken, are engaged in
a game of coordination. Thus, consider the Row Player, on the vertical axis, in the payoff matrix
above: If she expects the Column Player to play Dove, she should play Hawk, giving her a
payoff of 10. If she expects the Column Player to play Hawk, on the other hand, she should

138 More colloquially, Hawk-Dove games are the familiar game of Chicken, in which two cars race toward
one another, and the Chicken (i.e., “Dove”) is the one who swerves first. Cf. Robert B. Ahdieh, The Role of
139 See DIXIT & SKEATH, supra note 48, at 341; see also supra note 136 (describing emergence of Nash
equilibria in Hawk-Dove games from opposite, rather than matching, strategies).
play Dove. She receives no payoffs in that scenario, of course, but the latter is better than the negative payoffs of playing Hawk.

Dynamics of coordination, then, are no less in salient in conflictual settings. The presence of conflict in real world settings, including the financial markets, high-tech competition, and the vibrant market surrounding the internet, therefore, need not preclude coordination game analysis. That coordination dynamics are at work in an area, conversely, does not necessitate any conclusion that regulation is superfluous.

This leads to the second false assumption in legal scholars’ conception of coordination: that communication can be relied upon to alleviate any potential coordination failure that might arise. In the pure coordination cases of choosing which side of the road to drive on and finding my friend in New York, an inability to communicate was assumed. Had communication been available, there could be no coordination failure. With some caveats, the same might be said of the Stag Hunt and similar species of coordination games.  

Even in such non-conflictual games, it is important to recognize the limits of communication, as we shift toward an n-person game. With additional participants, thus, the transaction costs of effective communication increase, perhaps dramatically. If one evaluates the choice of a common standard for a given internet protocol, for example, true communication may be all but impossible. This may be the case, in fact, in many of the most critical coordination settings in the real world.

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140 Even in the Stag Hunt game, communication may not eliminate the possibility of coordination failure. As Jean Jacques Rousseau envisioned the game, thus, a player might abandon coordinated strategies, in return for the certainty of short-term gain. He explains: “If it was a matter of hunting a deer, everyone well realized that he must remain faithful to his post; but if a hare happened to pass within reach of one of them, we cannot doubt that he would have gone off in pursuit of it without scruple...” JEAN-JACQUES ROUSSEAU, A DISCOURSE IN INEQUALITY 11 (trans. M. Cranston 1984).

141 See OLSON, supra note 30, at 18-19.
Thus, the strategic complementarities and herd behavior at work in financial crises involve far more players than could readily be brought into meaningful communication with one another. Likewise, in some subset of the pharmaceutical innovation cases that Heller has in mind, and in many of the copyright cases that Lessig emphasizes as obstacles to a remix culture. In the latter settings, in fact, even the identification of those who hold relevant rights may stand in the way of effective communication. Some standard-setting battles, finally, are to similar effect, given the massive pool of relevant consumers.142

Even if the transaction costs of communication among large numbers of relevant actors could be overcome, however, communication still cannot ensure efficient coordination in conflictual settings. Again, consider a standard-setting battle, but one in which relevant preferences diverge – perhaps significantly. Producers of competing consumer interfaces, designed for use on incompatible computer or telecommunications networks, for example, might see significant utility in coordination around a common standard. For each, such standard-setting offers the promise of significantly expanded market share. Alongside their strong desire for a common standard, is an equally strong preference that it be their own.

Given such conflicting preferences, communication offers no miracle cure. In the extreme case, it might even reduce the potential for efficient coordination. Thus, recall the Battle of the Sexes game, but with adjusted payoffs, such the net utility of going to the boxing march is much greater. Assume, for example, that the husband deeply loves boxing, while the wife’s attendance at the ballet is more a matter of convention, than any real taste for it.

142 In some standard-setting circumstances, of course, it will suffice for relevant producers to be capable to effective communication.
<table>
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<tr>
<th></th>
<th>Ballet</th>
<th>Boxing Match</th>
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</thead>
<tbody>
<tr>
<td>Ballet</td>
<td>(10,5)</td>
<td>(2,4)</td>
</tr>
<tr>
<td>Boxing Match</td>
<td>(-5,-5)</td>
<td>(5,20)</td>
</tr>
</tbody>
</table>

In the presence of such conflict, communication will not necessarily ensure coordination in the lower-right, Pareto superior quadrant. Given these payoffs, any such communication itself becomes strategic in nature. Further, it operates in the shadow of whatever salience a given coordination point enjoys, regardless of its Pareto superiority or inferiority. Consider each possibility in turn:

In the coordination game at work in any form of bargaining among parties, communication is designed to establish an expectation that one’s “commitment point” – the point beyond which a party claims she will not concede further – is in fact her “reservation point” – the actual point beyond which she will not concede further. Communication in the Battle of the Sexes, thus, consists primarily of each spouse trying to convince the other of their unwillingness to go to the disfavored venue. Communication in coordination settings of conflict – i.e., outside the universe of pure coordination games – therefore cannot be expected to yield consistently efficient coordination.

Such strategic talk in coordination game settings, moreover, plays out against a backdrop of existing focal points and resulting salience. Even if the communications of a particular player do not alter their counterpart’s expectations in ways that produce a Pareto inferior equilibrium, a relevant focal point may produce that result. Thus, if the upper-left

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quadrant in our Pareto-ranked Battle of the Sexes matrix is focal for some reason – perhaps the ballet is closer to home, they already have tickets for it, or some friends will also be attending – it may emerge regardless of the impact of any strategic communication.\footnote{First-mover effects might yield a similar result. In contract negotiations, similarly, I have identified established contracting norms as a potential source of such salience. \textit{See id.} at 1053-55.}

Finally, an optimal strategy may even involve \textit{cutting off} communication. As Schelling colorfully describes it, in a telephone conversation with her husband, the wife in the Battle of the Sexes might simply declare that “I’m leaving for the ballet!” and promptly hang up the phone.\footnote{See SCHELLING, \textit{supra} note 120, at 146 (“When the outcome depends on coordination, the timely destruction of communication may be a winning tactic. When a man and his wife are arguing by telephone over where to meet for dinner, the argument is won by the wife if she simply announces where she is going and hangs up. And the status quo is often preserved by a person who evades discussion of alternatives, even to the extent of simply turning off his hearing aid.”).} Similarly, in military conflict, the combatant whose preferred position enjoys some salience might take advantage of a loss of communication to achieve their strategic ends.

* * *

Contrary to conventional assumptions, then, coordination cannot be promised to arise as a matter of spontaneous order, whether because of the limits of communication or the presence of some dimension of conflict. What, then, are the implications of coordination for regulatory design? Coordination game settings, as suggested, may present their own potential market failures. Such failures are different in kind than those we have commonly emphasized in Prisoner’s Dilemma accounts of the social and economic order, however. Likewise, the resulting form that relevant regulation must take. To appreciate as much, it is useful to consider the precise shifts attendant to the move from Prisoner’s Dilemma to coordination dynamics.

\textbf{B. From Incentives to Expectations}

In the Prisoner’s Dilemma, as described above, the operative payoffs incentivize players to defect from a socially optimal equilibrium. Each player’s rational exercise of her individual
incentives, as such, generates an inefficient result. While the provision of well-maintained roads, public parks, scientific innovation, and the like is socially desirable, thus, individual citizens are incentivized to free-ride on others’ contributions to such public goods. Likewise, while collective utility is diminished by air or ground pollution, any given industrial polluter would prefer to dispose of its waste freely, if it could do so without detection. High-risk strategies by lenders are to similar effect, finally, given negative externalities to the financial markets generally.

In coordination games, by contrast, players’ incentives do not dictate any necessary inefficiency. There is nothing in the relevant incentives that predicts sub-optimal results. Rather, where coordination failure occurs – whether by dint of a failure to coordinate (i.e., selection of mismatched strategies) or coordination at a sub-optimal equilibrium – it is a result of the players’ flawed expectations of one another.

The solution to coordination games thus lies in each player’s ability to develop accurate expectations of the likely strategy to be played by the other. More precisely, it turns on each one’s ability to determine what the other player is likely to expect of them. As Schelling thus put it: “What is necessary is to coordinate predictions, to read the same message in the common situation, to identify the one course of action that their expectations of each other can converge on. They must ‘mutually recognize’ some unique signal that coordinates their expectations of each other.”

In selecting among competing exchanges on which to list or trade, for example, a firm going public, a broker, or a dealer must attempt to develop accurate expectations of the likely

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146 See DIXIT & SKEATH, supra note 48, at 274.
147 See McAdams, supra note 47, at 256-57.
148 See SCHELLING, supra note 120, at 21; Ahdieh, supra note 143, at 1053; McAdams, supra note 47, at 231.
149 See SCHELLING, supra note 120, at 54.
150 See id.
behavior of their counterpart corporations and traders. Similarly, hedge funds and banks, in
determining whether to invest and lend, in the face of a potential or existing credit crunch.\footnote{See Diamond & Dybvig, supra note 70, at 402 (noting genesis of bank runs in “shift in expectations”).}

Beyond the financial markets, meanwhile, the choice of whether to buy a VHS or Betamax
system, to develop programs for Blu-ray or HD DVD, or to interconnect with one transmission
network versus another, are all likewise dependent on one’s expectations.

