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Social Networks in Policy Making

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Abstract

Recent advances in data collection, computing power, and theoretical modeling have stimulated a growing literature in economics and political science studying how social networks affect policy making. We survey this literature focusing on two main aspects. First, we discuss the literature studying how (and if) social connections in Congress affect legislative behavior. We then discuss how social connections affect the relationship between policy makers and the outside world, focusing on lobbying; the importance of family, caste, and ethnic networks; and social media and public activism. In our discussion, we highlight the key methodological challenges in this literature, how they have been addressed, and the prospects for future research.

1. INTRODUCTION

An often implicit assumption in political economy models is that political actors (politicians or voters) are self-interested, individualistic utility maximizers: Public policies are seen as the interaction of independent individuals. There is, however, a long tradition in political science that questions this assumption, stressing the importance of social connections among political actors. In Congress, legislators' actions are deeply influenced by bonds of friendship, respect, and patronage that transcend partisan or ideological divisions. Outside of Congress, political activism is also influenced by social connections and often amplified by social media, and politicians' attitudes toward their constituency depend on their social groups. Recent advances in data collection, computing power, and theoretical modeling have stimulated a growing literature in economics and political science attempting to formally study these relationships. These questions have been made more salient by the increasing importance of social media in shaping political beliefs and the diffusion of fake news designed to spread in social networks.

In this article, we review the literature on social networks and policy making, focusing on two keys aspects. We start by reviewing the existing literature on the role of social connections in legislatures, especially the US Congress. We then expand the overview to include the role that social connections play in the relationship between policy makers (legislators as well as government officials) and society.

In Section 2, we review the different metrics used to describe interpersonal relationships within legislative bodies and discuss the key theories and findings regarding how social links among legislators affect their legislative policy making. In assessing the importance of social networks in shaping politicians' decisions, there are two main issues to solve. The first issue is causality—that is, it is necessary to establish that social connectivity is not just correlated with specific patterns of behavior but indeed affects them. Causality is hard to establish because of one of three reasons: (*a*) There may be unobserved variables affecting both the choice of social ties and the observed political activity; (*b*) social connections can be the result rather than the source of politicians' decisions; and (*c*) politicians may be exposed to the same common shocks (e.g., information), and this is what drives their correlated behavior. For example, cosponsorship networks may simply reflect common ideologies, shared geographical factors, and common exposures to particularly influential interest groups or marketing campaigns. They could also be the consequence rather than the driver of a legislator's political choices because more successful politicians can be viewed as role models and thus attract more supporters. The second issue is the observability of the social network. Most of the research to date assumes that social connectivity can be proxied by some observable network (proximity, alumni, or others), but it does not attempt to directly estimate the network. We highlight those key empirical challenges in the identification of social network effects and discuss how the most recent literature has addressed them.

In Section 3, we turn to discussing how social connections affect and shape the relationship between policy makers and society. There are various ways in which society affects policy makers, and we focus on three specific aspects that have been studied in recent research. First, in Section 3.1, we discuss recent work on the role of social connections in lobbying. If interpersonal relationships truly play a role in legislators' behavior, then we should expect them to play a role in how interest groups allocate resources among legislators. Second, in Section 3.2, we review the literature examining societies in which actors are linked by powerful social connections such as family ties, as well as ethnic and religious networks. These links affect the effectiveness of policy makers in pursuing their goals and also make civic society influential through informal channels. We discuss the extent to which these links may act as a disciplining force, thereby limiting moral hazard problems or, conversely, making it easier for policy makers to be captured by organized

interests. Finally, in Section 3.3, we discuss how social connections (and specifically social media) affect the way grassroots activism influences policy makers' activities. The increasing importance of social media has raised the question of how platforms such as Facebook and Twitter affect collective movements. Never before has it been so easy to share information in social groups. How are these social innovations changing the relationship between citizens and rulers? On the one hand, there is a general understanding that social platforms are making grassroots activism easier and more powerful. On the other hand, there is a sense that they are also making it easier for governments to control the information flow, exert censorship, and manipulate public opinion. Section 4 concludes with some remarks on questions that are open for future research.

2. SOCIAL NETWORKS IN LEGISLATURES

The early literature on social networks in politics has focused on documenting the existence of interpersonal relationships within a legislative group and investigating their driving forces. The first approach used to measure legislators' social connections was to ask them directly. The seminal article in this regard is by Patterson (1959), who interviewed the members of the 1957 session of the Wisconsin State Assembly. The author shows that the assembly was divided into subgroups on a friendship basis and argues that each politician was affected by the norms of these informal groups in their own decision-making behavior. Using interviews with the 124 members of the Iowa State Legislature in 1965, Caldeira et al. (1987, 1993) reveal that major forces driving friendships among Iowa legislators were party affiliation, physical proximity, committee membership, and attitudes toward legislative life and duties. Education and legislative experience, meanwhile, predicted respect between legislators. Using the same methodology—an elite-level survey—on members of a different legislature, Arnold et al. (2000) and Peoples (2008) show that friendship between two members of the 1993 Ohio State House of Representatives was associated with similar voting behavior.[1] More recently, Ringe et al. (2013) use a web-based questionnaire to construct a map of the social links between legislative offices in the European Parliament. They interviewed the parliamentary assistants of the members of the European Parliament Committee on the Environment, Public Health and Food Safety, using the social network of staffers as a proxy for the corresponding social network of the legislative offices. They suggest that social networks in legislative politics reflect information exchange. They postulate that legislative offices establish connections among each other that maximize the value of the information they trade. In particular, politicians are prone to elicit information from sources that are predictably biased—that is, from other politicians who are very close to, or very far from, their own preferences. Because the information provided by those sources is predictable, the legislators can use it to confirm their predispositions (if the expected information matches the actual one) or to update their beliefs (if the information deviates from their expectations). Using voting behavior as an outcome, Ringe et al. (2013) find evidence that the presence of social ties is negatively associated with covoting for those who are ideologically opposed. However, they do not have enough variance in their data to test whether it is also true that being socially connected is positively associated with covoting for ideologically similar legislators.

