GLOBAL NETWORKS
AND DOMESTIC POLICY
CONVERGENCE
A Network Explanation of Policy Changes

By XUN CAO*

I. INTRODUCTION

It is often said that in today’s globalized world, everything is connected;¹ as flows of goods, services, capital, and labor speed up at an unprecedented rate, almost everyone is connected to the global market and, eventually, to everyone else. A more connected world brings more opportunity but also conflict between old traditions and the new rules of the market. National governments are confronted with challenging questions. As the communist, socialist, and Keynesian experiments all eventually failed, joining the global economy seems to be the only option left. But how many new economic policies and institutions do national governments need to adopt to survive and possibly thrive? Are we all heading in the direction of efficiency-mandated minimalism?

Various scholars have been trying to provide answers to these questions. In international and comparative political economy, a line is often drawn between those who believe in the persistence of national


World Politics 64, no. 3 (July 2012), 375–425
Copyright © 2012 Trustees of Princeton University
doi: S0043887112000081
varieties and those who hold a convergence view. The former group tends to emphasize how various factors internal to domestic politics can resist the pressure of globalization so that there is still room to move. The latter group points to the structural power of an integrated global market to discipline states. Moreover, in sociology, the world polity literature has shown that the institutionalization of the increasingly dense global network of states and international organizations is altering the landscape of world politics. Indeed, beyond the economic forces of globalization, there is a social dimension of globalization, such as embeddedness in the web of intergovernmental organizations (IGO), which also shapes state policy in many domains.

How much of a convergence in domestic economic policies has been achieved and what explains variations in the convergence- divergence phenomena across space and time? This article focuses on globalization forces such as trade, capital flows, and IGO connections and how they affect convergence in domestic economic policies. Both the theoretical argument and empirical analysis make novel contributions to existing studies of policy convergence. On the theoretical front, the article relies on a network approach to conceptualize globalization forces and interdependence between states. Moving beyond the standard argument of existing theories that economic competition and exchange induce policy convergence, this study demonstrates that network position similarity defines groups of competitor countries in the global market and ultimately, due to competitive pressure among peers, drives policy interdependence. Moving further away from conventional explanations based on market dynamics, the network approach also reveals that network position proximity induces policy convergence by facilitating policy learning and emulation among closely connected countries. The empirical analysis employs new data that enable better precision when measuring countries’ network position characteristics, such as structural equivalence in exports for example, and applies sophisticated and necessary statistical tools that bring rich data to empirical tests of the network theories the article presents.

First a network view of the international political economy is introduced, followed by hypotheses that relate two network position characteristics—position similarity and proximity—to domestic policy convergence. To capture contemporary convergence-divergence
phenomena, countries’ movements in three multidimensional policy spaces—policies related to the size of the government (fiscal policies); access to sound money (monetary policies); and regulations of credit, labor, and business (regulatory policies)—are traced. The empirical evaluation of the network hypotheses applies a latent-space model for relational/dyadic data. The final section concludes and discusses implications for future theoretical and empirical work.

II. A NETWORK CONCEPTUALIZATION OF INTERNATIONAL POLITICAL ECONOMY

Clark Kerr, discussing the future of industrial societies, defines convergence as the tendency of policies to grow more alike in the form of increasing similarity in structures, processes, and performances. In the recent convergence-divergence debate, however, convergence has a much narrower definition and is often equated with a process leading to a neoliberal configuration involving privatization, dismantling of social welfare apparatuses, deregulation, and tax cuts. For instance, Susanne Berger and Ronald Dore define convergence as a process wherein distinctive domestic institutions and economic policies fade over time, giving way to common economic structures whose efficiency and universality produce superior strength in the market. In the context of globalization, forces of market integration, such as trade and capital mobility, are often considered drivers of this neoliberal type of convergence.

In order to gauge the extent to which a country is subject to the pressures of globalization, the first step has been to incorporate variables from the international level to models of domestic political and economic processes. Tremendous effort has been made to closely study macroeconomic policy changes, such as social welfare policies, industrial subsidies, and monetary and fiscal policies. It is a common practice in the literature to summarize the economic forces of globalization with an estimate of a country’s overall trade exposure to the global market. Indeed, trade exposure is conceptually important as it reflects the actual and perceived economic conditions and levels of insecurities associated

---

6 Kerr 1983.
7 Fourcade-Gourinchas and Babb 2002.
8 Divergence, therefore, refers to persistent diversity of national policies and institutions. See Berger and Dore 1996.
12 Capital-market openness is another variable that is often used to capture financial globalization.
with the vagaries of the global market which, in turn, affect the chances to unleash changes through domestic political processes. However, this is also an undifferentiated way to conceptualize globalization forces. Figure 1, in a simple setting of international trade, illustrates the conceptual limitations of such a view; the global market is conceptualized as an empty box to which a national economy is connected by its overall trade exposure.\textsuperscript{13} No effort is made to distinguish the composition and geographical distribution of the actual trade flows going in and out of a country. The extent to which a national economy is subject to the economic forces of globalization is simplified to its overall level of trade exposure, which is captured in Figure 1 by the width of the gray lines connecting countries to the empty box of the global market.

This conceptualization misinterprets a key aspect of the global competition faced by nation states. Governments do not look only at indicators of overall trade exposure and adjust policies accordingly; they are more sensitive to their specific export markets and key competitors in the global market. For instance, from the perspective of South Asian countries such as India and Pakistan, lifting textile-import quotas in Europe and America at the beginning of 2005 brought less opportunity and a potential loss of market share to China, a newly unfettered competitor.\textsuperscript{14} The textile and clothing industries are important for developing countries and competition among peer developing countries is fierce. China, India, Pakistan, and other textile/clothing-exporting countries are often engaged in a race. They closely watch each other and the markets in America and Europe. Any policy effort in one country to reduce production costs thereby increases competitiveness and is likely to trigger similar moves in the other countries.

The pressure on convergence is not a single dimension of trade exposure, but rather is in the form of competition among multiple dimensions of the global market. Figure 2, provides a more realistic view of the global trade market wherein a country is connected to the rest of the world by its export ties. In it, countries are positioned in such a way that the distance between them captures how “structurally equivalent” they are in the network of trade: the smaller the distance, the more similar the ways in which they are connected to the rest of the trade network. (The meaning of structural equivalence is discussed below in the main hypotheses section.) A country’s total trade is disaggregated into bilateral trade flows and further differentiated by its

\textsuperscript{13} Countries are represented by three-letter acronyms in Figures 1–5; a complete list can be found in Appendix 1.

\textsuperscript{14} \textit{Economist} 2005.
composition to measure export competition. The same set of sixty-three national economies in Figure 1 is distributed in a much more complex representation: in addition to clusters of countries defined by structural equivalence, the size of each country’s acronym represents its overall trade volume, and the width of the gray lines connecting two countries represents the size of their bilateral trade.\(^{15}\)

**International Markets as a System of Networks**

Indeed, in addition to trade, connections at the international level, such as capital flows and multiple layers of intergovernmental organi-

\(^{15}\) A quick look at this trade network uncovers important features of global trade. Figure 2 shows that some countries serve as hubs of the trade network (the United States (USA), Japan (JPN), and Germany (GMY) for example), while others form clusters (the Western European countries of Germany, France (FRN), the Netherlands (NTH), and the United Kingdom (UKG), for example, and the Asian Pacific countries of the Republic of Korea (ROK) and Singapore (SIN), and Mexico (MEX)). In this figure, country positions are calculated by multidimensional scaling on a similarity matrix of structural equivalence of the trade network. Also note that I choose $5 billion as the threshold to show a tie between two countries. The complication is that the absence of a tie between two countries in the figure could also mean that data are missing for that bilateral connection. See Appendix 1 for a complete list of country acronyms.
Organizations, constitute complex network structures in international political economy. Current models in the field, however, tend to overlook the network nature of the global economy. Empirical studies following this fashion, unsurprisingly, reveal a mixed picture of convergence/divergence caused by globalization. Some have found growing cross-national similarity in monetary and fiscal policies in advanced capitalist democracies and related this convergence to trade and capital market openness.16 Other studies on government consumption spending,

transfer payments, and public employment in the Organization of Economic Cooperation and Development (OECD) countries uncover persistent national diversities and limited effects of economic internationalization. Meanwhile, findings for developing countries suggest that exposure to international markets has significant and negative effects on government welfare efforts. The network approach presented in this article provides insight into and explains these mixed findings: depending on their position in international networks, national economies are subject to different levels of pressure to adapt to the forces of globalization, which results in national variations in a wide range of domestic policy outcomes.

Specifically, one way to conceptualize the international political economy is to picture a complex system of networks where national economies are embedded in and connected by multiple networks. Moreover, states are not connected or influenced by these network structures in the same way because networks often, if not always, imply hierarchy and clustering. Therefore, it is reasonable to suspect that globalization forces impose differential impacts on national economies and politics depending on their relative positions in networks. Convergence and divergence in domestic economic policies therefore can be considered as different ends of a continuum. In other words, globalization does not have to mean a uniform convergence of national policies and institutions. Berger and Dore’s definition of convergence as a special case where the destination of the convergence process is a set of neoliberal policies and institutions, for example, is just one of many types of convergence.

In political science and sociology, the idea of studying networks in international economy has a long tradition. Dependency theory, world-system theory, and other studies of networks and hierarchies in the international system often categorize countries as the core, the periphery, or even the semiperiphery. State behavior and performance are then structurally determined by the state’s group label in the system. This is a rather static version of network effects—static in the sense that once a country is locked in a specific position in the system, its behavior is also predicted to be locked in to a certain pattern, such as economic underdevelopment for some developing countries.

18 Kaufman and Segura-Ubiergo 2001; Rudra 2002; Wibbels 2006; Rudra 2008.
19 Cardoso and Falletto 1979.
because of their peripheral positions. 22 What has occurred in the past three decades, however, seems to undermine the explanatory power of the dependency logic. The gap in economic development between developing and industrialized countries has not been shrinking, 23 which indicates no sign of weakening hierarchies in the system, but there is a growing willingness by developing countries to adopt liberal economic policies similar to those applied in developed countries. 24

More recent studies in international relations have discovered the logic of externalities of national economic policy-making. 25 A country’s policy decisions depend on what the neighbors are doing. One explanation, according to Beth Simmons and Zachary Elkins, is that a country’s policy decision alters the costs and benefits of the policy for others, either materially through direct economic competition or ideationally through the subjective pressures of prevailing global norms. 26 From this perspective, the behavior of each country is influenced by the subset of countries that it is most closely related to. One vivid illustration is tax competition and harmonization. For example, the European Union (EU) has witnessed a battle between its old and new member states over corporate tax. On one side is a group of countries led by France and Germany that launched a joint initiative to harmonize the tax base for corporate taxes in the EU in order to establish minimum rates. On the other side are the eight new EU members from Central and Eastern Europe that have joined Britain and Ireland in standing up for tax competition. It is easy to see why new member states’ corporate tax policies triggered immediate responses from old member states: Poland has reduced its basic rate from 27 percent to 19 percent, Slovakia from 25 percent to 19 percent, and Estonia does not even levy corporate tax on reinvested earnings. By contrast, Germany levies a 38.3 percent corporate tax rate and France a 34.3 percent rate. 27

Main Hypotheses

From the perspective of network analysis, the behavior of each node, that is, a national economy, is both a function of country characteristics and determined by a country’s positions in networks. 28 I argue that

---

22 This does not mean that countries do not move from one stratum to another. Numerous studies have shown that some developing countries did move out of the periphery. See Steiber 1979 and Mahutga 2006.
25 Simmons, Dobbin, and Garrett 2006; Gleditsch and Ward 2006; Franzese and Hays 2007.
26 Simmons and Elkins 2004.
systemic-level convergence forces do not hit individual countries unmediated, but through complex network structures. Below, I focus on network position similarity and network position proximity as two key network position characteristics that drive policy convergence.