Expectations are the relevant target, then, in any efficiency-enhancing intervention by
public authorities in coordination settings. It is to the shaping of expectations, rather than the
alteration of incentives, that coordination-driven regulation is directed. Given as much, three
important aspects of such regulation are suggested. Though interrelated, we do well to
consider each in turn.

1. Regulation Beyond Command-and-Control

The first goes to the coercive nature of regulation. Conventional notions of regulation
see it as inherently coercive. It is the very quality of coercion, in a sense, that makes it

This is hardly surprising, given a Prisoner’s Dilemma conception of the task at
hand. Where the relevant regulatory project is to alter the incentives of private actors – in a
game theoretic framework, to alter the payoffs to different strategies – regulation will ordinarily
have some coercive quality. Whether accomplished by way of carrot or stick, for regulation to
be effective in this setting, it must alter existing payoff structures.\footnote{See Andrew T. Guzman, A Compliance-Based Theory of International Law, 90 Cal. L. Rev. 1823, 1844 (2002).}

Environmental regulation thus imposes costs on the creation of pollution externalities,
and thereby disincentivizes their production. Traditionally, it has done so by the imposition of
absolute limits on relevant outputs. With proposals for a cap-and-trade system of carbon
emissions now on the legislative agenda, however, the intent to alter relevant incentives becomes even clearer.\textsuperscript{154} A similar account can be given of workplace safety rules, by which employers’ competitive incentive to deviate from safety norms is disabled by the Occupational Safety and Health Administration’s mandatory standards.\textsuperscript{155}

The shaping of players’ expectations, by contrast, involves no necessary dimension of command-and-control. Expectations may be altered by any number of non-coercive means, including cheap talk, signaling, information-provision, and the like. Where the operative question is what each player – holding their incentives constant – expects of the other, such non-coercive measures can be quite effective.\textsuperscript{156}

Thomas Schelling thus highlighted the function of “focal points” in addressing coordination dilemmas. Specifically, he posited the presence of some cognitive process – something more in the nature of art than science – by which individuals develop coherent expectations of the likely behavior of their counterparts. In the face of the question of where I might find you across the breadth and width of New York City, thus, Schelling suggested that the focal quality of a certain location might indicate a solution.\textsuperscript{157} Given its possession of what Robert Sugden would later term “salience,” some site may simply stand out.\textsuperscript{158}

Drawing on the latter notions – as well as Randy Picker’s suggestion of a “norm seeding” function for public authorities, in facilitating the emergence of efficient social norms\textsuperscript{159}

\begin{footnotesize}
\begin{enumerate}
\item[154] See Jim Snyder, Budget Includes Cap and Trade Revenues, THE HILL, Feb. 26, 2009.
\item[156] Command-and-control regulation may also shape expectations, of course, if with a necessarily heavier hand. At least in some circumstances, moreover, it does so not especially by dint of its coerciveness.
\item[157] See SCHELLING, supra note 120, at 57-58.
\end{enumerate}
\end{footnotesize}
– I have previously described a “cueing” role for state authorities in coordination settings.\textsuperscript{160} Given the potential salience of public initiatives in a coordination setting, as such, even non-coercive state action – the issuance of reports, the convening of conferences, use of the government’s purchasing power, and the like – might play a significant role in facilitating coordination around a particular norm.\textsuperscript{161} Likewise – if with greater difficulty – in displacing an inefficient status quo norm.

In the financial markets, to this effect, I have highlighted the role that governmental use of a given trading system for transactions in public securities might play, in facilitating its emergence out of the shadow of some alternative securities exchange.\textsuperscript{162} Public authorities’ generation of technical information regarding alternative trading structures might be to similar effect. Likewise, government facilitation of market linkages, through the creation of opportunities for heightened interaction and engagement.

As to the recent financial crisis, meanwhile, the structuring of public investment in troubled banks and other financial institutions with a clear signal of expected returns – perhaps even in the relatively near term – might fall within such a non-coercive, cueing function. In essence, by signaling some public expectation of positive returns, it might help to foster such expectations in the market more generally. Information dissemination might likewise play a role – as in highlighting sound fundamentals in certain industries, as well as relatively low price-earnings ratios, and the like. Likewise, facilitating recurrent engagement among relevant market participants, as in the Treasury Department’s convening of meetings among the major banks, early in the financial crisis.\textsuperscript{163}

\textsuperscript{160} See Ahdieh, supra note 59.
\textsuperscript{161} See id. at 259-61.
\textsuperscript{162} See id. at 276-78.
\textsuperscript{163} See Jane Sasseen & Theo Francis, Paulson Buys Up the Banks, BUSINESS WEEK, Oct. 13, 2008.
Finally, the targeting of assistance to lenders and investors whose return to the markets might be expected hold greater salience than that of others might also be noted. The re-engagement of such institutions in the markets might thus be expected to impact relevant expectations among banks, hedge funds, and private equity firms more generally. A mandate that banks in receipt of public assistance increase lending, by contrast, ought not be expected to accomplish much— notwithstanding all the attention it received amidst the recent crisis.164 Expectations of continued (or healthy) lending and investment are thus unlikely to be altered by the coercion of lending and investment.

The potential impact of non-coercive interventions in coordination settings, however, might be seen to cut two ways. As suggested, command-and-control regulation—and prescriptive regulation more broadly—will not always be necessary in the increasingly important universe of settings in which coordination is the critical dynamic at work. But the flip side of the coin is no less significant. In coordination settings, state interventions we would never have considered a species of “regulation”—let alone to be worthy of review—may now become so.

Consider, for example, the government’s generation of white papers and other research on various aspects of internet regulation,165 its facilitation of HDTV standard-setting by way of its Advisory Committee on Advanced Television Service,166 and its convening of representatives of the major Wall Street banks, early in the financial crisis.167 In each of these cases, no public

165 See, e.g., FEDERAL COMMUNICATIONS COMMISSION, FCC05-151, POLICY STATEMENT ON THE INTERNET (Sept. 23, 2005).
166 See Ahdieh, supra note 59, at 251-52.
mandate was issued. No threat was made. In a sense, there was no whiff of “command” or “control” at all.

Given as much, we have commonly resisted the characterization of such interventions as being in the nature of regulation. Rather, they are simply state action of some indeterminate – and implicitly inconsequential – variety. If such interventions have the power to create strong focal points in coordination settings, however, they may be no less consequential than coercive regulation, in their effective “disciplining” of private behavior. They may, as such, be no less influential than command-and-control rules of the familiar sort.168 If so, our conception of what constitutes regulation – and perhaps even what we should review as such under the Administrative Procedure Act – may require adjustment.

Yet this highlights a further potential extension in the nature of “regulation” in coordination settings. If coordination-driven state interventions involve no necessary coercion, then the state’s monopoly on force ceases to be a distinguishing characteristic in defining the nature of regulation.169 If this is true, however, then even relevant private action might exhibit something in the nature of “regulatory” effect. If the impact of interventions in coordination settings lies in their focal power, there can be little doubt that certain private actors – given their market power, their history as prescient first movers, or the like – may possess a coordinative power no less than that of public authorities.

Schelling thus suggests the potential for The New York Times to generate a relevant focal point in the Meeting Place game. For friends separated in New York, he argues, the appearance of the Empire State building on the front page of the Times might lead each to expect the other

168 See McAdams, supra note 131, at 1712 (describing law’s effect on behavior as not simply a product of legal sanctions, but because of its impact on environment in which people interact).
to go there. Likewise, a bystander with no official authority might assume significant power to direct traffic in a gridlocked intersection, if the traffic lights should fail and no other mechanism of coordination presents itself. At least in some coordination settings, then, it may be important to acknowledge – and perhaps even regulate – a kind of private regulation as well.

2. Information as Regulation

As the foregoing suggests, besides a move beyond the regulatory paradigm of command-and-control, the shift from incentives to expectations as the locus of regulatory design also highlights the critical importance of information in coordination settings. Recent years have seen much talk of the “information economy,” the “knowledge-based economy,” and the like. Dynamics of coordination in the financial markets, on the internet, in technological innovation, in standard-setting, and elsewhere are deeply intertwined with this emphasis on information and knowledge. Thus have developments in each of these areas – as well as in other coordination settings – been seen to be both motivated by and contributing to an information revolution in the modern social and economic order.