Surveys are of limited use in eliciting social networks because they are confined to specific legislatures for which interviews are feasible. Another source of information used in the literature relies on data on memberships to informal organizations in Congress, such as caucuses. Victor & Ringe (2009) analyze the caucus system in the House of Representatives as a social network in

[1]Peoples (2008) also uses seating charts to identify social contacts. Masket (2008) adopts the same approach to study connections in the California Assembly between 1941 and 1975.

which the ties between persons are determined on the basis of common membership in one or more of the House caucuses. They show that the same legislators that are powerful in the party and committee systems are also powerful in the caucus system. Victor et al. (2014) expand the data to cover nine Congresses (1993–2010) and test a theory according to which participation in the voluntary caucus system provides opportunities for legislators to build cross-partisan relationships and profit from shared information. They hypothesize that, being exposed to more viewpoints, politicians involved in many caucuses are less likely to consistently vote with their party and more likely to buck the party. They indeed find evidence that legislators are more likely to covote if they share more caucus connections.[2]

A completely different approach for measuring social networks among politicians in legislative bodies is based on legislators' behavior. Cosponsorships, "Dear Colleague" letters, and participation in press events are the activities most widely studied. Cosponsorship networks are based on the fact that, since the mid-1930s in the Senate and 1967 in the House, legislators have had an opportunity to express support for a piece of legislation by signing it as cosponsors. Fowler (2006a,b) was the first to utilize this information to construct the networks that existed from 1973 to 2004. In a cosponsorship network, legislator *i* is linked to legislator *j* if *i* cosponsors one or more bills sponsored by *j*. Cho & Fowler (2010) investigate the topological properties of these networks and show that variations in topologies across time are associated with variations in the politicians' legislative activity.

Following studies have further refined this approach, recognizing that the patterns of cosponsorships can be used to map different levels of social interactions among Congress members. Bernhard & Sulkin (2009) distinguish between original cosponsors, who make the decision to cosponsor prior to or coincident with the introduction of a bill, and postintroduction cosponsors, who sign on after introduction. The idea is that original cosponsorship is more indicative of a personal relationship between the sponsor and the cosponsor.[3]

Kirkland (2011) distinguishes between strong and weak ties using the frequency of the collaborations. This distinction is justified by Granovetter's (1973) theory of how a legislative social network may affect legislative success. The underlying idea is that in the cosponsorship network, legislators are linked to colleagues who commonly support the same pieces of legislations because of factors like ideology, party, and demographics as well as to other legislators less similar to them, with whom they cooperate only occasionally for specific policy goals. Following the repeated interaction with similar colleagues, a Congress member forms strong ties in the cosponsorship network. These strong ties represent the base of support of a legislator: those colleagues who would back the legislator's agenda even if they were not linked to the legislator by a strong tie. At the same time, legislators establish weak ties with whom they have sporadic interactions. According to Kirkland, weak ties are crucial for increasing legislative success because they allow diffusing a legislator's influence beyond their base of support. Using cosponsorships between legislators to measure tie strength, Kirkland (2011) constructs cosponsorship networks for eight state legislatures in 2007 (North Carolina, Alabama, Minnesota, Mississippi, Alaska, Hawaii, Indiana, and Delaware) and for the 102nd through the 108th US House (1991–2004). The author shows that the probability

[2]Porter et al. (2005) propose a related but alternative approach: They represent interactions between US House members in the 101st–108th Congresses (1989–2004) by using committee and subcommittee interlocks. In their network representation, two committees are linked if they share at least one member. Their analysis reveals that legislators' committee assignments contain information about the legislators' ideological preferences apart from what is indicated by standard measures of partisanship.

[3]Fowler (2006a) distinguishes between active cosponsors (defined as those who help write or promote legislation in some way) and passive cosponsors (defined as those who do nothing more than add their names to the bill).

of bill survival increases together with the number of weak ties. This evidence documents the importance of having a diverse pool of cosponsors for legislative success.[4] Following the same logic, Kirkland & Williams (2014) show that US legislators collaborate on legislation across chamber lines. Using data on cross-chamber bill sponsorship in legislatures in Texas, Colorado, Maine, and Oklahoma, they show that cross-chamber collaborative partnerships exist even across party lines.

Parigi & Sartori (2014) adopt a similar approach to study social networks in party politics. Using data from the sixth legislature of the Italian parliament (from 1972 to 1977), they classify cosponsorship ties between members of Parliament as either weak (one collaboration only) or strong (more than one collaboration) to gauge the extent to which political parties aggregate relevant local social cleavages at the national level. The authors hypothesize that these cleavages are then reproduced in the form of coalitions inside the party. They find that belonging to the same social cleavage, as measured by provenance from the same macro region, raised the probability of cooperation between members of Parliament of the same party but did not affect collaboration across parties. The largest party, the Christian Democrats [Democrazia Cristiana (DC)], appeared to be organized as a network in which clusters of politicians coming from the same geographical regions were linked by strong ties, whereas those clusters were linked to one another by weak ties. In this analysis, therefore, parties emerge as loose coalitions of local interests organized to foster cooperation between these interests and to win elections against parties on the opposite side of the ideological spectrum (in the case of the DC of the 1970s, the Communist Party). Cintolesi (2018) documents evidence that politicians' connections are also important across party lines. Using data on the composition of local council boards in Italy from 1985 to 2014, the paper shows that members of the winning party have a greater probability of being appointed to local council boards if they are connected with a leader of the opposition party (where connected means having previously sat together on a local council board). Interestingly, this relationship disappears when a single party holds more than 50% of the seats, indicating that social networks across party lines are especially important when cooperation across party lines is necessary to secure a majority in the council.

Another avenue for inferring social connections in Congress is to use the so-called Dear Colleague letters. Dear Colleague letters, named for their common salutation, are official correspondences between US Congress members for the purpose of persuading or informing other politicians on a bill or issue. These letters have been commonly used since the early twentieth century and signal that legislators are working jointly toward a shared goal (Petersen 2005).[5] Although the underlying networks of Dear Colleague letters have been recognized as potentially holding vital networking information, they have been unavailable in digital form until recently (Krutz 2005). More recently, the letters have been moved to an electronic database, allowing them to be more readily examined. Craig (2015) uses these data to map networks among Congress members for the 111th Congress and shows that members from the same party are less likely to collaborate on legislation compared to members who come from the same state or share collaborators. Members who collaborate with their colleagues more often are more successful in gathering cosponsors for their legislations, though there is limited evidence that increasing the number of cosponsors on a bill makes it more likely to pass. Using a unique data set on Dear Colleague letters sent among members of Congress from 1999 to 2010, Box-Steffensmeier et al. (2019) identify which interest

[4]Battaglini et al. (2019) find evidence in line with Kirkland's theory using data from the US House of Representatives for the 109th–113th Congresses.

[5]Straus (2013) uses Dear Colleague letter data from the 111th Congress to explore the factors that correlate with a politician's likelihood of using this method of communication. The regression analysis identifies rank-and-file majority party members who are electorally safe as the politicians who are most likely to use the Dear Colleague system.

groups endorse which piece of legislation and at what stage of the legislative process. They show that endorsements from interest groups that are well connected across the branches of government are associated with a larger number of cosponsors on a bill in the early stages of the process, whereas at the later stages the more successful bills (i.e., those with a higher probability to pass the House) are the ones endorsed by a larger number of interest groups.

