

Phone Calls and Fax Machines: The Limits to Globalization

Globalization is everywhere. States, economies, and societies are increasingly integrated. Flows of goods, capital, humans, and cultural objects now link all of us in a global integrated web.¹ The development of international trade has had the most immediate (or most visible) consequence, but money in and of itself has arguably come to play an even larger role than the transfer of material goods. Labor, while still subject to much greater control than capital, moves transnationally, while tourism involves an estimated 600 million international travelers a year. The ubiquity of CNN is already a cliché, and entertainment industry budgets are calculated on the basis of a global market.

The world is experiencing a compression of international time and space; no country, no economy, and no society can expect to remain an island.² The separation of production and consumption that defines the market economy appears to have reached its zenith. Political structures are not immune to apparently overwhelming forces of globalization; even the most powerful states tremble before the vagaries of the international market. Globalization is not just another buzzword (“globaloney”) but very much a real and significant phenomenon.

But what does it mean? What does a globalized world look like? Much of the writing on globalization takes one of two equally simplistic positions.³ The optimists view globalization as a practically unmixed blessing destined to increase economic production, reduce political tensions, and create new forms of communication over and above national loyalties and customs. Pes-

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simists see it as increasing the already wide gulf between the haves and the have-nots. With few exceptions, however, analyses of globalization have largely been lacking in any systematic empirical basis and many of them have been descriptive.⁴ Anecdotal evidence of Rambo screenings in Borneo, Chunnels, and 24-hour stock trading can only give a flavor of the changes taking place; they do not give a clear picture of what, if any, structural transformations are occurring.

We use changes in international telecommunications to explore the process of globalization.⁵ Telephone communication nicely captures all of the various elements involved in international integration. It reflects contacts on a variety of social levels, from the frantic calls of high finance to the family conversations of illegal workers. Unlike most measures, telephone contact includes both the social and economic dimensions involved in globalization. Telecommunications transmit information on the movement of goods, capital, and human beings.⁶ Analyses of individual country telephone patterns indicate that telephone traffic is correlated with both economic relations (for example, trade) and social ties (for example, tourism and migration).⁷ Telephone networks, therefore, are not only a part of the increasing interconnectivity, but they also serve as a wonderful reflection of the myriad of links.

We ask a set of simple questions: How much has telecommunications grown? How has that growth been distributed? How has the shape of the international network of countries changed over the past 15 years? In short, who calls whom? Readers should note that we are not making causal claims about how or why these trends developed. Such an analysis would require parallel data on trade, migration, and so on (information that we are currently in the process of gathering). For now, we are limited to describing rather than explaining what we see. Given the central importance of this phenomenon and the relative scarcity of solid information about it, we consider even such a limited goal worthwhile.

Models of the Global Web

There are currently three dominant interpretations of the process of global interdependence, and we have used them to structure our discussion of the data.

“Interdependent globalization” is defined by a generic and system-wide increase in reciprocal ties between countries. From this perspective, the web of international contact is expanding in a fairly uniform shape. This has been the largely accepted assumption behind much of the discussion of increasing interconnection. A universal globalization process would be char-

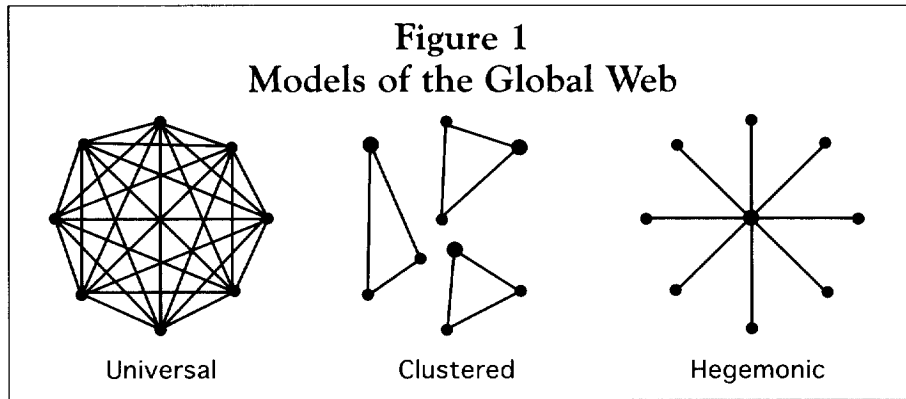
acterized by an exponential increase in absolute telephone traffic and a homogenous rate of growth of contact between definable clusters of countries.

“Civilizations and empires” is a much less optimistic view defined by an increasing concentration of communication within clusters of countries that are united by a common cultural heritage or united by an imperial past. According to the first variant associated with the recent work of Samuel Huntington, we have seen and will continue to see increasing divisions across cultural lines.⁵ For our purposes this would be characterized by the presence of distinct subnetworks based on language or culture, an increase in contact within these subnetworks, and a relative decline in contact between clusters. The second or “empires” perspective serves as a materialist parallel to the Huntingtonian clash. In this version we would expect clustering around the three major powers of the United States, the European Union (Germany), and Japan. This pattern would be characterized by a presence of distinct subnetworks following economic, ex-colonial, or regional links with states assuming asymmetrical positions within these subnetworks.

Finally, “hegemonic globalization” is defined by the consistent or increasing centrality of a small core of rich countries and perhaps domination by a single power. This view sees globalization as merely an acceleration of the concentration of resources and influence in the European and North American cluster, with some limited East Asian additions. In our data, this would be reflected in the increasing asymmetrical network centrality of the United States and an increasing centrality of core countries.