An emphasis on information should not, to be sure, be understood as synonymous with coordination games’ emphasis on expectations. Expectations arise on a variety of bases, some information- and knowledge-based, and others more amorphous and less rational in nature.

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170 See SCHELLING, supra note 120, at 56.
171 See id. at 63.
173 See Diamond & Dybvig, supra note 70, at 404 (“[A] bank run in our model is caused by a shift in expectations, which could depend on almost anything, consistent with the apparently irrational observed behavior of people running on banks.”); Masson, supra note 76, at 4; see generally Thomas C. Schelling, For the Abandonment of Symmetry in Game Theory, 41 REV. ECON. & STAT. 213, 220-21 (1959).
It is clear, however, that information is a central determinant of expectations as to likely coordination points, and the likely behavior of other players in moving toward them.

Consider the dynamic in various standard-setting environments: In a process of *de jure* standard-setting – dictation of standards by law – standards must emerge out of some pattern of coordination among relevant market participants.174 Some part of this dynamic can be traced to pure market power. A big enough player may thus “dictate” the standard that emerges, by dint of its size alone. Even in such settings, information about the prevalence of alternative standards, their utility and limitations, their relative interoperability, and the like may remain the *lingua franca* of the standard-setting process. In the absence of such market power, meanwhile, this is most assuredly so. In shaping a given participant’s expectations of the likely outcome of the coordination game at work in defining the ultimate standard, information about such questions is likely to play an essential role.

Hence, an important coordination function for regulatory authorities, in generating, compiling, and distributing both technical and market information. This might be observed in various high-tech settings, where the National Institute of Standards and Technology (NIST), the Federal Communications Commission, and other government agencies have played an important function in generating information and facilitating its exchange. In overcoming the prolonged delay in the commercialization of HDTV technology, for example, the government-established Advisory Committee on Advanced Television Service played a central role.175

Similar patterns might be observed in the financial markets. There, of course, information is the coin of the realm, as evident in the elaborate securities disclosure regimes in


175 See Ahdieh, *supra* note 59, at 251-52.
place the last seventy-five years.\textsuperscript{176} The very structure of the markets, more broadly, is designed to make them effective mechanisms of informational efficiency.\textsuperscript{177} Hence the keen interest in regulatory initiatives directed to the ease of trading across exchanges, including long-standing aspirations to a National Market System and related requirements of best execution.\textsuperscript{178} In both cases, relevant regulation serves to encourage the exchange of information conducive to efficient coordination.

A regulatory regime responsive to dynamics of coordination in the modern economy can thus be expected to include important information generating, forcing, filtering, and disseminating functions. In this account, the NIST – commonly considered a backwater of the administrative state – actually has a critical role to play.\textsuperscript{179} The production of white papers and analogous reports by the NIST and other agencies thus takes on heightened significance. Likewise, the imposition of reporting requirements by agencies including the Food and Drug Administration, the Federal Trade Commission, and the Federal Communications Commission, among others.

Where coordination dynamics are the source of relevant demands on the administrative state, then, information initiatives become critically important. In the shaping of relevant


\textsuperscript{179} The National Institute of Standards and Technology describes itself as a “non-regulatory” federal agency within the Department of Commerce. \textit{See} National Institute of Standards and Technology, \textit{General Information}, Nov. 11, 2008, at \url{http://www.nist.gov/public_affairs/general2.htm}. Its mission is to promote innovation by advancing measurement science, standards, and technology. \textit{Id.}
expectations – and hence in the service of effective and efficient coordination – information will often hold the key. It thus becomes a central feature, not a superfluous sideshow, in the modern regulatory project.

3. The Behavioral Dimensions of Coordination

Yet this highlights an important caveat in the regulatory implications of a move from incentives to expectations as the operative target of state intervention. Recent years have seen a growing body of work in the field of behavioral law and economics.\(^{180}\) Much of this work may soon find application in law and regulation, moreover, with Cass Sunstein – a leading scholar in the field – up for nomination as administrator of the Office of Information and Regulatory Affairs, the division of the Office of Management and Budget responsible for oversight of administrative rulemaking.\(^{181}\) The coordination dynamics emphasized herein, however, counsel some caution in the overly quick embrace of the behavioral remedies that Sunstein and others have pressed.

As now widely known to legal scholars, over the last twenty years, psychologists and experimental economists have collected significant evidence that the rationality assumption of neoclassical economics does not fare well in practice. Experimental analysis has thus highlighted significant cognitive failures, both in information processing – as with the hindsight and availability biases – and in valuation – as with the famous endowment effect.\(^{182}\)

In the face of these experimental results, scholars of regulation have begun to identify techniques by which regulation might alleviate such biases, work around them, or even to take


\(^{181}\) See Brian C. Mooney, *Harvard’s Sunstein to Oversee Regulation*, BOSTON GLOBE, JAN. 9, 2009.

advantage of them. Most recent has been the joint work of Sunstein with Richard Thaler, culminating in the recently published *Nudge: Improving Decisions About Health, Wealth, and Happiness*. Thaler and Sunstein, in essence, posit that government authorities might do well to take advantage of consistent cognitive biases and failures to encourage good decisions. The use of Pareto superior default rules, the selective display of certain consumer goods versus others, and similar adjustments in what they term “choice architecture” thus emerge as potentially valuable “nudges” in individual decision-making.

Although Thaler and Sunstein do not address dynamics of coordination – understandably, given that many of the settings they describe are not characterized by coordination – their ultimate prescription of “nudges” can obviously be seen to echo the non-coercive account of regulation offered herein. Like my regulatory cues and Picker’s “norm seeding,” nudges represent a mechanism of potentially substantial – even determinative – regulatory influence, yet with no dimension of coercion.

But a deeper point of intersection between the behavioral law and economics literature and the paradigm of coordination-driven regulation offered herein should also be noted. Within traditional accounts of the social and economic demands on the administrative state – grounded in the prospect of Prisoner’s Dilemma-like defection – the cognitive failures identified by behavioral psychology and economics represent barriers to efficient results. Most broadly, it is the failure to appreciate the private losses that ultimately result from defection that underlie the resulting dilemma.

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184 See id. at 3.
185 See Rostain, supra note 180, at 990-95.
At least in some coordination settings, however, such “failures” of rationality hold the key to efficient outcomes. As Thomas Schelling has emphasized, thus, the solution to coordination games – grounded as it is in the formation of expectations – is more in the nature of art than science.\textsuperscript{186} Rational decision-making, as such, does not dictate any given solution to coordination dilemmas. As noted above, a wife in search of her husband in a department store might look for him at the “Lost and Found” desk,\textsuperscript{187} while friends separated in New York might choose to go the Empire State Building – whether because a picture of it appears in that day’s \textit{New York Times}\textsuperscript{188} or simply because it is the tallest building in town. Such decision-making is not “rational,” at least in any coherent sense of the word. Yet it works.

The ideal regulatory approach to cognitive biases, then, may not be as obvious as some of the behavioral literature would suggest. At least in some settings, such biases might have a valuable role to play, including in facilitating coordination. Given as much, Sunstein and others might do well to be cautious, in seeking to regulate around, alleviate, or eliminate those biases.

\textbf{C. From Dominant Strategies to Multiple Equilibria}

Echoing the shift from incentives to expectations is a related move from dominant to interdependent strategies in coordination settings. In a sense, this is the core distinction in the dynamics at work in the Prisoner’s Dilemma versus coordination games. As we turn from regulating the consumption of public goods, preventing free-riding, and internalizing negative externalities, to facilitating efficient coordination in standard-setting, network-building, and

\textsuperscript{186} See SCHELLING, supra note 120, at 54-56; see also Diamond & Dybvig, supra note 70, at 404 (noting potential irrationalities behind shifts in expectations that drive bank runs); Masson, supra note 76, at 4 (describing notion of “sunspots” in economics: “irrelevant variables that nevertheless coordinate investors’ expectations”). Such irrationality is understandably problematic for scientific analysis, formal modeling, and the like. See Masson, supra note 76, at 4. Nonetheless, it is irreducibly relevant to effective coordination.

\textsuperscript{187} See SCHELLING, supra note 120, at 54, 57.

\textsuperscript{188} See id. at 57-78.
elsewhere, we move from a world characterized by dominant strategies, to one defined by multiple equilibria.189

The central feature – and stumbling block – in Prisoner’s Dilemma settings is the presence of a dominant strategy. While such dominance may be present in other strategic settings as well, it is at the heart of the Prisoner’s Dilemma. In the latter, thus, each player is incentivized to confess, regardless of the choice made by their counterpart. Recall, to this effect, the Prisoner’s Dilemma payoffs outlined above.190 If my co-conspirator refuses to confess, I can decrease my sentence by confessing alone. Even if my co-conspirator confesses, however, I do well to confess, to avoid being penalized as the lone holdout.

