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CONGRESS

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CHAPTER 3

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FORMAL APPROACHES TO THE STUDY OF CONGRESS

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OVER the past half century one of the most notable developments in the study of the American Congress has been the incorporation and expansion of rational choice approaches and formal models to enhance our understanding of legislative policymaking, of internal congressional politics, and of external interactions between Congress and its broader environment. While formal models have been developed to analyze a wide range of topics in congressional studies, they have been adopted inconsistently and have had varying impacts across substantive sub-fields. We believe that much of the promise of formal approaches lies in their ability to cut straight to the heart of strategic decision-making, offering (sometimes counterintuitive) explanations of broad empirical patterns.

Yet such promise is limited when formalization is incompletely exercised or when formal modelers do not make their findings readily accessible to a broad audience.

To help overcome these limitations, we take on five main tasks in this chapter. First, we define what constitutes a complete formal model, thus laying the groundwork for understanding the potential contributions of formal approaches. Second, we survey examples of how formal models have been used to study the internal politics of Congress (with a specific focus on distributive politics and coalition formation) and the external relations between Congress and other institutions (specifically examining congressional–bureaucratic relations). Third, we draw upon the development of formal models in these two areas, to identify lessons about how techniques of formal modeling can be used to overcome scholarly roadblocks commonly found throughout the study of Congress (as well as throughout political science more broadly). Fourth, we apply these lessons learned to suggest paths forward in the contentious debates regarding parties in Congress. We conclude by identifying other substantive areas ripe for further scholarly exploration via formal approaches.

A complete formal model

Congressional scholars rooted in the rational choice tradition tend to assume that members of Congress are goal-directed and take certain actions to enhance their chances of achieving those goals. Such approaches, while still controversial to some, are commonplace in the study of Congress today. However, much less work has explicitly analyzed clearly articulated formal theories of Congress and congressional policymaking. For the purposes of our discussion below, we begin by defining a *complete formal model* as a mathematical (i.e. formal) characterization of politics (i.e. model) that specifies actors, structure, outcomes, preferences, and decision criteria. These last five elements, needed to make a formal model *complete*, are detailed as follows:

(a) *Actors.* A complete formal model specifies the relevant actors for the topic being studied. Actors in models of Congress, for example, may include individual legislators, committees, parties, voters, lobbyists, bureaucrats, and presidents, as well as the Congress as a whole, treated as a single actor.

(b) *Structure.* A complete formal model identifies how the actors interact. Model structure therefore can capture such considerations as the sequence of events that actors confront and the range of actions that are available to them. The foundation for such structure might be found within codified rules (e.g. the Standing Rules of the House of Representatives) or within less codified settings, such as behind-the-scenes coalition formation processes; or model structure may have little real-world foundation whatsoever.

(c) *Outcomes.* A complete formal model specifies the outcomes that occur when the actors interact within the structure of the model. Outcomes in models of Congress include such wide-ranging results as a policy choice on a left–right unidimensional space or in a multidimensional space, division of a budget, appointment of a judge, or reelection of an incumbent member of Congress.

(d) *Preferences.* A complete formal model specifies the preferences of the actors over such outcomes. Actors might be motivated, for example, by the desire to be reelected; they could have spatial policy preferences and receive much less utility as outcomes diverge from their ideal points; or they could care about directing spending to their districts. Yet it may be costly to engage in the fundraising, information gathering, and coalition building that help achieve these beneficial results.

(e) *Decision criteria.* A complete formal model articulates the criteria that underlie actors' decisions. More specifically, a complete formal model includes assumptions about such concerns as actors' cognitive constraints (e.g. whether they optimize or satisfice when making choices), the solution concept employed (e.g. Nash equilibrium, perfect Bayesian equilibrium, or the core), and the actors' beliefs about the structure of interactions and the preferences of other actors. The default (and often unstated) assumptions in most contemporary formal models of Congress are that all actors are fully rational and fully informed about the model structure and the preferences of other actors. Yet this need not be the case.

These five elements should sound familiar to students of non-cooperative game theory, far and away the most common formal approach used to study Congress. Under such an approach, the game structure specifies the possible actions available to players and the order of play. The set of possible actions players can take each time they are faced with a decision defines their strategy set. And the commonly used Nash equilibrium concept then generates a coherent description about how the game is played, wherein all players' strategies are matched in such a way that no player can unilaterally reach a more preferred outcome by changing her own strategy alone. Thus a game-theoretic equilibrium characterizes the strategies that actors (element a) take within the model structure (element b) to help bring about the outcomes (element c) that they prefer (element d), while they are constrained by their decision-making abilities and beliefs (element e) and by the strategic choices of other actors. While these five elements of a complete formal model are thus immediately relevant in non-cooperative game theory, with minor modifications they also apply broadly to other formal approaches, such as cooperative game theory, social choice theory, bounded rationality models, and agent-based models.[1]

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[1] In cooperative game theory, for example, the model structure typically allows players to make binding agreements before and during the play of the game, and outcomes are sought that satisfy a number of normatively attractive axioms. In social choice theory, scholars are interested in how individual preferences map into collective choices over outcomes. Without relying on a specific *game structure*, social choice theorists do not typically focus on actor strategies and actions, but still tend to be interested in *model structure*, because changes in such features as the dimensions of the policy space or

Models that are incomplete in any of these elements cannot be solved mathematically so that we may derive formal principles about the workings of Congress. For example, if the possible outcomes in a strategic situation are not specified, it is impossible to know what ends actors are pursuing. If actor preferences are not specified, we cannot determine what actions they will take. Or, if their decision criteria are unspecified, we cannot discern how actors will behave in the face of complex decisions or limited information. In other words, a model without these elements relies on other (often implicit) assumptions to justify its conclusions.

As we allude above, a substantial body of literature in the rational choice tradition specifies the relevant actors and their preferences, while leaving the other crucial elements (structure, outcomes, and decision criteria) unstated. Hence, many such studies make arguments about congressional politics and policymaking (i.e. claims regarding strategic behavior and the resultant outcomes), but in so doing they rely on fundamentally unstated assumptions that, upon closer inspection, may be inconsistent with their stated premises.

We argue neither that all studies of Congress should contain complete formal models nor that all complete formal models help advance a better understanding of Congress. Rather, we define a complete formal model to clarify which types of studies we review here, and to set the stage for a clearer view of how such formal models have been used (and can be used better in the future) to study the internal workings of Congress and its important role in the American separation of powers system.

THE INTERNAL WORKINGS OF CONGRESS

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Formal approaches to studying the internal workings of Congress have addressed such topics as the roles of committees, rules, leaders, and bicameralism in producing policy outcomes, to name just a few areas of scholarship. Rather than recount the contributions in all of these areas, we focus here on the contributions of formal modeling in the area of coalition formation and distributive politics. We chose this area to comment upon because of its importance and because it is well suited to show the benefits of formal approaches as well as the challenges that must be overcome in adopting such approaches.

some members' veto powers lead to different model conclusions. Models of bounded rationality feature decision criteria in which actors are cognitively constrained. Rather than reasoning through all actions and their implications, these actors may rely on heuristics or simplifications, such as continuing to take an action that has worked relatively well in the past. Such models are solved either analytically or computationally, the latter being often referred to as "agent-based modeling." In most of these approaches, actors' beliefs are irrelevant (because everyone is fully informed) or are treated in special ways, for instance as following Bayes' Theorem in non-cooperative game theory, or as being cognitively limited under bounded rationality approaches. For some of the tradeoffs across these approaches, see Krehbiel (1988) and Diermeier and Krehbiel (2003), who ultimately advocate in favor of non-cooperative game theory.