These three generic perspectives obviously do not exhaust the possible models. They do serve as examples, however, of the three basic network patterns. The interdependent globalization model assumes a world in which each unit is equally connected to every other unit, as in the first diagram below. The civilizations and empires model perceives the world as a series of closed cliques, with little communication among them and intensive interaction within the respective groups, as in the middle diagram. The hegemonic globalization model imagines the world system in terms of the spokes on a wheel, where there is little or no contact between the various points on the circumference and each point is oriented toward contact with the center. It should be obvious that globalization will have very different consequences depending on which model it follows. Each of the following sections discusses how the telephone data fit these different perspectives.

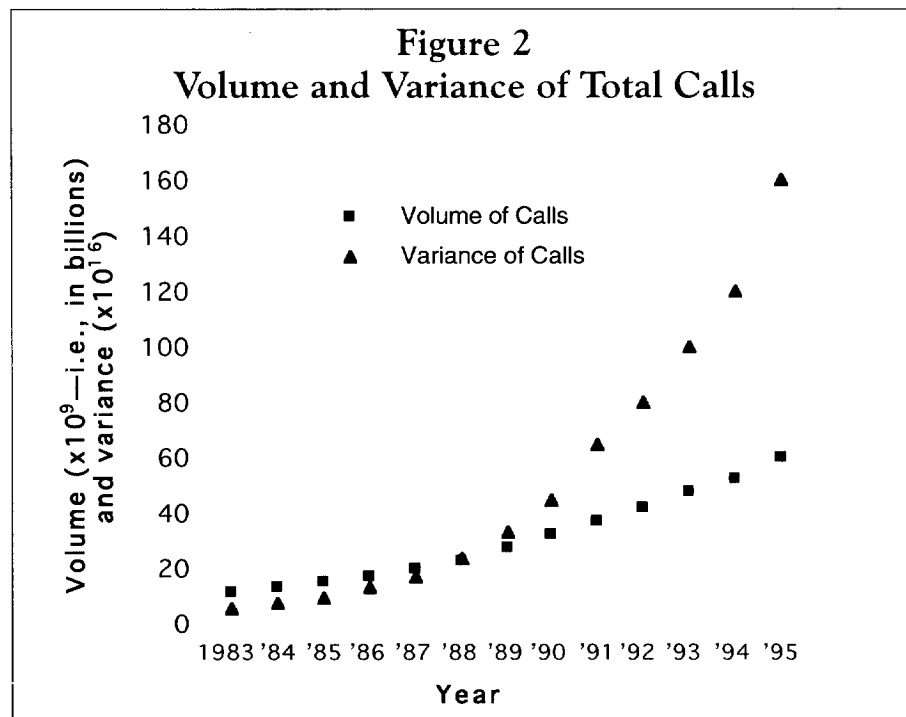
Telephone traffic is correlated with both economic relations, like trade, and social ties, like tourism.

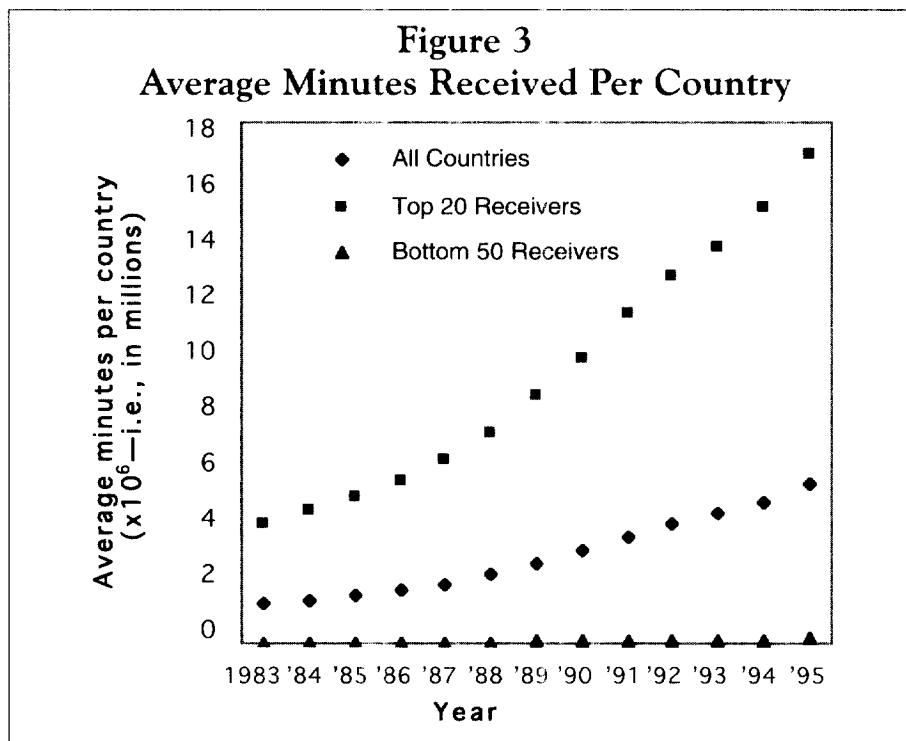


How Big a Web?

With globalization an unchallenged fact of life, we expected to find the phenomenon reflected in international telephone calls in fairly obvious ways—exponential growth in the numbers of calls, growing numbers of cross-cultural calls, and so on. The inverse is in fact more nearly true, and our findings call into question the extent to which international integration has recently accelerated.

To begin with, while there are more international phone calls taking place every day, there is no evidence of dramatic growth over the past de-





cade. The rate of annual change has been quite consistent. When we standardize the data to take into account population and economic growth (using the number of total telephones), the *propensity* to call has remained remarkably stable after a sharp increase in the late 1980s (Figure 2). Thus globalization (as measured by telephone contact) does not seem to be accelerating. Individual countries have experienced this growth in quite different ways. While the average amount of contact has been increasing over time, there is a parallel increase in variance (Figure 2). That is, in recent years there is a larger gulf between countries that make and receive a lot of calls and those that make and receive few. Figure 3 illustrates the basic inequality in the distribution of calls. It separates the 20 most frequently called countries from the bottom 50. Obviously the more popular are growing even more so.