NETWORK POSITION SIMILARITY AND COMPETITION

Competition is one of the key mechanisms that drive the diffusion of norms, rules, and organizational practices.\textsuperscript{29} It refers to policy interdependence stemming from peer pressure between countries competing with each other, for example, for the same export markets and the same sources of finance.\textsuperscript{30} For instance, Simmons and Elkins argue that governments’ liberalization policies will be influenced by the policies of their most important foreign economic competitors.\textsuperscript{31} William Berry and Brady Baybeck also attribute the diffusion of policy across American states to interstate competition.\textsuperscript{32}

The competition mechanism points to a key aspect of network position characteristics, that is, position similarity. One can argue that it is the similarity in network positions that defines groups of competitor countries and ultimately drives the competition mechanism of policy diffusion. Indeed, when competing in the international market, countries targeting the same sources of foreign investment and the same overseas markets are facing a collective action problem as they all want to be more competitive than their major rivals. A country often has strong incentives to adopt efficiency-mandated economic policies and institutions to gain advantages. Peer countries respond by going even further in that direction. Such competition at the group level results in convergence to liberal-style minimalism among a group of competitors.

From a network perspective, these competitors are connected in similar ways to the same external markets and sources of finance; therefore they occupy similar or even equivalent positions in the networks. Sociologists often recognize a duality between actor and position and expect that position is the primary determinant of opportunity and constraint.\textsuperscript{33} Similarity in network positions often causes competition among peers in the same network since they are substitutable; competition among substitutable peers induces them to engage in similar

\textsuperscript{29} DiMaggio and Powell 1983; Burt 1987.
\textsuperscript{30} Simmons, Dobbin, and Garrett 2006.
\textsuperscript{31} Simmons and Elkins 2004.
\textsuperscript{32} Berry and Baybeck 2005. Also see Baybeck, Berry, and Siegel 2011 for a formal model of intergovernmental competition and policy diffusion.
\textsuperscript{33} See, for example, Podolny, Stuart, Hannan 1996.
moves that result in similarity in nodal (country-level) characteristics.\textsuperscript{34} I borrow these insights and argue that similarity or even equivalence in network positions causes competition that in turn results in convergence. More specifically:

—Hypothesis 1. Similarity in network positions, especially in exports and financial inflows networks, induces convergence in domestic economic policies by peer competitive pressure.

In other words, national economies with similar profiles of exports and/or inflows of investments are substitutable from the perspective of importing countries and international investors. To survive the competition with their rival countries, they have strong incentives to adopt efficiency-mandated domestic economic policies.\textsuperscript{35}

Indeed, the competition for foreign capital has become one of the most important overarching policy goals for many policymakers in the world. Government policies that reduce returns to capital owners will subject its national economy to reduced investment and therefore slower growth. Capital’s threat to exit, especially that from more mobile capital, generates great pressure for countries chasing similar pools of foreign investments. Recent studies indicate that investors are sensitive to indicators of monetary policies and to the ways that governments collect and spend money.\textsuperscript{36} Understanding and expecting a response from the capital market, policymakers have strong incentives to work on those policies, especially when their key competitors have already done so.

In trade competition, network position similarity can induce competition among countries targeting the same overseas markets. In theory, when facing export competition, reducing production costs (by reducing social spending, for example) is not the only option left. For countries competing in labor-intensive product markets, upgrading is another option; for countries competing in high-end production, further investment in research and development might also be an alternative to a race to the bottom. However, for developing countries, moving up the production chain is difficult, if not impossible. Richard Doner, Bryan Ritchie, and Dan Slater have shown that very few devel-

\textsuperscript{34} Burt 1992.
\textsuperscript{35} Some commodities, such as oil and raw materials, are not fully substitutable. Countries whose exports are dominated by these commodities are less influenced by competitive pressure and they might even be able to form cartels, such as the Organization of the Petroleum Exporting Countries. Such countries included in the empirical analysis of this study are Kuwait, Oman, United Arab Emirates, and Venezuela.
\textsuperscript{36} Mosley 2000 and 2003; Ahlquist 2006.
oping countries (South Korea, Taiwan, and Singapore) have managed to upgrade. Moreover, a recent study on developing countries shows a negative correlation between social spending and exposure to the global market, suggesting that when facing competition in the global market, most of these countries choose a downward move rather than upgrading. For developed countries, one might argue that some firms compete on quality rather than on price and therefore are not necessarily subject to a downward pressure. Few firms competing in the global market, however, can afford to ignore the price aspect of the competition. Even German firms, famous for their high-quality production system, have taken advantage of geographical proximity to gain access to low-cost labor in Central and Eastern Europe.

In essence, what Hypothesis 1 argues is that even though two countries might be far away from each other geographically and have little direct economic contact with each other, the fact that they are connected to the rest of the world market in a similar fashion, such as exporting the same goods to the same overseas markets and/or receiving foreign investment from the same sender countries, puts them in a similar network position and induces policy convergence by competitive pressure.

There are different ways to characterize network position similarity. In this research, I choose structural equivalence because it provides the most rigorous test for the hypothesis of peer competitive pressure. In the context of binary relationship networks (nonvalued networks), Ronald Burt defines a set of structurally equivalent nodes as a set of nodes connected by the same relations to exactly the same people. The actor’s position in the network is determined by to whom she is connected. Two actors may be said to be structurally equivalent if they have the same pattern of ties with other actors. They are therefore substitutable as Robert Hanneman and Mark Riddle vividly put it, “Whatever opportunities and constraints operate on one member of a

---

37 Doner, Ritchie, and Slater 2005.
38 Rudra 2002.
40 The competition mechanism discussed in Hypothesis 1 emphasizes strategic interaction. However, competition with differential mortality might also create convergence. For example, certain firms will drop out faster than others in price competition, and the “leftovers” will be those cost minimizers that look similar; see Nelson and Winter 1982. According to neorealism, similar logic can be applied to state competition in a self-help system; Waltz 1979. It is important to differentiate “competition as strategic interaction” from “competition with differential mortality.” However, there is reason to believe that competition as strategic interaction plays a more important role for policy convergence than the latter mainly because states do not drop out from competition as easily as firms do.
41 Burt 1976.
class are also present for the others.”42 It is rare to observe exact structural equivalence in large networks of binary relationships, and even harder to find it in valued networks where the tie is a measurement of the strength of a relationship. Therefore, it is more practical to examine the degree of structural equivalence, which is often measured by the correlation between countries’ profiles of connections in the network.

NETWORK POSITION PROXIMITY AND SOCIALIZATION

As Waldo Tobler’s first law of geography says, “Everything is related to everything else, but near things are more related than distant things.” Actors that locate close to each other often enjoy a higher chance of interaction. Interaction in turn facilitates the learning and emulation that induce the diffusion of ideas and practices. In the context of globalization, one needs to go beyond proximity in physical distance and consider how connected countries are in the networks of international markets.43 Proximity in a typical network in the global economy can be conceptualized as a positive function of the magnitude of interactions between two nodes in that network. For example, in the network of trade, the volume of goods exchanged between two countries is often considered an indicator of how close they are in the network. A high volume of bilateral trade indicates a close relationship between two countries and, potentially, a high level of policy learning and emulation.

—Hypothesis 2. Proximity of national economies in networks increases domestic economic policy convergence through policy learning and emulation.

The rationale behind this hypothesis has to do with the microprocesses of socialization among states at the international level. Most of the states in the world do not invent economic policies all on their own. Rather, states engage in a socialization process where they learn from each other; they may also emulate the behavior of self-identified peers. Policy learning and emulation are two key aspects of the socialization process and both point to the important role of information in the process of policy-making. Indeed, policy-making often is not a simple response to societal pressure, and the state is more than an arena for the aggregation of societal interests.44 As Hugh Heclo puts it: “... Governments not only ‘power’. . . they also puzzle. . . . Much political interaction has constituted a process of social learning expressed through

42 Hanneman and Riddle 2005.
43 Beck, Gleditsch, and Beardsley 2006.
44 Hall 1993.
Societal pressures might trigger and set the overarching goals for policy changes, but the specific policy instruments used are the result of a complex process of policy-making where the richness and credibility of information for relevant policies play important roles.

First, policymakers need information about the nature and consequences of certain policy and its alternatives before they can make a decision. They have to be persuaded that it is the best policy among the alternatives they know to achieve some overarching goal. Persuasion has to do with cognition and active assessment of the content of a particular policy. According to Alastair Johnston, “The probability of some change in attitudes through cognition increases in an iterated, cognition-rich environment where there is lots of new information that cues linkages to other attitudes and interests.” In other words, policymakers tend to choose a policy about which they can constantly get relevant information in order to engage in systematic and intensive evaluation of the policy. Interactions at the international level can serve as channels of information that facilitate the policy-learning aspect of the socialization process. For example, frequent interactions in intergovernmental organizations push countries closer to one another in the social space for international interactions. Such interactions often bring in information regarding various aspects of the partner country’s economics and politics that policymakers can rely on to make informed judgments about policies that have been implemented in other countries.

Moreover, the source of information matters for its persuasiveness. Information from in-group members is often more convincing, and therefore is more likely to be considered persuasive, than that from out-group members. When there is conflicting information about certain policy, or when there are so many policy alternatives that it is beyond

45 Heclo 1974.

46 The competition mechanism (Hypothesis 1) that connects position similarity to policy convergence might also involve certain elements of learning. For example, firms see other firms do things in more efficient ways and they adopt these best practices. This often assumes that the adopting agents do not have prior knowledge of these efficient practices before looking at their competitors. However, the competition mechanism in this study assumes that countries have no prior knowledge of alternative policy choices. In fact, countries often know the consequences of relevant policies. The reason why they are alert to competitor countries’ policy moves is because the competitors’ move would generate strong externalities for them. Here, learning as absorbing and digesting different aspects of policies is not relevant. Moreover, for the competition mechanism, paying attention to others’ actions might not even be necessary. Countries will feel the changes in competitive pressure through the market. All a competitor country needs to do is to pay attention to its own incentives, the positive and negative stimuli it receives from its policies, and its own perception of marginal returns on policy moves. Thus, the competition mechanism might involve certain elements of learning but learning is not a necessary element of the competition mechanism.

the cognitive limits of real-world actors to look at everything, policymakers might simply choose to emulate policy choices of those in-group members. Group membership involves the identification of peers and often implies “liking.” Liking increases with more exposure, contact, and familiarity. The self-identification process involves long-term interactions along different dimensions—economic as well as social and cultural—that might create a sense of affinity among countries. This affective dimension based on trust, empathy, and sympathy is important for human interactions.48 In a policy-making process when uncertainty is high and the decision is difficult to make, policymakers are more likely to emulate the policy choice of their self-identified peers, even when they often cannot ascertain that doing so will in fact be in their best interests. It is important to note that the network version of policy learning and emulation in this study is not equivalent to recent policy-diffusion literature’s conceptualization of policy learning and emulation. That literature emphasizes learning and imitating from past experience and successful stories;49 network position characteristics (proximity) are not involved as key drivers of policy diffusion.