Researchers have also used press events to measure social networks in Congress. These events tend to be very visible and involve high levels of coordination between members of Congress.[6] Desmarais et al. (2015) use participation in joint press events held by US senators to draw a social network of legislators for the 97th–105th Congresses. They argue that press events can capture collaborative relationships better than cosponsorship of legislation and comembership in policy-focused legislative organizations (i.e., committees or caucuses). This is because joint press events feature a limited number of participating politicians, are costly to organize, require extended planning and coordination between several offices at both the member and staffer level, and are subject to very few formal constraints. The authors show that being connected in the press event network predicts covoting in roll calls.

A more recent approach to the study of social networks in Congress is to construct alumni networks, that is, to define two politicians as connected if they attended the same educational institution. There are a variety of mechanisms that support the idea that educational institutions provide a basis for social networks. For example, alumni connections may make it easier to form social connections through common acquaintances.[7] Alumni may share similar ideologies or preferences, similar connections with lobbyists, and/or more effective communication patterns because communication is enhanced when the two parties are more alike (Rogers & Bhowmik 1970).[8] Cohen & Malloy (2014) use alumni networks to show evidence of logrolling in the voting patterns of US senators. Their results are consistent with the theory that school ties are a preferential channel that makes vote trading easier. Interestingly, they document that the effect of alumni connections is stronger in two key situations: (*a*) when a vote on an action before the legislature is close, thus potentially causing rational actors within the network to exploit the alumni network to whip votes for or against the measure, and (*b*) when a piece of legislation is inconsequential to the politician's home state and, accordingly, less relevant to that politician's constituents, thereby presumably lowering the cost of supplying a vote. When these two circumstances are combined—that is, during close votes in which the bill is less important to the voting senator—the alumni effect is especially pronounced.

The literature survey above has documented various effects of social connections in the US Congress and provided valuable insights on the mechanisms through which these social connections affect the political activities of the members of Congress. Summarizing, three main channels have been brought to light: information transmission, vote exchange, and the workings of political parties. This literature has certainly provided suggestive evidence on the relationship between social connectedness and legislators' behavior. Moving away from a mere descriptive analysis, however, presents several empirical challenges. Finding solutions to these challenges is the subject of a

[6]Specifically examining the Senate, Sellers & Schaffner (2007) argue that congressional leaders hold press conferences with rank-and-file senators as a public display of their networks.

[7]Educational institutions explicitly encourage socialization among alumni. For example, Cornell University has a Second Decade Program for graduates 10 to 20 years past graduation; Yale organizes groups called BOLD, or Bulldogs of the Last Decade; Harvard organizes groups called GOLD, or Graduates of the Last Decade. At the Princeton reunions, graduation years are organized as satellites around the classes that celebrate major reunions (fifth, tenth, fifteenth reunion, etc.). These channels for socialization are independent and possibly orthogonal to congressional activity.

[8]There is direct evidence that school relationships are more homophilous than those formed in other settings (Kalmijn & Flap 2001).

recent literature in both economics and political science, which is growing at a rapid pace. Those studies are reviewed in the next two sections.

2.1. Assessing Causality

Ideally, to determine the causality of social connections we would randomly form social bonds among legislators and then observe what effects these bonds have on the legislators' behavior. Although this type of intervention is typically impossible, researchers have found natural environments in which this random assignment occurs. Two prominent examples are provided by Rogowski & Sinclair (2012) and Harmon et al. (2018), who measure social networks using physical proximity.[9]

Rogowski & Sinclair (2012) note that the order in which newly elected members of the US Congress can choose offices is random, as are presumably their office proximities. The random selection order, while obviously not directly relevant for voting behavior, is directly correlated with the legislators' physical proximities, allowing a clean evaluation of how physical proximity affects legislative behavior. Interestingly, the authors find that

> members whose offices are located in the same building vote together about 1% more of the time than legislators whose offices are located in different buildings. The effect is even larger for cosponsorship: legislators whose offices are in the same building cosponsor together 3% more frequently than legislators whose offices are less proximate. (Rogowski & Sinclair 2012, p. 326)

Still, when the authors control for network endogeneity, they find that physical proximity has no significant effects.

Harmon et al. (2018) use a similar approach, though in a different context and with different results. The authors note that members of the European Parliament (MEPs) sit, with the exception of party leaders and four small parties, in alphabetical order. Therefore, they use the MEPs' alphabetical order as an instrument for physical proximity. They employ a dyadic regression model in which MEPs' probability to agree (or disagree) on a vote depends on their similarity on a variety of characteristics (party, gender, experience, etc.), including seat proximity. Their results suggest the existence of peer effects (as measured by the effect of sitting close at random), which are stronger among women, among politicians from the same country, and in close votes. Because MEPs vote in different venues (Brussels and Strasbourg) that have different seating configurations, the authors also have the ability to study whether peer effects are persistent over time. The results show that MEPs who have sat together in the past are less likely to disagree on a given vote even when they are not seated adjacently at the time of the vote. Using the full randomization of the seating arrangement in the Parliament of the Republic of Iceland, Saia (2018) provides further evidence that the seat proximity of politicians makes their voting behavior closer, even if they belong to different parties.

A drawback of the approaches exploiting random physical proximity is that they have limited applicability because most seating assignments in legislatures are not random, and more generally, it is difficult to find true natural experiments. For example, an analysis like the one by

[9]Besides the above-mentioned work by Peoples (2008) and Masket (2008), the early political science literature using physical proximity to draw social contacts also includes work by Young (1966) and Bogue & Marlaire (1975). Young (1966) argues that during the Jeffersonian Congress, physical proximity, in the form of a shared boardinghouse, significantly influenced legislators' voting behavior. Bogue & Marlaire (1975) question this interpretation by noting that legislators self-select their boardinghouse groups based on shared characteristics. Thus, the observed voting behavior may be the result of mutual beliefs, rather than shared lodging.

Harmon et al. (2018) would not be possible for the US Congress, where seating assignments are not exogenous.[10] Two other approaches with wider applicability have been suggested. The first was mentioned before, and it is based on the use of alumni networks both as a measure of social connections per se and as an instrument to control for the endogeneity of cosponsorship networks. The other is structural: directly modeling network formation and its endogeneity.[11]

2.1.1. Alumni networks. Alumni networks are appealing because they provide a way to draw social links among legislators that are not contemporaneous to the legislative activity and therefore are not codetermined. As mentioned above, Cohen & Malloy (2014) use alumni networks as a measure of social networks among US senators. They show that the fraction of senators in one's alumni network who vote in favor of a given bill is strongly related to a senator's own likelihood of voting in favor of that bill, even after controlling for other well-known predictors of voting behavior.