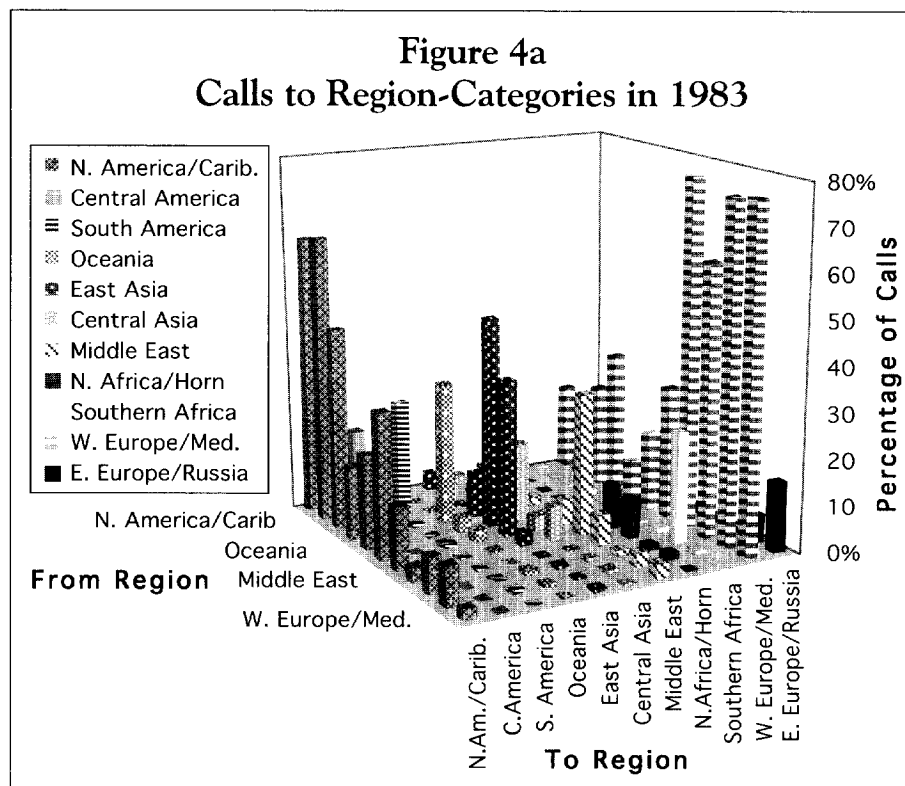
To what extent are countries speaking with the same partners of a decade ago? We defined telephone cliques or groups of countries that call each other. Almost half of the cliques (54 of 109) defined by levels of mutual contact in 1983 still exist in the same form in 1995. Moreover, in 1995, 63 percent of the cliques identified in 1983 still had a membership that was 90 percent the same. Finally, for each clique in 1983 excepting one, there is a clique in 1995 in which at least 60 percent of the members match.

This evidence makes us question the supposed universality of globalization: certain countries have increased their amount of contact with each other, but this has been a relatively steady process over the past two decades. No communication revolution has taken place nor has the social hierarchy of telephone contact changed remarkably.⁹ This is not to deny that a technological transformation has occurred but only to question the extent to which it has transformed the underlying structure of international relations.

If it is fairly clear that the international telephone network of countries is highly stratified, the next step is to determine its underlying structure.

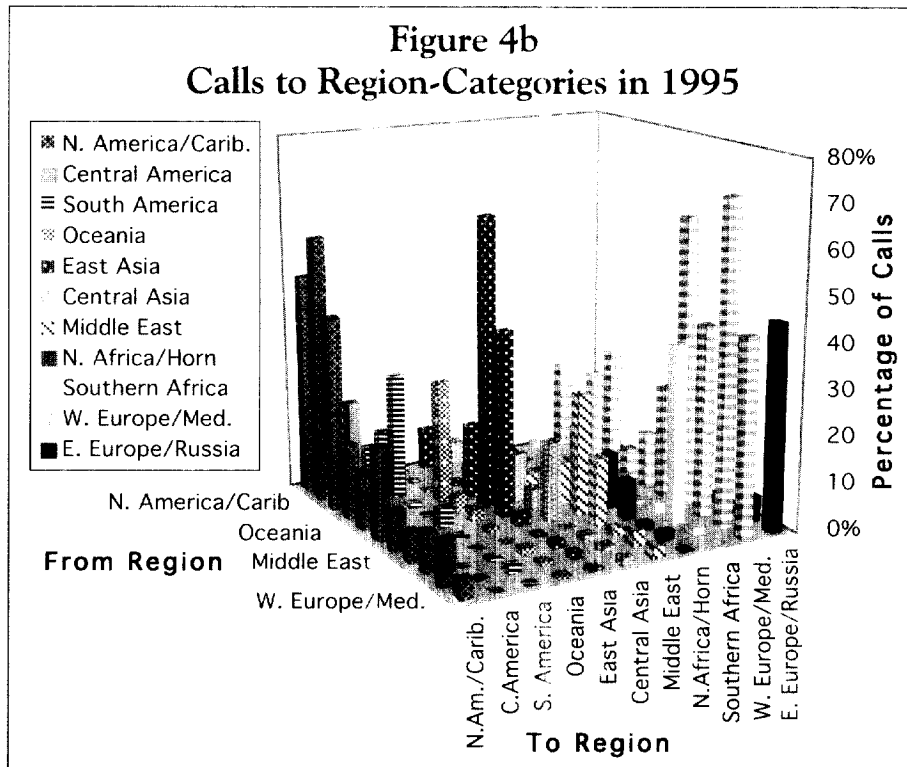
Clashing Cliques?