Before turning to the specifics of coalition formation in the realm of distributive politics, a brief aside regarding the historical development of formal approaches in political science is worthwhile. Early work applying mathematical tools to the study of political strategy sought a high level of generality. In the area of legislative politics, social choice scholars, in particular, investigated what collective outcomes resulted from the consideration only of actors' policy preferences and of the aggregation rules that governed the collective decision. In so doing, they hoped to achieve general understandings of politics without being limited to the description of any one particular institutional setting. While yielding a variety of useful insights, these approaches were seen as reaching an impasse when scholars discovered that many such general models did not typically generate significant limitations over which policies were likely to emerge (e.g. Plott 1967; McKelvey 1976; McKelvey and Schofield 1987).[2]

Although such general social choice approaches continue to offer helpful answers to political science questions, such as identifying the existence of equilibria under broad modeling assumptions, the vast majority of formal modelers in political science have turned toward the incorporation of specific institutional structures within their (largely game-theoretic) models. The benefit of general models, where they can be used successfully, is that they do not limit our understanding to, say, one subcommittee's decision-making processes. On the other hand, to the extent that specific legislative rules and interactions matter for political behavior and policy outcomes, fully and properly characterizing those structures is essential to understanding legislative behavior.

Early formal work

This over-time trend from the general to the specific can be seen in the formal models constructed to study most areas of congressional politics. In the area of coalition formation for the division of budgets across legislative districts (commonly referred to as distributive politics), classic general studies, such as those of Riker (1962) and Buchanan and Tullock (1962), actually referred to Congress very little, as congressional politics was just one of the many broad political phenomena these scholars intended to address. These early theoretical treatments made several arguments that still resonate in the contemporary scholarly literature, including the ideas that supermajority voting rules generically protect the rights of minorities, that coalition formation can be difficult, and that adding superfluous members to coalitions is costly (and thus leads to the prediction of minimum winning coalitions).

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[2] In more technical terms, social choice scholars were exploring the difficulty in obtaining a "nonempty core" in multidimensional settings, among other concerns. Austen-Smith and Banks (1999) offer an excellent overview and formalization of the findings of this vast literature.

Building upon these arguments, a body of scholarship emerged nearly 20 years later that imposed more explicit structure on these early authors' theoretical foundations; and, in being more explicit about actors, their preferences, their decision criteria, and model structures, this next generation of scholarship began to identify the limits and additional implications of these early scholarly arguments. Among the foundational works in this second "generation" of scholarship was a series of articles by Weingast (1979), Shepsle and Weingast (1981), and Weingast, Shepsle, and Johnsen (1981). Weingast (1979) analyzes the conditions under which legislators would collectively prefer to form universal coalitions around distributive projects instead of the minimum winning coalitions suggested by Riker. Similar to earlier works, Weingast's assumes that projects can be characterized by district-specific benefits with costs that are evenly dispersed across all districts through broad-based taxes. Yet Weingast argues that, if given the choice, legislators would prefer to commit *ex ante* to forming universalistic coalitions, whereby all members of the legislature receive some project benefits. Because an individual legislator does not know whether she will be included in any particular minimum-winning coalition, she would prefer to remove all uncertainty and increase her *ex ante* utility by pre-committing to a "norm of universalism." While Weingast notes (1979, 253) that legislators would still have short-term incentives to propose minimal-winning coalitions, he suggests potential mechanisms that the chamber might adopt to support a universalistic norm, including punishing members who deviate from this desirable practice.

Shepsle and Weingast (1981) build directly on Weingast (1979) to identify how this norm of universalism can be obtained even when project costs unambiguously exceed project benefits—that is, for the classic case of pork barrel politics. Related to this point, Weingast, Shepsle, and Johnsen (1981) establish a relationship between legislature size and the scope of distributive policy inefficiency. Denoted as "the Law of $1/n$," the result states that, if each district's share of aggregate taxes is decreasing in the number of districts, then projects should become more inefficient as the legislature increases in size (1981, 654). In other words, because a legislator's district receives all the benefits from a particular project but pays only $1/n$ of the costs, the district receives a net benefit for projects that cost up to n times as much as their benefits. Under the norm of universalism, such highly inefficient bills are nevertheless included in the universalistic coalition.

Questions and concerns

These last three works thus offer interesting insights into the size and nature of coalitions as well as into the level of inefficiency found in distributive politics. Yet, in terms of our definition of a complete formal model, these models fall short. They all clearly specify the relevant actors (individual legislators) and their preferences (more district spending, fewer taxes) over outcomes (budget divisions across districts). That said, all three of these papers lack a formal statement of the model's structure, and details regarding aspects of actors' decision criteria are somewhat ambiguous.

Specifically, rather than a process by which bills and proposals are placed on an agenda and voted upon, it appears that these models rely on an assumption that all legislators can merely add their own pet projects to the pork barrel and the norm of universalism will ensure that all pass. Agenda-setting, voting, and the specific mechanisms through which such a norm would be obtained and enforced are all left unspecified.[3]

Such lack of specificity in model structure was particularly troubling given the social choice findings at this point in time regarding the lack of a "core" of collectively preferred policies in a multidimensional policy space (see McKelvey 1976; McKelvey and Schofield 1987). More specifically, for any status quo policy, a majority can be found that prefers a different policy under almost all circumstances (Plott 1967). Because distributive politics clearly contains multiple dimensions (each legislative district being a separate dimension of spending), models that did not confront this result, but instead assumed the existence of an equilibrium through a norm of universalism (without explicitly modeling voting and amendment procedures), were not completely satisfying theoretically.

Moreover, on the empirical side of scholarship, the theoretical claims of universalism were confronted by a problematic reality, as qualitative accounts were backed up by quantitative evidence that federal outlays were far from universalistic (e.g. Bickers and Stein 1994; Stein and Bickers 1995). Thus the early work, while provocative, faced skepticism both theoretically and empirically. Many questions remained regarding the nature of coalition formation, coalition sizes, and budgetary efficiency. Unfortunately, on theoretical grounds, there seemed little way forward to overcome the general lack of equilibrium inherent in multidimensional distributive policymaking.

Overcoming obstacles

The seminal breakthrough in this area was Baron and Ferejohn's (1989) work on "bargaining in legislatures," analyzing how a legislature divides a budget, stylized as a single dollar, into particularistic projects by majority rule. Similarly to what one finds in Weingast, Shepsle, and Weingast (as well as in others), projects are particularistic in that they only provide benefits to the legislators (districts) that receive them. Unlike in these earlier works, however, the agenda formation process, possible amendments, and voting mechanisms are all fully specified, thus producing a complete formal model of distributive politics. One technical breakthrough of Baron and Ferejohn came in their explicit assumption that the legislature is governed by a recognition rule, in that proposals cannot be made unless a legislator is recognized, each member having a specific probability of recognition.

In their baseline closed-rule model (1989, 1183–4), Baron and Ferejohn assume that the game begins with a randomly recognized legislator making a policy proposal to

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[3] This point is raised and addressed by Niou and Ordeshook (1985), who derive universalism in a specific game-theoretic model based on constituency motivations.

divide the dollar. After the proposal is made, it is subject to an up-or-down vote and, if it obtains at least a minimal majority of "yes" votes, the allocation ensues as defined by the proposal. If, however, the proposal fails, another round of recognition occurs, where a randomly chosen legislator makes another proposal that is subject to the same terms of debate and agreement. The model allows for discounting across proposal periods, so if a proposal fails, the size of the resource available for distribution effectively shrinks before the next proposal is made.

