Organizing the In-between: The Population Dynamics of Network-weaving Organizations in the Global Interstate Network

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This article examines the population dynamics and viability of network weavers, which are organizations that provide network relations for others. An analysis of the population dynamics of the intergovernmental organizations (IGOs) that are the basis of the interstate networks that influenced global economic relations, peace, and democracy in the 1815–2000 period shows that IGO founding and failure depends on the ease and value of specific interstate relations. Results indicate that network-weaving organizations are easier to operate when they encompass proximate and similar actors, yet they also reap rewards for bringing together otherwise disconnected actors, in particular, actors with conflicts. Combined, these organizational processes can account for the high clustering and short-path distance between nodes that are characteristic of the endemic small-world network structure. Furthermore, the study shows that the concepts of legitimacy and competition can be applied to identify particular spaces in the network of bilateral relations that are more or less hospitable for IGOs.●

The focus on networks is among the most momentous trends in recent efforts to explain the differential performance of individuals and other actors. Favored positions in networks are increasingly documented as contributing to the competitive advantage of organizations, the progress of managerial careers, the relative returns of industries, and even the development of states. Consequently, network relations have been thoroughly examined as an influence on many outcomes and have been incorporated into the strategies of actors of many types. We now have good descriptions of how actors may benefit from their network connections to others, but we know much less about opportunities, performance, or strategies of organizations that facilitate network connections for others. In the network literature, the contexts of affiliations often disappear from the analysis (Feld, 1981). It is routine to see network diagrams that contain only actors and no reference to the organizations and other institutions that brought them together. Yet understanding the dynamics of a network, and thereby the origins of the outcomes of that network, may require attention to the underlying organizational processes (Guimerà et al., 2005). For example, Putnam's (2000) stylized account of the declining social connectedness of Americans suggests that the population dynamics of bowling leagues have a material role to play.

The role of many organizations is to provide a context for the continuing or regularly repeated relationships between actors over time. This role, which has been referred to as network weaving (Krebs and Holley, 2006), consists of encouraging communication, facilitating shared understanding, and providing an institutional framework for maintaining ties. Examples of organizations that weave networks between individuals include alumni organizations, professional associations, and service clubs such as Kiwanis and Rotary. Firms and other organizations are also heavy users of network weavers, manifested as trade associations, research and development (R&D) consortia, as collaborative small-business networks (Human and Provan, 2000), or even as for-profit organizations specializing in weaving networks and disseminating knowledge

0001-8392/10/5504-0577/$3.00.

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We are grateful to John Freeman, both for commenting on this paper and for teaching us that social outcomes depend on organizational dynamics. We are also grateful to Elizabeth Borland, Glenn Carroll, Ernesto Castañeda, Emilie Hafner-Burton, Erik Gartzke, Ray Horton, Ozgecan Kocak, Christopher Marquis, Alexander Montgomery, Chuck Tilly, Jana von Stein, and Lihua Wang, and seminar participants at Columbia University, Durham University, Harvard University, the IGOs in Action Workshop in San Diego, and the New Science of International Organization Workshop at the University of Pennsylvania for helpful comments on earlier drafts. A version of this paper was presented at the Annual Meeting of the American Political Science Association, Philadelphia, August 2006.

among contractors (Zuckerman and Sgourev, 2006). The organizations that are the basis of the empirical analysis here, intergovernmental organizations (IGOs), facilitate network relations between the states of the world.

For network-weaving organizations, entrepreneurial opportunity and the structure of their market can be understood as a function of the potential and realized network between the actors they seek to connect. The population dynamics of such organizations will depend on the value that such ties provide to the actors but also on the ease by which those ties can be created and maintained. Similarly, legitimacy and competition for these organizations will vary across network space. The traditional approaches from the organizational ecology and industrial organization literatures for identifying opportunities and threats in markets, which amount to counting potential customers and counting other organizations that aim to serve those customers, are a strained fit when service involves forging an appropriate link between two actors.

Although early research on organizations that provide the context for affiliations between individuals has applied network imagery to understand competition, empirically this research has tended to measure competition as the overlap of the types of people who participate in the organizations, not the overlap of affiliations that are organized (McPherson, 1983). As for the organizations that are the contexts for relations between other organizations, the research on such federations is only recently emerging. And though it tends to use network arguments, these have so far been applied mainly to explain the structure of those organizations (e.g., Doz, Olk, and Ring, 2000; Human and Provan, 2000) or their influence on their members (Khanna and Rivkin, 2001) rather than to explain their own performance or inform their strategies.

Against this patchwork of previous research, we set out some systematic ideas about when and where network-weaving organizations will thrive, taking into account (1) the "cost of production" of these organizations in terms of the ease of creating and maintaining specific bilateral affiliations among actors in a network; (2) the "value of production" in terms of specific bilateral affiliations; (3) competition in terms of the crowding of specific spaces in the network and the relational capacity of actors; and (4) legitimacy in terms of the familiarity of specific bilateral affiliations and of the overall acceptance of a form of relationship. Thus we deal with the familiar strategic inputs of production value and costs, competition and legitimacy, with the difference being that we examine the supply of relations in a network.

We test our arguments with an analysis of the founding and failure rates of IGOs, organizations that forge a network between nation-states, in the period of 1815–2000. The states of the world society are tied to each other through multifaceted interactions and relations, which together form the interstate network. Simultaneous membership in IGOs constitutes one type of tie in that network, and the set of IGO ties, which we call the IGO network, is thus a facet of the more comprehensive interstate network. IGO ties facilitate and extend interaction between states through their maintenance of institutions and their active advocacy. The founding analysis below is informative

as to what positions in the interstate network are fertile grounds for new IGOs. The failure analysis provides the best picture of performance for these organizations that do not seek profits but are nevertheless subject to the familiar bureaucratic drive toward survival (Cox and Jacobson, 1973).

THE POPULATION DYNAMICS OF NETWORK WEAVERS

IGOs and the IGO Network

IGOs are operationally defined as organizations that meet regularly, are formed by treaty, and have three or more states as members (Pevehouse, Nordstrom, and Warnke, 2004). Some prominent examples are the World Bank, the World Trade Organization, the North Atlantic Treaty Organization, and the (British) Commonwealth, but there have been almost 500 of these organizations, of varied memberships and mandates, and only a small minority of these organizations are household names.

The first IGO was the Central Commission for the Navigation of the Rhine (CCNR), founded in 1815 and still operating. The CCNR has a relatively small secretariat, focused mainly on its core mandate, to maintain the safety of navigation along the Rhine waterway. Its scope has expanded only slightly over the years, to include an aim to unify fluvial law and to support economic prosperity in the Rhine area. Both the size and function of IGOs vary, however, and at the other end of the scope is the United Nations (UN), a sprawling conglomerate of international bureaucracies and treaties, which deals with a wide range of issues, from arms proliferation and international security to human rights and culture.

Both the CCNR and the UN are robust organizations that can be expected to be in operation for the foreseeable future, but the ability to secure adequate resources for continued operation cannot be taken for granted. A number of IGOs have failed. Among those is the predecessor of the UN, the League of Nations, which was dissolved after World War II. A more recent example is the International Natural Rubber Organization, founded in 1980 with the goal of stabilizing the price of rubber, which had been falling considerably. Regardless of the efforts of the organization, which included the build-up of a buffer stock, rubber prices continued to fall, which led to disagreement, disbandment of the organization, and the liquidation of the buffer stock in 1999.

In political sociology, IGOs, along with non-governmental organizations (or NGOs), have been identified as key institutions in the increasing integration of "world society" or "world polity" (Boli and Thomas, 1997; Meyer, Boli, et al., 1997; Dobbin, Simmons, and Garrett, 2007). International organizations are argued to facilitate the legitimation and diffusion of models of state behavior, for example, state policies regarding the natural environment (Frank, Hironaka, and Schofer, 2000; Meyer, Frank, et al., 1997) or education (Schofer and Meyer, 2006). Though the emphasis of empirical studies in world polity theory has been more on non-governmental organizations (whose members are individuals, not states) than IGOs, in the international relations field of political science, a longstanding

literature has emphasized IGOs and examined the influence of those organizations on state behaviors, particularly warring and trading (e.g., Wallace and Singer, 1970; Jacobson, Reisinger, and Mathers, 1986).