With one exception, there is no evidence of increasing integration along cultural lines or homogenization of phone contacts. If we analyze the Islamic world, the “civilization” that most concerns Huntington, we find that the proclivity to contact other countries within this supposed block has remained consistent at around 38-39 percent since 1983. This pattern remains even when we standardize the data to take into account development and population growth. Countries in the European category (Western Eu-

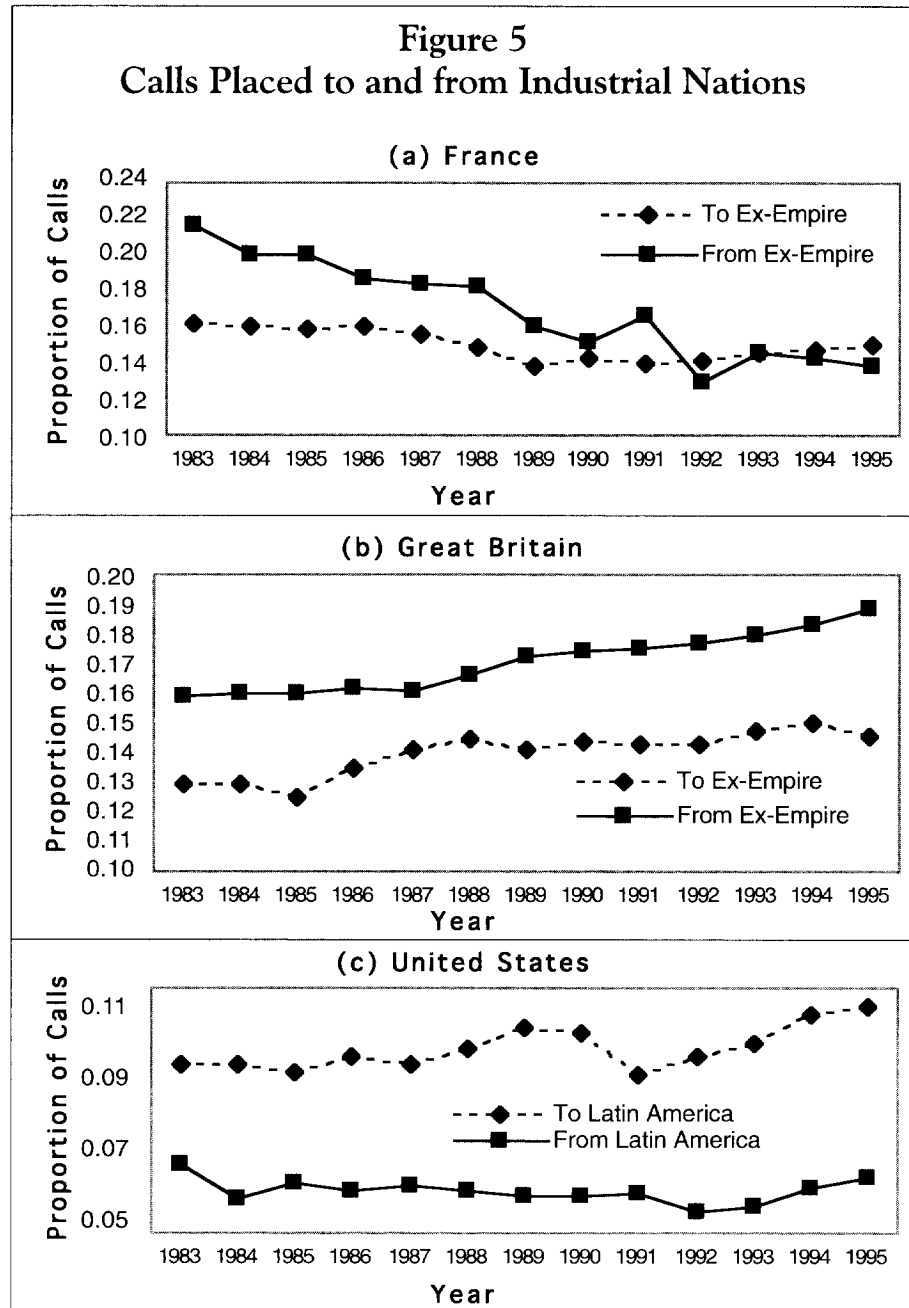


rope and the Mediterranean minus Iberia, plus the United States and Canada) are actually the ones most likely to call fellow cultural partners, but even here there has been a decline in the relative importance of intra-category communication. The one exception in which we do note an increase in auto-communication is in what we have called the “Buddhist-Confucian” civilization (figure 4 a-b).¹⁰ This is an obvious instance in which comparisons with other data are critical. Given its exceptionality and the changes that occurred in this region during the past decade, we suspect that this calling effect has little to do with a common culture and is more a result of economic integration.

If we look at selected countries we note the same pattern: there is no sign of an increase in the clustering of “Islamic” countries, but it does exist among “Confucian-Buddhist” countries and could be driven by noncultural reasons. Egypt’s contact with other Islamic countries has remained relatively constant since 1983 as a proportion of its total telephone traffic (64 percent of incoming and 41 percent of outgoing in 1983 to 61 percent incoming and 43 percent outgoing in 1995). Thus the clique analysis does not confirm the increasing integration of Egypt within an Islamic world. Egypt has only joined one dominantly Islamic clique in the past decade (which also includes the United States), as well as one featuring Israel! Taiwan and