Whereas without a clear bargaining structure little could be said formally about how governmental resources are distributed, the structure of this complete formal model generated clear equilibrium predictions.[4] In the model's equilibrium, the dollar is divided in the first period among a minimal majority of legislators, and all coalition partners (other than the proposer) receive exactly the amount of resources necessary to make them indifferent between accepting the proposal and rejecting it (and thus moving to the next round of bargaining). The model's structure also allows the *politics* (agenda-setting, amending, voting) of distributive policymaking to be examined explicitly, rather than hidden behind assumed norms of behavior. Substantively, the Baron and Ferejohn results illustrate how proposal power (which diminishes with open voting rules and rises in coalition partner impatience), coalition size (which rises above minimum winning when amendments are possible), and variance in budgetary divisions depend on key parameters of the model.

Beyond these substantive points, it is not an overstatement to say that the technology deployed in their analysis revolutionized the field of formal legislative studies, as it was readily portable into numerous subsequent works.[5] Baron (1991), for example, builds on the Baron–Ferejohn structure to model legislative bargaining over particularistic goods with explicitly derived distributive taxation, which allows him directly to engage the works of Weingast (1979), Shepsle and Weingast (1981), and Weingast, Shepsle, and Johnsen (1981) so as to identify when universalism might be obtained, and when legislatures (such as Congress) might engage in efficient (or inefficient) policymaking. McCarty (2000) adds a presidential veto to the Baron–Ferejohn model, with implications for divided government and electoral rules. Ansolabehere, Snyder, and Ting (2003) build upon Baron–Ferejohn technology to analyze legislative bargaining in bicameral settings (analogous to policymaking in the House and the Senate) and demonstrate conditions under which malapportionment and supermajoritarian rules can induce unequal divisions of expenditures across

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[4] Because proposals could continue endlessly in this model (until one of them passes), the Baron–Ferejohn model is a type of infinitely repeated game. A commonly understood result, or folk theorem, associated with infinitely repeated games of this sort is that they tend to contain an infinite number of equilibria, depending on the nature of the "punishments" associated with deviating from equilibrium behavior. Another technological innovation that Baron and Ferejohn employ is a stationary equilibrium refinement, wherein the same proposal is made in all instances of players confronting identical game structures moving forward from the point of their proposal, which allows the authors to focus on a single equilibrium to their game.

[5] Moreover, the Baron–Ferejohn results have proven to be quite robust to variations in fundamental assumptions (e.g. Kalandrakis 2006).

legislative districts. Volden and Wiseman (2007) use the Baron–Ferejohn technology to analyze legislative policymaking over district-specific particularistic projects and collective goods, and identify (among other things) why institutional reforms aimed at curtailing particularistic incentives may actually induce greater levels of particularistic spending.

The Baron–Ferejohn approach, and the development of other similarly complete formal models with explicit proposal and voting structures, allowed scholars to revisit the classic "Law of $1/n$" and coalition size debates, which had seen a clash between theoretical and empirical findings. Primo and Snyder (2008), for example, demonstrate that, for a wide range of taxation and distribution assumptions, the "Law of $1/n$" does not hold; and in fact the opposite result can be easily obtained. Chen and Malhotra (2007) incorporate a Baron–Ferejohn bargaining protocol into a model of bicameral legislative policymaking. This allows them to establish a relationship between the number of members in a legislature's upper chamber (n), the ratio between the number of members in the lower and upper chambers (k), and the amount and inefficiency of legislative spending. This resultant "Law of k/n" states that total legislative spending decreases in the ratio of lower-to-upper chamber seats. Chen and Malhotra continue to find that total legislative spending increases in the number of seats (now in a legislature's upper chamber); and they illustrate that both of these results more cleanly match the empirical literature (and their own analysis) than the classic "Law of $1/n$" does.

Regarding coalition sizes, complete formal models with explicit proposal and voting stages offered insights into when one might expect to find universalistic coalitions, minimum-winning coalitions, and all sizes in between. Carrubba and Volden (2000), for example, develop a formal theory of logrolling where a legislature votes over packages of particularistic projects that have distributive costs. One of the more novel contributions of their theory is that they embed their model of legislative logrolls in a broader model of endogenous rule choice, thus creating a "metagame" that allows them to characterize the chamber's *ex ante* choice of voting rules (e.g. minimum majority versus supermajority versus unanimity), given the *ex post* incentives of legislators to renege on logrolls after their own bills have been passed. Taking a different approach, Snyder (1991) and Groseclose and Snyder (1996) analyze how non-policy-relevant factors, such as favors or campaign contributions, might be used by interested actors (whom they label "vote-buyers") to influence coalition formation, coalition sizes, and policy outcomes.[6] Embedding their models in a spatial setting where legislators have preferences over a one-dimensional policy space in addition to distributive, non-policy relevant "bribes," these authors characterize how the presence of one vote-buyer (Snyder 1991) or two competing vote-buyers (Groseclose and Snyder 1996) can lead to the passage of legislation that would normally not have

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[6] An interesting extension to the vote-buying literature is developed by Dal Bó (2007) and by Snyder and Ting (2005), who analyze the dynamics of coalition formation when vote-buyers are able to make offers that are conditional on whether voters are pivotal in determining the outcome. The primary finding of these models is that vote-buyers can generally obtain their most preferred outcomes at almost no cost.

sufficient support within the chamber, and can potentially result in supermajoritarian coalitions designed to withstand attacks from the opposing side.

Lessons learned

The distributive politics and coalition formation literature has been unambiguously successful at expanding our insights about how legislators interact with each other to produce public policy outcomes. In considering the evolution of this literature over the last fifty years, certain lessons emerge that might explain this success. We highlight four such lessons here, in the hope that they can be fruitfully applied in the future to other areas of research.

First, the development of the distributive politics literature clearly demonstrates the virtues of *specifying a complete formal model*, which includes an explicit model structure. By making explicit assumptions about the sequence of play and the range of actors' choices and information, scholars have succeeded in moving beyond the foundational works in this literature, to identify the scope (and limits) of earlier works as well as the breadth of their own models' findings.

Second, the distributive politics literature has advanced as the result of *cumulative model building*. The scientific enterprise features early work setting the stage for subsequent inquiry. Foundational contributions that identify important phenomena and ask key questions (e.g. Shepsle–Weingast) can set the scholarly community on a productive course of discovery. In addition, however, the literature on distributive politics has clearly benefited from cumulative theoretical advancements, wherein later scholars build upon foundational models (e.g. Baron–Ferejohn) that help them gain leverage on different substantive and theoretical matters.

Third, scholars studying distributive politics have made substantial efforts to *account for empirical findings* with their models. Empirical stylized facts are crucial in helping formal modelers make realistic assumptions about actors, their preferences, and the structure of their interactions. Moreover, empirical implications of model results have never before been as subject to deep scrutiny and sophisticated testing as they are today. Successful theoretical contributions to our understanding of coalition formation, for example, resulted from taking seriously the empirical evidence that neither universal nor minimum winning coalitions are especially prevalent in Congress or other legislatures. Moreover, because legislative models are abstract, they can often be applied outside of Congress to legislative bodies in the U.S. or around the world. Tests of these theories in diverse settings can help advance both theoretical and empirical research.