Thus might I persist in over-consumption of a public good, in the disposal of waste in a public waterway, and in providing diminished workplace safety protections – even if others are not following suit. The very reason defection is the regulatory concern in Prisoner’s Dilemma settings, thus, is because it is my dominant strategy. This is why players defect from socially optimal equilibria, regardless of what their counterpart chooses to do.

In coordination games, by contrast, the characteristic phenomenon is that of multiple equilibria.191 As described above, in coordination settings, there are multiple combinations of individual strategies from which neither party will have any incentivize to defect. In determining which side of the road to drive on, thus, if the right has emerged as the relevant equilibrium, neither driver will switch sides – even if they are British and would otherwise prefer to be on the left. Likewise, in the individual depositor’s analysis of whether to maintain her deposit or make a run on a bank, in a lender’s decision whether or not to issue new loans,

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189 See DIXIT & SKEATH, supra note 48, at 256; Crawford & Haller, supra note 134, at 572.
190 See supra notes 48-49 and accompanying text.
191 See Crawford & Haller, supra note 134, at 572.
and a hedge fund manager’s assessment of whether to buy available securitized debt offerings or continue to wait.

This does not change, as highlighted above, in the presence of conflict. Consider, thus, the most conflictual coordination game – the Hawk-Dove game, or Chicken, as it is more colloquially known. In Hawk-Dove games, the payoffs to the aggressive, Hawk strategy are greater than playing Dove. Yet that choice is not dominant. It is a dramatically inferior choice, in fact, in the face of the decision of one’s counterpart to play Hawk. Here, the infamous game of Chicken – in which two cars barrel toward each other, to see who will flinch first – is starkly suggestive. Surely I prefer to win by not swerving, while my opponent does so. I significantly prefer to lose by swerving, however, when my opponent does not do so. Not putting too fine a point on it, losing is Pareto superior to dying. Even if I would significantly prefer the alternative equilibrium in a coordination setting, then, unilateral defection to that strategy will diminish my payoff.

Significantly, a similar dynamic of multiple equilibria arises in repeat play settings of the Prisoner’s Dilemma. As widely appreciated in the legal literature, the study of evolutionary game theory in recent decades has highlighted the potential for indefinite repetitions of the Prisoner’s Dilemma to facilitate its resolution. Less appreciated has been the nature of the shift to indefinite repeat plays, as a conversion of the Prisoner’s Dilemma into a game characterized by multiple equilibria – a coordination game. As I will emphasize below, when we appreciate as much, the importance of attending to coordination game dynamics proves to

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193 See generally Amnon Rapoport et al., An Experimental Study of Coordination and Learning in Iterated Two-Market Entry Games, 16 Econ. Theory 661 (2000) (pointing to Nash equilibrium as explanation of tacit coordination in multi-member iterated games).
be even greater. A coordination-driven conception of regulation, it turns out, may even have application even in the wide universe of areas characterized – in single-shot circumstances – by the Prisoner’s Dilemma.¹⁹⁴

1. **Multiple Equilibria, Barriers to Entry, and Lock-in in Coordination**

   Rather than merely a bit of arcane math, the shift from dominant strategies to multiple equilibria emphasizes the dramatically distinct regulatory project in coordination settings. In the familiar universe of public goods, free-riding, collective action, negative externalities, and the like, relevant regulatory intervention seeks to address the prospect of defection. Why? Because such defection is the dominant strategy in these settings.

   Not so, in coordination games characterized by multiple equilibria. Here, as suggested above, there is no issue of defection. Coordination equilibria are stable, given that no player can gain by deviating from a prevailing coordination point. This is the story of sticking to right-versus left-hand driving, meeting at the further station, and accepting the embarrassment of swerving, once I have decided that you will not. More tangibly, this is the reality behind the stickiness of dominant standards – whether in high-tech or other areas.¹⁹⁵ Likewise, it is the tendency toward the dominance of a given securities trading system and other prevailing networks.¹⁹⁶

   Rather than defection, thus, the efficiency concern of interest in coordination settings is the presence of multiple equilibria. Properly understood, such multiplicity presents its own, potentially significant barriers to efficient outcomes. Specifically, it generates distinct

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¹⁹⁴ This is likewise true where repetition is not indefinite, but there is some operative uncertainty as to the timing of the final play.


challenges in achieving and maintaining efficient coordination, at what might respectively be thought of as the front- and back-end of the coordination process.

At the front-end, multiple equilibria create potential barriers to entry.¹⁹⁷ Such multiplicity may present little obstacle to entry, if players’ preferences among Pareto ranked coordination points are aligned. Even if one player’s gains from the given equilibrium are greater, no particular resistance to entry should be expected from their counterpart. The same might be true, if some focal point effect renders one coordination point dramatically more salient than the other.¹⁹⁸ Absent these assumptions, however, players may well resist or delay entry. In the presence of multiple equilibria, at a minimum, players who heavily prioritize coordination may fear their selection of the “wrong” choice.¹⁹⁹

This may be especially true in the presence of so-called “tipping effects,” as widely explored in the study of network effects – themselves involving a species of coordination.²⁰⁰ Network economies, as suggested above, are those characterized by demand-side economies of scale. Here, the utility of a certain technology – be it a particular currency, a choice of language, a preferred securities exchange, or one DVD standard versus another – depends on the size of its network of users.

Given as much, some tendency of network industries to “tip” has been predicted – and observed.²⁰¹ If the potential “network value” of a good significantly outweighs its “inherent value,” thus, network users can be expected to move fairly abruptly to a dominant network,

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¹⁹⁷ Cooper and John thus highlight the potential for underemployment equilibria, given “the inability of agents to coordinate their actions successfully in a many-person, decentralized economy.” Cooper & John, supra note 73, at 442; see also id. at 451 (“Due to coordination failures, the economy can get stuck at a low level of output.”).

¹⁹⁸ For example, if one coordination point has more often emerged in the past, or is in some way a norm or convention.

¹⁹⁹ This assumes, of course, the presence of some meaningful switching costs.

²⁰⁰ Coordination on a common network is thus the operative source of network value.

²⁰¹ See Ahdieh, supra note 59, at 226-28.
once that dominance becomes fairly evident. The emergence of the VHS standard over the
Betamax alternative, among other cases, has been commonly cited by way of example.  

Broadly, such tipping effects can be expected to arise in any setting in which we find a
strong preference for coordination. As in the particular sphere of network externalities, if the
value of coordination is sufficiently high, market participants can be expected to shift sharply to
a given coordination point, once its focal quality has become apparent.

In the face of such tipping effects, in turn, two patterns of barrier to entry have potential
to arise. First, no player may enter, given an inability – and a concomitant need – to predict the
likely success of one coordination equilibrium versus the other. Among other examples, this
may capture the extended delay in the commercialization of HDTV technologies. This
prospect of non-entry is increased, of course, by the relative inability to recoup sunk costs in the
presence of strong network or coordination effects. Thus, if the preference for coordination in a
given setting is sufficiently strong, the limited value of a non-dominant technology may prevent
a user of it from completing sales, even at marginal cost.

More likely may be the prospect of little entry beyond a first-mover. In the presence of
tipping effects, thus, we can expect to see strong first-mover advantages. In this case, by
contrast with the former pattern, there may be relatively little barrier to entry by the initial
entrant. Thereafter, however, the potential for entry may be dramatically diminished. The
seeming persistence of certain technical standards, notwithstanding their dated quality, may be

202 See Jagdish Sheth & Rajendra Sisodia, The Rule of Three: Surviving and Thriving in Competitive
203 See Ellen P. Goodman, Digital Television and the Allure of Auctions: The Birth and Stillbirth of DTV
204 See Ahdieh, supra note 59, at 227 n.45.
205 See William E. Cohen, Competition and Foreclosure in the Context of Installed Base and Compatibility Effects,
64 Antitrust L.J. 535, 550 (1996); Mark A. Lemley & David McGowan, Legal Implications of Network
Economic Effects, 86 Cal. L. Rev. 479, 531. 541.
suggestive in this regard. In such cases, a first-mover may have secured sufficient advantage, so as to disincentivize competitive entry.

If barriers to entry a potential market failure at the front-end in coordination settings, a further source of inefficiency may present itself at the back-end. Whether the equilibrium that emerges out of a coordination game is Pareto superior or inferior, it is likely to be – and to remain – quite stable. In coordination settings, thus, “mutual gains from an all-around change in strategies may not be realized because no individual player has an incentive to deviate from the initial equilibrium.”206 Given the lack of a dominant strategy, each player’s choice of strategy depends on the choice of the other. In this environment, the potential for individual adjustment and innovation, even in the face of a suboptimal equilibrium, is necessarily diminished. Any single player will only alter their strategy, as such, in tandem with other players’ decision to make a similar move.