Recently, attention in the various literatures that consider international organizations has turned from their diffuse effects on world culture and cooperation to more localized influences. For example, Beckfield (2003: 403) examined inequality in the world polity and noted how the "characterization of the world polity as being fairly 'flat' contrasts with the vision of the world system as a hierarchical network of nation-states bound by competitive and unequal relations." This shift has been accompanied by the increasing use of network methods to better identify just where in the space of international relations specific international organizations may have impact. There has been a fledgling effort to examine the bilateral network created by NGOs (Hughes et al., 2009).

Other researchers have examined the affiliation network forged between countries through their membership in IGOs. This IGO network, in which a tie between two states is defined by their shared IGO memberships, captures the empirical realities of the international system much better than mere counts of IGO membership because it takes account of the structure of the ties between states and the wider world society rather than just the level of such ties. This approach has represented a sea change for efforts to document the influence of IGOs and produced evidence that IGOs affect the incidence of war (e.g., Russett and Oneal, 2001; Boehmer, Gartzke, and Nordstrom, 2004; Hafner-Burton and Montgomery, 2006), trade (e.g., Mansfield, Milner, and Rosendorff, 2000; Ingram, Robinson, and Busch, 2005), the diffusion of democracy (Torfason and Ingram, 2010), and cooperation to sustain the natural environment (Frank, Hironanka, and Schofer, 2000; Ward, 2006).

On the surface, IGOs may seem different from other familiar organizations that weave networks because the actors they connect, states, are notably different from the individuals and organizations that more typically make up the nodes in network research. Yet network theory is distinguished by an emphasis on the content and structure of ties between actors and applies common principles to analyze networks of very different types of actors (Brass et al., 2004; Burt, 2005). The influence of the IGO network on its nodes is consistent with analyses of other networks—centrality in this network is associated with status, structural equivalence with competition, and direct ties in the network smooth exchange and promote cooperation between states.

IGOs, like other organizations, may be established to achieve any of a number of different goals, which often have parallels in other types of network-weaving organizations. To give just one example, the European Organization for Nuclear Research (CERN) is an IGO established to provide for collaboration among European states in (non-military) nuclear, sub-nuclear, and particle physics. The organization facilitates interaction among researchers and technicians aimed at improving and directing research in the field of particle physics (CERN, 2008). There are clear parallels between CERN and various

industrial R&D consortia. One of these is SEMATECH, a non-profit consortium of semiconductor manufacturers that performs basic research into semiconductor manufacturing and coordinates research and implementation in the field of semiconductors (SEMATECH, 2008; Moellering, Sydow, and Windeler, 2009). IGOs are also like other organizations in that, whatever their espoused goals, they are influenced also by institutional entrepreneurs and managers pursuing their own goals (e.g., Cox and Jacobson, 1973; Barnett and Finnemore, 2004).

Despite the fact that IGOs have different explicit functions, the identity shared by IGOs as an organizational form is clear and resonant. The fact that their members are states is a distinct defining characteristic that for observers outweighs the fact that one IGO conducts research while another resolves trade disputes. Since 1910, the Union of International Association (UIA) has published a yearbook listing each IGO, and on its Web site it publishes a detailed definition of the organizational form (UIA, 2008). Thus, when compared with many organizational forms whose membership is considerably fuzzy (Hannan, Pólos, and Carroll, 2007), this is a very clearly delineated form. This is reflected in the fact that a number of professional schools offer programs educating students specifically for work in these organizations and maintain registers of the number of graduates that are employed by them (see, e.g., SIPA, 2008).

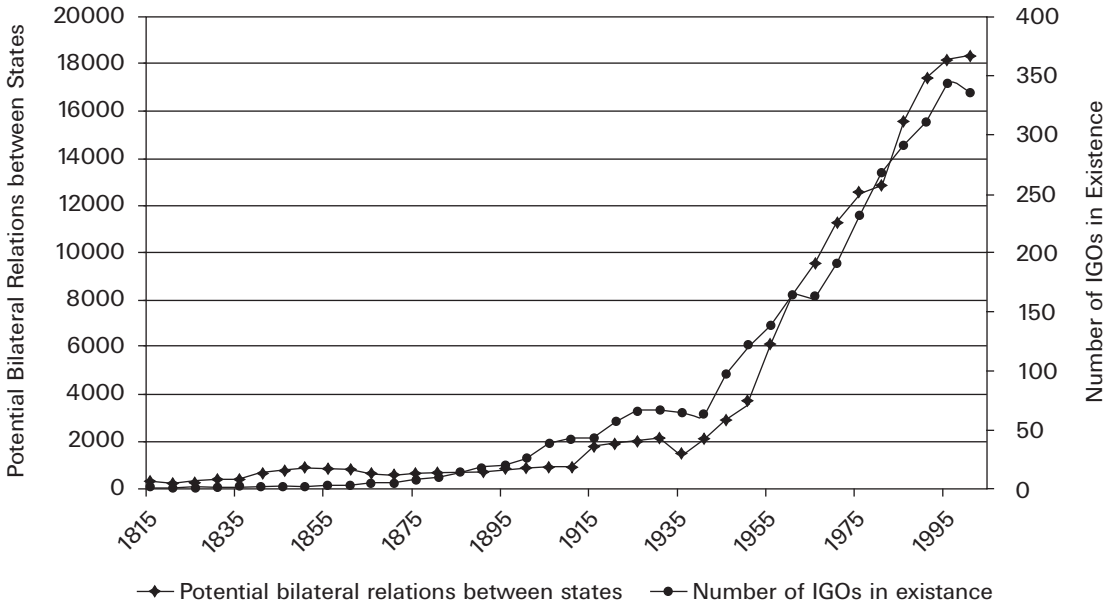
For network-weaving organizations, entrepreneurial opportunity and market structure can be understood as a function of the potential and realized network between the actors they seek to connect. Figure 1 graphically represents this idea for IGOs and the interstate network. The figure shows the time series of both the number of IGOs operating in the world system and the number of potential bilateral ties between states. There is a stunning correlation of 0.98 between the number of IGOs and the number of potential ties between nation-states.

That there should be a relationship between IGO counts and the number of potential ties is not unexpected. It is an extension to network-weaving organizations of Hannan and Freeman's (1989) claim that the size of a population varies as a function of the size of its resource niche. We would expect that as the set of potential interstate relations increases, institutional entrepreneurs will be encouraged to found new IGOs, and existing IGOs will perform better. Just as importantly, as the space of international relations is complicated by more states, and more potential interstate relations, the value of IGOs will become clearer, and resources will be more likely to flow to IGOs. Yet this basic correlation between the population of IGOs and the size of the interstate network says nothing about the very important question of which IGOs are most likely to thrive, and its correlate, which states are most likely to be connected by IGOs. To answer this, we go inside the interstate network and consider which spaces are favored for IGOs in terms of ease, value, competition, and legitimacy.

The Production of Affiliation

Ease of production. Certain conditions should favor the fundamental role of network-weaving organizations to

Figure 1. Population of IGOs and potential bilateral relations between states, 1815–2000.



produce the context by which other actors may affiliate with each other Some affiliations are easy to forge and sustain, most obviously affiliations between similar others, whose similarities smooth their interaction and support their shared understandings. Network-weaving organizations that encompass such affiliations should be favored in that their productive process is easier than that of network weavers that encompass members that are more dissimilar.

The idea that similarity is the basis of workable affiliations has a long history in the literature on interpersonal relations, which recognizes shared values as being an inherent source of reward, and an avenue for conflict resolution, in relationships such as friendship and marriage (Lazersfeld and Merton, 1954; Marsden, 1988). Organizations connecting similar actors in particular gain important advantages in terms of identity, in contrast with organizations whose identities are fuzzier and will therefore not stand out from competitors, which may confuse potential participants (Hannan, Pólos, and Carroll, 2007).

Similar observations have been made in the literature on interorganizational relations, in which shared experiences and shared status are argued to create the motivation and capacity for continued relations (Podolny, 1993; Gulati and Gargiulo, 1999). In international relations, it has long been recognized that democracies are more likely to have better economic relations and less war with each other than other types of government (Russett and Oneal, 2001). The level of democracy is one of the likeliest of the many possible state-characteristics to operationalize similarity that should lead to more smooth affiliations. Democracy represents core values of states and their citizens and is therefore a promising indicator of value homophily in our context. Further, Risse-Kappen (1995) has argued that there is a mutual identity

among democracies (and among autocracies), providing further basis for smooth affiliation between similarly democratic states. We expect that IGOs whose members are more similar in terms of the level of democracy are more likely to be founded, and less likely to fail, because of the relative ease of their process of producing affiliations:

Hypothesis 1a (H1a): Locations in the network that span states that have more similar democratic governance structures will have a higher IGO founding rate and a lower IGO failure rate than other locations.