Fourth, distributive politics theorists have successfully developed and employed *metagames* to study broad questions of institutional choice. Model variants with differing institutional structures not only allow scholars to determine how politics plays out in different settings, but also to explore why particular institutions may be chosen in the first place. Baron (1991), for example, was able to discern when open or closed rules are preferred. Carrubba and Volden (2000) identify optimal voting

rules (such as majority rule in the House, or a sixty-vote cloture rule in the Senate). Similarly, Diermeier and Myerson (1999) build upon vote-buying foundations to identify how legislatures organize themselves to respond to external veto points in a separation of powers system.[7]

CONGRESS AND EXTERNAL ACTORS

Just as there has been a vast formal literature on the internal workings of Congress, so too scholars have extensively studied the relations between Congress and external actors. Interactions between Congress and the president, Congress and the judiciary, Congress and interest groups, voters and elected politicians, or states and the federal government have all received formal treatments. We once again choose depth over breadth in limiting our examination here to the interaction between Congress and the federal bureaucracy.

Early formal work

The body of scholarship that focuses on the interactions between Congress and the bureaucracy finds much of its early inspiration in the foundational work of Niskanen (1971), who treats agencies as budget maximizers and analyzes congressional control of agencies through the appropriations process.[8] The actors in Niskanen's model consist of the Congress and a representative agency. The model's structure is adapted from a microeconomic model of monopoly production, wherein the agency submits a budget request to Congress, and Congress approves or vetoes the request. Outcomes in the model include a budget for the agency and policy outputs. Regarding preferences, the agency wants as large a budget as possible, while Congress cares about agency outputs and the efficiency of agency services. In terms of decision criteria, Congress's preferences are common knowledge, while the agency's production function (i.e. how their budget maps into policy outputs) is known only to the agency and cannot be discerned by Congress on the basis of the agency's proposal. This complete formal model produced the equilibrium result that the agency is able to amass sizable budgetary slack because of Congress's notable informational disadvantage and its limited role in merely accepting or rejecting the agency's proposal.

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[7] Related to this final lesson, however, is the third lesson above: the need for scholars to consider the insights from their theories in light of empirical evidence and the historical record. This point is particularly relevant to questions regarding institutional choice, where institutions arguably facilitate different goals at different points in time; and the theoretical justification for these institutions' creation may be somewhat unrelated to why they are sustained (and vice versa).

[8] Niskanen (2001) discusses the evolution of his thinking about bureaucracy over subsequent decades.

As instructive as this parsimonious model was, it was seen as lacking much of the politics surrounding congressional delegation to (and control of) the bureaucracy. Most notably, Miller and Moe (1983) build a complete formal model using the Niskanen structure, but also incorporating several other actors, including high- and low-demanding committees, private-sector counterparts to the agency, and competing agencies within government. They argue (and thus adopt the assumptions) that Congress: (a) has an active role in deciding the agency's budget, (b) has its own informational advantages, and (c) can engage in different types of oversight. "Demand-revealing" oversight occurs when the function characterizing Congress's demand for the agency's goods is publicly known, whereas "demand-concealing" oversight occurs when its demand function is private information. In their equilibrium analysis, Miller and Moe illustrate how demand-concealing oversight counterbalances some of the bureaucratic biases of Niskanen's model. They also show how agency competition and the privatization of tasks enhance governmental efficiency.

Banks (1989) varies Niskanen's model in a different way, giving the legislature the opportunity to uncover the agency's private information.[9] In the "closed procedure" version of Banks' model (which is similar to Niskanen's), the legislature can simply accept or reject the agency's budgetary proposal. In the "open procedure" version of the model, however, the legislature can accept, reject, engage in a costly audit to learn the agency's production function, and/or make a counterproposal to the agency. Analyzing Congress–agency budget negotiations within this framework allows Banks to identify how auditing tools might curtail an agency's agenda-setting power in the budget process, and how these tools influence the ultimate size of the budgetary request and outcome.

Building upon this modeling framework, Banks and Weingast (1992) establish relationships among auditing costs, agency design, and legislator–constituent interactions. More specifically, because higher auditing costs necessarily imply a greater informational advantage for the agency, Banks and Weingast argue that legislatures (e.g. Congress) have an incentive to ensure that agencies with high auditing costs have strong ties to external stakeholders who will inform legislators if the agency engages in inefficient policymaking. As such, constituency correspondence with legislators can serve as a substitute to agency auditing; and strategic legislators will structure agencies in such a way as to ensure that they can obtain sufficient information.[10]

Questions and concerns

While such models advanced and refined the "agency as budget maximizer" view, many congressional researchers questioned whether this approach was based on an

[9] In the two decades between the works of Niskanen and Banks, game theory advanced to include "models of incomplete information." Banks was therefore able to incorporate the ability of Congress to (at least partially) discern the nature of the agency's production function based on the information contained in the agency's budget request.

[10] Bendor, Taylor, and Van Gaalen (1985, 1987) engage similar information and monitoring topics, formulating models that yield further insights regarding the design of agencies and the utilization of legislative tools.

overly limited notion of legislative–bureaucratic relations. For example, while it had been understood since the writings of Max Weber that bureaucratic information and expertise was an important source of political influence, it was not clear that this asymmetric information was mainly over budgets and the production function for the provision of governmental services. Alternatively, perhaps, bureaucratic expertise could involve agencies bringing about better policy outcomes themselves. In particular, scholars started to confront whether bureaucrats had their own substantive policy preferences (rather than preferring simple budget maximization), whether those preferences differed from those of Congress, and whether bureaucratic information and discretion therefore led to policy outcomes that diverged significantly from those desired in a representative democracy. The well-honed tools in hand to engage congressional–bureaucratic budgetary relations seemed inadequately designed to tackle this set of concerns.[11]

McCubbins, Noll, and Weingast (1987, 1989) forcefully raised and confronted the idea that bureaucratic agencies had policy preferences apart from those of Congress and of the president, and had the ability to move policy away from the preferred outcomes of elected politicians and thus perhaps away from the desires of the American people. These authors (commonly referred to, collectively, as "McNollgast") followed aspects of the early social choice tradition in trying to ascertain what patterns could generally be revealed about the policy decisions that emerged from interactions among the president, the Congress, and a substantive policy agency, broadly construed. These three actors were each assumed to have preferences over policy outcomes in a (potentially multidimensional) policy space. Yet, falling short of our definition of a complete formal model, the model in the McNollgast works did not specify the structure and order of interactions among the actors. In terms of decision criteria and beliefs, all actors in the McNollgast setting are assumed to know each other's ideal points and the exact relationship between the policies that are chosen and the final policies that are implemented.[12]

While no equilibrium generally exists under a majority rule in such a multidimensional policy space (Plott 1967), the veto role of actors in the McNollgast models generates a set of stable equilibrium policies. The main take-away point from these models, then, was that, because various administrative procedures can influence the location of an agency's ideal point as well as which actors are involved in which decisions, the design of institutions and administrative procedures can systematically influence public policies. Hence the models demonstrate why Congress devotes

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[11] This is not to say that all formal scholarship through this era assumed that agencies care only about budgets, or that all subsequent work focused on spatial policy preferences, or that these have been the only two relevant perspectives. A wide body of work has analyzed other considerations that might motivate Congress and agencies (e.g. Fiorina's 1977 discussion of blame avoidance); but the dominant body of formal–theoretic work has considered one or the other of these two perspectives as driving congressional–bureaucratic interactions.