Consider the case in which an inefficient equilibrium emerges at the outset, whether because of a first-mover advantage, because an inferior coordination point enjoys significant salience, or otherwise. Given the assumed preference for coordination, even a player fully aware of the relevant inefficiency may not deviate from it. Absent collective action, in fact, she would be mistaken to do so. Any given player can thus be expected to adhere to even a suboptimal coordination equilibrium.

Even where efficient coordination is achieved at the outset, inefficient lock-in effects may ultimately arise. This would be the case, of course, if the relevant equilibrium should prove to be inefficient over time. Even in the face of exogenous factors reducing the efficiency of a prevailing coordination point, thus, the stickiness attendant to the preference for coordination may ensure that it persists.

206 Cooper & John, supra note 73, at 442-43.
The actual incidence of each of these potential efficiency failures in coordination game settings is ultimately an empirical question. Furthermore, it necessarily turns on a case-specific inquiry. I do not, as such, mean to assert any claim as to how common such barriers to entry and lock-in effects are in practice. My point is simply that they are issues in coordination game settings, in ways that go beyond the familiar terrain of Prisoner’s Dilemma analyses of the modern administrative state.

2. **Multiple Equilibria and the Role of Information**

If the operative concerns in coordination game settings are barriers to entry and lock-in, rather than defection, a sharply distinct paradigm of regulation is suggested once again. As with the shift from incentives to expectations, information again emerges as critically important. In overcoming barriers to entry generated by the presence of multiple equilibria, information directed to the relative utility of potential alternatives, to their existing market share, to the preferences of salient users, and to questions of compatibility and interoperability with related technologies, standards, or networks, may all be critical to efficient entry.

Likewise, in overcoming coordination-driven lock-in effects. Information along the latter lines might thus alter expectations about the credible potential for an alternative equilibrium to displace the prevailing one. In this way, it may help to encourage efficient adjustment to Pareto superior equilibria.

3. **Cues, Seeds, and Nudges: The Growing Scope of Modern Regulation**

Beyond the importance of information in particular, the distinct emphasis on barriers to entry and lock-in in coordination settings again highlights the role of regulation as a signaling device – here, in facilitating efficient patterns of entry and reform. In such circumstances, regulatory cues, as described above, may serve a salutory function. By shaping expectations in relevant coordination settings, such cues – including the dissemination of relevant data and
research, the organization of conferences directed to particular coordination questions, advicegiving,\textsuperscript{207} and use of the government’s purchasing power – may help to overcome barriers to entry and lock-in effects. Given their focal power, in essence, such measures may help to resolve uncertainty in the choice among multiple coordination equilibria.

This, again, is Randy Picker’s notion of a potential “norm seeding” function for government authorities.\textsuperscript{208} More recently, it is the pattern popularized in Thaler and Sunstein’s proposed “nudges” – governmental alterations of the choice architecture, to facilitate better individual choices.\textsuperscript{209} The latter, it is true, are seen by their advocates as particularly directed to the findings of behavioral psychology and economics. Such nudges might better be understood, however, as part of a broader pattern of emerging regulatory structures.

If cueing, seeding, or nudging functions are an important dimension of the regulatory role in coordination-driven areas such the financial markets, the internet, and standard-setting, however, two further extensions in the scope of relevant “regulation” also warrant attention. The first is the previously discussed category of potential private “regulation.”\textsuperscript{210} The second, noted more briefly above, encompasses those settings in which the state functions as market participant. In our constitutional jurisprudence, we have carefully parsed these occasions out from the universe of state action.\textsuperscript{211} In these circumstances, the argument goes, the government may well be bigger than others, but it is no different in kind.

In coordination settings, however, even the state’s mere participation in the market might be expected play a focal point function. Consider a competition between competing

\textsuperscript{208} See Picker, supra note 159, at 1284-85.
\textsuperscript{209} See Thaler & Sunstein, supra note 183, at 93.
\textsuperscript{210} See supra notes 169-71 and accompanying text.
standards – the choice between Lexis and Westlaw, for example. Given its significant market power, the decision of the government to favor one standard – in that particular case, the decision of the U.S. Department of Justice to purchase only Westlaw access – might be expected to play a substantial role in shaping private expectations as to the likely equilibrium for coordination.

Government procurement decisions might thus go a long way in addressing potential barriers to entry and lock-in effects in coordination settings. Where some efficient technology is being underutilized, for example, the government’s decision to adopt it may dramatically alter expectations of its potential to succeed in a relevant coordination game. Conversely, if that technology should thereafter exhibit some degree of lock-in, preventing the emergence of superior alternatives, public procurement of relevant alternatives might minimally help to diminish the focal power of the dominant technology.

Both where salient private actors communicate signals with focal effects, and where public authorities function as market participants, then, it may be necessary to evaluate some part of the dynamic at work as a species of regulation. Non-coercive though such conduct might be, its impact in coordination settings may deserve our attention. Even on the public side, this suggests a potentially notable shift, in which heretofore non-actionable state action becomes subject to review. In the private setting, of course, the result seems even more striking: What might be the criteria to determine when private action rises to the level of “regulation”? Might such conduct be subject to administrative constraints akin to those of the Administrative Procedure Act? Whatever prudence might counsel, the analysis herein minimally highlights the need to reconsider the appropriate scope of cognizable “regulation.”

4. **Regulation and Coordination in Innovation**

If multiple equilibria-generated barriers to entry and lock-in displace dominant strategy-driven defection as the impetus for regulation in coordination settings, a further word might be added, as to questions of innovation. In coordination settings, we might arguably see ourselves as motivated by just the opposite concern as in the Prisoner’s Dilemma settings of public goods, free-riding, negative externalities, and the like. In the latter circumstances, again, regulation seeks to respond to patterns of *excess* defection. Sub-optimal entry and lock-in of prevailing equilibria, by contrast, constitute a form of *inadequate* defection. In these circumstances, regulation aims to overcome inertia – or, more bluntly, to encourage defection.

This nexus of regulatory coordination and the dynamics of innovation should hardly be surprising. In the coordination-driven spheres highlighted above – the financial markets, the internet, and high-technology, among others – innovation and entrepreneurship have been, and remain, central issues. Thus has innovation been so widely discussed in recent years – not uncommonly, as noted above, with reference to whether the pace of innovation has slowed.\(^{213}\)

A distinct feature of coordination-driven regimes of regulation, then, might be some active encouragement of innovation.\(^{214}\) One might think of state interventions financing basic research, encouraging relevant linkages and partnerships, and even subsidizing the patent process along these lines. Likewise, the targeted financing of distinct areas of academic study, the development of common standards, and the sponsorship of relevant conferences and other gatherings of scholars and entrepreneurs. Whatever form it might take, such facilitation and encouragement of innovation may constitute an important facet of the regulatory regime, as we move from a world of dominant strategies, to one of multiple equilibria.

\(^{213}\) See Huebner, *supra* note 104, at 985.

5. **Regulatory Coordination and the Evolution of Cooperation**

In considering the regulatory implications of the shift from dominant strategies to multiple equilibria, a final point also deserves emphasis. As noted above, when we move from single-shot to iterative Prisoner’s Dilemma games, the dynamic at work is significantly transformed. The Prisoner’s Dilemma, in essence, becomes a coordination game. Thus did Robert Axelrod famously suggest the potential “evolution of cooperation” in repeat play Prisoner’s Dilemma games. When indefinite iterations of the Prisoner’s Dilemma occur, Axelrod highlighted, a cooperative strategy of non-defection emerges as a sub-game perfect Nash equilibrium. This equilibrium is not dominant, however, given that mutual defection – as well as various mixed strategies – remain potential equilibria.

Where Prisoner’s Dilemma settings are characterized by the potential for recurrent engagement over some indeterminate period of time, then, we find precisely the multiple equilibria of a coordination game. Once again, rather than a mere novelty, this suggests important extensions of the distinct account of coordination-driven regulation offered herein. Given the coordination dynamic in iterated Prisoner’s Dilemma games, regulatory coordination may have application not only in the coordination settings described in Part II, but in any setting in which Prisoner’s Dilemmas are subject to repeat plays. Where public goods, free-rider, or negative externality dynamics arise in iterative settings, thus, an account of regulation along the above lines – non-coercive, information-oriented, in the nature of cues and nudges, and so on – may have significant application.

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215 See supra notes 192-94 and accompanying text.
217 See *AXELROD, supra* note 216, at 10-11.
218 See id. at 45-46.
Consider free-riding in the generation of socially useful scientific research – an evident public good. In an indefinite repeat-play setting, the incentive of any given citizen to withhold support is diminished by an awareness that others will likewise defect thereafter, depriving all of the relevant benefits. Non-defection – here, support for relevant research – thus emerges as a potential equilibrium. In the actual selection of this (efficient) equilibrium over the alternative of mutual defection, however, non-coercive, information-oriented regulatory cues may have a useful role to play. As in the more conventional coordination settings outlined above, such coordinative regulation might contribute significantly to shaping expectations of the likely emergence of the Pareto optimal equilibrium of funded research.