How does the network account of policy convergence differ from the standard economic theory of convergence that focuses on market competition and economic exchange? The conventional explanation of market competition often assumes and understands behavior at the level of individuals. The structure composed of those individuals is often missing. For instance, neoclassical theory of economic exchange often assumes an idealized social system in which actors are independent, exchanges are arm’s length and impersonal, goods are private, and preferences are fixed. When applying this logic to model policy convergence among states, the pressure for countries to adopt neoliberal policies is often understood and studied at individual country level. Countries are assumed as independent and adjust to the pressure of globalization. The decision to change policies has very little to do with countries’ positions in the networks of the global economy because the structure composed of individual countries is often assumed away.

The missing structure of globalization forces is what the network theory in this study aims to capture. Hypothesis 1 adds the network position similarity that induces policy interdependence, but only among countries that are structurally equivalent in networks. The second hypothesis argues that proximity in network position induces

48 Granovetter 1985; Uzzi 1996.
49 See Simmons, Dobbin, and Garrett 2006.
domestic economic policy convergence because proximity facilitates policy learning and emulation and, therefore, policy diffusion. This moves further away from conventional explanations of markets and comes much closer to studies in economic sociology.\textsuperscript{50} The emphasis is on the close contacts between actors in the network that facilitate information flows and create a sense of trust. Note that network proximity does not have to overlap with geographic proximity. Countries might be distant from each other but closely connected in commerce and other types of international interactions, for example. A competing hypothesis, therefore, is that states converge through regional effects based on geography that induce both economic competition and social learning. The empirical analysis in the section below controls for the effect of geographic proximity and finds little evidence to support this alternative explanation.

III. Policy Distance in Multidimensional Policy Space

To capture policy convergence, I construct a multidimensional space for domestic economic policies, with each dimension specifying one important domestic economic policy. In this way, I am able to locate every country in a policy space and trace their movements. I provide a picture of convergence-divergence phenomena by including eleven domestic economic policies that can be broadly categorized into three important policy areas as follows:

Size of Government (fiscal policies)
- government consumption spending as a percentage of total consumption
- transfers and subsidies as a percentage of GDP
- government enterprises and investment as a percentage of total investment
- levels of top marginal tax rate

Access to Sound Money (monetary policies)
- money growth
- inflation variability
- inflation rate
- freedom to own foreign bank accounts

Regulatory Policies
- credit regulations
- labor regulations
- business regulations

\textsuperscript{50} Granovetter 1985; Podolny, Stuart, and Hannan 1996; Uzzi 1996; DiMaggio and Louch 1998.
The Fraser Institute’s Economic Freedom of the World index provides sufficient data for most of the economic entities in the world. I assume equal importance for each policy dimension, that is, each of these eleven dimensions of domestic economic policies is standardized on a 0 to 10 scale to measure the extent to which domestic economic policies support personal choice, voluntary exchange, freedom to compete, and security of privately owned property. High values indicate minimal government involvement in economic activities—a policy configuration often considered as being neoliberal. Note that I choose to treat a wide range of policy indicators rather than focus on one policy dimension for two reasons: to provide a more comprehensive account of policy convergence, and because previous studies have shown that different dimensions of domestic economic policies might not be independent from each other, policymakers might use different policies as substitutes. Xun Cao, Aseem Prakash, and Michael Ward show that policymakers in OECD countries use social welfare spending and industrial subsidies as substitutes to compensate those who face severe foreign competition, governments might cut spending in social welfare provision but at the same time increase industrial subsidies to help domestic industries. Therefore, if policy changes in only one dimension are considered, for example in social welfare spending, while at the same time the countries are subsidizing domestic industries through other policy instruments, there is risk of falsely concluding that they are converging to a neoliberal model.

I define the dependent variable of this study as the pairwise distance between countries in multidimensional policy space. I consider the three policy spaces separately. I denote a country i’s policy portfolio as \( P_i = [p_{i1}, p_{i2} \ldots p_{in}]’ \) with \( n \) here as the number of policy dimensions concerned; \( p_{in} \) describes country i’s score in the \( n \)th policy dimension. The distance between two countries, \( d(P_i, P_j) \), then can be calculated accordingly in an \( n \)-dimensional policy space. I use euclidean distance:

\[
d(P_i, P_j)^n = \sqrt{\sum_{n=1}^{N} (p_{in} - p_{jn})^2}.
\]

---

51 The choice of looking at fiscal, monetary, and regulatory policies in different spaces is based on conventional ways of categorizing government domestic economic policies; see Gartzke, Gwartney, and Lawson 2005. However, these eleven policies are by no means an exhaustive list of domestic economic policies. I intend, if necessary, to provide a multidimensional policy-space approach into which more policy dimensions can be added by future studies.

52 See Cao, Prakash, and Ward 2007. Rickard 2008 presents similar findings for developing countries.
Strictly speaking, this policy distance measure is a negative function of policy convergence defined as the tendency of policies to grow more alike.\textsuperscript{53} A decrease in average policy distance does not necessarily result from a convergence to the neoliberal policy configuration. It could also be the result of a “race to the top” or “to the middle.”\textsuperscript{54} However, countries’ movements in multidimensional policy spaces, illustrated in Figures 3, 4, and 5 in the sections below, demonstrate that policy convergence in the past decade and a half looks much closer to a neoliberal type. Moreover, by looking at the means of actual (unstandardized) policy indicators, it is clear that the majority of the eleven policy dimensions have experienced significant neoliberal policy changes. For example, among policies related to the size of the government, there has been a significant drop in government-owned enterprises and investment from an average of 35.4 percent (of total investment) in 1990 to 24.8 percent in 2003, and an important decrease in top income tax rates from 50 percent in 1990 to 37 percent in 2003.\textsuperscript{55}

Policy distance is a reasonable way to capture the convergence-divergence phenomena in general, which goes beyond the neoliberal type defined by Berger and Dore.\textsuperscript{56} Global level convergence-divergence in domestic economic policies can be estimated by the average distance between countries in multidimensional policy spaces: the smaller the average distance, the higher the average level of convergence. Some measurement of the variation of policy distances, such as the standard deviation, provides information about possible clustering among countries. The subsections below illustrate the convergence-divergence phenomena by tracing countries’ movements in three multidimensional policy spaces.\textsuperscript{57}

**Size of Government: Incremental Convergence**

Four of the eleven domestic economic policy components are used to measure fiscal policies: government consumption, government transfers and subsidies, government enterprises and investment, and top

\textsuperscript{53} Kerr 1983.

\textsuperscript{54} Hays 2003.

\textsuperscript{55} Because of space limitations, more detailed numbers on government-owned enterprises and investment as well as top income tax are not reported in the text; they are available from the Economic Freedom of the World index and also from the author upon request.

\textsuperscript{56} Berger and Dore 1996.

\textsuperscript{57} Visualizations in Figures 3–5 are not perfect given the number of countries involved (≥60) and the available space on paper for each year and each policy space. However, they give general impressions for countries’ movement over time. Higher-resolution figures are available upon request from the author.
marginal tax rates. I locate countries in the four-dimensional policy space according to their standardized scores.\textsuperscript{58} Because four-dimensional space cannot be plotted, I use multidimensional scaling to reduce the dimensions. The basic idea of such scaling is to decompose a distance/dissimilarity matrix of $n$ objects into $k$ vectors of coordinates to locate each object so that their distances in the $k$ dimensional space approximate those in the distance matrix. The $N$ by $N$ distance matrix ($N$ is the number of countries) is the matrix of policy distance that has been calculated using euclidean distance before the multidimensional scaling procedure. When doing multidimensional scaling, how many dimensions ($k$) to choose must be determined—too many dimensions ($k>3$) are impossible to display, while too few might lose important information carried by additional dimensions. Quite often, the number of dimensions $k$ is chosen so that after multidimensional scaling, the $k$ dimensions keep most of the information carried by the original data ($\geq 80$ percent).\textsuperscript{59} I follow this criterion to pick the number of dimensions $k$ for plots in Figures 3, 4, and 5.

Moreover, the first row of Table 1 summarizes changes in the average distance and variation of distances in the four-dimensional policy space regarding the size of the government. From 1990 to 2003, the average distance decreases, but slowly: from 6.75 to 6.26. The same incremental decrease occurs in the variation of policy distances (reported by the standard deviation within parenthesis below the mean policy distance values in the table). Figure 3 depicts countries’ relative positions in this policy space.\textsuperscript{60} Due to space limitations, I show the policy spaces of 1990 and 2003.\textsuperscript{61}

The Economic Freedom of the World index ranks Hong Kong as the economy with the smallest government size. I then use Hong Kong (CHK), which is on the far right side of the policy space, as a reference point; the farther away a country is from Hong Kong, the more likely its policy profile is characterized by high levels of government spending, transfers, and taxation, and a large public sector. In 1990, furthest away from Hong Kong are the countries of the Soviet bloc: Russia

\textsuperscript{58} The Economic Freedom of the World index uses a simple formula $10 \times \frac{V_{\text{max}} - V_i}{V_{\text{max}} - V_{\text{min}}}$ to standardize the first two dimensions. $V_{\text{max}}$ is the highest absolute score in policy outcome; $V_{\text{min}}$ is the lowest; and $V_i$ is the score of country $i$. The scales for the other two dimensions are estimated according to reference schemes in Gartzke, Gwatney, and Lawson 2005.

\textsuperscript{59} Numerically, this empirical rule is equivalent to choosing a $k$ such that the sum of the first $k$ eigenvalues is of the order of 0.8 of the sum of the total eigenvalues; see Everitt and Dunn 2001.

\textsuperscript{60} I choose not to display the axes in the figure because there is no substantive meaning for the x- and y-axis in a figure after multidimensional scaling. The axes only represent relative positions for countries in the policy space; one can simply rotate the figure (and therefore have different values for the axes) and keep the same configuration for the countries in the space.

\textsuperscript{61} Figures for 1995 and 2000 are available from the author upon request.
Figure 3


Size of government includes government consumption, transfers, investments, and taxation. Multidimensional scaling is used to collapse these four dimensions to display a two-dimensional space. In this policy space, a small distance between two countries indicates a high level of policy convergence. Current OECD countries are circled. See Appendix 1 for a complete list of country acronyms.
From 1990 to 2003, some countries did move closer to the neoliberal role model, but the overall degree of policy convergence was small. OECD countries (circled in the figures), especially those in Western Europe, form their own group and their cluster has been easy to identify over the years. While some newly industrialized countries (some of them OECD countries as well), such as Singapore (SIN), Mexico (MEX), and Argentina (ARG), have been approaching Hong Kong, wealthy small European countries such as Denmark (DEN), Belgium (BEL), Austria (AUS), and the Netherlands (NTH) occupy the other end of the policy space and are counter-examples of the convergence thesis.