Physical proximity is also a useful proxy for similarity on a host of state characteristics that are hard to measure for all the states of the world, particularly cultural dimensions, and represents opportunities for contact between citizens that should smooth affiliations between their states. Of course, religions and cultures are often regionally defined, suggesting that proximate countries are more similar on these dimensions. Further, regulatory policies diffuse between states partly as a function of physical proximity (Lee and Strang, 2006), providing another basis of similarity and easier affiliation. Contact and communications, and therefore understanding, is also higher among the citizens of proximate states, as indicated by gravity models of immigration and telephone calls (Wong, 2007; Lewer and Van den Berg, 2008). These mechanisms producing similarity and understanding between proximate states make them more easy affiliates, suggesting:

Hypothesis 1b (H1b): Locations in the network that span states that are more proximate geographically will have a higher IGO founding rate and a lower IGO failure rate than other locations.

Value of production. For actors with a history of confilict and a high degree of interdependence, bridges are most valuable. In our context, IGOs often aim to smooth relations between states with conflicts, and states have a clear interest in this help. For example, Boehmer, Gartzke, and Nordstrom (2004) argued and showed that co-membership in some types of IGOs reduces the likelihood of war between states. At the same time, conflict and interdependence may make it harder for actors to get along. Conflict and interdependence are often driven by differences between actors, suggesting an absence of the similarities that make affiliations easier that we described above. In our context, conflict between member states may disrupt the decision making, funding, and operations of IGOs, and members may leave and fracture the IGO if conflicts bubble over. Thus the spaces between states in conflict represent high risks and high rewards for IGOs. In this sense, the IGOs that connect states in conflict might be compared with entrepreneurial ventures, and like those ventures, we expect them to have both a high founding and a high failure rate. This is atypical among arguments of organizational founding and failure, in which the norm is to predict that influences that increase founding rates will decrease failure rates. An obvious indicator of states in conflict is war:

Hypothesis 2a (H2a): Locations in the network that span states that have recently been in armed conflict with each other will have a higher IGO founding rate but also a higher IGO failure rate than other locations.

Another important indicator of conflict and interdependence, and therefore the value of bridges, is trade. Though trade can be viewed as a form of cooperation, it is also associated with increased conflict. Trade occurs because states are differentiated in their economic products, and trade relationships signal economic codependence between two states and considerably increase the potential benefits of conflict resolution. The most common explicitly stated function of IGOs is smoothing trade conflicts and protecting property rights in global transactions (Ingram, Robinson, and Busch, 2005). In the realm of economic relations, our argument that the value of an affiliation makes it both more attractive and more fragile suggests the following:

Hypothesis 2b (H2b): Locations in the network that span states that trade extensively with each other will have a higher IGO founding rate but also a higher IGO failure rate than other locations.

Competition to Provide Affiliations

If the resource space for network-weaving organizations is defined by the size of a potential network, it makes sense to think about competition among IGOs in terms of locations (spaces between states) in that network and how densely they are filled. Thus we first consider the competitive interaction between IGOs that span the same bilateral relations. This view of competition is related to McPherson (1983) and McPherson and Rotolo's (1996) analyses of competition between voluntary organizations. As we do, they recognized the role of those organizations as contexts for affiliation and that organizations that tried to supply the same affiliations impinged on each other's viability. But they codified organizational overlap by the overlap of the organizational members; for example, two voluntary organizations are more competitive if the range of their members' ages overlaps. In contrast, and consistent with our overt attention to the interdependence between IGOs and the network they create, we look at overlap at the level of the interstate relationship.

Based on this view, one should expect that relatively empty spaces in the IGO network are hospitable locations for IGOs. If the member states of an IGO are otherwise weakly connected, the value of that IGO should be enhanced, as its role in the network is unique. Similarly, one might expect that relatively empty spaces in the IGO network will attract IGO foundings, controlling for other features of the states on either side of a potential bilateral connection.

The relational conceptualization of competition we employ here also evokes a familiar idea in structural sociology, that there are advantages accruing to actors that connect otherwise disconnected nodes, occupying what Burt (1992) called "structural holes." To put it simply, the advantage of spanning a structural hole is that the actor may reap benefits by connecting others that can benefit from each other indirectly. For example, the spanning actor may pass information between the disconnected actors and derive status, power, or a material payoff from the transaction. When there are many other IGOs that connect two states, the unique contribution of the focal IGO is lessened.

Counteracting the effect of competition is the potential impact of the legitimation and institutionalization of IGOs as an avenue of communication and as a mechanism for addressing issues facing the members. Hannan et al. (1995) found competition to be more localized than legitimation, with the important distinction that they examined spatial localization, whereas we focus on localization in a network. Of course, particular spaces in the interstate network may be more or less legitimated (e.g., a link between Canada and the United States vs. a link between Israel and Syria), but we expect that some of the factors that make a particular link legitimate will be captured by attributes of the two states that we have already discussed, such as their geographic proximity, similarity in terms of political systems, and whether they have been to war with each other. For these reasons, we expect that the crowding of IGO connections between two states will primarily represent competition rather than legitimation, impeding the formation and sustenance of other IGOs:

Hypothesis 3a (H3a): Locations in the network that span states that already have numerous dyadic IGO ties between them will have a lower IGO founding rate and a higher IGO failure rate than other locations.

We also examine the likelihood that the life-chances of network-weaving organization depend on the network relationships that its members maintain outside of the membership group.[1] The idea here is that maintaining relationships and participating in network-weaving organizations is costly, and there will be a point at which participation in a given network-weaving organization will be impeded by potential members' other networking activities. In the IGO context, this implies that an extant or potential IGO will experience competition as a function of its members' IGO connections to other states outside the membership group. Just as there is a limit to how many clubs an individual can join, or how many consortia a company can participate in, we expect there is a limit to how many IGOs a state can participate in. IGOs typically tax their members and require that members contribute diplomatic and administrative manpower as well as the attention of political leaders. These resources are not unlimited.

It is necessary to separate the local competition from other IGOs that occupy the same locations in the network as a focal IGO (H3a) and the more diffuse competition from other IGOs that do not occupy the same locations but nevertheless tax the "relational resources" of members. Therefore, we also examine this more diffuse competition in terms of locations in the IGO network. We expect that the spaces between the member-states of an IGO, or a potential IGO, will face more competition as a function of those member states' IGO affiliations beyond the membership group:

Hypothesis 3b (H3b): Locations in the network that span states that already have numerous IGO ties to third parties outside the focal group will have a lower IGO founding rate and a higher IGO failure rate than other locations.

In essence, with the above two hypotheses we are decomposing the IGO affiliations of the states in a focal group of

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Throughout the paper we use the word "group" to refer to the members of an existing IGO, when predicting failure, or a group of states that might found an IGO, when predicting founding.

countries into those that create direct competition through serving the same members (H3a) and those that create diffuse competition by connecting members to non-members (H3b). For a small IGO with three members, for example, Canada, the United States, and Mexico, there are three dyadic relations among them (Canada-U.S., Canada-Mexico, and U.S.-Mexico). H3a says that the focal IGO will be more likely to fail (or less likely to be founded) to the extent that other IGOs are also occupying those dyads, by incorporating two or three of these countries as members. H3b says that the focal IGO will be more likely to fail (or less likely to be founded) to the extent that Canada, the U.S., and Mexico have stronger connections to the other countries of the world that result from participation in IGOs with members outside this focal group of states.

Although these hypotheses address competition in terms of spaces in the IGO network, we also allow for the possibility that there may be population-level competition among IGOs. For example, a given IGO might face competition from IGOs with no member overlap, perhaps over global resources such as international bureaucrats or the attention of global citizens. We test for population-level competition in our models, but we do not offer explicit hypotheses about it because the phenomenon has been so thoroughly studied for organizational forms other than network-weaving organizations (e.g., Carroll and Hannan, 2000).

The Legitimacy of Affiliations

Examining the founding and failure of network-weaving organizations provides a rare opportunity to consider the legitimacy of particular forms of affiliation. Following Suchman (1995: 574), we define an affiliation as legitimized when it is generally seen as "desirable, proper, or appropriate within some socially constructed system of norms, values, beliefs, and definitions." This definition highlights that legitimacy involves both an object and an audience. Thus we can locate the legitimacy of a form of affiliation in regions of a network (or latent network) by identifying actors and sets of actors that view the affiliation as desirable, proper, or appropriate.