Yet this suggests an even broader point about relevant regulatory regimes, as we embrace a highlighted emphasis on dynamics of coordination. If Prisoner’s Dilemmas become more tractable coordination games when played repeatedly, one might well consider a potential role for regulation, in encouraging repeat plays in otherwise single-shot Prisoner’s Dilemma settings. Regulatory measures designed to encouraging repeat interaction might thus be folded into the patterns of a new regulation suggested herein. Tax incentives for joint ventures and other means of fostering intertwined business relations – such as code sharing among airlines, for example – might thus warrant our attention. Information generation and dissemination may also play a role here. By ensuring the availability of complete information as to the participation versus non-participation (i.e., defection) of individual players, for example, regulatory authorities might thus strengthen the repeat-play dynamic at work.

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219 Such tax incentives, of course, fall outside the paradigm outlined above, of non-coercive regulation not directed to incentives, but to expectations. Yet this makes perfect sense. In encouraging the iteration of otherwise single-shot Prisoner’s Dilemma games, the dynamic at work at the outset is not one of coordination. A multiple-equilibria coordination game only arises, thus, once the game has been rendered iterative in nature.

220 It is worth recalling, with regard to these and similarly motivated interventions, that the critical mechanism by which cooperation emerges in the Prisoner’s Dilemma is not repetition generally, but
Even in the face of familiar Prisoner’s Dilemma dynamics in modern social and economic life, then, patterns of coordination-driven regulation may have an increasingly important role to play. Conventionally, our regulatory response in such settings has sought to alter individual incentives to defect, by way of various coercive measures. When we appreciate the potential transmutation of Prisoner’s Dilemmas into coordination games, upon indefinite repeat play, an entirely different regulatory project is suggested. By facilitating repeat interactions and complete information, regulators may well facilitate spontaneous order. At a minimum, such intervention may render non-coercive, information-oriented regulation of the form described herein sufficient to facilitate efficient results.

D. From Individuals to Groups

Beyond the shifts from incentives to expectations, and from dominant strategies to multiple equilibria, one might lastly see in the move from Prisoner’s Dilemma- to coordination-driven demands on the administrative state, some shift in emphasis from individuals to groups. Coordination game environments, including standard-setting, network-building, and the like, are thus characterized – and motivated – by some pattern of collective conceptions and commitments. Coordination games are, at heart, group dynamics.

At a certain level, this might be said of Prisoner’s Dilemma games as well, given the aspiration of the latter to understand individual strategies in the context of the strategic choices specifically repetition that is indefinite – or at least where the likely timing of a final play is ambiguous. Beyond encouraging repeat plays generally, therefore, one might speculate about ways in which a coordination-oriented regulatory scheme might foster uncertainty as to when ongoing relationships might be terminated. Here, of course, competing values are at stake. Recalling the centrality of information in coordination settings, however, one might imagine a regulatory regime that dictates significant information disclosure up-front, but limits required information sharing thereafter, in such a way that fosters uncertainty of the sort conducive to spontaneous cooperation.

221 See AXELROD, supra note 216, at 155-56.
of others. One might even cast this as the aim of game theory generally. The dominant strategies that characterize the Prisoner’s Dilemma dynamic in public goods, free-riding, collective action, negative externalities, and similar settings, however, cut against this account. In the Prisoner’s Dilemma, ultimately, the strategy choice of any individual player is independent of any other player’s choice.

In coordination settings, by contrast, one player’s choice of strategy is entirely dependent on the other’s. If my wife goes to the ballet, so will I; likewise, if she goes to see boxing. Unhappy as I might be about it, if you refuse to swerve, I will; and if you do, I will not. More tangibly, if I could convince my colleagues to switch to Apple Mac’s, so would I; until then, I write this on my PC. To similar effect, if Citibank could get Wachovia to extend credit, and likewise if it cannot.

In defining the nature of regulation in coordination settings, this pattern may often be important. Regulation in such settings is about the group, at least as much as it is about the individual. It aims to shape group conceptions, group strategies, and ultimately group behaviors. In the standard-setting of the internet, for example, the first-order question is the commonality of the relevant standard, and the second is its particular nature. A lower-quality, but shared standard is thus preferable to the higher-quality one I use alone.

This might be seen to suggest some intersection between the coordination-driven account of regulation outlined herein, and the substantial body of recent scholarship directed to the study of social norms. In that body of work, scholars including Robert Ellickson, Lisa

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223 For classic treatments of social norms, see David Lewis, Convention: A Philosophical Study (1969); Sugden, supra note 158; Edna Ullman-Margalit, The Emergence of Norms (1977). This scholarship has been revisited and substantially refreshed over the past decade. See, e.g. Cristina Bicchieri, The
Bernstein, Richard McAdams, Eric Posner, and others have explored the operation of social sanctions, and expectations, in the backdrop of, alongside, and even in conflict with the demands of formal law. In particular, however, they have highlighted the role of social norms in solving collective action problems.\(^{224}\)

Social norms might be understood, however, to have particular resonance in settings in which coordination is the central dynamic at work. In facilitating effective coordination, such norms may play a pivotal role, as a critical determinant of relevant expectations. On the other hand, the reverse must therefore also be true: Recalling the barriers to entry and lock-in problems that may stymie efficient coordination, it may often be social norms of a sort that undergird such patterns of resistance. Going a step further, one might even think of certain coordination equilibria as themselves constituting a kind of social norm.\(^{225}\)

In the design of regimes of regulatory coordination, this suggests, coordination games’ orientation to groups might counsel some emphasis on both the creation and displacement of social norms. Beyond Picker’s “norm seeding” conception of a potential state role in shaping norms,\(^{226}\) others have also explored this possibility, including Bob Cooter, Larry Lessig, Richard McAdams, and Cass Sunstein.\(^{227}\) Most closely echoing the present analysis, McAdams posits a focal point function for law, in fostering shifts in social norms. Cooter, by contrast, offers an account in which law facilitates the internalization of norms. For Sunstein, finally, law may encourage “norm cascades,” in which tipping effects quickly displace a prevailing norm. In

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224 See Rostain, supra note 180, at 990-91.
226 See Picker, supra note 159, at 1284–85.
ways akin to these, a regime of regulatory coordination might be expected to engage social norms, in the encouragement of efficient coordination.

Beyond the intersections between social norms and coordination-driven regulatory regimes, a further implication of the shift from an individual to a group orientation in coordination settings concerns the potentially altered role of regulatory interventions directed to individuals. In Prisoner’s Dilemma settings, as described above, regulation seeks to adjust individual incentives, and thereby prevent defection from socially optimal equilibria.

Where coordination represents the impetus for regulation, analogous regulatory constraints on individuals might still occur – yet to distinctly different ends. In such settings, one might think of relevant prescriptive rules as less ends to themselves, than the means to desired ends. Thus, for example, where we regulate some institution’s use of a particular technical standard or securities trading system, our priority may not be the incentives and resulting strategy choices of that individual institution. Rather, we might see that institution’s choices as serving some focal point function along the lines described above. Thus, by preventing a salient player on the financial markets from executing block trades of a certain size on some given exchange, we may be less concerned with that particular institution’s choice of trading platform, than with the signal its use of an alternative system might send to others, in facilitating a shift in coordination.

Of course, this too might be connected back to the social norms dynamic discussed above. One might thus imagine command-and-control regulations directed to the incentives of relevant individuals, but not designed to change those individuals’ behavior, so much as to reduce the salience of a prevailing social norm. By coercing one market participant to move away from said norm, its stability as an operative social norm might thus be diminished.

228 See Ahdieh, supra note 59, at 279–84.
Most broadly, however, a shift from individual to group orientations in coordination settings might be seen to challenge the methodological individualism that underpins neoclassical economics – as well as the law and economics literature born of it. From the vantage of methodological individualism, of course, the operative unit of analysis in the study of any economic – as well as social and political – phenomena is necessarily reducible to the individual. The analysis of institutions from the state to the market must thus ultimately be directed to individual incentive and rational choice.

In a number of respects, however, one might see methodological individualism as under increasing pressure. The growing literature directed to network externalities – much of it motivated by the rise in standards-oriented technologies described above – is suggestive. In its focus on demand-side economies of scale, the network literature essentially speaks to a world in which individual utility curves cannot be meaningfully disaggregated from social consumption of the relevant network good. The individual benefits of a telephone, fax machine, online social network, securities exchange, or other network good or industry thus depend on its consumption by others. To talk about the individual utility of a network good, as such, misses at least as much as it captures.

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231 Besides the literatures outlined below – studies of network effects, the social nature of knowledge, social norms, and coordination games – other relevant research areas might also be noted in this vein, including analyses of strategic complementarities and herd behavior. See supra notes 73-75 and accompanying text; see also Cooper & John, supra note 73, at 442 (noting nature of strategic complementarities, as distinct from spillovers, as interactions between actors at the level of strategies, rather than merely payoffs).