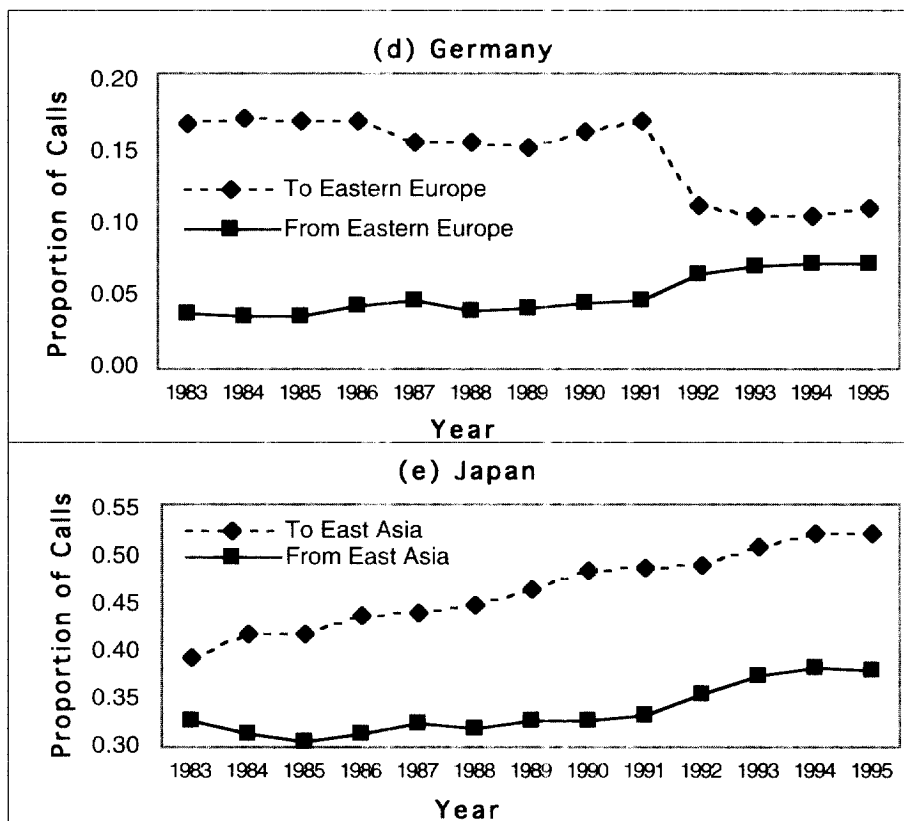


Singapore's contact with Buddhist-Confucian countries has increased marginally (20 percent incoming/28 percent outgoing to 30 percent incoming/30 percent outgoing and, 40 percent incoming/55 percent outgoing to 45 percent incoming 56 percent outgoing, respectively). While Taiwan has increased its membership in cliques dominated by other countries in the re-



gion (see below), it is difficult to discover a dominant cultural pattern without verging on the racist judgment that "Asians are all alike."

The notion of "empire" must also be treated with some caution (figure 5 a-e). Obviously, language, personal contacts, and economic legacies will continue to shape the pattern of international relationships for some time to come. The telephone data do reflect the influence of France in West Africa, that of Britain in parts of the Middle East and East Asia, and the dominant position of the United States in Latin America. But historical legacies may not be as strong as they are often assumed to be in classic dependency literature.¹¹ Despite its efforts to maintain a francophone zone, for example, France's accounts for a declining percent of all calls within its former empire. The United States' importance appears to have also declined in terms of Latin American international communication (reflecting the growth of regional ties such as Mercosur). On the other hand, the pattern for the former British Empire would indicate the increasing importance of the United Kingdom. Again, the point is not to deny the important roles that contacts with the imperial power play in ex-colonies but to analyze this trend within a pattern of globalization. As for possible new empires, we note that Germany does not appear to have established a dominant position vis-



à-vis Eastern Europe despite all the rhetoric about *Mitteleuropa*. Following our findings on East Asia, Japan does appear to play a much more central role in the telecommunications of that region.

The Rich Get Richer

The most salient finding from the International Telecommunication Union's and TeleGeography's data is the continuing and in some cases increasing concentration of calls to rich countries. Even when we standardized the data (thereby controlling for the greater number of phones in the industrial world) the pattern continues. Separate analyses exploring the number of calls among the other categories indicate little contact between the varying levels of peripheries. There appears to be an inverse relationship between income level and likelihood of concentrating calls on the rich core. (The exception is the ex-socialist countries, and this shift is partly accounted for by the increase in the number of countries and thus the change in calls from national to international). Overall, the developing countries have little independent contact with each other and concentrate their international interaction with the dominant powers (table 1).

The rich also tend to pay more attention to each other. Looking at clique

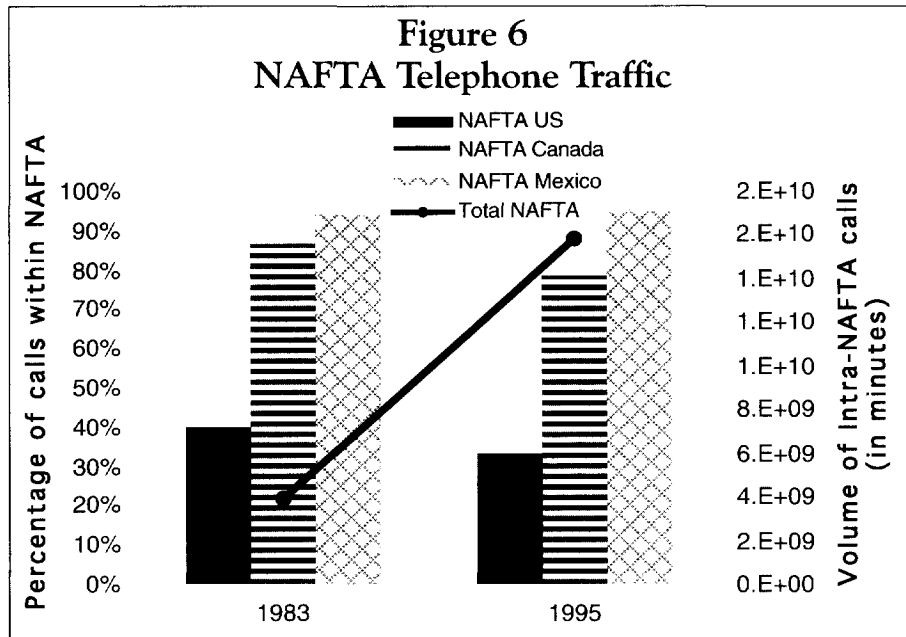
		Countries receiving calls, 1983					
		<i>Low</i>	<i>Low-Mid</i>	<i>Mid</i>	<i>High</i>	<i>Socialist</i>	
Countries placing calls	<i>Low</i>	5.5%	5.7%	7.6%	80.6%	0.6%	
	<i>Low-Mid</i>	1.2%	9.5%	6.2%	82.4%	0.8%	
	<i>Mid</i>	2.0%	12.3%	5.3%	78.8%	1.5%	
	<i>High</i>	1.8%	9.6%	6.4%	77.1%	5.2%	
	<i>Socialist</i>	0.3%	2.3%	2.3%	80.4%	14.6%	
			Countries receiving calls, 1995				
			<i>Low</i>	<i>Low-Mid</i>	<i>Mid</i>	<i>High</i>	<i>Socialist</i>
	<i>Low</i>	3.7%	4.2%	3.2%	85.8%	3.1%	
	<i>Low-Mid</i>	3.0%	9.2%	8.4%	77.0%	2.3%	
	<i>Mid</i>	3.5%	10.7%	4.4%	78.9%	2.4%	
<i>High</i>	7.5%	15.7%	4.8%	66.1%	5.9%		
<i>Socialist</i>	4.0%	2.4%	1.9%	55.1%	36.5%		