**Access to Sound Money: Convergence with Clustering**

I consider three policy dimensions related to money growth and inflation from the Economic Freedom of the World index as key components of monetary policies: the average annual growth of the money supply in the last five years minus average annual growth of real GDP in the last ten years, the standard inflation variability in the last five years, and the recent inflation rate. Moreover, the freedom to own foreign currency bank accounts domestically and abroad is considered as the fourth dimension of monetary policies.62

The second row of Table 1 shows that both the mean and the standard deviation of distances (in parenthesis) in the policy space have been decreasing over the fourteen-year period by more than 20 percent, revealing an overall trend of the monetary policy profiles of countries.

---

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Size of the government</td>
<td>6.75</td>
<td>6.56</td>
<td>6.18</td>
<td>6.26</td>
</tr>
<tr>
<td>(2.76)</td>
<td>(2.72)</td>
<td>(2.57)</td>
<td>(2.63)</td>
<td></td>
</tr>
<tr>
<td>Monetary policies</td>
<td>8.97</td>
<td>7.99</td>
<td>6.59</td>
<td>5.56</td>
</tr>
<tr>
<td>(4.92)</td>
<td>(5.37)</td>
<td>(4.42)</td>
<td>(3.75)</td>
<td></td>
</tr>
<tr>
<td>Regulation policies</td>
<td>5.75</td>
<td>4.01</td>
<td>3.18</td>
<td>2.77</td>
</tr>
<tr>
<td>(3.95)</td>
<td>(2.84)</td>
<td>(2.25)</td>
<td>(1.42)</td>
<td></td>
</tr>
</tbody>
</table>

---

62 The Economic Freedom of the World index uses the formula \(10 \times \frac{V_{max} - V}{V_{max} - V_{min}}\) to standardize the first three dimensions. For the last dimension, when foreign-currency bank accounts were permissible without restrictions both domestically and abroad, the rating is 10. When these accounts were restricted, the rating is 0. If foreign-currency bank accounts were permissible domestically but not abroad (or vice versa), the rating is 5.
Monetary policies include money growth, the level and fluctuation of inflation rates, and access to foreign currency. Multidimensional scaling is used to collapse these four dimensions to display a three-dimensional space. In this policy space, a small distance between two countries indicates a high level of policy convergence. Current OECD countries are circled. See Appendix 1 for a complete list of country acronyms.
becoming similar to each other, but only on average. Figure 4 displays countries’ positions in a three-dimensional space collapsed from the actual four-dimensional policy space for 1990 and 2003. Countries do move in the space over these fourteen-year periods. The overall trend is to move toward the cluster of countries/entities that have the most economically free type of monetary policies, such as Hong Kong (CHK), Singapore (SIN), and the United States (USA). Moreover, through the years these countries, which include some newly industrialized countries; oil-exporting countries; and current OECD members (except Mexico (MEX), Slovakia (SLO), Poland (POL), and Turkey (TUR)), have become more clustered. Some of them have almost exactly overlapping positions in the policy space, exemplifying a perfect case of convergence; the big cluster on the upper right corner of Figure 4(b) is formed by these countries. However, by 2003, another group of countries seems to form its own cluster that is quite distinguishable from that one. This cluster includes some important economies in the developing world, such as China (CHN), Brazil (BRA), Romania (RUM), and Mexico. There are some other very small clusters that have been formed during this period. Finally, Turkey remains an outlier from other countries—a vivid illustration of its high inflation rates that were out of control during this period.

Regulation of Credit, Labor, and Business: Convergence, the Perfect Case

The Economic Freedom of the World index considers three dimensions of regulation policies: credit, labor, and business. This policy area witnessed the most obvious trend of convergence. At the very beginning of the 1990s (Figure 5(a)), OECD countries formed their own cluster with a few newly industrialized economies such as Thailand (THI) and Singapore. At the same time, one can observe that China, Russia (RUS), and Poland shared very similar regulation policy profiles, reflecting their common communist legacies. A group of developing countries in Africa and Latin America (Algeria (ALG), Peru (PER), Nigeria (NIG)) found themselves close to neither the OECD nor the communist/socialist clusters. By 2003, all countries have moved

---

63 Details can be better seen on enlarged figures; higher-resolution figures are available upon request from the author.
64 There are five components of credit-market regulation to measure the extent of privatization and foreign ownership. Labor-market regulations include various aspects of the labor market such as minimum-wage laws and dismissal regulations. Regulation policies on business activities identify the extent to which regulatory restraints and bureaucratic procedures limit competition and the operation of the market.
closer to the OECD cluster, which moved much closer to the neoliberal role model, Hong Kong. This overall pattern of convergence is further reflected in the third row of Table 1 as it shows a persistent and significant decrease in the mean and the standard deviation of policy distances in the space for regulation policies. Another interesting phenomenon is the convergence among developed countries. The moves made by wealthy OECD countries are relatively small compared to those made by non-OECD countries. If considering only the clustering among OECD countries, some persistent clusters can be observed—the United States, Britain (UKG), and Canada (CAN), and that of Finland (FIN), Norway (NOR), and Sweden (SWD). This corresponds approximately to the categorization in the varieties of capitalism literature.65

RECAP OF THREE POLICY SPACES: DIFFERENTIATED CONVERGENCE

The overall trend of changes in domestic economic policies from 1990 to 2003 has been a convergence to an efficiency-mandated configuration characterized by small government, stable monetary policies, and business-friendly regulations. However, the extent of convergence varies across policy areas and countries. First, the pace of policy convergence is much greater on monetary and regulation policies (Figures 4 and 5) than on fiscal policies (Figure 3). One potential explanation has to do with the more sensitive nature of fiscal policies. Government consumption, transfers and subsidies, and government enterprises and investment all belong to the toolbox of compensation policies that have been used to protect those disadvantaged by the economic globalization.66 These policies are politically visible and sensitive issues to voters. Governments are often more hesitant to make even incremental cuts in these compensation policies.

Moreover, after having witnessed countries' policy moves in three different policy spaces, one can easily sense that some Eastern European countries and newly industrialized countries have made the largest moves by adopting more business-friendly economic policies. Developed countries, on the other hand, have moved relatively little, especially in the space for the size of the government (Figure 3). This seems to support the previous explanation of why the pace of convergence is much slower regarding policies related to the size of the government. In the wealthy developed countries where the idea of embedded liberalism and the practice of compensation policies are so entrenched, govern-

65 Hall and Soskice 2001.
66 Cameron 1978; Ruggie 1982.
Three important aspects of regulatory policy are credit, labor, and business. Multidimensional scaling is used to collapse these three dimensions to display a two-dimensional space. In this policy space, a small distance between two countries indicates a high level of policy convergence. Current OECD countries are circled. See Appendix 1 for a complete list of country acronyms.
ments face a great challenge when engaging in welfare state retrenchment.67 Finally, while the clustering of countries into different groups has become more and more evident in the space for monetary policies (Figure 4), clusters have disappeared as countries converge to the neoliberal configuration in the space for regulation policies (Figure 5).

IV. Empirical Evaluation of Network Hypotheses

Network Covariates

Similarity and proximity in network positions have to be defined with regard to specific networks in the system. In this section, I examine trade, portfolio investments, intergovernmental organization networks, and geography.68

Trade Networks

Recent literature on policy diffusion has made great progress in better specifying groups of competitor countries in trade networks. However, diffusion scholars tend to observe competitive pressures either in terms of bilateral trade patterns without making any distinction among the types of goods,69 or in terms of industry-level export profiles without making a distinction in the destination of these exports.70 Both of these measures of trade competition can mislead. In the former, two countries exporting to the same overseas market might export different products and therefore do not compete with each other. In the latter, two countries exporting similar products might target different overseas markets. A more compelling measure of trade competition should reflect both the bilateral and sectoral dimensions of trade.

I therefore use structural equivalence in the trade network that is operationalized as a similarity matrix of correlation and calculated based on each country’s export profile (detailed export product categories and destinations). I use bilateral export data and choose United Nations’ Standard International Trade Classification (SITC) to differentiate types of commodities. This standard classifies 1,832 types of commodities in international markets into ten sections (one-digit SITC level), sixty-three divisions (two-digit SITC level), 233 groups (three-digit

68 Countries might also find themselves in competition for foreign direct investments (FDI). I do not include FDI due to data unavailability. Both the OECD and the UNCTAD FDI data have no or incomplete records for the “non-OECD to non-OECD” part of the data matrix. Sector-specific FDI data are largely missing at the dyadic level.
69 Lee and Strang 2006.
70 Guler, Guillen, and MacPherson 2002.
sITC level), and 786 subgroups (four-digit sITC level). Two recent studies also measure structural equivalence at both bilateral and sector levels of trade. However, one problem associated with these two studies is the precision with which they differentiate commodity types. When calculating structural equivalence, they use bilateral export data aggregated to the one-digit sITC level. This level of aggregation is still quite broad and commodities within each one-digit sITC category are often very heterogeneous. Using higher-digit categorizations has the potential to improve the precision and to better capture the competitive pressure felt by individual countries.

Hence, I follow the classification at the two-digit sITC level to categorize international commerce. One empirical problem with two-digit categorizations is that there are over sixty categories. It is difficult to calculate correlations between countries’ export profiles defined at the bilateral level and over sixty two-digit sITC categories. The tradition in the sociological literature is to pick some key two-digit sITC categories that represent different levels of product processing. Here, I follow David Smith and Douglas White and Matthew Mahutga and use twelve two-digit sITC categories representing significant factors of commodities that span a continuous space between extraction based/labor intensive to production based/capital intensive:

- High Technology/Heavy Manufacture
- 71 machinery, other than electric
- 58 plastic materials, regenerated cellulose and artificial
- 69 manufactures of metal
- Extractive
- 64 paper, paperboard and manufactures thereof
- 25 pulp and waste paper
- 34 gas, natural and manufactured

---

72 See Cao 2010 and Cao and Prakash 2010. The ten categories are: food and live animals directly for food; beverages and tobacco; crude materials, inedible, except fuels; mineral fuels, lubricants, and related materials; animal and vegetable oils, fats, and waxes; chemical and related products; manufactured goods, classified chiefly by material; machinery and transport equipment; miscellaneous manufactured articles; and commodities and transactions not classified elsewhere.
73 Moreover, the last category, “commodities and transactions not classified elsewhere” is problematic.
74 Using trade data at higher-digit levels (for example, three- or even four-digit levels) is better for distinguishing more specific commodity types. However, while data quality decreases at higher-digit levels, measurement error and misclassification become increasingly problematic; see Mahutga 2006.
75 Nemeth and Smith 1985; Smith and White 1992; Mahutga 2006.
76 These twelve commodity categories consistently loaded high on the first factor of Smith and Nemeth 1988’s factor analysis and remained stable through the fifteen years that were analyzed (1965–1980). Mahutga 2006 also follows these twelve sectors and confirms that they remained stable in terms of their representativeness of the level of processing between 1965 and 2000.
Low Wage/Light Manufacture
- 84 clothing
- 85 footwear
- 83 travel goods, handbags and Similar Articles

Food Products and By-Products
- 01 meat and meat preparations
- 02 dairy products and bird eggs
- 29 crude animal and vegetable material

Calculating the correlation between country $i$ and $j$’s export profiles, that is, bilateral exports across the twelve two-digit STTC categories, I have a correlation measurement capturing structural equivalence between any two countries $i$ and $j$ in the networks of global trade. Finally, network proximity between country $i$ and $j$ in trade networks is measured by the volume of their bilateral trade.