232 See Joseph Farrell & Paul Klemperer, Coordination and Lock-In: Competition with
Echoing the latter has been the emphasis on the place of *knowledge* in the social and economic order, perhaps again in some relation to the changing nature of modern technology. Kenneth Arrow has thus emphasized the social nature of the production, possession, and very nature of knowledge – explicitly suggesting the necessary challenge this constitutes to methodological individualism.\(^{233}\) The role of technical information in the economy, as such, “is an especially significant case of an irreducibly social category in the explanatory apparatus of economics.”\(^{234}\)

The study of social norms might also be noted.\(^{235}\) Though perhaps not quite as sharply in tension with methodological individualism as the literatures above, here too one might observe some conflict. Social norms, of course, are grounded in the collective practice of some regularity of behavior. Such a regularity becomes a “norm,” in turn, where it is followed with some sense of obligation to act in accordance with it. Again, then, the collective would seem to quite critical to the nature of social norms.

Coordination game analyses, of course, can likewise be added to this litany. By dint of the interdependence of strategies at the heart of coordination games, thus, they too highlight the limits of a rigidly individualistic orientation. If collective expectations are the critical ingredient in the resolution of coordination games rather than individual incentives, methodological individualism would again seem to overlook a critical dimension of coordination dynamics.

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\(^{233}\) See Arrow, *supra* note 230, at 1 (“I want to argue today that a close examination of even the most standard economic analysis shows that social categories are in fact used in economic analysis all the time and that they appear to be absolute necessities of the analysis, not just figures of speech that can be eliminated if need be.”).

\(^{234}\) *Id.*

\(^{235}\) See *supra* notes 223-24 and accompanying text; see also Lawrence A. Cunningham, *Beyond Liability: Rewarding Effective Gatekeepers*, 92 Minn. L. Rev. 323, 337 n.75 (2007).
To be clear: None of these literatures directly undermine the claim of methodological individualism, since each might well be framed in its reductionist terms. Thus, the coordination game literature, like game theory generally, is ultimately directed to the strategic choices of individuals. That said, when considered as a collective whole, the analysis of network effects, the social nature of knowledge, social norms, and coordination games represent a meaningful challenge the adequacy of methodological individualism’s reductionist account. Individuals may well remain the appropriate unit of analysis. In the design of effective regulatory regimes, however, groups may matter as well.

**Conclusion**

It is important to be clear about the scope of the claim this essay seeks to introduce to the discourse of regulatory reform that most assuredly lies ahead of us. Dynamics of coordination are a source of significant demands on the modern administrative state – in the regulation of the financial markets, the internet, technological and other areas of innovation, the booming business of standard-setting, and the growth in both real and virtual networks. As is evident from this enumeration, moreover, these demands are likely to be areas of particular growth in the years ahead. If the facilitation of coordination is important today, it will become truly urgent in the years ahead.

The increasing importance of coordination, however, need not come at the expense of issues of defection. As acknowledged above, even the fundamentally coordination-driven financial crisis has included significant incidents of defection-driven market failure – from the banking industry’s high-risk investments and payout of executive bonuses, to the outright frauds of Bernie Madoff and Allen Stanford. Command-and-control restraints on deviations

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236 See Udehn, supra note 230.
from socially optimal equilibria thus remain critical instruments in the toolbox of the regulatory state.

With the rise in the demands of coordination, however, the relative significance of command-and-control regulatory regimes is necessarily in decline. Given as much, students of regulation and the regulatory state do well to step back, to reevaluate the basic assumptions that undergird our existing accounts of regulation. Reductionist as it may sound, it is increasingly critical for us to reconsider what regulation is, and what it does.

It is well beyond the scope of this merely suggestive essay, to play this question out in full. This is especially true, given the dependence of any such assessment on a close and particularized “microanalysis of institutions,” sensitive to the distinct dynamics of coordination at work in one regulatory setting versus another. Given the particular attention to the recent financial crisis in the above analysis, however, it may be useful to conclude by drawing together some of the potential implications of a coordination-driven account of the administrative state, for our regulatory response to such crises.

Most basically, of course, the analysis herein emphasizes the essential nature of financial crises as failures of coordination, rather than defection. For all the ink spilt over annual bonuses and executive compensation, over whether Bernie Madoff will be given bail and where in the world is Allen Stanford, and even over assistance to homeowners facing foreclosure, none of these were central to the recent financial crisis. At its heart, rather, the crisis arose from a failure of credit and investment.

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238 To be clear, I do not mean to suggest these are not grave concerns in their own right. Given its scope, the foreclosure crisis likely warrants even more attention it has received. I likewise recognize the secondary impact these varied market failures may have on credit markets. They do not speak directly to the financial crisis, however, and hence the recovery of the financial markets.
More precisely, it was a problem of multiple equilibria. Financial markets are characterized by alternative potential equilibria – one defined by the extension of credit, by investment, and by growth, and the other by the denial of credit, curtailed investment, and economic contraction. Given as much, the foundational issue in financial market regulation becomes how to minimize the risk of shifts from the optimal to the sub-optimal equilibria, in the ordinary case – and amidst crisis, how to encourage a shift in the opposite direction. How can regulatory authorities overcome barriers to entry in the credit and investment markets, overcoming lock-in of the sub-optimal equilibrium of non-investment? Ultimately, this can be reduced to a question of expectations: How can the Federal Reserve Bank, the Treasury Department, and even the White House shift market expectations of likely lending and investment practices? If the resolution of financial crises lies in such adjustments of expectations, and resulting shifts to the Pareto superior equilibrium of lending and investment, what implications follow, in painting a rough picture of the modern coordination state’s response to financial crises? Most important, perhaps, is the limited role this account suggests for coercive regulatory interventions such as the much-discussed possibility of requiring recent recipients of bailout funds to increase their lending.

239 A further dimension of the government’s task to facilitate coordination amidst the recent financial crisis lay in the structure of the credit markets, by which a bank’s lending is dependent on its ability to market its securitized debt to hedge funds and private equity firms. See supra notes 67-68 and accompanying text. Inherent in the latter, of course, is some dynamic of coordination across distinct categories of banking and private investment entities.

240 Again, I do not wish to suggest that such coercion does not have its place in addressing fraud, excessive risk-taking, and analogous defections from efficient equilibria – or that such defections are rare or disappearing.
expected to accomplish much. Whatever impact it might have on relevant incentives, its significance for relevant expectations is likely to be limited, at best.

The appropriate regulatory framework thus lies in cues and nudges designed to shape expectations through their focal power, rather than in any coercive alteration of incentives – whether by carrot or stick. In the face of financial crises, what might such cues or nudges entail? By way of example, consider the “stress tests” for major banks announced by the Treasury Department in early 2009.241 Non-coercive as this program was – and ambiguous as were the implications of “failing” – the significant attention the proposed testing received might be well explained by some implicit awareness of its potential role in shaping expectations. If the Treasury Department, by way of some plausibly systematic process, could separate out the wheat from the chaff of the financial markets, investors might be expected to begin to do so as well.

The Treasury and Federal Reserve’s convocation of gatherings of representatives of the major banks might be cited as another potential tool in the shaping of relevant expectations. Used somewhat, at the early stages of the financial crisis,242 greater frequency of such gatherings may well have been beneficial. Perhaps likewise, broader participation in them, including by the hedge funds and private equity firms on which banks are now dependent for their continued lending. Again, if the operative regulatory aim is to facilitate a coordination of expectations, such gatherings may represent far more than friendly chit-chat.

Beyond stress testing and gatherings of relevant market participants, other regulatory cues of relevance to financial crises might also be noted. As was evident in the financial markets’ close attention to Alan Greenspan’s every word, particularly in the 1990s, and

thereafter to the Kremlin-esque minutes of the Federal Reserve Bank’s Open Market Committee, official statements on the state of the markets hold great significance in a coordination dynamic. Rather than mere cheap talk, they may often hold the key to shifts between optimal and sub-optimal equilibria. The careful use of such statements – by the president, the chair of the Federal Reserve, the Treasury Secretary, and others – is therefore likely to be critical. Perhaps likewise, regular statistical reporting on the state of the markets. An effective regime of regulatory coordination, on the other hand, would need to carefully consider the appropriate frequency of such reporting. In the shaping of expectations amidst financial crises, some data might benefit from more frequent collection and dissemination; other information might better be offered with less regularity.

A final category of potential regulatory cues in the face of financial crises – among others that might be suggested – would be efforts to increase the salience of market behaviors inconsistent with the prevailing equilibrium of non-lending and non-investment. Some banks thus continue to lend, even amidst crises. Some funds continue to invest. And for each group, there are profits to be made. By emphasizing such activity – perhaps in the particular – the government may minimally diminish the salience of the sub-optimal equilibrium of non-lending and non-investment. In the best of all possible worlds, such efforts might eliminate the focal power of that equilibrium – or even re-establish lending and investment as the focal point for coordination.