structure, we note that both the Group of Seven (G-7) and other high-income countries have grown increasingly integrated and now tend to share a larger number of common cliques (the mean number of rich members in any clique increased from 5.5 in 1983 to 6.3 in 1995, while that of the G-7 increased from 3.1 to 3.5). These same countries are also in everyone's cliques. There were only two cliques without rich countries in 1995! The developed countries also dominate the top cliques in terms of the proportion of inter-clique calls sent or received.

On the other side of the global hierarchy stands an apparently permanent underclass of countries. The number of countries that do not qualify to belong to a single clique (they do not speak with any two other countries that also call each other) has remained remarkably stable (64 in 1983, 63 in 1995) and are largely concentrated in Africa. The only sign of progress here is the decline in the percentage of cliques that do not possess a single poor member (from 89 percent in 1983 to 76 percent in 1995). Even when these countries do belong to cliques, they are often in only one (40 countries) and are the only member from their region or income category. In short, the poor tend to be either nonmembers of the global community or isolated from each other.

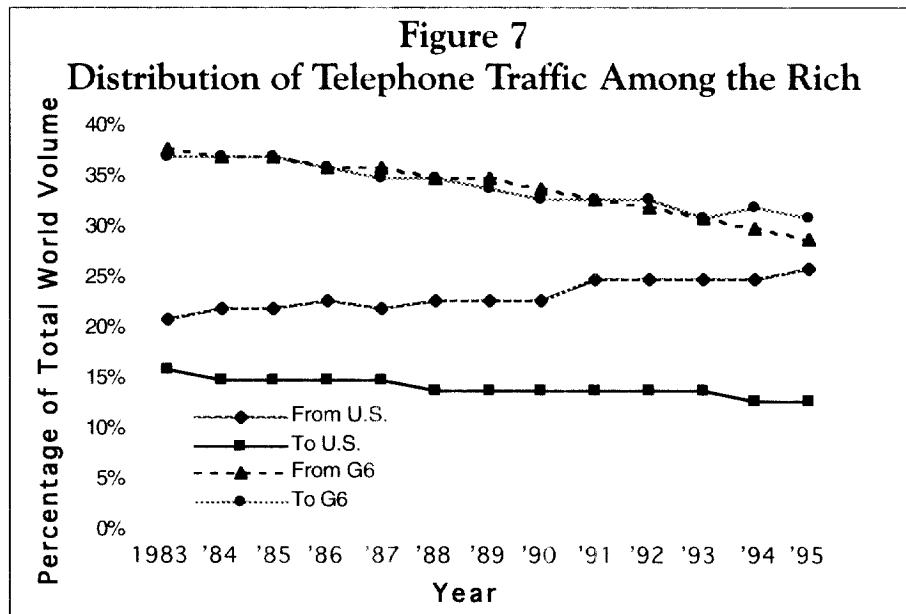
Analyzing the position and composition of what may be called the semi-periphery or newly industrializing countries is more difficult. We analyzed data for six countries that at least anecdotally would represent that global class: Brazil, Egypt, Nigeria, Poland, Singapore, and Taiwan. We only see signs of significant regional integration in the case of Taiwan (25 percent incoming/35 percent outgoing to 40 percent incoming/55 percent outgoing). Taiwan and Singapore have essentially developed two sets of cliques—those they share with dominant countries and a largely autonomous group of regional cliques. Brazil's links with South America have declined (14 percent incoming/23 percent outgoing to 9 percent incoming/20 percent outgoing). In terms of clique membership the isolation of Africa in a newly globalized world is indicated by the performance of Nigeria, one of the leading powers in the region. In 1983, 1989, and 1995 it belonged to only a single clique largely made up of rich countries.¹² Brazil's number of clique memberships has remained remarkably consistent while Poland's, Taiwan's, and Singapore's have skyrocketed. The latter two have arguably graduated into core status as they have expanded their set of contacts and serve as more

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than a subnode for European and North American economies. Poland has arguably done the same, but it remains something of an outsider in a series of cliques dominated by much richer countries. It does not, however, seem to fulfill the classic role of the semi-periphery as a bridge to poorer economies. Brazil's clique memberships, however, are a classic example of such a role. First, the majority of the members of its cliques are wealthier countries. Second, it rarely shares a clique with a large group of South American countries; rather, Brazil and a single other continental neighbor accompany the rich.