International cooperation through international organization is the form of affiliation whose legitimacy is germane for the rise of IGOs. The legitimacy of such international relations has not been constant over the time period we studied, and it has never been equally distributed among the states of the world. We therefore also consider which states at which times viewed international cooperation through international organization as more legitimate. We focus on two drivers of that legitimacy, the participation of a state's citizens in NGOs, which have pushed the idea that international relations are desirable, proper, and legitimate, and the level of democracy of a state, which serves to identify states that are isomorphic with IGOs in terms of governance.

NGO participation by the citizens of a state is a key indicator of "internationalist" orientation. Boli and Thomas (1997: 182) argued that NGO participation plays an important role in the propagation of elements of world culture that aggregate to

form the concept of "world citizenship," which holds that "everyone is an individual endowed with certain rights and subject to certain obligations; everyone is capable of voluntaristic actions that seek rational solutions to social problems; therefore, everyone is a citizen of the world polity." This concept is solidly behind the normative status of international relations through international organizations. World citizens explicitly recognize the importance of transnational collective goods, and it is natural that they would encourage their states to turn to IGOs as a way to achieve these, given the distribution of power resident in the current state system. Further, Boli and Thomas viewed IGOs and NGOs as being engaged in a process of mutual legitimization at the organizational level. Through consultative relationships, NGOs gain status and IGOs gain diverse inputs to policy that help them support claims of nonpartisanship and technical rationality. These ideas suggest that countries whose citizens participate more in NGOs will view IGO affiliation as more legitimate. Locations in the IGO network between such countries will be more hospitable for founding and sustaining IGOs:

Hypothesis 4a (H4a): Locations in the network that span states whose citizens have more memberships in NGOs will have higher IGO founding rates and lower IGO failure rates than other locations.

Another influence on whether IGO connections to other states are viewed as legitimate is the form of governance by which a state is ruled. DiMaggio and Powell (1983) argued that legitimacy concerns facilitate interactions between actors that represent compatible ideals. The governance structures of democratic states, which include both formal voting systems and limitations on the arbitrary power of the executive, are particularly compatible with the type of cooperation that takes place in IGOs. An internationalist orientation typically goes hand in hand with democracy (Boli and Thomas, 1999; Russett and Oneal, 2001), and democratic norms prevail in the IGO network (Torfason and Ingram, 2010). Furthermore, Mansfield and Pevehouse (2008) argued that democratizing states will join IGOs as a signal of their commitment to democracy. If democracies view IGO participation as more legitimate, we expect IGO population dynamics to be influenced by the level of democracy of a state, rather than just the democratic similarity of states, and that:

Hypothesis 4b (H4b): Locations in the network that span states whose governance structures are more democratic will have higher IGO founding rates and lower IGO failure rates than other locations.

As with competition, we also allow the possibility of population-level legitimation for IGOs. Again, as with competition, we treat this possibility with a control variable rather than a hypothesis, given the mature status of the theory of population-level legitimation.

METHODOLOGY

We compiled our data from several publicly available sources. For the definition of state actors, we rely on the state system

membership list compiled by the Correlates of War Project (COW, 2008). The Correlates of War state system is a widely used and comprehensive list of more than 200 states in existence since 1815, with explicit coding guidelines for inclusion, based on a combination of international recognition and size.

The foundation of our data is the time-varying listing of IGOs and their members from 1816 to 2000. This data set, originally compiled by Wallace and Singer (1970) and substantially updated by Pevehouse, Nordstrom, and Warnke (2004), has been used in a number of studies on IGOs (e.g., Boehmer, Gartzke, and Nordstrom, 2004; Hafner-Burton and Montgomery, 2006; Beckfield, 2010). The data set is based mainly on the *Yearbook of International Organizations*, but Pevehouse, Nordstrom, and Warnke (2004) have verified the accuracy of the data independently, obtained membership information directly from the IGOs in question, and in some cases incorporated additional archival data. In line with common convention, Pevehouse, Nordstrom, and Warnke (2004) defined IGOs as organizations that (1) include three or more members of the Correlates-of-War-defined state system; (2) hold regular plenary sessions; and (3) possess a permanent secretariat and corresponding headquarters.

IGOs may be formed directly by the states themselves or may be "emanations" formed by and maintaining dependence on another IGO. Pevehouse, Nordstrom, and Warnke (2004) listed all of the IGOs formed directly by states but excluded emanations. Emanations have proliferated, especially in the last half century, but because they are not independent from their parent IGOs, they do not represent autonomous organizations in terms of the risk of founding or failure, and Shanks, Jacobson, and Kaplan (1986) found that emanations are much more likely to be founded and to fail than are traditional IGOs. In the current analysis, we therefore excluded emanations. Pevehouse, Nordstrom, and Warnke (2004) identified 498 independent IGOs that existed at some point in history. We excluded three of these because of missing data on their structures, leaving 495 for the analysis.

Variables

Our unit of analysis is in each case a group of states, either the states that constitute an existing IGO (when examining failures) or a group of states that could potentially form an IGO together (when examining foundings). We therefore included a set of variables that captures the characteristics of these groups and their members in each year. For existing IGOs, we were also able to include variables describing the IGO itself. Additionally, to capture global influences, we included a set of variables that describe the characteristics of the global system in each year.

Characteristics of each group of states. To capture the effect of a number of dyadic network variables, we had to aggregate the dyadic measures that exist for each state-pair in a group of states to yield a variable that applied to the unit of analysis. Starting with the variables that test the ease of producing affiliation between states in a group, we operationalized each state's time-varying level of democracy using its polity

score (Marshall and Jaggers, 2005), a measure of democratic institutions widely used in international-relations research (e.g., Russett and Oneal, 2001; Boehmer, Gartzke, and Nordstrom, 2004). The polity score rates states each year on a scale of –10 to 10 based on the presence of democratic institutions and the absence of autocratic ones and measures both the competitiveness of elections and constraints on executive authority. H1a, on the influence of divergence on democracy among the states in a group, was tested with the variable *democratic variability*, which is the interquartile range of the polity score within the group. The interquartile range is a robust measure that is relatively invariant with group size, which makes it a good choice as a measure of divergence within a group. H1b was tested using *average dyadic distance*, calculated as the mean of the direct-line distance between each pair of states in a group.

Turning to the value of affiliations in a group, we tested H2a using *recent dyadic wars*, calculated as the percentage of dyads within the group that had engaged in militarized interstate disputes with each other in the previous 10 years. The data for this variable came from the third revision of the Militarized Interstate Dispute (MID3) dataset (Ghosn, Palmer, and Bremer, 2004). This dataset been used by Russett and Oneal (2001) and in other research on the causes of war. H2b was tested using *average dyadic trade*, a measure of the extent to which states within a group are dependent on trade with each other. The variable is based on Gleditsch's (2002) dyadic trade data. The data on trade are less extensive than data on the other variables we examined, which reduced our sample size. We therefore report regressions both with and without this variable.

To examine H3a, on the competition to supply particular dyadic connections, we calculated *average dyadic IGO ties within group* as the mean of the dyadic tie strength between each pair of states in the group. The dyadic tie strength is defined as the number of IGOs in which the two states of the dyad share a membership. This measure of tie strength has been used in a number of studies, and the underlying methodology is described in detail by Hafner-Burton and Montgomery (2006). To test H3b, we calculated *average IGO memberships outside group*, which counts the IGO memberships that do *not* contribute to IGO ties within the group. For a given state, an IGO membership that is not shared by any of the other states in the group is counted in full; IGO memberships that form the basis of ties with some but not all group members are counted proportionally. These two competition variables decompose each group member's participation in IGOs into those that create contact with other group members and those that do not. Therefore the sum of the two competition variables is mathematically equivalent to the average number of IGO memberships in the group.

To test H4a, on the legitimating effect of NGOs, we incorporated *average NGO memberships (logged)*, based on the total number of NGO memberships of the citizens of each state in the group as coded by Hafner-Burton and Tsutsui (2005). The data on NGO memberships are less extensive than data on the other variables we examined, which reduced our sample

size. We therefore report regressions both with and without this variable. H4b was tested using *average democracy*, which is the mean of the polity score within the group.