Although it is certainly true that the alumni network is by construction extraneous to the political process, a causal interpretation of these results should be considered with caution. In fact, it may be the case that some educational institutions attract students with similar characteristics, or that the type of education provided by some institutions is pivotal in forming successful politicians or politicians of a given ideology. As a result, the observed correlation between alumni network membership and similarity of behavior could simply reflect unobserved school quality or characteristics.

This problem can be tackled by moving from a small legislative body such as the US Senate to a larger body such as the US House of Representatives. Within a larger sample size, alumni networks from the same school can be divided into cohorts of a certain time frame. It is then possible to exploit variations in network ties among alumni of the same school who belong to different cohorts.[12]

Battaglini et al. (2019) propose a different use for the alumni networks. They study the extent to which social connections influence the legislative effectiveness of members of the US Congress by proposing a new model of legislative effectiveness that formalizes the role of social connections. In the empirical test of their theory, they control for possible unobserved factors driving both network selection and outcomes by implementing a two-step procedure à la Heckman. They add a selection correction term derived from the network formation model into the model used to estimate the relationship between outcomes and social network effects. The presence of a connection in the alumni networks is employed as an exclusion restriction of the Heckman model. The identifying assumption is that attendance at a given school may predict who is in contact with whom in Congress, but it is not directly related to the politicians' legislative activity. In testing the model predictions with data for the 109th–113th Congresses, they provide new insights into how social connectedness interacts with factors such as seniority, partisanship, and legislative leadership in determining legislators' effectiveness. Looking at the role of political parties in the US Congress, they find that connections with those outside one's own party are as important as connections within one's own party, supporting the hypothesis that the more effective legislators

[10] From the House Clerk's website (**http://clerk.house.gov/member_info/memberfaq.aspx**), we read: "Assigned seating for Members was abolished during the 63rd Congress, in 1913. Today, Members may sit where they please. Generally, Democrats occupy the east side of the Chamber to the right of the Speaker of the House, and Republicans sit across the aisle on the Speaker's left. The tables on either side of the aisle are reserved for party leaders and for committee leaders during debate on bills their committees bring to the House Floor."

[11] Observe that the reflection problem, which is an important issue in the estimation of peer effects, does not apply when network data are available. The intransitive relationships that are embedded in network topologies create nonlinearities that break the reflection problem (see, e.g., Bramoullè et al. 2009, Calvó-Armengol et al. 2009).

[12] We discuss this paper in the next section.

are those able to find a diverse support of cosponsors (Kirkland 2011). Their results also show that network effects increase in importance as the bill moves from the initial stage to the final vote on the floor.

2.1.2. Structural approaches. A way to deal with network endogeneity is to model it directly and estimate a structural model that accounts for it (see, e.g., Badev 2013, Mele 2017). In doing so there are two complications. On the one end, some theoretical models lead to sharp characterization of the equilibrium network: This is, however, obtained at the expense of making very strong assumptions and predictions that would be hardly supported by evidence. On the other end, certain models allow for more realistic assumptions but suffer from problems of multiplicity of equilibria: This is ill-suited for sharp identification of the underlying parameters. A structural analysis of network formation needs to strike a balance between these two problems.

Canen et al. (2017) provide a structural estimation of a model of network formation first proposed by Cabrales et al. (2011). In this model, each legislator chooses how much socializing to do but does not choose whom to socialize with. The higher the socialization level chosen by a legislator, the more likely the legislator is to form a social link with others. Links, however, are random and distinguish only between members of the same party. Socialization and legislative effort are complementary and contribute to the probability of legislators' reelection. Using this model, the authors obtain predictions that link the legislators' level of socialization to their legislative efforts. They are able to structurally estimate this by using a proxy for the level of socialization and a proxy for the legislative effort. As a proxy for a legislator's level of socialization, the authors use the log of the number of bills that the legislator has cosponsored. As a proxy for the level of legislative effort, the authors use an index based on roll call votes and the number of speeches in Congress. The authors conclude that partisanship is a significant driver of socializing in Congress, but their model suggests that social interactions are less polarized than a simple analysis of roll call evidence would suggest. Although this paper makes a novel contribution to the analysis of social networks in Congress, the assumption that social links are random and nontargeted defies the popular notion that legislators strategically socialize to maximize their effectiveness, and it appears to oversimplify the structure of social connections. The authors manage to estimate the entire social network in Congress using as the main inputs only the aggregate number of cosponsorships per legislator to measure socialization and only roll call votes and speeches to measure legislative effort. To fully harness the power of structural analysis, it seems necessary to use more granular information on the relationships between individual legislators.

Battaglini et al. (2018c) provide a different attempt to estimate the social network in Congress. This paper makes two contributions: First, it proposes a new model of network formation that, under assumptions that can be empirically tested, gives a unique equilibrium network; second, it estimates this network using a novel Bayesian methodology that is well suited for environments with large and complex networks. The model underlying this analysis has two stages: In the first stage, legislators choose to invest in their individual links to other legislators; in the second stage, legislators choose their legislative effort given the network chosen in the first stage. The legislators aim at maximizing their effectiveness, which depends on their legislative effort, their connections, and the effectiveness of the legislators to which they are connected. Although the game is simple, the analysis is complicated by the fact that each action generates very complicated indirect effects on the other players. These complications are not dissimilar to the complications one encounters when studying a general equilibrium in an exchange economy, in which a change in an agent's demand has an obvious direct effect on an agent's utility and an indirect effect on equilibrium prices. The solution in general equilibrium analysis is to assume that agents are price takers, that is, that they solve their optimization problems by taking prices as given; prices, however, must clear the

market in equilibrium. Such analysis is motivated by the fact that, in many exchange economies, each agent has only a marginal impact on equilibrium prices, thus allowing researchers to ignore the indirect effects. Battaglini et al. (2018c) use a similar approach by introducing the concept of a network competitive equilibrium. As in a competitive equilibrium, legislators are price takers with respect to the effectiveness of other legislators. The legislators' levels of effectiveness, however, must satisfy equilibrium conditions and be consistent with an individual legislator's optimizing behavior. The authors show that this equilibrium can be characterized as a system of equations with a unique solution. Although the system is typically very large for the US Congress (over 400 equations, one per legislator), it is sufficiently manageable to be estimated using large-scale Bayesian methods typically used in evolutionary biology and genetics. Using simulations based on theoretical and real-world networks, Battaglini et al. (2018c) show that this approach allows researchers to recover complex networks with surprising precision. They then use the approach to estimate the social network underlying the 109th–113th US Congresses. Their estimates give a significantly positive approximation for the social spillover and show that the social structure cannot be reduced to a simple linear structure as in standard models. Furthermore, their research provides an insight into the relationship between social connectedness and individual characteristics.