[12] While McCubbins, Noll, and Weingast (1989, 440) suggest that their theory could accommodate uncertainty over actors' preferences and over policy outcomes, their analysis never explicitly accounts for these possibilities.

significant attention to questions of structure and process in the design and oversight of agencies.

While ambitious and general in scope, the McNollgast work raised many questions that their model was unable to address without a detailed structure of the interactions among key actors. First, to be consistent with the expertise and informational advantage of bureaucrats, how do these policy dynamics play out in an uncertain environment? Second, what are the tools and relative powers of Congress and of the president vis-à-vis an agency in attempting to influence policy outputs? Third, how might administrative procedures influence policy outcomes beyond simply shaping agency preferences?[13]

Overcoming obstacles

Such questions could be answered neither in the Niskanen setting, which is focused on budgets, nor in the McNollgast setting, which lacks explicit model structure. And yet the tools to answer such questions were already available in the formal theory literature. What scholars had yet to discern, however, was how to import the relevant modeling techniques appropriately into the study of legislative–bureaucratic relations and to make them accessible to a broader audience. Epstein and O'Halloran helped overcome these hurdles with respect to delegation to the bureaucracy in a series of insightful works (e.g. 1994, 1996, 1999). Piece by piece, they systematically identify how uncertainty (regarding the mapping between chosen policies and realized policy outcomes) influences the degree of discretion given to agencies.[14] Across the variants of their main model, the common actors include a congressional median voter and an executive agency, whose preferences are defined over a unidimensional policy space. Specifically, actors' preferences are represented by quadratic loss utility functions over the final policy outcome, X, thus characterizing risk-averse policymakers. Most significantly, regarding information and decision criteria, Epstein and O'Halloran incorporate a technical innovation in that they define an outcome (X) to be a function of the policy chosen (p) and of the state of nature (ω), where $X = p + \omega$, with ω representing a disconnection between the written policy and its true effect. This "policy shock" is unknown to Congress but revealed to the agency via bureaucratic expertise. Although the $X = p + \omega$ technology to model policy uncertainty was borrowed from Gilligan and Krehbiel's (1987, 1989) work on legislative signaling games (which, in turn, was borrowed from Crawford and Sobel 1982), the importation of this technology allowed scholars to focus on the policy preferences and expertise of agencies within a well-structured model of legislative–bureaucratic relations.

[13] Many of these broad points are engaged in Moe's (1989) seminal work on the politics of bureaucratic structure, in which he argues (albeit not with a formal model) that, because agencies create policy, political conflicts over policy necessarily imply that decisions about agency structures are politicized. As a result, this conflict among political interests ensures that agencies are not designed to be effective.

[14] See Holmstrom (1984) and Martin (1997) for similar approaches exploring delegation to more fully informed bureaucrats.

The baseline model structure is a sequence of events that begins with Congress setting a policy and a level of agency discretion (d) that defines the extent of policy modifications that can be made by the agency. After discretion is established, the agency learns the state of the world (ω) and modifies the congressional policy within its bounds of discretion. Model variants include a possible legislative veto of the agency's proposal and the possibility of relying on a partially informed congressional committee rather than an executive agency. Equilibrium results characterize the policy choice, the optimal level of legislative delegation, and the relations between legislative delegation, increased uncertainty, and variations in the actors' ideal points across periods (e.g. "coalitional drift," 1994: 712–15). The Epstein–O'Halloran modeling framework also facilitates comparative institutional analysis, such as identifying when a legislature and agency will strictly prefer the existence of a legislative veto or will prefer internal information gathering instead of bureaucratic discretion.

Epstein and O'Halloran's modeling framework, and their technological advancement of incorporating policy uncertainty via $X = p + \omega$, in particular, provided scholars with a new tool to engage numerous questions. Gailmard (2002), for example, uses the Epstein–O'Halloran approach to analyze how legislative delegation relates to the legislature's ability to undertake costly agency investigations, as well an agency's ability to engage in costly "subversion" activities whereby it proposes policies that are outside of its bounds of discretion, thus incurring a penalty. Volden (2002) builds upon the Epstein–O'Halloran framework to analyze how the possibility of a presidential veto yields the maintenance of high bureaucratic discretion to executive agencies and the increased reliance of independent agencies under divided government.

After a decade of scholars relying heavily on the Epstein–O'Halloran approach, Bendor and Meirowitz (2004) sought to reevaluate this research program. Their concern was that the additive policy shock and the specific risk-averse preferences, along with other canonical model assumptions, were so frequently used in combination with one another that scholars were unable to discern which assumptions were critical to which theoretical results. To address such concerns, Bendor and Meirowitz consider a much broader family of models that represent the delegation relationship between a principal (e.g. Congress) and an agent (e.g. a bureaucratic agency) and establish a series of general results about their interactions. In so doing, they parse out the necessity and importance of earlier modeling assumptions, showing that few results of this literature hinge on risk aversion but that many are dependent on the fixed and additive policy shock. They loosen such assumptions and derive a broad set of additional results, which involve such considerations as costs of specialization, monitoring, and multiple principals.

While yielding a large and fairly robust set of findings, the Epstein–O'Halloran models, like all formal approaches, faced the usual tradeoff between model complexity and tractability. For scholars who were less concerned about the role of uncertainty and expertise, the Epstein–O'Halloran approach was too constraining, as adding further relevant actors and strategic interactions often resulted in a level of complexity that did not give way to clear and understandable solutions and predictions about

political behavior. Many scholars were therefore attracted to the alternative approach of Ferejohn and Shipan (1990), who present a spatial model that builds upon the classic median voter findings of Black (1948). The actors in their model consist of a congressional committee, an agency, the House median voter, a court, and a president. All actors' preferences are defined over a unidimensional policy outcome space; and all actors make rational decisions under complete and perfect information. In other words, all actors know each other's preferences and the full range of possible actions, with no uncertainty over available policy choices or how outcomes follow from those choices.

With respect to model structure, Ferejohn and Shipan begin with a preliminary model in which an agency proposes a policy, and then a congressional committee either proposes to change the agency proposal or engages in "gatekeeping," whereby no changes to the agency proposal can be considered. If the committee makes a policy proposal, the proposal is considered by the entire House, subject to an open amendment procedure. Building upon this foundation, Ferejohn and Shipan incorporate other actors including the courts, which may strike down an agency proposal through statutory review, and the president, who may veto the new congressional policy. Analysis of the model reveals the scope of congressional influence over bureaucratic policymaking in a separation of powers system, by characterizing the role each actor has in bringing about (or stopping) specific policy changes. The key permutations of the model involve the spatial ordering of actors and the temporal order in which they make policy decisions.

The simplicity and flexibility of Ferejohn and Shipan's model has facilitated numerous extensions. Steunenberg (1992), for example, builds upon a Ferejohn–Shipan framework to analyze when agency policymaking (i.e. that of Ferejohn and Shipan's model) will be more desirable to the legislature than "statutory policymaking," wherein a committee proposes legislation that is subsequently subject to House and presidential approval. Huxtable (1994) builds directly upon Ferejohn–Shipan, examining how their results are affected by the addition of a Rules Committee. More recently, Shipan (2004) analyzes a Ferejohn–Shipan model in a bicameral setting, to study the scope of congressional control over the Food and Drug Administration. In these (and many other) works, refinements to the Ferejohn–Shipan model have allowed scholars to identify how specific institutional assumptions, either involving actors or the sequence of actions, yield various equilibrium policy proposals and outcomes.