Control Variables

Most of the controls capture time-varying characteristics of the global system. Because the number of states, and dyadic relations between them, changed over time, we included the number of *potential bilateral relations*, which is simply the number of state pairs, calculated as n*(n – 1)/2, where n is the number of states in the system at any given time.

We controlled for *global war*, calculated as the percentage of state dyads that were involved in militarized interstate conflict at any time. We used the same data source (Ghosn, Palmer, and Bremer, 2004) as for dyadic conflict. To capture the level of commerce in the global system, we used estimates of *global GDP* (Delong, 1998) and *global trade* (Gleditsch, 2002).

Finally, we included variables that are conventionally used in ecological analyses of founding and failure. We controlled for *lagged IGO foundings* and *lagged IGO failures* (both are lagged by one year), as well as for *global IGO density (logged)*, which is a count of the number of IGOs, as well as the squared term of density. Other analyses of organizational founding and failure have found non-monotonic effects for lagged founding and failure, but in our analyses the effects were monotonic, so we do not report squared terms for these variables.

For the failure analysis, we were also able to incorporate measures of the IGO itself. We included the *bureaucratic structure* of the IGO, a measure constructed using Boehmer, Gartzke, and Nordstrom's (2004) coding scheme of IGOs as minimally structured, bureaucratized, or interventionist. In preliminary analysis, the influence of the latter two categories on failure was statistically the same, so they were collapsed into one *bureaucratic structure* category (minimally structured IGOs are the comparison category). A size measure, the *number of members* in an IGO was calculated directly from our main IGO data, as was the *age* of the IGO, for which we included first- and second-order effects to allow for the possibility of non-monotonic age dependence of failure.

We report descriptive statistics for these variables in table 1. The strongest correlations in the table are those between potential bilateral relations and variables that capture the size of the IGO population. The highest correlation, .98, is between potential bilateral relations and average IGO memberships outside group. Correlations between different variables that capture the size of the IGO population are also high in some cases, the highest ranging between .8 and .9. Other correlations are modest, in most cases well under .8. The results below are robust to the exclusion of highly correlated variables.

Founding Analysis

Following Pevehouse, Nordstrom, and Warnke (2004), we treated an IGO as being founded in the year it actually began operations. A well-known challenge for analyses of

Table 1

Descriptive Statistics and Correlations (N = 14,189)

Variable	Mean	S.D.	1	2	3	4	5	6	7	8	9
Characteristics of IGOs and their members											
1. Average dyadic distance	2.42	1.82									
2. Average democracy	2.07	5.15	.07								
3. Democratic variability	7.93	6.16	.39	–.22							
4. Average dyadic IGO ties within group	32.88	17.13	–.38	.49	–.45						
5. Average IGO memberships outside group	184.72	101.94	–.08	–.02	–.15	.53					
6. Recent dyadic wars	0.11	0.17	–.09	.00	–.12	–.09	–.22				
7. Average dyadic trade (logged)	–1.91	2.32	.07	.59	–.08	.23	–.22	.06			
8. Average NGO memberships (logged)	3.10	3.26	–.10	.13	–.17	.54	.79	–.18	.06		
9. Bureaucratic structure	0.45	0.50	.01	.01	–.07	–.03	–.01	.00	.02	–.01	
10. Number of members	26.07	32.55	.51	–.10	.46	–.22	.19	–.21	–.07	.10	.21
Characteristics of the global system											
11. Potential bilateral relations (1000s)	9.81	5.78	–.14	.07	–.21	.63	.98	–.21	–.14	.78	–.01
12. Global war	0.01	0.01	.00	–.10	.05	–.34	–.44	.01	.19	–.29	.02
13. Global democracy	–0.27	1.79	.00	.26	–.12	.25	.29	.02	.12	.27	–.05
14. Global trade	1.64	2.21	–.07	–.07	–.09	.25	.49	–.13	–.07	.56	.00
15. Global GDP	0.54	1.72	.01	–.03	.03	–.05	–.13	.00	–.18	–.19	.02
16. Global IGO density (logged)	5.13	0.88	–.06	.09	–.15	.62	.89	–.19	–.26	.65	–.03
17. Lagged IGO foundings	6.06	6.54	–.02	.00	–.05	.15	.24	–.06	–.12	.18	.00
18. Lagged IGO failures	1.78	1.79	–.04	.11	–.10	.32	.44	–.10	–.03	.42	–.02
19. Age	24.79	23.64	.16	.11	.19	.08	.13	–.10	.16	.14	.12

Variable	10	11	12	13	14	15	16	17	18
11. Potential bilateral relations (1000s)	.14								
12. Global war	–.07	–.42							
13. Global democracy	.06	.38	–.11						
14. Global trade	.04	.39	–.23	–.21					
15. Global GDP	.00	–.10	–.04	–.17	–.17				
16. Global IGO density (logged)	.14	.87	–.60	.19	.44	.00			
17. Lagged IGO foundings	.03	.22	–.17	–.05	.13	.00	.28		
18. Lagged IGO failures	.07	.50	–.14	.48	.05	.03	.39	.18	
19. Age	.35	.14	–.02	.09	.06	–.05	.11	.00	.09

organizational founding is that before the founding event, it is usually difficult (or impossible) to identify the social unit at risk of founding. Therefore, founding analysis is almost always performed by examining the number of organizations in the population founded in a year, looking only at aggregate population-level variables to explain that outcome. This approach is sufficient to explain *when* organizations within a population are founded but allows little insight into important questions of *which* of the organizations that qualify as members of the population are founded.

The IGO population is one for which the set of potential members for a new IGO is known and well defined: it is the set of combinations of three or more states that exist in a given year. Furthermore, because the actors at risk of founding IGOs are states, there is a reasonable amount of information on all of them over time. This opens the way for a radically different way of analyzing IGO founding, namely, to compare the groups of states that founded an IGO in a given year with the groups of states that did not. Unfortunately, though the set in question is well defined and bounded, it is

very large. For example, in the year 2000, there were 191 states, leading to over one million possible three-state combinations, 50 million four-state combinations, and two billion five-state combinations. The number of possible combinations reaches a maximum at 95-state combinations, at 10^{56}, a patently unmanageable number. To make this approach practical, we therefore utilized sampling from the risk set, selecting a limited number of groups from the risk set, matched against the groups that actually did found an IGO in a given year. Risk set sampling of this sort has been used in epidemiological studies to reduce the cost of data collection, and in some cases, the methods have also utilized matching on a subset of the independent variables (e.g., Langholz and Goldstein, 1996; Li, Propert, and Rosenbaum, 2001).[2]

We build on the methods used by Langholz and Goldstein (1996), adapting them to our setting. Thus, for each IGO that was founded in a given year, we sampled ten groups of states that did *not* found an IGO in that year and compared those groups with the focal group that actually founded the IGO. As noted above, the risk set is highly skewed toward groups of 90–100 states, whereas most actual IGOs are founded by groups of 3–20 states. Thus it was important to choose an appropriate sampling strategy, and we elected to match the size of the sampled groups with the size of the group that did found an IGO. This matching means that we were fully controlling for any effects of the size of founding groups, because it was eliminated in the analysis as a nuisance parameter. Of course, the matching procedure also meant that we could not analyze the effect of group size. In our analysis, matched groups were all selected from the same year as the focal group, which also controlled for any global period effects.

After constructing the matched data set, we could analyze it using a logistic regression, in which the dependent variable was 1 for those groups that experienced a founding and 0 for the matched samples from the risk set that did not experience a founding. We used conditional logit, which isolates the particular matching groups and analyzes differences only within each case-control set. This ensures that the results derive only from the variation between an actual founding observation and the samples that have been matched to that particular observation, rather than from variation across the whole pool of observations (Rothaermel, Hitt, and Jobe, 2006). The resulting coefficients are log-odds ratios. Because the matched sample was smaller than the actual group that did not experience founding, there is theoretically a positive bias, which affects the estimated coefficients but not the estimated z-statistics. In practice, the bias is very small, and the results are very similar for 1-1 sampling, 1-10 sampling and 1-100 sampling (the size of the matched samples is limited by computational issues).