2.2. Observability

The discussion of the structural models from the previous section suggests an additional question: Is it possible to estimate the social network in a legislature without any theoretical structure, just letting the data speak? Political scientists have dedicated considerable resources to gather data on politicians' behavior over time and to construct time series of indexes by combining the available information. Examples include the NOMINATE score, developed by Keith Poole and Howard Rosenthal, and the Legislative Effectiveness Score (LES), developed by Craig Volden and Alan Wiseman.[13] Suppose we observe a time series of the legislators' effectiveness. These outcomes give us information regarding how a legislator's effectiveness is correlated with the effectiveness of other members. Thus, we pose the following question: Can we use these outcomes to reconstruct the legislators' social connections? The complication in answering such a question is that a social network with N legislators is typically described as an $N \times N$ matrix. An unknown structure of interactions would thus require inferring $N \times N$ parameters.

Battaglini et al. (2018a) propose a graphical LASSO estimator to recover the parameters of a network model of peer effects in which a politician's legislative success depends both on the effectiveness of the legislators in their social circle and on standard determinants of legislative effectiveness. This methodology postulates the existence of a latent network among politicians and recovers its structure from the observation of the politicians' behavior (here, legislative effectiveness) over time. Importantly, Battaglini and colleagues provide conditions for which the parameters of the social interaction model are consistently estimated when using the recovered network.

De Paula et al. (2018) propose the only other methodology that is suited for the task of estimating network influences from unknown network structures using outcome data.[14] Whereas

[13] Real-time data on politicians' ideology (NOMINATE score and related variations) are available at **http://voteview.com** (Lewis et al. 2019). The data contain information on each politician from the first US Congress through the present. Data on politicians' legislative activity (LES) are available at **http://www.thelawmakers.org/** (Volden & Wiseman 2014). The data contain information for each member of the US House of Representatives from the 93rd Congress through the present.

[14] Breza et al. (2017) propose a different network reconstruction procedure. Instead of being based on outcomes, this network elicitation procedure uses aggregated relational data, that is, responses to survey questions asking agents to report, for instance, the number of their social connections.

Battaglini et al.'s (2018a) approach is based on parametric assumptions (in particular, normality of the error terms), De Paula et al.'s (2018) approach does not require such an assumption, but it does require observing outcomes for a number of time periods that is very large compared to the number of units: an assumption that requires the latent network to remain stable over many time periods. This is a strong assumption for applications in the political arena, where political networks change rapidly over time.[15]

3. POLICY MAKERS AND THE REST OF SOCIETY

Politicians' social connections are important not only for explaining the internal working structure of Congress (and legislative bodies in general), but also for understanding how Congress (as well as policy makers more broadly) interacts with the rest of society. In this section we discuss the literature that has studied the importance of social networks in the interaction between policy makers and the rest of society. We focus on three aspects of this question: lobbying, family caste and ethnic networks, and public activism.[16]

3.1. Lobbying

If interpersonal relations play a role in legislators' behavior, then we should also expect them to play a role in how interest groups allocate resources among legislators. Battaglini & Patacchini (2018) provide a theoretical framework to think about how social networks in Congress affect lobbying activities. They consider a model with two or more competing lobbyists attempting to influence a vote outcome. In the spirit of the vote-buying literature, the lobbyists make monetary promises that are contingent on the way legislators vote (for the vote-buying literature, see Banks 2000, Dekel et al. 2009, Groseclose & Snyder 1996). The departure with respect to the previous literature is the assumption that legislators have a bias toward voting as members of their social circle.[17] Because of this, legislators who are more central in the social network are more important: By buying their vote, lobbyists can influence a larger number of legislators. In general, the allocation of the interest groups' money is a complex function of the voting rule, the legislators' preferences for the policy, and the topology of the social network. The authors, however, show that when legislators are office motivated or when the number of legislators is large, the relationship between network topology and allocation of resources is simple: The interest groups allocate their resources in a way that is proportional to the Katz-Bonacich measure of centrality, a well-known concept of centrality in network theory (see, e.g., Zenou 2016 for a discussion). The authors find support for this prediction using the alumni network, as described in the previous sections.

The role of social networks in lobbying is also analyzed by Blanes i Vidal et al. (2012) and Bertrand et al. (2014). Blanes i Vidal et al. (2012) show that ex-staffers have differing compensations depending on their connections within Congress. Former House and Senate staffers tend to have higher revenues than other lobbyists. Among former staffers, those who worked for members of the Finance and the Ways and Means Committees (arguably the most important committees in the Senate and House, respectively) received a premium. Perhaps more interestingly, lobbyists connected to US senators suffer an average 24% drop in generated revenues when their employer

[15]They employ their method to study tax competition across US states.

[16]Another literature in behavioral political economy convincingly documents that individuals' social interactions influence voting and political participation (see, in particular, DellaVigna et al. 2016, Perez-Truglia & Cruces 2017). This literature is recent and still relatively small.

[17]Specifically, the assumption is that legislators' utility increases with the number of other legislators in their social network who vote as they do.

leaves the Senate. The drop, moreover, is proportional to the political power of the exiting politician. These findings suggest that lobbyists who serve in the government as staffers form political capital that makes them valuable to interest groups. This point is confirmed by Bertrand et al. (2014), who look at whether lobbyists' comparative advantage lies in "what they know" or in "whom they know." The authors measure lobbyist connections by using the contributions that lobbyists make to congressional election campaigns and then show that when the legislators they are connected to through previous campaign donations switch committees, they switch issues accordingly. These works suggest that understanding lobbying implies understanding the complex nexus of social connections among fellow legislators and among legislators and lobbyists.

3.2. Family, Caste, and Ethnic Networks

The discussion in the previous sections reveals how challenging it is to measure the exact topology of politicians' social connections. Exploiting the idea that ethnicity and religion are important dimensions along which social bonds form, some studies have used proximity along these dimensions to measure social networks and study their effect on policy making. This literature focuses on developing countries, where bonds along those dimensions are stronger.