PORTFOLIO INVESTMENTS

According to Hypothesis 1, structural equivalence in network positions of portfolio investments induces policy convergence among countries competing for similar sources of portfolio investments. The data for bilateral portfolio investment are from the International Monetary Fund’s (IMF) Coordinated Portfolio Investment Survey (CPIS). Geographic-breakdown tables of the CPIS data provide information on inflows of portfolio investments from seventy-one countries. When assessing financial network position similarity, ideally, one should focus on not only the source of investment but also the type of financial inflow. But the quality of the CPIS data do not allow this further differentiation; the data only break down portfolio investment into three categories, equity securities, long-term debt securities, and short-term debt securities. Moreover, large numbers of missing observations exist when one looks at these categories separately. Therefore, I use only the bilateral total portfolio investment inflow data. Correlation between country $i$ and $j$’s profiles of bilateral total financial inflows can capture the concept of structural equivalence in the network of portfolio investment.77

77 I do not consider position proximity for this network because of the anonymous nature of portfolio investment; International Monetary Fund 1992. Bilateral contact in short-term investment might facilitate convergence in accounting and auditing standards because changes in these standards involve issues that are more technical than political. Changes in policy areas, however, involve more sensitive political choices. Policy learning and emulation in these areas require certain level of direct interaction. Moreover, the correlation between network position similarity (included in this study) and position proximity (not included) in portfolio investment is quite low: 0.07, 0.08, and 0.05 for 2001, 2002, and 2003, respectively. Therefore, not including position proximity in portfolio investment is unlikely to cause omitted variable bias because omitted variable is not a big threat if either the omitted variable has no causal effect on the dependent variable or the omitted variable is uncorrelated with the included variable. King, Keohane, and Verba 1994.
Note the CPIS data provide an important alternative to common practices used in the recent policy diffusion literature to measure competitive pressure. In other studies, competitor countries in the global capital market are often measured as countries ranked in the same investment category (for example, with the same credit rating or in the same government bond index) or that are similar in the level of development measured by similarity in education levels and infrastructure indicators. But empirical data analysis suggests that structural equivalence in the network of short-term capital cannot be simply reduced to rankings in investment category and/or levels of development because they are often uncorrelated. For example, the similarity measurement based on educational and infrastructural profiles does not correlate to the structural equivalence measurement based on the actual portfolio investment flows; the correlation between the two for 2001 is only 0.07.

INTERGOVERNMENTAL ORGANIZATION NETWORKS

The last network considered is that of intergovernmental organizations. Recognizing the difference between international institutions and intergovernmental organizations, this study tests whether and how the networks of formal IGOs affect policy convergence in domestic economic policies. I use the IGO data (version 2.0) on intergovernmental organizations with at least three independent states as members maintained by Jon Pevehouse, Timothy Nordstrom, and Kevin Warnke. Scholars have already demonstrated how structural equivalence in IGO networks affects bilateral trade. I focus instead on proximity because the competition in IGO networks is unlikely to induce countries’ efforts to change domestic economic policies; if competition in IGO networks exists (for leadership or reputation, for example), it is more likely to be conducted at the international level. I measure proximity by the absolute number of shared IGO memberships between country $i$ and $j$.

GEOGRAPHICAL PROXIMITY

Finally, I control for the effects of proximity in geography. The geographical connection between two countries is set to 1 (and 0 otherwise) if they are considered geographically “connected.” I use the minimum-distance data by Kristian Gleditsch and Michael Ward. This data set records the shortest distance, in kilometers, between points

---

78 Simmons and Elkins 2004; Simmons, Dobbin, and Garrett 2006.
80 Ingram, Robinson, and Busch 2005.
on the outer boundaries for two polities. It provides the shortest distance between states as long as the two states are within 950 kilometers between the closest points on their outer boundaries. I use “within 950 kilometers between the closest points on outer boundaries” as the threshold for geographical proximity.  

**MODELING RELATIONAL/DYADIC DATA**

The dependent variable of this study belongs to relational data, which consist of measurements that are made on pairs of objects or under pairs of conditions (dyadic). However, statistical modeling for relational data often provides a challenge to standard statistical models that assume independence among observations. It is well known in the statistical literature that dependencies among dyadic observations are prevalent in most relational data.  

This point is relevant for this study because of the possibility of autocorrelation among dyadic observations for the dependent variable: the policy distance score of a certain country pair can be determined by the policy distance scores of other country pairs. For example, in the multidimensional policy space, if Germany is close to France, and France is close to Italy, it is likely that Germany is not far away from Italy. This kind of autocorrelation between dyadic observations is often called third-order dependence in the statistical literature. Ignoring third-order dependence in dyadic data and treating dyads {Germany, France}, {France, Italy}, and {Germany, Italy} as independent from each other, can cause bias in parameter estimation.

Indeed, political scientists have recognized the potential problems associated with autocorrelation among dyadic observations. For example, in a recent study on environmental policy convergence, Katharina Holzinger, Christoph Knill, and Thomas Sommerer briefly discuss the existence of autocorrelation in dyadic data: “In emphasizing these advantages we do not overlook potential weaknesses of the pair approach, in particular the possibility of autocorrelation between different dyads: the score of a certain country pair can be determined by the score of other country pairs.”

The statistical literature has proposed the concept of latent space to control for autocorrelation among dyadic observations. A series of

---

82 The basic findings are robust to other thresholds, including 600 and 900 km.
84 See Hoff 2005.
85 They, however, provide no statistical model to control for autocorrelation among dyadic observations in their data analysis. See Holzinger, Knill, and Sommerer 2008, 573.
latent-space models have been recently developed by Peter Hoff, Michael Raftery, and Mark Handcock where countries’ unobserved characteristics are captured by some latent vectors. See Appendix 2 for more explanations on the rationale of latent-space models.) For example, we can use two latent vectors, $z_i$ and $z_j$, to locate two countries in this study (countries $i$ and $j$) in the latent space and capture third-order dependence (autocorrelation) in the dyadic observations of policy distance among countries. The latent-space model has also been recently applied in the political science literature, but is mainly used to model actual flows such as trade and migration. The application of the latent-space model in the context of policy convergence, however, is long overdue.

In this study, I use the following latent-space model:

$$y_{ij} = \beta_d' x_{ij} + a_i + b_j + \varepsilon_{ij} + z_i' z_j.$$ (2)

Where $y_{ij}$ is the policy distance between country $i$ and $j$ in a multidimensional policy space, $\beta_d' x_{ij}$ represents network covariates (network position similarity in trade and portfolio investments and network position proximity in trade and IGO networks) and geographical proximity, and $a_i$ and $b_j$ represent the country random effects. $\varepsilon_{ij}$ represents a normally distributed random error. Therefore, without the cross product of latent vectors ($z_i' z_j$), $y_{ij} = \beta_d' x_{ij} + a_i + b_j + \varepsilon_{ij}$ is a typical random effects regression setup with a dyadic dependent variable.

The cross product of latent vectors of $i$ and $j$ — $z_i' z_j$ — is further added in to control for third-order dependence/autocorrelation in dyadic observations of policy distance ($y_{ij}$’s). Note that I do not include

86 Hoff, Raftery, and Handcock 2002; Hoff 2005.
87 Ward and Hoff 2007; Breunig, Cao, and Luedtke forthcoming.
88 Modeling the structure of policy distances between countries in a multidimensional policy space directly using Exponential Random Graph Model (ERGM) might be an alternative to the latent-space model. ERGM has the advantage of providing a precise and parsimonious description of the forms of dependence that can exist in relational data. I chose to delay such an exercise mainly because of the inability of ERGM to model networks with nonbinary ties. There are ways to transform the dependent variable, policy distance, into a binary measure, but do so will lose important information. Moreover, binarization necessarily involves choosing a threshold and the threshold is often somewhat arbitrary. Readers interested in the prospect of using ERGM to model policy convergence should read Cranmer and Desmarais 2011 for a related discussion and example ERGM applications in political science.
89 The dimensionality of the latent vectors can be chosen depending on the purpose of the model. If the goal is descriptive, then a choice of $k = 1, 2, \text{ or } 3$ would allow for a simple graphical presentation. Alternatively, one could examine model fit as a function of $k$ based on the log-likelihood, or use a cross-validation criterion, if primarily concerned with predictive performance. See Hoff 2005. The goal of the latent analysis for this paper is to control for higher-order dependencies while making inference of the network effects. Log-likelihoods suggest that model fits better when $k = 2$ or 3. To be consistent and cautious (not to miss one additional dimension), I set $k = 3$. 
any domestic variables and other country-pair-level variables (for example, common polity and common culture between two countries). However, the latent-space model controls for these by country random effects \((a_i\) and \(b_j\)) and cross product of countries’ latent positions \((z_i z_j)\). The former \((a_i\) and \(b_j\)) controls for domestic variables and the latter \((z_i z_j)\) can be considered as taking up the unexplained interactive/dyadic effects.90

**Empirical Findings**

I estimate the latent-space model separately in 1995, 2000, 2001, 2002, and 2003. However, because for almost every year there are some variables that do not have data, the model includes all five dyadic variables only in 2001. Robert Feenstra et al. provide bilateral division-level (two-digit SITC categories) trade data from 1962 to 2000 that I use to calculate how similar countries are in the trade network in 1995 and 2000.91 For 2001, I use Feenstra et al.’s trade data from 2000, assuming a one-year lag. For network proximity in trade (the volume of bilateral trade), I use trade data from the IMF’s Direction of Trade Statistics. I also use one-year lagged IGO membership data for 2001 since the IGO data set also ends in 2000. Meanwhile, the IMF’s Coordinated Portfolio Investment Survey is only available for 2001-2005. The availability of the five dyadic covariates for each of the five years is summarized in Table 2.

Table 3 provides a summary of the effects of network variables, presenting the mean and the lower and upper bounds of the 95 percent credible intervals for the estimated coefficients. Because I estimate the latent-space model separately for 1995, 2000, 2001, 2002, and 2003, and for three policy spaces respectively, these summaries of coefficients are also organized by year and by policy space. The names of variables are listed under the header “Parameter”: Similarity (export) and Similarity (investment) refer to network position similarity in exports and in portfolio investments; Proximity (trade) and Proximity (IGOs) refer to network position proximity in trade and in IGO networks; and Proximity (geography) refers to geographical proximity. The effects of these network variables on policy convergence are summarized by 95 percent credible intervals in each year and in each policy space.

Does network position similarity in exports induce convergence across different policy areas? The results in Table 3 suggest that it does

---

90 The latent positions and the latent-space model are estimated by Bayesian Markov Chain Monte Carlo (MCMC). Empirical Bayes priors are used. See Hoff 2005.

91 Feenstra et al. 2005.
in fiscal and regulatory policies but not in monetary policies. Specifically, in terms of fiscal policies (Size of Government), competitive pressure in trade seems to make countries converge in 1995, 2000, and 2001 as it is negatively associated with policy distance in this space; the 95 percent credible intervals for the variable clearly indicate negative associations. Therefore, in 1995, 2000, and 2001, the more similar the two countries are in export network position, the smaller the policy distance between them in the space for size of government. Furthermore, in the space for monetary policies (Sound Money), similarity in export network position is negatively associated with policy distance only in 2000 and 2001. In 1995, the 95 percent credible interval is \([-0.28, 1.35]\) with a mean coefficient estimate of 0.53, suggesting an undetermined relationship. Finally, in the area of regulation policies (Regulatory), empirical findings also suggest the negative effect of position similarity on policy distance by either looking at the 95 percent credible intervals (\([-0.60, -0.01]\) for 2000 and \([-0.56, -0.05]\) for 2001) or the 90 percent credible interval (\([-0.66, -0.01]\) for 1995).