Failure Analysis

The population that is at risk for failure events is well known, bounded, and of manageable size: it is simply the set of all IGOs that existed at each point in time. Thus we modeled IGO failure using event-history (hazard) models. We used the

2
Though some analyses of network dynamcis have sampled dyads (Powell et al., 2005; Sorenson and Stuart, 2008), this method has not to our knowledge been used in previous research on organizational founding. The nearest precedent to our approach is Ruef, Aldrich, and Carter's (2003) examination of the composition of entrepreneurial founding teams. They compared actual founding teams to potential teams, created by randomly reforming the actual teams, but because their data included information only on individuals that actually founded a company, the characteristics of non-founders (those who could potentially have engaged in founding but did not) did not enter into the analysis. We consider the full risk set of potential founding members of IGOs, which allows leverage on a number of additional and important research questions.

proportional hazard model developed by Cox (1972), allowing us to make minimal assumptions on the effect of time (in these models, age) on failure.[3] We broke the life histories of each IGO into one-year spells to incorporate time-varying covariates, yielding 13,940 spells in the models for which there are no missing data.

To define failure events, we considered that IGOs disappear through three routes: (1) they cease to exist (an outright failure); (2) they are merged with another IGO; or (3) they are replaced by a new IGO. Outright failures and mergers reduce connectedness in the IGO network and therefore have direct implications for the important outcomes that are associated with that network. When an IGO is replaced by a new IGO, however, there is no change in the number of IGOs through which states may forge international relations. Replacements, such as the replacement of the Paris Commission by the OSPAR Commission in 1992, are better understood as instances of organizational change—when an IGO is replaced, its mandate, policies, and structures are renegotiated. Therefore we defined an IGO as failing if it ceased to exist or was merged into another IGO but not if it was replaced by a new IGO. Of the 495 members of the IGO population, 139 failed by this definition, 129 outright and 10 by merger. Seventeen were replaced and were treated as right-censored (non-failures) in our analysis, and 339 were still operating at the end of the year 2000. Supplementary analyses in which we treated the 10 mergers as right-censored produced results comparable to those we report below.

RESULTS

Because our group-level founding analysis provided inherent controls for both group size and global variables, we present global and group-level foundings in separate analyses, in tables 2 and 3. For our failure analysis, we included global variables along with the group-level variables in the same set of analyses, which we report in table 4.

Foundings

Table 2 reports results for IGO foundings at a global level. In model 1, we analyze the effect of basic population and niche variables on the founding rates of IGOs. The model shows that the number of potential bilateral relations in the system has a positive effect on IGO foundings, as expected, given that this variable captures the niche or market size of network-weaving organizations in this context. The effects of population density at the global level are also in line with typical findings in organizational ecology (Carroll and Hannan, 2000). Global IGO density (logged) has a positive effect, suggesting that legitimation through numbers supports foundings, but global IGO density squared has a negative effect, in line with previous findings that suggest that at high levels of population density, the negative effects of competition outweigh the positive effects of legitimation. Model 2 incorporates global control variables, including measures of global democracy, war, trade, and production. We find a positive effect of global democracy, which is in line with the idea that democracies and democratic norms of governance provide legitimation and support for IGOs.

3
We tested that the proportionality assumption of the Cox model holds for our data. We have performed our estimations using exponential models and models with parametric age dependence, and we present one exponential model in table 3. The choice of estimation technique did not affect our results.

Table 2

Negative Binomial Analysis of Population-level Founding Rates of IGOs*

Variable	Model 1	Model 2
Potential bilateral relations	0.102••	0.211••
	(2.607)	(3.844)
Global IGO density (logged)	0.963••	0.939••
	(9.166)	(7.736)
Global IGO density squared (hundreds)	–0.234••	–0.426••
	(–4.399)	(–4.794)
Global democracy		0.150••
		(3.699)
Global war		–0.000
		(–0.246)
Global trade		0.000
		(1.429)
Global GDP		–0.000
		(–1.015)
Constant	–3.040••	–3.008••
	(–7.701)	(–6.503)
Log-likelihood	–259.4	–231.7
Observations	154	143

• $p < .05$; •• $p < .01$; one-tailed tests for hypotheses, otherwise two-tailed tests.
* The absolute value of the z statistics is in parentheses.

Table 3 shows the result of our group-level founding analysis. Model 3 includes measures of geographic distance and democracy in the (potential) group of founding states, as well as measures of existing IGO memberships and IGO ties. Even while controlling for the average level of democracy, we find that democratic variability in the potential founding group has a significant negative effect on the probability of founding. This is consistent with our prediction in H1a that democratic similarity reduces the cost of producing affiliation, leading to higher rates of IGO founding. And as predicted by H1b, average dyadic distance between potential founding states has a negative effect on the rate of founding. We therefore find robust support for the idea that network-weaving organizations are especially likely to be founded in locations in which the production of affiliation is easy because of the similarity and proximity of actors.

Model 3 also incorporates average dyadic IGO ties within group, which provides a test of the idea that IGOs are more likely to be founded in the space between states that are weakly connected in the extant IGO network. Contrary to the prediction of H3a, the coefficient for average dyadic IGO ties within group is positive. But the variable average IGO memberships outside group has a negative effect, as predicted by H3b. We therefore find evidence that competition suppresses the founding rate of IGOs, but it is only the organizations that provide network ties outside the focal group that show a competitive effect, not the organizations that provide ties within the group.

Model 4 adds measures of armed conflict, trade, and the level of NGO memberships. We find that both recent dyadic wars between states in the potential founding group and average

Table 3

Conditional Logit Analysis of IGO Founding Compared with Baseline Sample from Risk Set*

Variable	Model 3	Model 4
Average dyadic distance	–1.024••	–1.423••
	(–7.103)	(–5.124)
Average democracy	0.431••	0.264•
	(5.946)	(2.522)
Democratic variability	–0.315••	0.030
	(–3.570)	(0.212)
Average dyadic IGO ties within group	0.654••	0.601••
	(10.399)	(6.597)
Average IGO memberships outside group	–1.033••	–1.079••
	(–8.977)	(–5.665)
Recent dyadic wars		6.929••
		(3.032)
Average dyadic trade (logged)		9.386•
		(2.490)
Average NGO memberships (logged)		1.759•
		(1.759)
Log-likelihood	–129.7	–47.8
Observations	5377	3861

• $p < .05$; •• $p < .01$; one-tailed tests for hypotheses, otherwise two-tailed tests.
* The absolute value of the z statistics is in parentheses.

dyadic trade (logged) within the group have a positive and significant effect on the probability that the group will found an IGO in a given year. Although these two variables are superficially quite different, they both capture relations between states that increase the potential value of producing affiliation tremendously. The positive effects of recent dyadic wars and average dyadic trade (logged) therefore provide support for H2a and H2b, respectively. The coefficient for average NGO memberships (logged) is also positive, supporting H4a, which predicts that participation in NGOs will lend legitimacy to international affiliations through IGOs. As in model 3, we find the positive effect of average democracy consistent with the argument in H4b that IGO affiliations are viewed more legitimately by more democratic countries.

The effects of average dyadic distance, average dyadic IGO ties within group, and average IGO memberships outside group are also very similar to those observed in model 3, though the effect of democratic variability is now absent. In auxiliary analysis (not reported here), we found that it is not the inclusion of the additional variables in itself that causes this change but the removal of observations that have to be omitted when the new variables are included. Specifically, the effect of democratic variability disappears when we remove the observations for which information on average dyadic trade is missing. As Gleditsch (2002: 716) himself noted, data availability for dyadic trade is a difficult problem, and data are especially likely to be missing for developing and socialist states. It is therefore not surprising that the effect of democratic variability within a group of states is especially vulnerable to the exclusion of these observations.

Failures

Table 4 presents the results of the failure analysis. A positive coefficient estimate means that increasing values of the corresponding variable lead to an increased chance of IGO failure. Model 5 includes global-system variables, including the measure of potential bilateral relations. The coefficient is negative and significant. Consistent with our view that the network is the niche for network-weaving organizations, IGOs become less fragile as the dyadic spaces in which IGOs can provide useful connections become more numerous. We find that the global level of war increases the failure rate of IGOs. Because periods of war are highly destabilizing to most global institutions and structures, it is not surprising that IGOs are vulnerable in such periods. We find a positive coefficient for global IGO density, suggesting that beyond the competition in specific network spaces that we discuss below, global-level competition between IGOs also influences failure. In supplemental analyses we tested for but did not find a non-monotonic effect of density on IGO failure. The coefficients for global democracy and GDP are both positive, an unexpected result. A possible explanation is that periods of democracy and wealth are more dynamic, facilitating a changing world system rather than a stable one.