By exploiting the random system of reserving local council seats for caste groups that was introduced in India in 1991 with the 73rd Amendment, Munshi & Rosenzweig (2013) document that representatives with extended caste networks (as measured by belonging to the most numerous eligible subcaste in each ward) are associated with higher provisions of public goods and better competencies than representatives elected without caste discipline. Given the short-term nature of the mandate, the system does not allow citizens to hold politicians accountable for their actions through reelection. The caste system helps solve the agency issue that arises when politicians are tempted to deviate from the wishes of their constituents because the representatives are held accountable by their caste. The elected representatives, however, respond only to their own social groups, whose preferences may differ from those of the median individual of the constituency. Still using the 73rd Amendment in India but focusing on the mandated caste-based reservation for the position of Pradhan (head of the local government), Besley et al. (2004) examine how proximity to the leader in both group identity and location matters in the distribution of different forms of public goods. This study shows that caste networks seem to provide benefits in the distribution of targeted household public goods but not of village-level public goods.[18] The latter interventions are instead primarily targeted at the village where the leader resides, thus making physical proximity with the leader, rather than a shared group identity, the important determinant.

The mechanism through which caste networks affect politicians' decision making is difficult to pin down. Using data from the Kenyan national government, Burgess et al. (2015) find evidence of the presence of ethnic favoritism. They document that, across the 1963–2011 period, in any given year Kenyan districts where more than 50% of the population was coethnic to the president received twice as much expenditure on roads, and almost five times the length of newly built paved roads, relative to what would have been predicted by their population shares. The political regime, however, is an important determinant of ethnic favoritism. Ethnic favoritism disappears during periods of democracy, suggesting that democracy limits the ability of the president to favor coethnicities.

As strong as castes and ethnic ties may be, their effect is limited by the fact that they involve only indirect and often impersonal relationships. It is natural to expect family ties to play an even more

[18]Household public goods include the construction of the family's house and of toilets and the provision of private water or electricity; village public goods include the construction or improvement of roads, drains, streetlights, and water sources.

salient role due to the presumable strength and personal nature of these types of relationships. Mapping politicians' family networks is, however, as difficult as mapping their social networks. Very recently, some studies have engaged the challenge by exploiting special contexts. Naidu et al. (2016) use genealogical data in Haiti to provide suggestive evidence that families with higher network centrality (as measured by Bonacich centrality) are more likely to support a coup. They construct family networks by building ties between families through intermarriages. Cruz et al. (2017) apply a similar network construction procedure on data covering 20 million individuals in more than 15,000 villages in the Philippines. Their findings reveal that a politician's family network is a strong predictor of candidacy and electoral success, and they are in line with the idea that politicians from families that are more central (as measured by eigenvector centrality) have a greater ability to buy votes. Using biographical information concerning members of the US Congress from 1789 to 1996, Dal Bó et al. (2009) show that legislators who hold power for longer become more likely to have relatives entering Congress in the future. This pioneering study stimulated a strand of recent literature looking at the existence and consequences of political dynasties in different countries (see, in particular, Braganca et al. 2015, Querubin 2016). Using a novel data set on heads of states and their background characteristics in about 200 countries, Besley & Reynal-Querol (2017) show a positive correlation between a country's growth rate and the presence of a hereditary leader in office. The association, however, holds only if executive constraints are weak, as measured by how leaders are bound by institutional constraints on a scale between 1 and 7, based on the Polity IV database provided by the Center for Systemic Peace.[19]

Using data for Italy from 1985 to 2011, Gagliarducci & Manacorda (2016) examine the potential monetary gain corresponding to having a politician as a family member. They exploit the fact that in Italy the taxpayer identification number contains the first three consonants of one's last name and an identifier for the municipality of birth. They define families as groups of individuals sharing the same first three consonants in the tax code and born in the same municipality. Although the procedure is not free from measurement error, the fact that in Italy last names are geographically concentrated, the number of geographical divisions is high, and the geographical mobility is low allows them to identify families with a reasonable degree of precision. Using data on the employment history of around 1 million private-sector employees randomly sampled from social security records, they show that the return on having a politician in the family is large—an increase in private-sector earnings of about 3.5% relative to a baseline level. The effect increases as the resources available to the administration where the politician serves increase, in line with rent-seeking behavior. Fafchamps & Labonne (2017) perform a similar analysis using the main data and network construction method adopted by Cruz et al. (2017). Their analysis reveals that, in the Philippines, the effect of being related to a politician is particularly noticeable at the top of the occupational distribution: Individuals connected to currently serving local officials have an ~20% increase in the mean probability of being a manager. Their investigation of the pathway for this effect suggests that office holders favor their relatives in the distribution of employment opportunities because they trust them and can possibly supervise and monitor them more easily. Querubin (2011) finds that, in the Philippines, introducing a term limit does not reduce the persistency of political dynasties. Folke et al. (2017) reveal that being a child with a parent elected as mayor of a Swedish city is associated with an increase in yearly earnings of about 10% of the average earnings. Their analysis of the mechanisms behind this, however, does not suggest the presence of rent-seeking behavior associated with a higher probability of getting a public sector job, nor that the children inherit their parents' premayoral job. The authors suggest that the boost

[19]The Polity IV Project collects authority characteristics of all states with a total population of 500,000 or more in the most recent year; see **http://www.systemicpeace.org/polityproject.html**.

in income is likely to be driven by the fact that the children of newly elected majors are less likely to pursue higher education.[20]

3.3. Social Media and Public Opinion

It has been long argued that social media make grassroots politics easier and more effective. Besides studying this proposition, recent work has also investigated the reverse statement: that social media provide new tools for governments to manipulate public opinion. In the next two sections we discuss these two lines of research.

3.3.1. Social media and public activism. An early work emphasizing the importance of communication among citizens for the success of protests or revolutions is by Chwe (2000), who studies a coordination game in which the benefit of activism increases with participation. In his model, agents have incomplete information, knowing only whether their neighbors in a network participate in the protest. The author emphasizes the importance of social links to guarantee coordination. Focusing on the case in which agents are pessimistic regarding the agents for whom they have no direct information, the author shows conditions under which strongly linked networks with larger cliques are better for coordination and thus make activism easier. The model, however, abstracts from what makes activism effective because it assumes that its success is an exogenous function of participation and it does not analyze how expectations about other agents are formed in general environments.

More recent work has extended these insights in two ways: first, by maintaining the assumption that the success of activism is an exogenous function of participation and thus focusing on the determinants of participation and, second, by making the policy maker's reaction to activism endogenous and characterizing in what conditions grassroots activism has sufficient informative value to affect policy. This is important because a systematic positive effect of social media on activism can be found when the effectiveness of activism is endogenous.

With respect to the first line of research, Shadmehr & Bernhardt (2011) consider a model in which citizens are uncertain about the benefits associated with a successful revolt, an event that, as in Chwe (2000), is triggered when the number of protesters passes an exogenous threshold. They show that the availability of more information or more correlated signals may increase or decrease the probability of a revolt, depending on the primitives: On the one hand, correlated or more precise signals aid coordination, which makes activism easier; on the other hand, with imperfect information on the state of nature, we may have equilibria in which activism occurs even when it would not have occurred with complete information (essentially, when agents are active and hope for good signals from others).