Different from the effects of network position similarity in exports, the coefficient estimates of the variable Similarity (investment) in Table 3 show that network position similarity in transnational portfolio investments is only consistently associated with policy convergence in the policy space for size of government.\(^92\) First, for fiscal policies and for the three years 2001–03, network position similarity in portfolio investment is associated with smaller policy distances as indicated by significant and negative coefficient estimates; for 2001, even though the 95 percent credible interval includes zero, the 90 percent credible interval is \([-1.03, -0.08]\). Second, with regard to monetary policies, Similarity (investment)

\[^92\] Consistently understood as being statistically significant (by looking at the 90 percent or 95 percent credible interval) for all years for which the data for the variable are available.
is associated with smaller policy distances only for 2002 and 2003; for 2001, the 95 percent credible interval is $[-0.54, 0.89]$ with a mean coefficient estimate of 0.16, suggesting an undetermined relationship. Finally, for regulatory policies in the years 2001, 2002, and 2003, their 95 percent credible intervals indicate the estimated effect is not significant.

I now turn to the test results for Hypothesis 2 regarding proximity in network positions. I start with the network variable from the trade network, Proximity (trade). Table 3 reveals no consistent significant effect on policy convergence. Proximity in trade has a significant and negative association with policy distance in only one out of the fifteen policy-space years—in 2003 for “Sound Money.” Therefore, trade networks, however multifaceted they are, seem to have no consistent effects on countries’ decisions regarding policy convergence via the mechanisms of policy learning and emulation.93

Moving on to the last network variable of the study, Proximity (IGOs), Table 3 reveals that proximity in IGO networks consistently has a negative and significant association with policy distance. For 1995, 2000, and 2001 and all three policy spaces, the coefficient estimates are all negative and significant as indicated by the 95 percent credible intervals. In other words, the more common IGO memberships that two countries share, the smaller the policy distance between them, which implies more similar profiles of domestic economic policies. The finding on the consistently significant converging effect of position proximity in IGO networks might come as a surprise for students of international and comparative political economy who often focus on the economic forces of globalization. It suggests that in addition to the field’s common focus on trade and mobile capital, there is a social dimension of state interactions that might have real impact on domestic policies and that involves learning and emulation among those closely connected by common memberships in intergovernmental organizations.

Of course, the use of IGOs as an explanatory variable often raises the endogeneity question, that is, whether common IGO memberships cause convergence or policy convergence gives rise to IGO connections. The problem of reciprocal causality is a serious threat to any strong causal claim on the converging effect of IGO connections. Indeed, it is often very hard to determine whether states join an international organization because they tend to comply with its policy agenda or

93 One reason might be that much of world trade is standard commodities and natural resources being exchanged for industrial products. Such exchange, based on site specificity of extraction, might reduce the ability of bilateral trade to spread information for policy learning and to create a sense of affinity for emulation. Intraindustry trades, therefore, might be better at inducing convergence.
<table>
<thead>
<tr>
<th>Year</th>
<th>Parameter</th>
<th>2.5%</th>
<th>Mean</th>
<th>97.5%</th>
<th>2.5%</th>
<th>Mean</th>
<th>97.5%</th>
<th>2.5%</th>
<th>Mean</th>
<th>97.5%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Size of Government</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1995</td>
<td>Constant</td>
<td>10.92</td>
<td>11.75</td>
<td>12.61</td>
<td>10.94</td>
<td>12.60</td>
<td>14.22</td>
<td>4.59</td>
<td>5.52</td>
<td>6.42</td>
</tr>
<tr>
<td></td>
<td>Similarity (export)</td>
<td>-1.85</td>
<td>-1.41</td>
<td>-0.95</td>
<td>-0.28</td>
<td>0.53</td>
<td>1.35</td>
<td>-0.75</td>
<td>-0.34</td>
<td>0.09</td>
</tr>
<tr>
<td></td>
<td>Similarity (investment)</td>
<td>0.00</td>
<td>0.01</td>
<td>0.02</td>
<td>-0.04</td>
<td>-0.02</td>
<td>0.00</td>
<td>-0.02</td>
<td>-0.01</td>
<td>0.00</td>
</tr>
<tr>
<td></td>
<td>Proximity (trade)</td>
<td>0.00</td>
<td>0.01</td>
<td>0.02</td>
<td>-0.04</td>
<td>-0.02</td>
<td>0.00</td>
<td>-0.02</td>
<td>-0.01</td>
<td>0.00</td>
</tr>
<tr>
<td></td>
<td>Proximity (IGOs)</td>
<td>-0.12</td>
<td>-0.10</td>
<td>-0.09</td>
<td>-0.13</td>
<td>-0.10</td>
<td>-0.08</td>
<td>-0.04</td>
<td>-0.03</td>
<td>-0.02</td>
</tr>
<tr>
<td></td>
<td>Proximity (geography)</td>
<td>-1.01</td>
<td>-0.63</td>
<td>-0.23</td>
<td>-1.00</td>
<td>-0.32</td>
<td>0.40</td>
<td>-0.35</td>
<td>0.00</td>
<td>0.36</td>
</tr>
<tr>
<td>2000</td>
<td>Constant</td>
<td>9.56</td>
<td>10.31</td>
<td>11.12</td>
<td>9.00</td>
<td>10.51</td>
<td>11.86</td>
<td>3.75</td>
<td>4.62</td>
<td>5.40</td>
</tr>
<tr>
<td></td>
<td>Similarity (export)</td>
<td>-1.83</td>
<td>-1.41</td>
<td>-1.02</td>
<td>-1.72</td>
<td>-1.11</td>
<td>-0.50</td>
<td>-0.60</td>
<td>-0.30</td>
<td>-0.01</td>
</tr>
<tr>
<td></td>
<td>Similarity (investment)</td>
<td>0.00</td>
<td>0.00</td>
<td>0.01</td>
<td>-0.01</td>
<td>0.00</td>
<td>0.01</td>
<td>-0.01</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td></td>
<td>Proximity (trade)</td>
<td>-0.09</td>
<td>-0.08</td>
<td>-0.06</td>
<td>-0.10</td>
<td>-0.08</td>
<td>-0.06</td>
<td>-0.04</td>
<td>-0.03</td>
<td>-0.02</td>
</tr>
<tr>
<td></td>
<td>Proximity (IGOs)</td>
<td>-0.84</td>
<td>-0.49</td>
<td>-0.14</td>
<td>-0.21</td>
<td>0.53</td>
<td>1.26</td>
<td>-0.20</td>
<td>0.03</td>
<td>0.36</td>
</tr>
<tr>
<td>2001</td>
<td>Constant</td>
<td>10.70</td>
<td>11.59</td>
<td>12.46</td>
<td>8.56</td>
<td>9.79</td>
<td>11.07</td>
<td>3.22</td>
<td>3.70</td>
<td>4.19</td>
</tr>
<tr>
<td></td>
<td>Similarity (export)</td>
<td>-2.02</td>
<td>-1.60</td>
<td>-1.15</td>
<td>-1.49</td>
<td>-0.96</td>
<td>-0.40</td>
<td>-0.56</td>
<td>-0.31</td>
<td>-0.05</td>
</tr>
<tr>
<td></td>
<td>Similarity (investment)</td>
<td>-1.09</td>
<td>-0.55</td>
<td>0.02</td>
<td>-0.54</td>
<td>0.16</td>
<td>0.89</td>
<td>-0.18</td>
<td>0.13</td>
<td>0.46</td>
</tr>
<tr>
<td></td>
<td>Proximity (trade)</td>
<td>-0.01</td>
<td>0.00</td>
<td>0.01</td>
<td>-0.01</td>
<td>0.00</td>
<td>0.01</td>
<td>-0.01</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td></td>
<td>Proximity (IGOs)</td>
<td>-0.11</td>
<td>-0.09</td>
<td>-0.08</td>
<td>-0.10</td>
<td>-0.08</td>
<td>-0.06</td>
<td>-0.03</td>
<td>-0.02</td>
<td>-0.01</td>
</tr>
<tr>
<td></td>
<td>Proximity (geography)</td>
<td>-0.59</td>
<td>-0.24</td>
<td>0.12</td>
<td>-0.18</td>
<td>0.41</td>
<td>1.00</td>
<td>-0.24</td>
<td>-0.04</td>
<td>0.17</td>
</tr>
<tr>
<td>Year</td>
<td>Constant</td>
<td>Similarity (export)</td>
<td>Similarity (investment)</td>
<td>Proximity (trade)</td>
<td>Proximity (IGOS)</td>
<td>Proximity (geography)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>------</td>
<td>----------</td>
<td>---------------------</td>
<td>------------------------</td>
<td>------------------</td>
<td>-----------------</td>
<td>----------------------</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2002</td>
<td></td>
<td></td>
<td>-2.37</td>
<td>-0.01</td>
<td>-1.94</td>
<td>-0.41</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>-1.86</td>
<td>0.00</td>
<td>-1.58</td>
<td>-1.80</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>-1.37</td>
<td>0.00</td>
<td>-1.20</td>
<td>-1.31</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>-1.90</td>
<td>-0.02</td>
<td>-1.01</td>
<td>-1.48</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>-1.28</td>
<td>-0.01</td>
<td>-0.60</td>
<td>-0.89</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>-0.71</td>
<td>0.00</td>
<td>-0.15</td>
<td>-0.30</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>-0.41</td>
<td>-0.01</td>
<td>-0.55</td>
<td>-0.34</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>-0.18</td>
<td>0.00</td>
<td>-0.38</td>
<td>-0.08</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0.04</td>
<td>0.00</td>
<td>-0.21</td>
<td>0.17</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2003</td>
<td></td>
<td></td>
<td>-2.32</td>
<td>-0.01</td>
<td>-2.12</td>
<td>-0.34</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>-1.80</td>
<td>0.00</td>
<td>-1.76</td>
<td>-0.08</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>-1.31</td>
<td>-0.01</td>
<td>-1.42</td>
<td>0.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>-1.48</td>
<td>0.00</td>
<td>-0.74</td>
<td>0.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>-0.89</td>
<td>-0.01</td>
<td>-0.36</td>
<td>0.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>-0.30</td>
<td>0.00</td>
<td>-0.57</td>
<td>0.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>-0.34</td>
<td>0.00</td>
<td>-0.39</td>
<td>0.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>-0.08</td>
<td>0.00</td>
<td>-0.21</td>
<td>0.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Mean and lower and upper bounds of the 95 percent credible interval for estimates of the effects of network variables on policy distance in the space for the size of government, sound money, and regulatory policies for 1995 and 2000–2003.*
whether the IGO membership has real constraining effect on policies. However, even though the reciprocal causality cannot be completely separated, the finding of a consistently significant and negative effect of IGO connections on policy distances indicates the importance of the social dimension of globalization, one that is separate from the actual material forces of competition and exchange.