In the design of a regulatory regime grounded in such cues and nudges, several further points might also be highlighted. To begin, there is the critical importance of consistency. In a


This need not correlate with the likelihood that some reports versus others will offer better news. Rather, the notion is that some types of short-term information may be more prone to impact expectations in negative ways.
sense, this is equally true of command-and-control regulation. In a regulatory regime directed to the shaping of expectations, however, it is especially crucial. The government response to the recent financial crisis may be disturbingly suggestive, in this regard. Arguably, much of the markets’ failure to respond to the government’s various initiatives through 2008 and 2009 might be blamed on the striking inconstancy of those policies. The purchase of banks’ toxic assets, the lending of significant funds to the banks, the extension of credit to hedge funds and private equity funds, and even the threat of nationalization might each have effectively loosened the credit markets – if they had been pursued consistently. Why? Because the shaping of expectations, by its very definition, is an issue of consistency.

Further dimensions of the coordination function of regulation amidst financial crises turn on the aforementioned role of government as market participant, and on the role of relevant private behavior. In each of these circumstances, as described above, there is no dimension of coercion. Yet each may have a substantial role in shaping relevant expectations.

As to the power of the government as market participant, the basic notion – as suggested above – is that government purchasing decisions may impact expectations of the potential for a given standard, technology, or network to succeed. In a sense, this is just the notion at work in the government’s recent investment in firms from Bear Stearns and IndyMac Bank, to Citibank and AIG. An emphasis on shaping the expectations of market participants, however, might counsel particular investment and payout structures, given their potentially stronger signal of

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245 Inconsistent prosecution of legal or regulatory violations, on the other hand, can be fully effective, if coupled with some indeterminacy as to the occasions for prosecution, and sufficiently severe penalties, when it occurs.

246 Treasury Secretary Timothy Geithner’s initial presentation of the Obama administration’s financial market rescue plan might be criticized along analogous grounds, for its vague and undefined terms. See Deborah Solomon, *Market Pans Bank Rescue Plan*, WALL ST. J., Feb. 11, 2009. In the shaping of expectations, again, certainty and predictability may be especially essential.

247 I have already emphasized, in the discussion above, the potential role of private action in directly fostering coordination. See supra notes 169-71 and accompanying text.
an expectation of likely – and perhaps timely – reimbursement, perhaps even with some positive return.\textsuperscript{248} Going a step further, one might see hard bargaining by government agencies in this setting to serve a kind of cueing function, by mimicking the behavior of private investors to whom relevant public investment is intended to send a signal.

As to private actors, meanwhile, a coordination- and hence expectations-oriented account holds similarly notable implications. Above, I noted the limited role of coercion – whether in the form of carrots or sticks – in shaping expectations. If the lending and investment practices of certain private firms have particular salience in the market, however, a caveat may be in order. Such firms, by dint of their greater potential to impact market expectations, might well be plausible candidates for coercive regulation of one sort or another. The encouragement of lending and investing by increasing the incentives to do so – no less than mandates to this effect – ought not be expected to meaningfully impact the expectations of market participants as to the likely lending and investment practices of others – at least beyond the effects of the immediate stimulus. On the other hand, such incentives might well play a salutary role – not as an end unto themselves, or even as offered widely – but rather in prompting lending and investment by \textit{particular} firms, whose financial practices exhibit some focal power. One might thus imagine the effective subsidization of a salient firm’s unilateral – and lasting – shift to the optimal equilibrium of lending and investment. Even at significant cost, such a shift might play some meaningful focal point function, in facilitating a shift in expectations toward renewed lending and investment.

\textsuperscript{248} This, of course, is what occurred in the case of the 1994 bailout of Mexican peso, on which the U.S. turned a profit. One might cite the government’s relatively quick resale of IndyMac Bank, subsequent to its takeover, in this light. \textit{See Equity Partnership is Formed to Buy Remnants of IndyMac Bank for $13.9 Billion, N.Y. Times, Jan. 3, 2009, at B3.}
In designing regimes of regulatory coordination, a further point highlighted above is the central role of information. In the particular shift in expectations necessary to alleviate financial crises, information will likewise be the key. This is most obvious in the potential impact of data dissemination. Each of the lines of action suggested above, however, incorporates some dimension of information generation and distribution, including the facilitation of organized interactions among relevant market participants, public statements by relevant government authorities, stress testing, and analogous mechanisms of generating new information.

This suggests an interesting question, however, in the appropriate approach to information amidst coordination-driven financial crises. If the operative goal is to shift expectations toward the lend/invest equilibrium, one might plausibly argue for a strategy of selective information dissemination, in which only positive information sees the light of day. As the above discussion of official statements and the collection and distribution of market data suggests, I appreciate the wisdom in this conception. Yet it is important to recognize its serious limits as well. The impact of toxic assets in the recent financial crisis helps to highlight as much.

In some part, the contraction of the credit markets can surely be traced to the diminished value of these assets, following the collapse in the housing market. Given the limited volume of these assets as a proportion of the total assets of most relevant financial institutions, however, this explanation is insufficient on its own. Much of the crisis, instead, lay in uncertainty as to the extent of exposure of any given financial institution. Thus, as has been evident at least since the collapse of Bear Stearns in March 2008, it was the unknown scope of liability, as much as anything else, that prevented the effective pricing of assets and institutions – and that hence precipitated the credit crunch.

Whether rosy or gloomy, this suggests, information may be useful to the alleviation of financial crises. Whether an asset or institution is worth pennies, dollars, or its weight in gold, I
can buy it, and sell it, if I know its worth. When I do not, and perhaps cannot, by contrast, I do better to sit it out.

In handling the toxic assets generated by the sub-prime mortgage crisis, including under the ill-fated TARP program, then, the generation and dissemination of accurate information may be even more crucial than the removal of such assets from relevant financial institutions’ books. Valuable as the latter might be to said institutions, it may not be important in alleviating the financial crisis. Financing and technical assistance for effective forensic accounting might thus be a far more important step in that direction. More dramatically, government-sponsored auctions might have a role to play, in helping the market to generate price information on distressed assets of one sort or another. Whatever form it takes, however, the encouragement of information-generation may be critical to the shaping of expectations amidst financial crises.

That said, the role of cold, hard information in shaping expectations should not be overstated. As emphasized above, important dimensions of expectation formation are non-rational in nature, and have little to do with “information” as such. Perhaps especially on the financial markets, where Keynes spoke of the power of “animal spirits,” a coordination-oriented regulatory regime would thus do well to acknowledge – and even embrace – the role of irrationality. Here, of course, it is especially difficult – even in rough terms – to offer a coherent account as to potential regulatory design. The relevant lesson of coordination, in fact, may lie in just the opposite notion: The need for a regulatory approach to financial crises that recognizes the potential for non-rational factors to play a significant role, and a willingness to take advantage of such factors, when possible. Be it the adjustment in expectations prompted

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251 See supra notes 186-88 and accompanying text.
252 See KEYNES, supra note 74, at 161-62.
by a salient market participant’s decision to lend or invest, the potential for a similar response to the decision of a competitor to do so, or broader tendencies toward herd behavior, non-rationality may be an important dimension of coordination-driven responses to financial crises.

Finally, by way of this thumbnail sketch of a potential coordination-oriented approach to financial crises, there is the need for regulators to attend closely to group dynamics. Most readily, one might see this in the aforementioned role of gatherings of relevant market participants, in shaping coordinated expectations. But a group conception of the regulatory project amidst financial crises likewise underlies the possibility of targeted incentives directed to salient market participants. In this case, individual benefits – in terms of lending or investment – are not an end unto themselves. Rather, they are the means to a hoped-for adjustment in group expectations.

It bears emphasizing, once again, that I do not mean to suggest that regimes of regulatory coordination along the lines posited herein have – or soon will – displace defection-oriented regulation. Further, it is important to acknowledge again the very rough lines of the picture painted by this preliminary account of an emerging modern coordination state. Whatever the extent and precise nature of the emerging regime of coordination-driven regulation, however, it could not be more clear that it deserves our attention. Coordination stands at the heart of many of the most important – and most chaotic – areas of modern regulation. If our regulatory approach to the financial markets, the internet, standard-setting, networks from the power transmission grid to Facebook, technological and pharmaceutical innovation, and the like, is ultimately to succeed, the analysis of coordination must move to the center of modern regulation theory.

Almost fifty years ago, amidst dramatic changes in the nature of the modern administrative state and its place in social and economic life, Charles Reich wrote of the need to
recognize the emergence of a “new property.” Fifty years further along in that evolution, we may now be in need of a “new regulation” as well.

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See Reich, supra note 1, at 787.