With the Epstein-O'Halloran and Ferejohn–Shipan approaches in hand, the scholarly literature has dramatically expanded in recent years, explicitly to consider the roles of different actors within and outside of Congress. In doing so, the literature has been able to return to questions from the foundational works of McNollgast and Niskanen, among others. Ting (2002), for example, revisits the McNollgast questions about agency design and control with a model that identifies when Congress would choose to assign multiple tasks to one, rather than several, agencies. Gailmard (2009) bridges the two relatively distinct camps of budget-focused and preference-focused actors and illustrates how, even if scholars are currently placing less emphasis on

certain types of analytical approaches (such as the Niskanen type of assumption that bureaucrats are budget-motivated), the insights from earlier literatures can inform contemporary scholarship in a variety of interesting ways.[15]

Lessons learned

Similar to the distributive politics and coalition formation literature, formal models of congressional interactions with the bureaucracy have notably evolved over the past forty years, and have expanded our understanding of the fundamental nature of legislative delegation, bureaucratic control, and the implementation of law. Once again, relevant lessons can be drawn about how obstacles have been overcome to bring about new insights. Many such lessons in the congressional–bureaucratic relations literature reinforce those above, such as the need for complete formal models and the benefits of cumulative model building, seen clearly in both the Epstein–O'Halloran and in the Ferejohn–Shipan approaches. Beyond those points, we highlight three additional lessons.

First, scholars of congressional–bureaucratic interactions have made several gains by *building useful technologies or by borrowing them* from other fields. More specifically, the congressional–bureaucratic politics literature was clearly advanced by Epstein and O'Halloran's incorporation of the $X = p + \omega$ technology to model policy uncertainty, and by the clarity of the Ferejohn and Shipan spatial modeling approach. In both cases, the authors relied on well-understood technologies from other fields and sub-fields, but offered important contributions by appropriately applying them to a new substantive topic of interest. Bringing in models that did not capture compelling aspects of the relations between Congress and bureaucratic agencies would not have resulted in the same level of cumulative scholarly insight.

Second, a consideration of this literature also highlights the virtues of substantively appropriate *simplification*. Simultaneously considering the joint impacts of a multi-member Congress, of a hierarchical judiciary, of a diverse agency, and of other actors on the policymaking process can be analytically intractable, unless scholars are willing to make certain simplifying assumptions. Ferejohn and Shipan (1990) and the scholarship that they inspired rely on completely informed actors, and thus remain silent on issues of information and uncertainty. Yet such analytical simplification allows

[15] Several other studies of congressional–bureaucratic relations have relied on the insights and approaches of Epstein–O'Halloran and Ferejohn–Shipan, although not building on their modeling technologies directly. For example, Bawn (1995, 1997) focuses on the roles of different legislative coalitions and internal actors of Congress, such as committee chairs, to characterize how their positions and preferences map into choices about bureaucratic discretion and control. Huber and Shipan (2002) model the interactions between a legislature and a bureaucratic agency, where the legislature sets an initial level of bureaucratic discretion, and the agency decides what (if any) policy to implement in light of non-statutory factors, such as constituent feedback, which can lead to legislative sanctions. Boehmke, Gailmard, and Patty (2006) analyze how both bureaucratic agencies and interest groups can serve as competing sources of relevant information for Congress. More recently, Wiseman (2009) engages the topic of contemporary executive clearance, developing a model in which agency policies are subject to *ex post* oversight by an executive with divergent preferences both from the agency and from Congress.

the broad incorporation of numerous actors and institutions, while still retaining a parsimonious model that yields new and interesting theoretical insights.

Third, scholars in this field have been very willing to *refine and reassess* their modeling choices. As the congressional–bureaucratic politics literature evolved, scholars made specific modeling choices, which had a substantive and technological impact on subsequent work. While modelers have aggressively refined existing models and pushed them in new directions, this sub-field is also notable in that scholars (e.g. Bendor and Meirowitz 2004) have been cognizant of how initial modeling choices influence the subsequent literature. By reassessing the findings of canonical models and by modifying their assumptions, the breadth of these contributions can be better understood and new directions can be taken.

PARTIES IN CONGRESS

Having surveyed the literature on the internal workings and external relations of Congress in two specific settings, we have uncovered a series of lessons about the benefits of formal approaches. In this section we rely on those lessons to offer suggestions for the further development of formal approaches to the study of parties in Congress. In so doing, we seek to illustrate how important (and often contentious) areas of scholarly inquiry may benefit from the use of formal approaches. Once again, we characterize early contributions as well as the questions and concerns raised by such works. Here, however, we then examine how the lessons learned from the previous sections can be applied to help answer the questions and overcome the obstacles faced within this literature.

Early formal work

While scholars have long considered the role of parties in Congress, formal theoretic work began systematically to address congressional parties in the late 1980s and early 1990s. This scholarship corresponded, understandably enough, to a time when parties seemed to be gaining prominence in Congress. While several studies that developed during this period paved the way for contemporary research, we highlight three, in particular, that helped to set the agenda for subsequent decades.

One approach was developed by David Rohde (1991), who articulated the theory of "conditional party government," which holds that, when parties face relatively little intra-party heterogeneity but relatively substantial inter-party heterogeneity, members of the majority party empower their leaders to control the legislative agenda and to induce majority party-favorable policy outcomes. A second, complementary perspective was advanced by John Aldrich (1995), who argued that strong parties

help solve numerous social choice problems (see Arrow 1951; Plott 1967; and McK-elvey 1976) that make policymaking unpredictable and problematic for the average reelection-seeking member of Congress. A third perspective was offered by Gary Cox and Mathew McCubbins (1993), who argued that the role of parties in legislatures was something analogous to the role of Thomas Hobbes's *Leviathan*. Because reelection-seeking legislators, left to their own devices, would pursue selfish goals culminating in sub-optimal (and possibly electorally destructive) policy outcomes, members of Congress are willing to sacrifice some of their individual autonomy to a party (to a legislative leviathan, so to speak). By structuring the legislative agenda, by promoting some policies over others, and by instilling party discipline in a way that facilitates an electorally valuable party brand name, the majority party thus advances the interests of its members.

Questions and concerns

While all three of these works formalized their ideas to some degree, none offered a complete formal model as delineated above. All three, for example, specified the relevant actors and their preferences (to varying degrees), yet explicit discussions of the models' structures and of the actors' decision criteria were vague or nonexistent. As a result, the claims regarding the theories' predictions (e.g. the actions of majority party leaders) did not clearly follow from the theories' postulates, and key strategic details were left unspecified (e.g. what specific powers were ceded to leaders or what mechanisms were used to enforce party discipline). While such lingering issues might prove troublesome from an epistemological viewpoint, these scholars' arguments stimulated numerous debates and questions that were ripe for empirical and theoretical pursuits.

A central point of inquiry (and a source of much frustration) quickly emerged under the rubric of the "parties vs. preferences debate." This rubric featured the claim that congressional politics (and policy) are merely byproducts of legislators' preferences independent of party affiliation (conservatives tend to be Republicans, while Democrats tend to be liberal), rather than the result of strong partisan activities and pressures (e.g. Krehbiel 1993). In this view, members would be torn between acting in favor of their electorally induced preferences and pursuing their party's goals. Why, then, would they choose to delegate parliamentary authority to party leaders whose choices might ultimately harm their electoral prospects?

