

revolutions in the eighteenth century and in the twentieth century in his analysis of Americanism and Fordism.

12. However, it also includes many of the elites and emerging middle classes in the former East Bloc and the Third World, as well as many subcontractors, import-export, and other smaller businesses and small investors that are linked to the activity of transnational corporations and investment in stock markets.

13. Of course, the precise ways in which the political and the economic are separated or combined varies across different state-civil society complexes, that is, in forms of what Gramsci (1971) called the "extended state": the ways that political and civil society are inter-penetrated in the form of state.

14. One intense example is the predicament of the vast majority of women in the Third World. In many parts of Africa working-class and peasant women tend to have to bear more of the burdens of structural adjustment in, for example, caring for the young, the old, and the infirm. African public health care systems have been disintegrating due to a combination of maldevelopment, budget austerity imposed to pay external debts, and epidemics that are ravaging the continent (e.g., AIDS).

15. Elsewhere I have called this development the emergence of a "post-Modern Prince." What I have in mind is a form of transnational collective agency that goes beyond the association of leadership and collective action with a particular individual (à la Machiavelli's *The Prince*) or indeed with a specific political party, internationalist or otherwise (as in Gramsci's *Modern Prince*). The postmodern prince is not to be confused with postmodern philosophy since it has a universalist aspect. Although it operates in a localized and decentralized way, it seeks to mobilize and to create global democratic potentials in the twenty-first century. Stephen Gill, "Imagining a 'post-Modern Prince' in an era of global crisis," Toronto, Canada, Mimeo, 1998.

3

Stateness and System in the Global Structure of Trade: A Network Approach to Assessing Nation Status

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Brian Uzzi¹

Global stratification of states and nations is a much debated feature of the contemporary world system. Business analysts and many international scholars have advocated comparative advantage as the tool for analyzing variations and dynamics of outcomes such as nation status. This type of analysis highlights the importance of factors internal to a nation and stresses factors such as modernization level, educational training of citizens, and investments in domestic capital as determinants of national prosperity. World-system theories stress a global embeddedness approach to investigating nation status, highlighting how historical contingency and position in the global political economy impact nation status and other outcomes of interest.

More recently, the argument that the structure of global trade patterns economic outcomes reinforces a central claim of contemporary economic sociology regarding the embedded nature of economic activity (Coleman, 1990; Granovetter, 1985). In this view, dynamics of behavior and relationships create a structure that at times helps or hinders actors' ability to be economically successful. Thus, two actors with comparable resources and internal attributes will receive different rates of return because of their positions in a web of exchanges that affects the process of trading (DiTomaso, 1982; Miller, 1980).

We apply this embeddedness approach to understand the trade dynamics of the world system. In this chapter, we test empirically these perspectives in three time periods, 1965, 1970, and 1980, to show the impact of system and stateness on standard indicators of national prosperity. This chapter reports original theoretical arguments and evidence about state and system based factors affecting nation status, building on initial findings from our work on the contingent effects

of social capital in the world system (Sacks, Uzzi, and Ventresca, forthcoming). We show how these effects have changed over time as the institutional conditions of the world system have shifted. Finally, we address the implications of our findings for nation status in the new millennium.

STATE VERSUS SYSTEM-BASED ARGUMENTS ABOUT CHANGES IN NATION STATUS

Theorists have articulated a variety of perspectives on how nation status changes in the world system (McMichael, 2000). Modernization theory asserts that all nations follow relatively uniform stages of development, and that less developed nations must "modernize" their economic, social, and cultural foundations in order to develop more quickly. Nations were seen as being in various stages of development, with those struggling seen as "less developed" than the more advanced Western nations. Differences in development are seen as manifestations of uneven modernization throughout the world, and modernization theorists argue that as "modern" features diffuse into the "underdeveloped" nations, they too will follow the path to greater levels of industrialization and economic prosperity (Chiot, 1986; Rostow, 1960a). This research focuses on the role of internal processes in the economic growth of nations (Delacroix, 1977) and proposes that the best strategic approach a nation can take in the global market is to enhance its own internal characteristics (Griffin, 1981). Recent work on "competitive advantage" advances modernization ideas and retains the same focus on factors internal to the nation (Porter, 1990).

Standard economic analyses of the strength of national economies are typically assessed through comparative advantage—using internal national economic indicators (i.e., inflation rates, unemployment figures, etc.) to compare economic statuses. This framework stipulates internal measurements as the units for analyzing nation status in the global economy, with any relevant external factors such as international aid incorporated into the endogenous analysis (Linnemann, 1966; Meyer and Hannan, 1979). Thus, national comparisons are often made irrespective of the roles of other global actors in the process of economic growth.

In contrast to comparative advantage approaches, world-system theories emphasize the importance of international economic, social, and political interdependencies in understanding nation status (Bergesen, 1980; Chase-Dunn, 1989). A key paradigm for analysis of global structure is Wallerstein model of core/periphery/semi-periphery status (Wallerstein, 1974b). In this view, national prosperity is an outcome of a nation's position in the stratified world system and the global processes that lead to these outcomes. World-system theory "challenges the assumption that national societies constitute independent units whose development can be understood without taking into account the systematic ways in which societies are linked to one another in the context of a larger network of material exchanges" (Chase-Dunn, 1989: 1). World-system theorists have

argued that nation status cannot be measured with internal economic indicators alone because this framework neglects the process and effects of more fundamental structural relationships.