Model 6 incorporates two IGO-level control variables, the level of bureaucratic structure and the number of members. As might be expected, the coefficient for bureaucratic structure is negative: structured IGOs are more robust, consistent with Weber's (1946: 228) observation that "once it is fully established, bureaucracy is among those social structures which are the hardest to destroy." The same holds true for the number of members, which reduces the probability of IGO failure. In all likelihood, this is both because large IGOs have more access to resources and because a failing IGO may shed members before it is finally disbanded, contributing to the negative coefficient.

Model 7 includes all the variables for which we present explicit hypotheses. H1a and H1b are both supported, by two variables that indicate that IGOs are more robust when the production of affiliation is easy. The democratic variability of members has a positive and significant effect, as predicted by H1a. The coefficient on this variable indicates that when members' levels of democracy are more similar, the risk of failure is lower. The other variable we use to capture ease of producing and maintaining affiliations between states, the average dyadic distance between members, also has a positive coefficient. As predicted by H1b, this result shows that IGOs whose member states are geographically proximate are less vulnerable to failure than IGOs whose members are widely dispersed.

H2a and H2b predicted that locations in which the value of producing affiliations was especially high were likely to support the foundation of IGOs, even when those IGOs were contested and risky, and that these venture-like IGOs would be more prone to failure than IGOs in other locations. These predictions are borne out by our failure analysis, in which we find that both recent dyadic wars (H2a) and average dyadic

Table 4

Event History Analysis of IGO Failures*

Variable	Model 5	Model 6	Model 7	Model 8
Characteristics of the IGO and its members				
Average dyadic distance			0.118•	0.119•
			(1.962)	(1.991)
Average democracy			–0.082••	–0.091••
			(–3.082)	(–3.448)
Democratic variability			0.052••	0.055••
			(2.716)	(2.905)
Average dyadic IGO ties within group			0.047••	0.048••
			(2.730)	(2.816)
Average IGO memberships outside group			0.029•	0.030•
			(2.030)	(2.166)
Recent dyadic wars			0.773•	0.827•
			(1.852)	(2.039)
Average dyadic trade (logged)			0.381••	0.404••
			(6.586)	(7.060)
Average NGO memberships (logged)			–0.307••	–0.319••
			(–6.214)	(–6.536)
Bureaucratic structure		–0.666••	–0.655••	–0.693••
		(–3.354)	(–3.089)	(–3.310)
Number of members		–0.037••	–0.038••	–0.041••
		(–4.513)	(–4.070)	(–4.269)
Age				0.047••
				(3.036)
Age squared				–0.001•
				(–2.499)
Characteristics of the global system				
Potential bilateral relations (1000s)	–0.191••	–0.206••	–0.583••	–0.616••
	(–3.256)	(–3.346)	(–2.844)	(–3.051)
Global war	33.393••	31.831••	30.094••	33.557••
	(3.913)	(3.731)	(3.371)	(3.823)
Global democracy	0.397••	0.393••	0.481••	0.488••
	(5.105)	(4.899)	(5.610)	(5.688)
Global trade	0.028	0.017	0.064	0.053
	(0.596)	(0.357)	(0.933)	(0.781)
Global GDP	0.116•	0.130••	0.200••	0.200••
	(2.489)	(2.787)	(3.766)	(3.840)
Global IGO density (logged)	1.341••	1.414••	0.863	0.995
	(2.744)	(2.791)	(1.079)	(1.235)
Lagged IGO foundings	0.018	0.019	0.025•	0.025•
	(1.658)	(1.750)	(2.435)	(2.460)
Lagged IGO failures	–0.071	–0.068	0.007	0.008
	(–1.222)	(–1.160)	(0.103)	(0.112)
Constant				–10.468••
				(–3.571)
Log-likelihood	–711.2197	–679.7066	–621.989	–247.9833
Observations	13940	13880	13805	13805

• $p < .05$; •• $p < .01$; one-tailed tests for hypotheses, otherwise two-tailed tests.
* The absolute value of the z statistics is in parentheses.

trade (H2b) have positive coefficients. Again, we emphasize that we do not believe that the potentially high value produced by IGOs is itself hazardous to their survival. Rather, we believe this effect to be a result of different and more fragile IGOs being founded in locations in which their potential value is high and that this is what leads to the increased hazard of failure.

We also find support for our hypotheses about the effects of competition among IGOs. As predicted by H3a, when an IGO's members' average dyadic IGO ties increase, its risk of failure increases, resulting in a positive and significant coefficient for that variable. There are survival advantages for occupying weakly connected parts of the IGO network, where an IGO's unique contributions to members' networks are greatest. H3b, which predicts that IGOs are vulnerable when its members are heavily engaged in other IGOs that forge ties to states outside the focal IGO, is also supported, as we find a positive effect of average IGO memberships outside group. Thus, for the failure analysis, the observed effects of competition are fully consistent with our predictions.

We also find consistent support for the idea that the legitimacy of IGO affiliations at the level of the focal group of states supports existing IGOs. Thus we find a negative coefficient for both the number of average NGO memberships (H4a) and for the average democracy of the states in the focal IGO (H4b). When an IGO's members are more democratic and more heavily engaged in nongovernmental organizations, the IGO is less likely to fail.

Table 4 concludes with model 8, which uses a different specification for the survival model. Rather than using a proportional hazard model, this regression uses an exponential hazard model, which allows an examination of the age dependence of IGO failure. Keohane (2005) and other political scientists suggested that the longevity of old IGOs is substantively relevant because these organizations may represent old ideas. The model shows an $\cap$-shaped failure rate, which peaks at an IGO age of twenty-five and crosses the origin at an age of fifty. The most robust IGOs are the oldest, after an age of fifty. Again, the coefficients for other variables are comparable to the Cox model estimations shown in model 7.

DISCUSSION

Overall, seven of our eight hypotheses were supported for both founding and failure, while one held in the failure but not the founding analyses. IGOs are more likely to be founded and less likely to fail when they incorporate easier affiliations, particularly those between states that are similarly democratic and geographically proximate. IGOs that incorporate affiliations that are particularly valuable were both more likely to be founded and more likely to fail, with valuable affiliations being those between states that had recently warred and those with more dyadic trade. IGO competition can be located in particular network spaces, as IGOs whose (potential) members are more connected through other IGOs are more likely to fail, but not less likely to be founded, an anomaly we examine below. Competition for members' limited capacity for affiliations is evidenced by the fact that IGOs are more likely to fail and less likely to be founded to the extent their (potential) members have more affiliations outside the membership group. Evidence of the legitimacy of IGO affiliations is provided by the fact that IGOs are more likely to be founded and less likely to fail with members that have more NGO connections and are more democratic.

These results have a number of implications for organizational theory and for the study of global networks.

With the ever wider recognition that network positions can be a source of advantage for actors of all types, it is time to think more about how networks are created and favorable positions achieved. Often, networks are built on organizations that serve as contexts for the affiliation of other actors. In this article, we are encouraging attention to the opportunities that potential and realized networks present for these organizations, a shift toward the suppliers of networks and away from the almost exclusive focus on the consumers. These opportunities have their foundation in familiar ideas about organizational performance. Organizations thrive where their output is easier to produce and more valuable, where competition is low and legitimacy is high. But identifying and acting on these opportunities requires a different way of thinking about the market as a set of edges or locations in a network that may be more or less connected and easier or harder to connect.

The foundation of our arguments is an assertion about how to best conceptualize the niche for network-weaving organizations. For network-weaving organizations, the space of potential relations between the relevant actors forms their niche. This idea provides a new link between network analysis and analyses of organizational population dynamics and illuminates the founding and failure processes of the many other network-weaving organizational forms, from alumni groups to R&D consortia to industry associations.

Upon the foundational idea that the network is the niche of network-weaving organizations, we built four theoretical arguments about organizing network markets. The first concerned the ease of production for network-weaving organizations, that their viability would depend on the workability of relationships between their members, with workability in our context being a function of similarity and proximity. The evidence for this claim appears in both founding and failure analyses. IGOs are more likely to be founded and less likely to fail in the space between states that are more proximate to each other and more similar in terms of democracy. This result evokes the endemic process of homophily that explains the tendency for affective relationships to form between people with similar characteristics (McPherson, Smith-Lovin, and Cook, 2001). Apparently, affiliation is also easier for similar states, which, combined with theory about the role of similarity for smoothing interorganizational relations of other types (DiMaggio and Powell, 1983), suggests that the strategists of network-weaving organizations should target relations between similar actors. In some cases, institutional entrepreneurs may be able to influence this similarity, or at least the perception of it: by articulating divides between groups of actors, they may create a sense of shared identity within the groups, smoothing relations and encouraging cooperation between group members (Tajfel and Turner, 1986).