Finally, for all three policy spaces (fiscal, monetary, and regulatory), geography does not emerge as consistently significant and therefore has no systematic effect on policy convergence. Table 4 presents a summary of what has been discussed with regards to the effects of network variables on policy distance: proximity in IGO networks is the only variable that has consistently shown significant and negative association with policy distance across the three policy spaces and for all three years for which data are available. Position similarity in the exports network induces convergence in fiscal and regulatory policies. Position similarity in the network of transnational portfolio investments induces convergence only in fiscal policies. Finally, proximity in trade and proximity in geography have no consistent (over time) effect on policy convergence.94

V. Conclusion and Discussion

This article attempts to answer two questions in the convergence-divergence debate. The first concerns patterns of domestic economic policy changes. I reveal the overall pattern of policy convergence to a neoliberal policy profile. Moreover, the extent of convergence varies across different policy areas and different countries. The second asks for an explanation of the convergence-divergence phenomena. I focus on how the networks of trade, portfolio investment, and intergovernmental organizations affect convergence in domestic economic policies. I present and test two hypotheses: first, the similarity of network positions induces convergence in domestic economic policies as a result of competitive pressure, and second, the proximity in network positions facilitates policy learning and emulation and eventually policy convergence. The empirical findings from a latent-space model provide strong support for these network hypotheses.

94 Because of space limitations, the estimates of country-level random effects and variances of latent space dimensions are not reported in Table 3. Appendix 3 provides detailed information of the findings regarding the converging effects (or lack thereof) of network variables for 2001, in the space for the size of the government.
What does this study illuminate about the workings of globalization? Three general points deserve to be highlighted. First, it brings a network perspective to the understanding of how globalization affects domestic policy changes. The network perspective conceptualizes international political economy as a complex system with national economies embedded in multiple networks. The approach gives the often-

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Year</th>
<th>Size of Government</th>
<th>Sound Money</th>
<th>Regulatory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Similarity (export)</td>
<td>1995</td>
<td>converging</td>
<td></td>
<td>converging*</td>
</tr>
<tr>
<td></td>
<td>2000</td>
<td>converging</td>
<td>converging</td>
<td>converging</td>
</tr>
<tr>
<td></td>
<td>2001</td>
<td>converging</td>
<td>converging</td>
<td>converging</td>
</tr>
<tr>
<td></td>
<td>2002</td>
<td>n.a.</td>
<td>n.a.</td>
<td>n.a.</td>
</tr>
<tr>
<td></td>
<td>2003</td>
<td>n.a.</td>
<td>n.a.</td>
<td>n.a.</td>
</tr>
<tr>
<td>Similarity (investment)</td>
<td>1995</td>
<td>n.a.</td>
<td>n.a.</td>
<td>n.a.</td>
</tr>
<tr>
<td></td>
<td>2000</td>
<td>n.a.</td>
<td>n.a.</td>
<td>n.a.</td>
</tr>
<tr>
<td></td>
<td>2001</td>
<td>converging*</td>
<td></td>
<td>converging*</td>
</tr>
<tr>
<td></td>
<td>2002</td>
<td>converging</td>
<td>converging</td>
<td>converging</td>
</tr>
<tr>
<td></td>
<td>2003</td>
<td>converging</td>
<td></td>
<td>converging</td>
</tr>
<tr>
<td>Proximity (trade)</td>
<td>1995</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2001</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2002</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2003</td>
<td></td>
<td></td>
<td>converging</td>
</tr>
<tr>
<td>Proximity (IGOs)</td>
<td>1995</td>
<td>converging</td>
<td>converging</td>
<td>converging</td>
</tr>
<tr>
<td></td>
<td>2000</td>
<td>converging</td>
<td>converging</td>
<td>converging</td>
</tr>
<tr>
<td></td>
<td>2001</td>
<td>converging</td>
<td>converging</td>
<td>converging</td>
</tr>
<tr>
<td></td>
<td>2002</td>
<td>n.a.</td>
<td>n.a.</td>
<td>n.a.</td>
</tr>
<tr>
<td></td>
<td>2003</td>
<td>n.a.</td>
<td>n.a.</td>
<td>n.a.</td>
</tr>
<tr>
<td>Proximity (geography)</td>
<td>1995</td>
<td>converging</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2000</td>
<td>converging</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2001</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2002</td>
<td>converging</td>
<td>converging</td>
<td>converging</td>
</tr>
<tr>
<td></td>
<td>2003</td>
<td>converging</td>
<td>converging</td>
<td>converging</td>
</tr>
</tbody>
</table>

*“Converging” indicates a significant converging effect at 95 percent credible level; “converging*” indicates a significant converging effect at the 90 percent credible interval; “n.a.” indicates missing data for the policy-space year; and a blank space indicates a statistically insignificant effect.
discussed but underspecified globalization forces a richer structure by revealing different aspects of network positions and relating those position characteristics to the detailed mechanisms by which globalization forces affect domestic policy convergence. It also takes a significant step beyond the recent attention to spatial dependence and policy diffusion mechanisms, which often focus on geographical proximity and similarity in the level of development.\textsuperscript{95}

Second, the study differentiates specific position characteristics for each network. By further focusing on network position similarity and proximity, two among many network position characteristics that could potentially affect domestic policies, the network approach generates testable hypotheses and models for existing data. Sophisticated and necessary tools (for example, the latent-space model) are capable of bringing rich data to empirical tests of these hypotheses. Third, in addition to detailed analysis on the economic forces of globalization (trade and capital flows), the study brings in a social dimension of globalization that has often been overlooked by the comparative and international political economy literature. Indeed, the empirical findings of this research suggest that the social dimension of globalization as reflected by countries’ embeddedness in the IGO networks is an important driving force for domestic policy convergence.\textsuperscript{96}

I recognize that this research is only a first step to connect networks of international political economy to domestic policy changes and the empirical findings beg future research efforts. Given the fact that most of the work on policy convergence to date uses some measure of trade to capture globalization pressure, the finding of no converging effect from direct trade connections is a reminder that research in this area might have to target new sources of globalization pressure. In this regard, the socialization mechanism in the IGO networks deserves special attention in future studies.\textsuperscript{97} Detailed analysis to expose and differen-

\textsuperscript{95} Simmons and Elkins 2004; Franzese and Hays 2007.

\textsuperscript{96} At the same time, the clear lack of support for direct bilateral trade connections as a mechanism for policy diffusion suggests that one needs to go beyond the normal focus of trade as direct contact to understand, and maybe affect, economic policy diffusion across borders. For developing countries, simply joining the global trade network and establishing trade contacts with developed countries are probably not going to easily induce within-country economic policy changes. The social dimension of international interactions, such as in the IGO networks, might play a more important role.

\textsuperscript{97} This paper treats all IGOs alike, which is not a perfect way of teasing out different causal mechanisms such as learning, emulation, and coercion in cases of strong IGOs (for example the European Union and the OECD). In an earlier study, I deal with these problems by looking at different types of IGOs; see Cao 2009. The findings there demonstrate the important roles played by salient IGOs such as the World Trade Organization, the EU, and the OECD. The findings also support the policy learning mechanism through even the weakest types of IGOs, that is, those with the minimal level of institutional capacity to force countries to commit.
tiate microprocesses of the socialization mechanisms would advance the understanding of potential ways in which international institutions affect state behavior.\(^9\)

Moreover, this study only examines the networks of trade, portfolio investments, and IGOs. Future research should incorporate other networks of international political economy, such as migration networks and information flows through the Internet.\(^9\) Furthermore, the link between networks at the international level and changes in domestic institutions remains unexplored. I focus on policy outcomes rather than institutions because of the stickiness of institutions. However, some of the policy outcomes are largely a function of institutional settings. For instance, stable monetary policies are often linked to central bank independence.\(^1\) Whether and how network dynamics at the international level drive the spread of certain domestic economic institutions are interesting though more challenging questions for future research. Finally, network effects—competitive pressure and policy learning as well as emulation—are likely to be mediated by various national political institutions and other political dynamics. In this article, I rely on a latent-space model to control for the effects of domestic variables statistically. Future research needs to extend the existing theoretical model to include domestic political dynamics and mediating effects of domestic political institutions.\(^1\)

For the past few decades, network analysis has been used to explore processes and phenomena as diverse as the diffusion of information through an organization, the adoption of innovations in society, and the spread of infectious disease in a population. Network analysis has also been applied to study phenomena that intrigue political scientists, such as environmental sustainability,\(^2\) proliferation of atomic weapons,\(^3\) cosponsorship in the congress,\(^4\) and militarized interstate conflicts.\(^5\) My hope is that this article contributes to the new network tradition in political science research and particularly inspires further research that

---

98 Like many quantitative studies that use structural variables as explanatory variables, it is difficult for this study to demonstrate causal mechanisms step by step. Formal models and process-tracing case studies are promising ways to reveal microlevel evidence.

99 See Appendix 4 for further robustness checks including variables such as polity distance.

100 Broz 2002.

101 Cao and Prakash 2012 present a model in which the effects of trade competition on environmental regulations are mediated by domestic political constraints and issue visibility.

102 Ward 2006.


104 Fowler 2006a; Fowler 2006b.

105 Hafner-Burton and Montgomery 2006; Maoz 2006; Maoz et al. 2006.
advances the understanding of how networks of international political economy affect various aspects of state behavior.

APPENDIX 1
COUNTRY NAMES AND ACRONYMS

Algeria (ALG), Angola (ANG), Argentina (ARG), Australia (AUL), Austria (AUS), Belgium (BEL), Brazil (BRA), Bulgaria (BUL), Canada (CAN), Chile (CHL), China (CHN), China Hong Kong (CHK), Colombia (COL), former Czechoslovakia (CZE), Czech Republic (CZR), Denmark (DEN), Dominican Republic (DOM), Ecuador (ECU), Finland (FIN), France (FRN), former Federal Germany (GFR), Germany (GMY), Greece (GRC), Hungary (HUN), India (IND), Indonesia (INS), Iran (IRN), Ireland (IRE), Israel (ISR), Italy (ITA), Japan (JPN), Kazakhstan (KAK), Korean Republic (ROK), Kuwait (KUW), Libya (LIB), Luxembourg (LUX), Malaysia (MAL), Mexico (MEX), Morocco (MOR), Netherlands (NTH), New Zealand (NEW), Nigeria (NIG), Norway (NOR), Oman (OMA), Pakistan (PAK), Peru (PER), Philippines (PHI), Poland (POL), Portugal (POR), Qatar (QAT), Romania (RUM), Russian Federation (RUS), Saudi Arabia (SAU), Singapore (SIN), Slovakia (SLO), Slovenia (SLV), South Africa (SAF), Spain (SPN), Sweden (SWE), Switzerland (SWZ), Thailand (THI), Tunisia (TUN), Turkey (TUR), United Arab Emirates (UAE), United Kingdom (UKG), former USSR (USR), United States of America (USA), Venezuela (VEN), Vietnam (DRV), and former Yugoslavia (YUG).

APPENDIX 2
AUTOCORRELATION IN DYADIC DATA AND LATENT SPACE MODELS

How can third-order dependence (or autocorrelation) be controlled when estimating dyadic data? In order to find a solution, the nature of third-order dependence must first be understood. Studies from recent statistical literature have provided extensive technical discussion on this topic. Put simply, third-order dependence/autocorrelation among dyadic observations reflects similarities in some underlying characteristics of countries. These characteristics are often unobserved or not measured by the existing data, therefore, they cannot be easily modeled as control variables. However, countries that have similar latent characteristics often behave similarly, for example, adopting similar economic policies. This results in autocorrelation/third-order dependence among dyadic observations (for example, the policy distance scores of this study) involving these countries. The more similar the countries
are in terms of these underlying latent characteristics, the closer they are in latent space and the higher the level of third-order dependence expected to be observed among dyadic observations of these countries. In other words, the latent space that summarizes these unobserved characteristics is another “image” of the autocorrelation in the dyadic data. If the positions of each country in latent space can be mapped out, it can then be assumed that dyadic observations are conditionally independent given these latent positions.