Little (2016) distinguishes between two coordination problems that must be solved for successful activism: what the author calls a political coordination problem, related to whether a sufficiently large number of citizens participate, and a tactical coordination problem, related to whether activists coordinate on the same strategy (where, when, and how to protest). The author argues that social media help citizens solve the tactical coordination problem but may exacerbate the political coordination problem. Better information may reveal that a regime is unpopular, just as it

[20] A related literature looks at the value of political connections for firms and banks. In this literature, a company is defined as politically connected if at least one employee (a top officer for most papers) has, had, or will have a high-level government position or is closely related to a top politician. For brevity, we do not survey this literature here (see Cingano & Pinotti 2013, Faccio 2006, Fisman 2001, Fisman & Wang 2015, Klor et al. 2016).

can reveal that a regime is popular, thus having an ambiguous effect on participation. Tactical coordination, by contrast, is unambiguously improved.

Jackson & Barbera (2017) provide a different but complementary angle on how social media may affect public protests. They assume there is uncertainty about the potential number of protesters: The key strategic evaluation for a citizen is therefore the number of other protesters who are "out there." The authors assume that a citizen can observe some other citizens' preferences, and they study how this piece of information affects activism when there is homophily, that is, when people are biased toward meeting people with the same preferences. The authors show that by reducing the informational content of the observed signal, homophily makes protesting easier when coordination is a key factor; by the same token, however, it makes protesting harder when it is important to acquire information.

Overall, this literature, in which the policy maker's reaction function is exogenous, presents ambiguous results on the relationship between social media and activism, characterizing conditions in which the effect may be positive or negative. A systematic positive effect of social media on protests is found when the effect of protests on policies is endogenized, as in Battaglini & Benabou (2003) and Battaglini (2017).[21] Battaglini (2017) considers a model in which some policy makers choose a policy without knowledge of a relevant state variable. As suggested by Condorcet (1785), valuable information is dispersed among citizens, who can individually attempt to signal their private information to the policy maker through their participation in petitions and protests. The author shows that, even in the presence of an arbitrarily large number of informed citizens, signaling is possible only if the signals available to individual citizens are sufficiently precise. To understand the reason for this, it is important to examine why social media may make activism more effective. Assume a policy maker has to choose between policies *A* and *B* and is more prone than the citizens to choose *A* over *B*. Citizens can protest to induce the policy maker to choose *B* over *A*: They will be able to affect the policy maker's policy if their protesting convinces the policy maker that there are signals in favor of *B*. Citizens who are evaluating whether to protest a policy condition their decision on the event in which their action matters, i.e., affects the policy maker's choice at the margin. If the agent's private signal is weak, they will have a posterior close to the posterior of the policy maker when indifferent between the two decisions regardless of the value of the signal and the number of other informed activists. Because the policy maker is more prone to choose *A* over *B*, and in correspondence to the pivotal event the policy maker is indifferent or almost indifferent between the options, the citizens will strictly prefer to protest independently from the observed signal, thus making an informative equilibrium impossible and making public activism irrelevant. In this context, social media allow groups of socially connected citizens to share their information, can relax the incentive compatibility constraint for information revelation, and allow for the existence of informative equilibria. Groups that share information pool their information in equilibrium and act as individuals: Although this reduces the number of independent signals available to the policy maker, it allows for the existence of informative equilibria in environments in which they would not otherwise be possible.

In light of all these theories, is it then true that social media make public protests more effective? Recent literature has found creative ways to test this conjecture and even gain some insight on the mechanisms behind it. The major complication in this research is to establish causality because the fact that social media are adopted as a form of communication by activists does not necessarily imply that they make activism easier. This can only be established by finding sources of exogenous variation that drive the diffusion of social media.

[21]Lohmann (1993) and Banerjee & Somanathan (2001) present earlier signaling models of activism with an endogenous policy maker's reaction function. These studies, however, do not consider the effect of social media or, more generally, of communication among activists on the effectiveness of information aggregation.

Using details on cell phone coverage, Pierskalla & Hollenbach (2013) and Manacorda & Tesei (2016) document that the diffusion of cell phone technology in Africa has induced a significant increase in the probability of mass activism.[22] Both papers address concerns regarding potential endogeneity between cell phone coverage and mobilization events with a variety of econometric techniques and instrumental variables. Pierskalla & Hollenbach (2013) show that the same qualitative results are obtained with and without instrumenting when cell phone coverage is instrumented using an index of the local regulatory quality (which is correlated to phone coverage, but they assume to be unlinked to violent protests). Manacorda & Tesei (2016) show that the same results are obtained when cell phone quality is instrumented using the number of lightning strikes during storms (which are negatively correlated with cellular phone infrastructure but presumably not with mass protests). Within the theoretical arguments presented above, mobile phones consistently appear both to improve the information available to citizens, making them more responsive to economic conditions, and to make it easier for them to coordinate.

Enikolopov et al. (2016) propose a completely different strategy to study empirically the effect of social media on public protests. They document that the penetration of VK, a Russian equivalent of Facebook, was correlated with protest activities in Russia in December 2011. They then use an original source of exogenous variation to show causality: information on the city of origin of the students who studied at the same institution where the founder of VK was studying when he started VK, Saint Petersburg State University (SPU). The idea is that when the company was founded in 2006, students from SPU were the early adopters of the network and those who determined its diffusion. Enikolopov et al. (2016) find that the number of students from a given city who studied at SPU with the founder of VK is positively correlated with participation in the 2011 protests. With this analysis, the authors conclude that a 10% increase in the number of VK users in a city corresponds to a 4.6% increase in the probability of protests and a 19% increase in protest participation.

It is useful to interpret these findings in light of the theories discussed above. All of these works see social media as a tool for information distribution and coordination, but they do not always distinguish between these two. This tendency reflects the fact that theories of public protests have been based on information aggregation and signaling alone (as in Lohmann 1993) or on pure coordination problems alone (as in Kuran 1991). Recent work, however, makes it clear that it is not possible to separate these two motives. Battaglini (2017) proposes that coordination allows citizens to act as one, thus pooling their signals. This changes the precision of independent signals and therefore relaxes the incentive compatibility for information revelation: With no coordination, there would be no information revelation. At the same time, when the policy maker's response function is endogenous, with no information aggregation and revelation, there would be no reason for the citizens to coordinate.[23]

Protests are only one way that a citizen can be politically active; another way in democratic countries is to donate to a campaign. This activism is normally seen as consisting of large donations from wealthy individuals or corporations. Social media change this perspective, as they can lower the barriers to entry. Intriguing evidence on this front is presented by Petrova et al. (2016), who document that creating a Twitter account increases the donations to political candidates

[22] Specifically, Pierskalla & Hollenbach (2013) show that the diffusion of cell phones is associated with an increase in the likelihood of violent collective action, whereas Manacorda & Tesei (2016) show that cell phone coverage makes mass mobilization more likely during economic downturns.