Our second theoretical insight is derived from the fact that the most valuable affiliations are not necessarily the ones that are easiest to establish and maintain—and in fact, the opposite may well be true in many cases. For example, connections

between different actors may allow those actors to manage symbiotic interdependencies and therefore present both opportunities and challenges for network-weaving organizations. We saw this in our results in the form of increased founding *and* failure of IGOs that connect states that have recently engaged in war or have higher levels of trade. Given the benefits of diversity in many types of network relationships, this result indicates what provides potential advantage for organizations that produce network affiliations. Specifically, organizations that are better than others at surviving when they include members with difficult dyadic relationships would be expected to benefit as sources of rare but valuable connections. Future research on this topic should examine the governance structures of network-supplying organizations as a source of robustness in the face of difficult interdependencies between members. There is some support for this suggestion in research suggesting that IGOs with more bureaucratic structure do more to reduce the risk of war and promote trade between their members (Boehmer, Gartzke, and Nordstrom, 2004; Ingram, Robinson, and Busch, 2005).

Our next theoretical claim was that network-weaving organizations would find competition at the level of the affiliation. We considered both the direct competition to supply a given affiliation between members and the diffuse competition from members' affiliations to non-members. With regard to diffuse competition, we found that a given IGO was more likely to fail and less likely to be founded as a function of its members' affiliations to others outside of the group. This suggests that a constraint on network-weaving organizations is the relational capacity of their members and potential members.

Regarding direct competition between IGOs that supply the same dyadic affiliations, we found support for our prediction in the failure analysis, in which an IGO was more likely to fail if its members had more connections through other IGOs. In contrast, we found that a new IGO was actually more likely to be founded to connect two states the better connected those states were through other IGOs. One explanation for this result may be that the affiliations fostered by existing IGOs lead to increased interdependence, which increases the potential value of managing that interdependence, in much the same way as with bilateral trade. This possibility is encapsulated in the idea of the "ever closer union," which has been prominent in the evolution of the European project. The term was first coined fifty years ago, as the European Economic Community was being born, and over the years, Europe has seen ever closer integration in a number of fields. Among other things, this has included the establishment of the Euro as a single currency and the Schengen agreement to eliminate internal border controls—each of which in turn necessitated the establishment of a separate IGO to manage these challenging projects. If the effect of other IGOs is to increase interdependence in similar ways, one would in fact expect that the impact of competition would be diminished, and the population dynamics in such areas would come to resemble the venture-like patterns associated with high-value locations, as we found in our empirical analysis.

These effects of crowded dyads link to what has surely been the most important evidence that network analysis has produced on competitive advantage, the "structural hole" concept that performance is higher for actors that span others that are disconnected (Burt, 1992). We found that when IGOs link weakly connected actors—and thus span structural holes in the underlying bimodal network—they are less likely to fail. This result yields yet more evidence that competitive advantage comes from spanning weakly connected actors, but the founding evidence suggests that such positions may be rather hard to achieve. The chances of an IGO being founded by a group of weakly connected countries are low, but conditional on being founded, such an IGO is very likely to survive.

An important part of the entrepreneurial challenge of filling structural holes may be to legitimize previously absent relationships. Zaheer and Soda (2009: 26) showed that status influences subsequent formation of structural holes in the context of project teams and suggested that "the signaling effect of status attracts otherwise disconnected players to the focal actor"—a mechanism highly evocative of legitimation effects. The role of legitimacy is suggested by the positive relationship of edge-crowding on the founding rate, which evokes the legitimation dynamic from the theory of density dependence (Carroll and Hannan, 2000), and also by other analyses of network-supplying organizations that have identified the importance of creating legitimacy for specific ties (Human and Provan, 2000). A rich topic for future research would be to examine the implications of variations within the IGO population for legitimizing particular bilateral relationships. Specifically, IGOs are formed for different purposes, including social, cultural, environmental, political, economic, and military purposes. We wonder in particular whether social and cultural IGOs play a role in establishing the groundwork of legitimacy for relationships between two states, to be followed by IGOs that pursue economic, military, and other ends.

The possibility that ties in particular dyads may be more or less legitimate leads directly to our fourth and final set of predictions, which examined the conditions under which particular types of affiliation are more legitimate. We considered the influences on the legitimacy of a type of affiliation with a particular social group. In our empirical context, this meant unpacking the legitimacy for international relations through international organizations for particular states and their citizens. Of particular substantive interest on this question is the role played by NGOs, which have been characterized as a key source for the idea of world citizenship and international cooperation through organizations. We found that IGOs are more likely to be founded, and less likely to fail, when their members are states whose citizens participate more actively in NGOs. This is an important result because it makes concrete a positive interdependence between IGOs and NGOs, which has so far been only speculated about in the various literatures that examine international organizations. Theorists such as Boli and Thomas (1997) have argued that these two types of organizations are symbiotic, but empirical research on the impact of international organization

can be (very roughly) divided into a cultural camp that examines the influence of NGOs on the legitimized model of the state and a structural camp that focuses on IGOs' influence on dyadic and international relations. The results here indicate the mutual dependence of culture and structure: citizens who embrace internationalist ideals influence states to form and maintain intergovernmental organizations. If globalization, as Guillén (2001) has suggested, is an organizational phenomenon, then the interdependence between the forms of international organization must be determined. It will be very useful in that effort to turn toward questions of how IGOs and NGOs affect each other's founding, failure, and change, and away from questions about which organizational form has more important effects on states.

Our investigation of the legitimacy of international relations also revealed that IGOs that include democracies are more likely to be founded and less likely to fail. This relationship evokes isomorphism as a legitimating mechanism and suggests a connection between domestic and global governance, that the explicit governance structures on which democratic states are founded are especially compatible with international cooperation through IGOs.

Ultimately, the interest in the founding and failure of network-weaving organizations is tied to the interest in network dynamics. Beckfield (2010) has made provocative observations about the dynamics of the network created by IGOs and states, arguing that rather than becoming more uniformly connected as some world-polity theorists have argued, it is instead becoming fragmented and regionalized. A trend toward regionalization is consistent with our finding that IGOs flourish in the spaces between similar and proximate states. Relatedly, our evidence that IGOs are less likely to be founded in unoccupied parts of the IGO network, and that IGOs whose members are in conflict are more likely to fail, would also work against a tendency toward uniform connectedness in the world polity.

The organizational processes behind the evolution of the IGO network are not unique. Recently analyzed networks such as those between movie actors and Broadway artists are derived from organizations and teams that likely reflect the organizational processes we have identified for IGOs (Watts, 1999; Uzzi and Spiro, 2005). Both movies and Broadway productions rely on the smooth interactions that derive from participants' similarity, which is why we recognize genres, yet each of these organization types may also benefit from the challenging organizational feat of bringing together weakly connected participants as a source of creativity. In those cases, the result of these underlying organizational dynamics is a small world of actors and artists (Guimerà et al., 2005). A logical extension of this article would be to apply our findings on which types of network-weaving organizations are founded, and which survive, to project the evolution of the networks those organizations facilitate.

In any such effort, it is important to keep in mind that network measures were not the only influences on IGO founding and failure. Most important for organizational theory is the evidence

in the failure models that bureaucratic structure is strongly associated with organizational survival, a relationship that is predicted in classical theory but has not to our knowledge been documented by empirical analyses. In line with other research, we also observed population-density effects and IGO-level factors such as age and size. For international relations, the influence of bureaucracy, age, and size has important implications, because it implies that very old, large, and bureaucratized IGOs are also very robust. As Keohane (2005) suggested, the oldest IGOs can be expected to represent the oldest ideas and may therefore be an important source of institutional inertia.

The non-network variables in our analysis are important as reminders of why researchers must study organizations to understand the dynamics of affiliation networks. A large, old, bureaucratized IGO might survive, even in an inhospitable part of the network (e.g., connecting disparate and distant countries). It is therefore impossible to predict the evolution of the IGO network without considering the other organizational influences that enable the IGOs that create it to be founded and to persist. Thus the analysis of network dynamics is deeply intertwined with the analysis of the dynamics of the network-weaving organizations themselves.

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