Moving beyond this broad debate, other questions emerged as scholars sought to understand the relative influences of parties in the electoral and legislative arenas, as well as to uncover the proper analytical unit within political parties. For example, what specific steps might parties take to move policy outcomes away from what would occur in the absence of such partisan activities? Furthermore, would it be appropriate (and worthwhile) to think of a party as a sometimes divided collection of voters, activists, and officeholders, and/or to think of leaders as being responsive to a majority (or even a supermajority) of party members?

Overcoming obstacles with lessons learned

As the parties-in-Congress literature stood a decade ago, scholars were unsure about how to separate parties from preferences, how to isolate the substantive actions of parties, and even how to characterize a party and say what constituted it. Over the past ten years, however, some progress has been made as formal approaches have begun to address many of these topics. Moreover, in looking ahead, one would imagine that, if formal approaches to the study of Congress are to have much value, these sorts of issues should be (at least partially) resolved through the adoption of such approaches. In this sub-section, then, we take the seven lessons learned from the distributive politics and from congressional–bureaucratic relations literatures and apply them to the questions and concerns faced by the parties-in-Congress literature. In so doing, we hope to illustrate how formal approaches can be (and have been) used to further our understanding of Congress.

Lesson I: Specify a complete formal model, including explicit model structure

While the foundational works of Rohde, Aldrich, and Cox and McCubbins generated significant scholarly interest, the relatively vague theoretical structures in these authors' works left many of their results ambiguous, and thus open to debate and misinterpretation. The imposed clarity of complete formal models could help resolve scholarly confusion over how, when, and why parties matter. Indeed, over the past decade, scholars have started to formalize the arguments found in these earlier foundational works. For example, Cox and McCubbins (2002, 2005) build on their earlier work, having a complete formal model of partisan agenda-setting in Congress. In their model, the majority party median (in a one-dimensional policy space) decides what policies are sent to the floor for consideration under an open amendment rule. In equilibrium, the majority party exerts negative agenda power whenever the status quo is closer to the party median than the floor median position is, and is thus never "rolled" by losing a floor vote. Responding to Cox and McCubbins's theoretical claims and empirical tests, Krehbiel (2007) develops a formal model of probabilistic voting in Congress that seeks to establish a reasonable null hypothesis regarding roll rates without majority party influence. Also illustrating the power of formalization, Patty (2008) obtains Aldrich–Rohde-style conditional party government results by modeling party strength as a bond which is determined endogenously by majority party members, and which is effectively sacrificed by members if they vote against the party.

Lesson II: Build or borrow useful technologies

While a wide body of qualitative and quantitative literature addresses the multiple dimensions of congressional politics and policymaking, most of the formal theoretical work on parties to date has not advanced beyond a one-dimensional policy space (implicitly building on Black 1948). The status of this sub-field stands in contrast to that of the broader collection of multidimensional models that have made in-roads

in studies of distributive politics and legislative–bureaucratic relations. Beyond the spatial setting, insights and technologies from other fields and sub-fields could be appropriately applied to the study of parties in Congress. For example, models from industrial organization (within economics) and from "the theory of the firm" could be imported to study parties' internal organization and their production of public policies.[16] Similarly, while scholars consistently suggest that parties solve collective action problems (e.g. "party cartel" arguments), these models typically only rely on a prisoners' dilemma setting rather than building upon the technologies used, in order to study market cartels and other collective action problems within the field of industrial organization.[17] Alternatively, scholars might seek to adopt approaches from other fields of legislative studies and apply them to studying parties in Congress. For example, Austen-Smith and Banks (1988) develop a formal model of elections and subsequent legislative policymaking in a parliamentary democracy that speaks to the role of parties both in the electoral and in the legislative arena. Such concerns are clearly relevant to scholarship on the U.S. Congress; yet similar congressional models that simultaneously incorporate elections, legislative politics, and policy choice have yet to be developed and solved.[18]

Lesson III: Build models cumulatively

In considering the body of formal–theoretic work on parties in Congress, one clear weakness, compared to the two sub-fields discussed above, is its relative failure to engage constructively in cumulative scholarship. As suggested above, the field has not advanced very far beyond Black's basic spatial model of legislative policymaking. That said, there are a couple of notable exceptions to this general trend that exemplify the virtues of cumulative model-building. Krehbiel's (1996) pivotal politics theory represents a constructive hybrid between Black (1948) and Romer and Rosenthal's (1978) agenda-setter model, which allows him to speak to the role of political parties in producing (or inhibiting) legislation. Building directly upon Krehbiel, Chiou and Rothenberg (2003) incorporate additional actors into their model, in order to engage more explicitly the potential roles of parties in legislative policymaking under different assumptions about the scope and tools of partisan influence. Among other benefits, such cumulative work helps ensure clarity, in that all scholars building upon

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[16] Weingast and Marshall (1988) explore possible ties between industrial organization and legislative organization.

[17] An extensive body of scholarship analyzes these topics in firm and market scenarios. Tirole (1988) provides a broad overview of theoretical scholarship on industrial organization, while Roberts (2004) provides a more recent, non-technical overview of research analyzing firm organization and strategies. An interesting distinction between economic models and models of politics involves the ability to transfer utility from one actor to another in economics (via money and incentive-based contracts), which is much more limited across the institutions of government.

[18] Fruitful work in this vein includes Snyder and Ting (2002), who develop a formal model of partisan affiliation in the electoral arena with implications for legislative policymaking. Unlike the work of Austen-Smith and Banks, however, theirs does not explicitly model legislative interactions that occur after the election. In an alternative approach, Groseclose and McCarty (2001) include the voting public as an audience in the blame game of high-level bargaining between Congress and the president.

similar model structures will tend to use the same terms with similar actors and common modeling assumptions.

Lesson IV: Simplify when appropriate

While the body of scholarship that develops complete formal models of parties in Congress is relatively small, as it grows and becomes more cumulative, the lessons of simplification will become more valuable. Some such benefits are already apparent. Krehbiel and Meirowitz (2002), for example, adopt a simple stylized version of the motion to recommit to illustrate how minority rights and majority power vary depending on the order of moves by (and preference divergence among) the model's main actors. Cox and McCubbins's (2002, 2005) negative agenda-setting model significantly simplifies and clarifies their earlier works (from an analytical perspective) and, in doing so, allows them to incorporate additional actors into their model of the policymaking process (e.g. committees) and to provide the motivation for well-explicated empirical hypotheses.

Lesson V: Account for empirical findings

The literature on coalition formation in Congress showed a healthy interchange between initial models, empirical examinations, further model developments, and subsequent tests of those models' new hypotheses. Down this path of scientific progress, the parties-in-Congress literature has not developed as far as it might. Without question, scholars (e.g. Clinton 2007; Krehbiel 1993, 1999; McCarty, Poole, and Rosenthal 2001; Snyder and Groseclose 2000; Wiseman and Wright 2008) have empirically investigated the theoretical postulates of Aldrich, Rohde, and Cox and McCubbins, to identify the presence (or absence) of party effects in legislative organization, policymaking, and politics. While a robust empirical debate ensued, there has been much less theoretical scholarship that explicitly engages these challenging empirical findings. Hence, to some degree scholars have been talking past each other, with empirical analyses identifying support and limitations of partisan theories, and little effort has been made to refine explicit theories that can account for these regularities and suggest new directions for empirical research.