An analysis of regional blocks highlights the tenuous position of even the middle-range countries. The North American Free Trade Association (NAFTA) community gives a good indication of why universal statements regarding the nature of globalization are insufficient and why the information on structural positions provided by network analysis will provide a much better picture of whatever new world order emerges from the twentieth century. While intra-NAFTA traffic has increased quite dramatically in absolute terms, the relative importance or network centrality of the community for the United States and Canada has actually declined. For Mexico, however, the NAFTA countries were and remain the only game. We suspect that these findings indicate a wider pattern. The international connections of industrial countries have become more dispersed and heterogeneous. Those of developing countries, however, may simply have intensified but not changed in any structural form (figure 6).



If there is a center to the international telephone network, however, it may not necessarily be the generic rich, but rather, a single power. The data reveal the importance of distinguishing a core or center from the rise of a global hegemon. If we look at the importance of the G-7 (a reasonable starting definition of a global center), we find an apparent decline in overall centrality of members other than the United States. This would suggest the increasing monopolization of power, with the United States as the sole hegemon and the possible appearance of significant semi-peripheral centers. The evidence certainly supports the idea of the United States as the major player in the new world order. The American share of international telephone traffic has been slowly but consistently increasing and now accounts for nearly 40 percent.¹³ This parallels American domination in other areas such as popular culture (figure 7).¹⁴

Looking at clique membership, the subhierarchy among the dominant players becomes even clearer. The most outstanding characteristic is the overpowering presence of the United States, which is included in close to 90 percent of all cliques. Germany is a distant second while France and Great Britain appear to have switched positions in terms of global network centrality. The most significant contrast is between Japan and the United States. Not even during the glory years of the late 1980s did Japan belong to more than a quarter of global telephone cliques. No matter what its powerful role in the world economy and within its own region, it did not have a global reach. The rich may be getting richer, but at least as measured in terms of telecommunications there is only one center.

Conclusions

We can therefore make several observations about the process of globalization as measured by international telephone traffic:

- While the amount of international communication did increase dramatically from 1983 to 1995, we do not observe a significant acceleration of this process. Moreover, we find remarkable stability in terms of who calls whom, with the most popular countries retaining the lead.
- There is little evidence of an increase in intra-cultural contact. The one exception is in East Asia, where the likely cause has more to do with economic development than with increasing cultural chauvinism. Similarly, the evidence indicates the decline of “imperial” zones, with the possible exception of Japan and East Asia.
- There is a clear hierarchy of telephone contact, with most of it concentrated on and in the wealthiest countries. Developing countries are either marginal to international communications or linked via asymmetrical relationships to a group of richer nations.
- The center is increasingly monopolized by the United States, with the relative position of Europe weakening.
- At least as measured by telecommunications, the global web may be expanding, but so is the importance and significance of the country at its heart, the United States. We are only beginning to explore what accounts for this pattern. Certainly differences in tariff structures explain a great deal. Patterns of migration may also account for much, as would trade and political influence. The point, however, is that in our conversations about globalization we should not forget its basic shape, that is, that it is increasingly unipolar.

Methodological Note

For each year we have created a matrix that simultaneously represents all of the contact (and the direction thereof) between each country and every other. Thus, the ij^{th} entry in any year’s matrix represents the volume of telephone contact from country i to country j ; the ji^{th} entry would record the reciprocal contact. Each individual matrix represents a particular year, and the matrices are stacked on top of one another (providing a three-dimensional matrix) to analyze the data over time.

Several points need to be clarified. First, our data may suffer from the distortion brought about by “call back” systems, which allow calls to be channeled through countries with the lowest rates. Thus a Peruvian might use a U.S. call back system to call Venezuela—such a call would register as a con-

tact between Peru and the United States (the direction would depend on the type of call back system used) and then from United States to Venezuela. Since callbacks are often illegal, there are no aggregate measures available regarding their total volume. Given the years of our analysis we do not believe that they constitute a major distortion. We have also been unable to ascertain the possible effect of cellular communications and how these may be accounted for in the data. Depending on the years and the country pairs, there was a significant amount of missing information. Given the sensitivity of network data to this problem we decided to extrapolate or interpolate data for missing years. When possible we interpolated, assuming a linear progression between the two years for which we had data. In the absence of adequate starting or end points with which to obtain a trend line, we used the global mean of growth in telephone traffic.

We also faced the difficult situation of the changing composition of the global state system. This was particularly troublesome for post-1989. Our default definition for all years was based on the countries existing in 1995. If a country did not exist in a previous year contacts to and from it were input as 0. In the case of the Soviet Union, we have it listed as the only participant from 1983 to 1992. Then, beginning in 1993, the Soviet Union receives and sends 0 calls and we listed its component states. In the case of Yugoslavia, we retain that entry despite its changing composition (so by 1995 it only includes calls to and from Serbia-Montenegro). Other components of the former Yugoslavia are added as we have data and are listed as having no phone contact prior to their creation. (This is important to keep in mind when we look at aggregate data on countries with no contacts in different years.) Because of reporting problems, Czechoslovakia includes only data from the Czech Republic after 1992.

A major concern involves the unit of analysis. As it stands, we are inferring attributes of actions made by individuals to countries. The real network we are describing is one among 5 billion individuals, not 200 countries. But given the modes of reporting telephone data, there is no way to avoid the artificial categorization by nation states. The important question must be whether the individuals who dominate the network enjoy their privileged position because of their ascribed characteristic of citizenship. In the case of the United States, we would argue that the answer is yes. What we cannot address, obviously, is the fact that only certain members of each of these societies are making the phone calls and that beneath the global stratification that we find lies an equally great domestic division.