The statistical literature has proposed the concept of latent space to capture these underlying characteristics and a series of latent space models have been recently developed by Peter Hoff, Adrian Raftery, and Mark Handcock where countries’ unobserved characteristics are captured by some latent vectors. For example, two latent vectors, \( z_i \) and \( z_j \), can be used to locate two countries in this study (countries \( i \) and \( j \)) in latent space and capture third-order dependence/autocorrelation in the dyadic observations of policy distance among countries. The latent positions (\( z_i \) and \( z_j \)) for countries \( i \) and \( j \) are not observed directly, but can be estimated from the data by a latent-space model, such as the one developed by Hoff and applied in this study.106

Therefore, by assuming that each country has a vector of latent characteristics and that countries relate preferentially to others with similar latent characteristics, the latent-space model controls for third-order dependence/autocorrelation in dyadic data and gives more accurate estimates for the effects of the network variables on policy convergence. In the model used by this study, \( y_{ij} = \beta' \cdot x_{ij} + a_i + b_j + \varepsilon_{ij} + z_i' \cdot z_j \), the cross product of latent vectors of \( i \) and \( j \) — \( z_i' \cdot z_j \) — are used to capture third order dependence/autocorrelation in dyadic observations of policy distance (\( y_{ij} \)’s).

APPENDIX 3
Detailed Findings for 2001, Size of the Government

Table A3 provides more detailed information of the findings regarding the converging effects (or lack thereof) of network variables for 2001 in the space for the size of government. Notice that the country-level random effects (\( \sigma^2 \)) are important. This indicates that there is still a large amount of variation in the dependent variable unexplained by the network variables in the study. Also, the variances of dimensions of latent space (\( \sigma^2_{z1}, \sigma^2_{z2}, \) and \( \sigma^2_{z3} \)) are also significant, revealing the exis-

106 Hoff, Raftery, and Handcock 2002; Hoff 2005.
tence of third-order dependence/autocorrelation in the dyadic data of this study. This further supports the use of the latent-space model to control for potential (now proved) autocorrelation among dyadic observations.

**APPENDIX 4**

**FURTHER ROBUSTNESS CHECKS BY INCLUDING POLITY DISTANCE**

Does political similarity offer an explanation for diffusion? That is, do countries with similar political regimes learn more from each other? This section presents findings from a test of this alternative hypothesis. The additional variable, Distance (polity), is dyadic and is defined as the absolute difference between the polity scores of country $i$ and $j$. If countries are more likely to learn from countries with similar political regime types, we should expect a positive relationship between Distance (polity) and policy distance.

Table A4 reports the empirical findings. The estimated effects of other variables do not change much compared to those summarized in Table 3 when Distance (polity) is not included: proximity in geography does not have consistent effect over time; proximity in IGO networks induces policy convergence in all three policy areas; similarity in exports mainly affects policy convergence in fiscal and regulatory policies. What is new and interesting here is the effect of polity distance:

**Table A3**

<table>
<thead>
<tr>
<th></th>
<th>2.5%</th>
<th>Mean</th>
<th>97.5%</th>
<th>$\hat{\sigma}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>$\beta_0$</td>
<td>10.70</td>
<td>11.59</td>
<td>12.46</td>
</tr>
<tr>
<td>Similarity (export)</td>
<td>$\beta_1$</td>
<td>-2.02</td>
<td>-1.60</td>
<td>-1.15</td>
</tr>
<tr>
<td>Similarity (investment)</td>
<td>$\beta_2$</td>
<td>-1.09</td>
<td>-0.55</td>
<td>0.02</td>
</tr>
<tr>
<td>Proximity (trade)</td>
<td>$\beta_3$</td>
<td>-0.01</td>
<td>0.00</td>
<td>0.01</td>
</tr>
<tr>
<td>Proximity (IGOs)</td>
<td>$\beta_4$</td>
<td>-0.11</td>
<td>-0.09</td>
<td>-0.08</td>
</tr>
<tr>
<td>Proximity (geography)</td>
<td>$\beta_5$</td>
<td>-0.59</td>
<td>-0.24</td>
<td>0.12</td>
</tr>
<tr>
<td>Variance of country random effects</td>
<td>$\sigma^2_z$</td>
<td>1.13</td>
<td>1.74</td>
<td>2.66</td>
</tr>
<tr>
<td>Error variance</td>
<td>$\sigma^2_\epsilon$</td>
<td>3.76</td>
<td>4.04</td>
<td>4.33</td>
</tr>
<tr>
<td>Variance of latent dimensions 1</td>
<td>$\sigma^2_z$</td>
<td>0.06</td>
<td>0.12</td>
<td>0.22</td>
</tr>
<tr>
<td>Variance of latent dimensions 2</td>
<td>$\sigma^2_z$</td>
<td>0.04</td>
<td>0.10</td>
<td>0.20</td>
</tr>
<tr>
<td>Variance of latent dimensions 3</td>
<td>$\sigma^2_z$</td>
<td>0.04</td>
<td>0.10</td>
<td>0.19</td>
</tr>
<tr>
<td>Year</td>
<td>Parameter</td>
<td>Size of Government</td>
<td>Sound Money</td>
<td>Regulatory</td>
</tr>
<tr>
<td>--------</td>
<td>-------------------------------</td>
<td>--------------------</td>
<td>-------------------</td>
<td>-----------------</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2.5%</td>
<td>Mean</td>
<td>97.5%</td>
</tr>
<tr>
<td></td>
<td>Similarity (export)</td>
<td>−1.87</td>
<td>−1.41</td>
<td>−0.97</td>
</tr>
<tr>
<td></td>
<td>Similarity (investment)</td>
<td>0.00</td>
<td>0.01</td>
<td>0.02</td>
</tr>
<tr>
<td></td>
<td>Proximity (trade)</td>
<td>−0.11</td>
<td>−0.09</td>
<td>−0.08</td>
</tr>
<tr>
<td></td>
<td>Proximity (IGOs)</td>
<td>−1.02</td>
<td>−0.66</td>
<td>−0.31</td>
</tr>
<tr>
<td></td>
<td>Distance (polity)</td>
<td>0.03</td>
<td>0.06</td>
<td>0.08</td>
</tr>
<tr>
<td>2000</td>
<td>Constant</td>
<td>8.39</td>
<td>9.09</td>
<td>9.87</td>
</tr>
<tr>
<td></td>
<td>Similarity (export)</td>
<td>−1.86</td>
<td>−1.46</td>
<td>−1.05</td>
</tr>
<tr>
<td></td>
<td>Similarity (investment)</td>
<td>0.00</td>
<td>0.00</td>
<td>0.01</td>
</tr>
<tr>
<td></td>
<td>Proximity (trade)</td>
<td>−0.07</td>
<td>−0.06</td>
<td>−0.05</td>
</tr>
<tr>
<td></td>
<td>Proximity (IGOs)</td>
<td>−0.79</td>
<td>−0.46</td>
<td>−0.13</td>
</tr>
<tr>
<td></td>
<td>Distance (polity)</td>
<td>0.07</td>
<td>0.10</td>
<td>0.12</td>
</tr>
<tr>
<td>2001</td>
<td>Constant</td>
<td>8.89</td>
<td>9.87</td>
<td>10.81</td>
</tr>
<tr>
<td></td>
<td>Similarity (export)</td>
<td>−2.13</td>
<td>−1.71</td>
<td>−1.29</td>
</tr>
<tr>
<td></td>
<td>Similarity (investment)</td>
<td>−0.81</td>
<td>−0.32</td>
<td>0.22</td>
</tr>
<tr>
<td></td>
<td>Proximity (trade)</td>
<td>−0.01</td>
<td>0.00</td>
<td>0.01</td>
</tr>
<tr>
<td></td>
<td>Proximity (IGOs)</td>
<td>−0.08</td>
<td>−0.07</td>
<td>−0.06</td>
</tr>
<tr>
<td></td>
<td>Proximity (geography)</td>
<td>−0.61</td>
<td>−0.23</td>
<td>0.12</td>
</tr>
<tr>
<td></td>
<td>Distance (polity)</td>
<td>0.10</td>
<td>0.13</td>
<td>0.16</td>
</tr>
<tr>
<td>Year</td>
<td>Parameter</td>
<td>Size of Government</td>
<td>Sound Money</td>
<td>Regulatory</td>
</tr>
<tr>
<td>------</td>
<td>----------------------------------</td>
<td>--------------------</td>
<td>-------------</td>
<td>------------</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2.5%</td>
<td>Mean</td>
<td>97.5%</td>
</tr>
<tr>
<td>2002</td>
<td>Constant</td>
<td>1.84</td>
<td>3.46</td>
<td>5.05</td>
</tr>
<tr>
<td></td>
<td>Similarity (export)</td>
<td>-1.61</td>
<td>-1.11</td>
<td>-0.65</td>
</tr>
<tr>
<td></td>
<td>Similarity (investment)</td>
<td>-0.01</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td></td>
<td>Proximity (trade)</td>
<td>-1.47</td>
<td>-1.16</td>
<td>-0.85</td>
</tr>
<tr>
<td></td>
<td>Proximity (geography)</td>
<td>0.47</td>
<td>0.61</td>
<td>0.74</td>
</tr>
<tr>
<td></td>
<td>Distance (polity)</td>
<td>0.57</td>
<td>0.68</td>
<td>0.79</td>
</tr>
<tr>
<td>2003</td>
<td>Constant</td>
<td>1.38</td>
<td>2.63</td>
<td>3.93</td>
</tr>
<tr>
<td></td>
<td>Similarity (export)</td>
<td>-1.47</td>
<td>-0.97</td>
<td>-0.47</td>
</tr>
<tr>
<td></td>
<td>Similarity (investment)</td>
<td>-0.01</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td></td>
<td>Proximity (trade)</td>
<td>-1.49</td>
<td>-1.17</td>
<td>-0.86</td>
</tr>
<tr>
<td></td>
<td>Proximity (IGOS)</td>
<td>0.57</td>
<td>0.68</td>
<td>0.79</td>
</tr>
<tr>
<td></td>
<td>Distance (polity)</td>
<td>0.57</td>
<td>0.68</td>
<td>0.79</td>
</tr>
</tbody>
</table>

*Mean and lower and upper bounds of 95 percent credible intervals for 1995 and 2000–03.*
I find a positive relationship between Distance (polity) and policy distance and the effect is consistently significant over the years for fiscal policies (Size of Government). This suggests that countries do tend to learn more from those with similar political regimes, especially in fiscal policies.

Further robustness checks test the network theories in subsamples of countries. I have experimented with a subsample of the OECD countries. The results concerning the effect of IGO connections are very similar to those in Table 3; for Similarity (export)—the difference is that the consistent (over time) converging effect disappears for fiscal policies. I have also tried to only use the non-EU countries. The results are also very similar to those in Table 3 when all countries with available data are used. Tables for these further robustness checks are not presented in the paper because of space limitations; but are available upon request.

References