Lesson VI: Use metagames to study institutional choice

As shown in our examples above, cumulative model building can give way to the production of metagames that allow scholars to study institutional choice. Models of legislative–bureaucratic relations can then be used to study why Congress establishes bureaucratic agencies in the first place; and models of coalition formation under different voting rules can be used to study the initial selection of such rules. Given the limited cumulative model building around parties in Congress, this is still an area ripe for investigation. Promising early work in this area includes Volden and Bergman (2006), who add a first-stage party cohesion decision to Krehbiel's (1996) pivotal politics model, to explore when party members have an incentive to empower

their leaders to impose discipline on party members.[19] Among other findings, such a model produces many of the hypotheses arising from the conditional party government theory.

Lesson VII: Reassess modeling choices

Perhaps the lesson of reassessing modeling choices would be more aptly applied were there a larger set of formal models of parties to draw upon. However, even among the models advanced to date, there are many assumptions that could be examined and reassessed, on the basis of our definition of a complete formal model:

- Who are the relevant *actors* that constitute a party? Is it sufficient and appropriate simply to model a party as a monolith (e.g. as the median party member in Congress), or should scholars model the party as the whole of the party's members in Congress, or perhaps as a collection of political elites both inside and outside of the chamber? Should scholars treat parties differently across the House and Senate chambers? Should scholars consider majority and minority parties to be analytically distinct from one another?
- What model *structure* characterizes the relevant interactions between parties and other key actors? Does a party attempt to exert influence in committees or during votes on the floor? How do parties facilitate relations between the House and the Senate or between Congress and the president? Are interactions among these actors, or between parties and their members, best modeled as repeated events?
- What are the relevant *outcomes* over which parties and their members have *preferences*? Do parties mainly seek to obtain and maintain majority status or do they simply wish to protect incumbent members? When do policy goals trump electoral goals, such that parties at the peak of their power adopt policies that may differ from what average Americans desire?
- How might *decision criteria* regarding the optimizing or satisficing behavior of parties or the uncertainty about future interactions between parties, their members, and the electorate influence party activities and legislator actions?

CONCLUSIONS AND FUTURE DIRECTIONS

In considering the impact of formal approaches to the study of the U.S. Congress, we have sought to define a complete formal model, to draw lessons from sub-fields that have used such models in order to achieve significant theoretical advancements in recent years, and to illustrate how those lessons could be fruitfully applied to

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[19] Bawn (1998) also uses a series of formal models to examine the incentives of party leaders.

advance scholarship in somewhat less theoretically developed areas of inquiry. We do not argue that distributive and coalitional politics or congressional–bureaucratic relations are the main areas of successful formal modeling of Congress, nor that the parties-in-Congress area faces the greatest need of reform. Indeed, we believe that the lessons drawn above could be applied to advance formal modeling enterprises broadly, both within and beyond the study of Congress. We conclude therefore not with a reiteration of our arguments but with a brief survey of exciting areas for future theoretical work on Congress, ordered so as to match, roughly, topics from this *Handbook*, with significant formal contributions highlighted that may well serve as starting points upon which to build these sub-fields further, in light of the lessons suggested here.

Capacity and ability of members

All too frequently, models of Congress treat all legislators identically, varying only in their preferences in a policy space or in the districts to which they would like spending to be directed. Models that allow for the possibility that members of Congress differ in their capacity to understand politics and form coalitions, to see the linkages between written laws and on-the-ground policy outcomes, or to shepherd more effectively their preferred legislation through the policy process would capture a much fuller view of congressional politics. One building block along these lines might be the model of Denzau and Munger (1986), wherein the varied abilities of members influence legislative organization as well as how legislators interact with each other in distributive policymaking, bureaucratic oversight, and partisan politics. An alternative approach might capture varying levels of competence through different probabilities of recognition across members, in a Baron and Ferejohn (1989) type of bargaining model.

Elections

As we develop more sophisticated models of congressional politics, it is important not to lose focus on the fact that Congress is best understood in the broader context of American democracy. Among other considerations, this means that scholars should examine how electoral mechanisms and incentives influence legislators' careers and choices. Ashworth (2005), consistently with the point immediately above, assumes that legislators vary in their abilities, and that they choose how to allocate their efforts between policy work and constituency service over time. Voters retain their member depending on their assessments of his or her ability. Among other findings, Ashworth's analysis explains why more junior members of Congress might devote more effort to constituency service than do senior legislators; and his model also has implications for legislative organization.

Deliberation

Despite the inclusion of decision criteria among the main elements in our definition of a complete formal model, we have given little attention to the cognitive limits of congressional actors or to the formation of their beliefs. This is a function of the sparse theoretical coverage of these topics in the study of Congress. Despite models of how pivotal legislators make choices based on the information at hand, very little scholarship has explicitly analyzed how groups of legislators arrive at collective decisions on the basis of the sharing of information. The broad subject of deliberation in Congress is clearly worthy of study, but has yet to overcome many of the obstacles confronted in the areas of study that we explore in-depth above. Austen-Smith and Riker (1987), however, offer a foundational study upon which further theories of deliberation could be advanced.[20] In their model, legislators possess private information about the effects of proposed policies, choosing what information to reveal to their colleagues during the debate process. Equilibrium results identify when legislators have incentives to withhold information, as well as when legislative debate makes final decisions deviate from the collective preferences of members.

Congressional development

As Congress has evolved over its more than 220 years of history, members have experimented with a wide range of innovative internal structures and parliamentary practices. Given such broad historical development, it would be constructive to think systematically about which institutional structures are most beneficial to Congress and its members at any given point in time. Although vastly important, formal theoretical scholarship in this area has been piecemeal at best. Some highlights in the area of congressional committees, upon which further developments could be based, include Gilligan and Krehbiel's (1987) analysis of information and expertise, Denzau and Mackay's (1983) work on restrictive rules and agenda-setting, and Crombez, Groseclose, and Krehbiel's (2006) study of gatekeeping.

Congress and the private sector

In considering interactions between Congress and external actors, surprisingly little formal work has been conducted on the relationship between Congress and business interests. While complete formal models exist that consider the interactions between Congress and lobbyists (e.g. Austen-Smith and Wright 1992), less work focuses on how private (corporate) interests influence the content of legislation and the enforcement of existing laws. Encouraging signs of an emerging formal literature in this area have appeared, however, in Gordon and Hafer's (2005, 2007) studies of the

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[20] Landa and Meirowitz (2009) offer a useful review and discussion of game-theoretic approaches to the study of deliberation more generally.

relationship between corporate campaign contributions and regulatory oversight, and in David Baron's research program (e.g. 1999, 2001, 2006) on integrated governmental and non-governmental lobbying strategies by private interests. Both of these approaches present foundations upon which much more work could be built.

Congress in the Separation of Powers System

Finally, although the literature on congressional–presidential and congressional–judicial relations is nowhere as sparsely developed as many of the above topics, the richness of these inter-branch relations merits far more theoretical attention than it has received in the past.[21] Here the building blocks are far more numerous and well established. For example, Canes-Wrone (2006) and Cameron (2000) offer excellent models, which seriously engage the relationship between Congress and the president in policy formation and execution. Similarly, Rohde and Shepsle's (2007) and Krehbiel's (2007) recent work on Supreme Court confirmations illustrate how even partial characterizations of congressional–judicial relations yield interesting and important insights.[22]

The consideration of these and numerous other sub-fields in congressional studies suggests many areas that are deserving of theoretical investigation. We hope that this chapter, and the lessons offered here, will prove helpful to future scholars, regardless of what substantive areas they choose to pursue.

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[21] Similarly, the important role of Congress within American federalism deserves a far more robust theoretical treatment than it has received to date.

[22] These works build upon the model and empirical examinations of Moraski and Shipan (1999).

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