Of equal concern is the fact that in using network analysis we have treated the countries as equivalent units. While not so relevant in our discussion of volume, such an assumed equivalence may be problematic for

cliques. In these cases, however, the difference in volume (a function of size and development) would help to ameliorate this shortcoming. Conversely, the differences in size and development level may also overwhelm indications of strength of ties. In the analysis that follows we report two different sets of data. The first, to which we most often refer, is the absolute number of minutes of telephone traffic between any pair of countries or country groups. The second is a standardized measure through which we sought to reduce the effects of size and development level. For the latter, we divided each data cell by the product of the number of phones in each of the countries in the dyad in any particular year. This measure thus represents the amount of contact given the total potential number of telephone links between two countries.

The main network procedures useful for analyzing this type of data are centrality and clique analysis and structural equivalence. Centrality and clique-based measures examine actual contact between countries. Centrality can measure the country most phoned, controlling for all calls made by other countries, and the country that phones the most (again with appropriate controls). Clique analysis is useful because it allows us to separate regions of the matrix (groups of countries) that have more relative contact with each other than with other countries. Cliques are formed for this sort of data by determining an acceptable minimum level of phone calls that act as a cut-off point for determining if there exists strong connection, a weak connection, or no connection between the countries. Combinations of clique and centrality measures allow us to determine local or regional centrality. We can also define partial cliques and those countries that serve as bridges between different cliques or regions. Structural equivalence methods maximize the similarity of in and out ties of any two countries, whether or not they have ties to one another. If countries A and B make calls to countries C and D but not to country E, then they are structurally equivalent. We would expect that structurally equivalent countries play similar roles in international relations.

Notes

1. See James H. Mittelman, *Globalization* (Boulder, Colo.: Lynne Rienner, 1996), and Paul Hirst and Grahame Thompson, *Globalization in Question* (Cambridge, Mass.: Blackwell, 1996).
2. There is considerable debate, however, about how new this process is, because a similar and perhaps more dramatic trend may be observed in the quarter century before World War I.
3. See Gloria Epstein, James Crotty, and Patricia Kelly, "Winners and Losers in the Global Economics Game," *Current History* 95, no. 604 (1996): 377-381; and Dani

- Rodrik, "Sense and Nonsense in the Globalization Debate," *Foreign Policy* 107 (Summer 1997): 19-36.
4. See George Barnett and Joseph G. T. Salisbury, "Communication and Globalization: A Longitudinal Analysis of the International Telecommunications Network," *Journal of World System Research* 2, no. 16 (1996) at <http://csf.Colorado.EDU/wsystems/jwstr/vol2/v2_ng.htm>; D. Snyder and E. Kick, "Structural Position in the World System and Economic Growth, 1955-1970," *American Journal of Sociology* 84 (1979): 1096-1126; and D. A. Smith and D. R. White, "Structure and Dynamic of the Global Economy: Network Analysis of international Trade 1965-1980," *Social Forces* 70 (1992): 857-893.
 5. The *Direction of Traffic* report (Geneva: International Telecommunication Union; Washington, D.C.: TeleGeography, 1996) includes information on the absolute number of phone calls (measured in minutes) between nearly 200 countries since 1983. This is precisely the type of data suited to network analysis, because it allows for the definition of network density (amount of contact) as well as social hierarchy (direction of contact). Network analytic procedures allow us to test a number of properties of the relationships between the countries for which we have information.
 6. See A. Kellerman, "Telecommunications and the Geography of Metropolitan Areas," *Progress in Human Geography* 8 (1985): 222-246; and V. Dökmeci and Lal Berköz, "International Telecommunications in Turkey," *Telecommunications Policy* 20, no. 2 (1996): 125-130.
 7. Thus, for example, Turkey's most popular international telephone destination is Germany (the home of the largest Turkish guest worker population) and the best predictor of overall traffic is incoming tourism (Dökmeci and Berköz, *ibid.*). For the United States and Israel, foreign investment and exports are closely correlated to telephone traffic (see A. Kellerman, "US International Telecommunications, 1961-88: An International Movement Model," *Telecommunications Policy* 16, no. 3 (1992): 156-166; and A. Kellerman and A. Cohen, "International Telecommunications as International Movement: the Case of Israel, 1951-1988," *Telecommunications Policy* 6, no. 2 (1992): 156-166.
 8. Samuel Huntington, "The Clash of Civilizations?" *Foreign Affairs* 72, no. 3 (1993): 22-49, and *The Clash of Civilizations and the Remaking of the World Order* (New York: Simon and Schuster, 1996).
 9. We have been unable to locate reliable data on Internet communication, but what little data exist tend to support our findings from telephones. Data on "snail mail" from the Universal Postal Union (IPU) also support our findings.
 10. There is an even more extreme increase in Slavic numbers, but while much of it is real—after 1990—it also simply reflects the growth in the number of countries and thus the percentage of calls categorized as international. In order to further analyze these relationships, we also categorized the countries by geographical region. Once again, Europe and North America are consistently the regions most likely to call themselves. These are also the regions (following the pattern of "civilizations" as well) that other regions are most likely to call. We also note that East Asia, where we observe an increase in clustering, is the one exception in a pattern of relative stability.
 11. Christopher Chase-Dunn and Peter Grimes, "World Systems Analysis," *Annual Review of Sociology*, 21 (1995): 387-417; and Gary Gereffi and Stephanie Fonda, "Regional Paths of Development," *Annual Review of Sociology* 18 (1992): 419-448.
 12. The South African position is quite different, but given pre-Mandela history we de-

cided it would not serve as a good indicator of the African position in the global telecommunications system.

13. There is also a parallel domination in the Internet. While we have been unable to locate raw data for Internet traffic, there are some illustrative materials available at <<http://www.cybergeography.com>>, <<http://www.mids.org>>, and other sites.
14. See David Rothkopf, "In Praise of Cultural Imperialism," *Foreign Policy* 107 (Summer 1997): 38-53.