[23] A direct test of Battaglini (2017) using laboratory experiments is presented by Battaglini et al. (2018b). The experiments show that information transmission and coordination are intimately related: When the possibilities for coordination are changed (by allowing for communication within social groups), players change their strategies and change the informativeness of their actions.

who have never been elected to Congress. This increase in money comes specifically from new donors and from areas with lower print newspaper circulation. Specifically, this occurs when the candidate tweets more informatively. The use of social media, therefore, can help citizens have their voices heard through donations to candidates who may not receive as much financing due to their newer stature.

3.3.2. Social media and government control. The dark side of the development of powerful social media is that they give autocratic governments powerful tools to monitor and influence public opinion. For example, Qin et al. (2017) show that most of the real-world protests and strikes observed between 2009 and 2013 in China could be predicted one day in advance using data from Sina Weibo, a Chinese equivalent of Twitter, thus allowing the regime to intervene even before the protests had started. Although a theoretical understanding of how social media change the way governments (especially of the autocratic type) interact with their citizens is still in its infancy, recent work has highlighted important facts about the strategies used by autocratic governments.

King et al. (2014) focus on censorship in China. In order to observe which online posts were subsequently deleted by the authorities, they collected data on all published posts on Chinese social media. In order to observe which posts were not allowed to be published at all, they posted messages using fictitious social media accounts. Their analysis outlines a clear picture of the strategy used by the Chinese regime. They find that criticism of state and local leaders and their policies was not censored; conversely, authorities would censor any post that might generate collective action as well as posts that might bring support to groups seen as obstacles to the Communist Party. Words such as "masses," "incident," "terror," "go to the streets," and "demonstration" were commonly found in posts that were held for further censorship review. This finding is supported by Bamman et al. (2012), who identify similar expressions (such as "Tibetan independence," "democracy movement," and "Central Propaganda Section") that were also blocked on Sina Weibo.

By allowing some freedom of expression, the national party can use social media posts to monitor officials in local regions (King et al. 2013). By letting local officials be criticized for corruption or inaction, the central government can be informed of any issues and see if the local officials correct their conduct. If the local officials fail to meet the expectations, the central government can intervene. Qin et al. (2017) note that just by using social media activity it is possible to predict which politicians will be charged with corruption up to one year before any legal action is started.

Autocratic governments, however, do not limit their activities to censorship. They are also very active in manipulating public opinion. King et al. (2017) estimate that 448 million comments each year on Chinese social media can be attributed to agents sponsored by the Chinese government. Qin et al. (2017) estimate that about 4% of all posts on Sina Weibo are generated by state agents.

King et al. (2017) use machine learning to identify the posts of agents sponsored by the regime [the so-called 50 cents (50c) accounts] and study their characteristics. They find that the regime-sponsored posts are not used for defending government policies or to engage in discussions on controversial issues with government critics; rather, they are used to promote symbols of the regime and eulogize the revolutionary history of the Communist Party. The authors propose that the reasoning is strategic and that these posts are designed to distract the citizens from general negativity, a common grievance, or events that the party would like to contain. An analysis of the timeline of these posts and of the spikes of activity of the 50c accounts reveals connections with major events such as the Shoshan riots, the Urumqi Rail explosion, and Martyr's Day. These are events that the party would either want to distract the public from or bring positive attention to for the purpose of helping the party.

Until recently, much less was known about how public opinion is manipulated in nonautocratic regimes. Recent events in which Russia attempted to interfere with the US elections, however, are stimulating research in this direction. Allcott & Gentzkow (2017) conduct a systematic study of the diffusion of so-called fake news, which they define as news articles that are intentionally and verifiably false, including intentionally fabricated news, into the media consumed by US citizens during the 2016 election. Unlike the Chinese 50c ones, these posts tend to be focused on political discourse and on supporting one presidential candidate over another. The authors focus on the fake news dispersed via Facebook[24] (specifically, 156 election-related news stories determined to be false by leading fact-checkers), while also using a postelection online survey covering 1,200 individuals. They note that although media outlets may want to politicize the fact that fake news heavily favored then-candidate Donald Trump over Hillary Clinton, the evidence garnered through exposure on Facebook is inconclusive. More importantly, Allcott & Gentzkow (2017) discuss the economics of fake news and how it can exist in equilibrium. Due to the high cost of determining the validity of a news source, as well as the desirability of partisan news, there is room for fake news to exist in the social media sphere.

4. CONCLUDING REMARKS

In this article we have reviewed recent works studying how social networks affect policy making. We have focused on two specific aspects of this question. First, we have surveyed the literature studying how social connections affect behavior in legislative bodies, especially in the US Congress: how (and if) social links play a role in legislators' votes and how they determine the effectiveness and success of legislators. Second, we have surveyed the research on the role played by social networks in the interaction between policy makers and the outside world. This is obviously a broad question that we have addressed by limiting the analysis to three channels: social networks and lobbying; the role of religion, family links, and ethnicity; and the relationship between social media and grassroots activism.

A big push behind many of the works discussed above has been recent advances in data collection that allow researchers to better measure social connections among policy makers and other social actors, as well as advances in theoretical modeling that provide new theories linking social connections to lobbying, public activism, and other forms of political behavior. Still, important methodological challenges, such as problems concerning the observability of social networks and the identification of causal links between policy makers' social connections and their policy choices, have only started to be addressed. Progress along those lines requires not only advanced theoretical frameworks to help interpret the data, but also outright creativity in finding new data and identification strategies.

More work is needed to understand how networks operate and affect policy making. The existing literature suggests that social connections may affect policy outcomes by helping legislators to establish vote-trading networks and share information. Which of these two activities is prevalent, and under what conditions? In addition, social links play more than a supporting role in the interior functioning of political parties, especially in parliamentary democracies where they have such an important role. This seems to be an important aspect that is not emphasized enough in the literature, which has been mostly focused on the US system. For all these issues, we have only a limited theoretical understanding and not enough empirical evidence. It is clear that more research is needed on all these fronts.

[24]It should be noted that during the 2016 election, Facebook was not the only social media outlet that was affected by targeted fake news. Social media such as Twitter, Instagram, and YouTube were also affected and received hundreds of millions of views (see Isaac & Wakabayashi 2017, Pappas & Berger 2018).

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