In this chapter, we develop Wallerstein's arguments in the context of international trade. In this view, nations positioned at the core of international economic activity experience advantaged interactions in global trade, those located in the semi-periphery experience somewhat disadvantaged interactions, while those nations in the periphery experience highly disadvantaged interactions in global trade. Despite the substantial impacts of this classic argument, efforts to test the theory have struggled to corroborate its empirical claims. Questions over stratum membership, number of categories, conflicting sources and consequences of the stratification, and methodological difficulties have all contributed to disagreements and confusion over exactly how to operationalize Wallerstein's model. Additionally, this approach focuses solely on the structure of the world trading network, without looking more deeply into the dynamics that reinforce and perpetuate it. World-system theorists argue that international roles and relationships are key in any causal understanding of national economic statuses and changes within particular nations (Chiot and Hall, 1982; Korlos, 1991). Despite general agreement on this idea, specific descriptions of the global social structure are a fairly recent development. Network analysis researchers have only recently begun to clarify the disparate views surrounding these questions (Su, 1995).

Network analyses of the world system provide an empirical framework for operationalizing theories of global structure and use international trade figures as the basis for constructing the world network. Early efforts to use network analysis of the global economy showed that nations more central in the world system in 1965 experienced faster rates of economic growth than those more peripheral (Snyder and Kick, 1979). Nemeth and Smith (1985) improved on Snyder and Kick's methodology by limiting the scope of analysis to exclusively international trade data and by developing more precise network analytic procedures to measure their data in relational terms. In an effort to examine the world system more dynamically, Smith and White (1992) performed network analyses for three periods—1965, 1970, and 1980—and made comparisons across these time periods. While the network structure remained fairly consistent during these times, nineteen nations shifted toward the center while three slipped toward the periphery of the world-system network. The authors did not address the causes of this network mobility; they simply demonstrated that some nations did in fact shift in the global network. Why nation status improves or declines in the world system remain questions only addressed at the theoretical level.

Dependency theory is a version of system-based approaches that seeks to explain how world systemic factors influence nation status change. This approach asserts that core nations exploit less developed ones for raw materials and resources (Munford, 1978; Roxborough, 1976). This process systematically alienates the less developed nations from the rest of the world and from full

participation in the global economy, which is dominated by the few, rich nations in the core. In this view, peripheral nations need to overcome global trade alienation and assert their power as interdependent players in the international division of labor (Diamond, 1979). Through collaborating with one another, peripheral nations can form alliances to better negotiate for more favorable trading terms with the core nations (Gerami, 1985). The thrust of dependency theory focuses on the exploitation of periphery nations for the benefit of core ones. Accordingly, a nation's regional location is a prime determinant for its experiences in global relations and trade.

World-system perspectives suggest that nations with similar internal characteristics and production capabilities can gain unequal returns on their international trade because of the bargaining positions offered by their network positions. In this view, the global trade structure impacts nations' abilities to economically prosper, as some nations can gain better rates of return on trade based on their position in the global network. We apply Burt's (1992) theory of structural autonomy to test the impact of network position in the global structure of trade.

WHAT IS STRUCTURAL AUTONOMY?

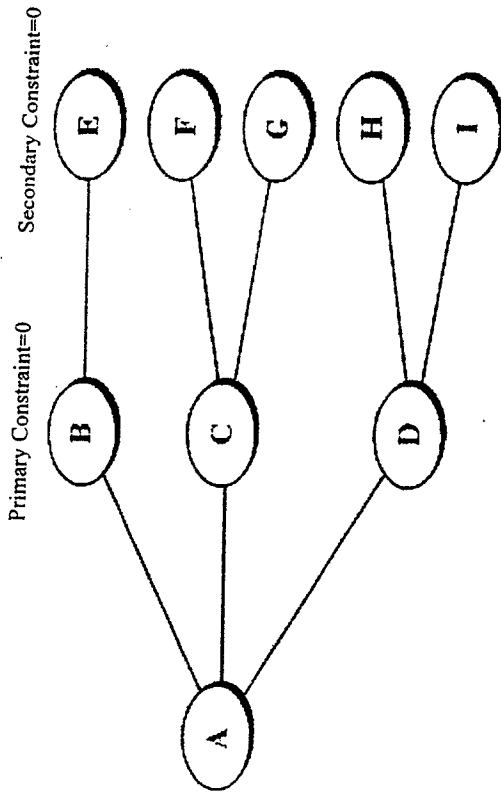
Burt (1992) argues that attributes of individual actors (human capitals such as education and ability for individual persons; efficiency at the organization level) can determine the amount of value possible within economic transactions, but position in a social structure better predicts which actors get what portion of that value. Actors with higher structural autonomy—network freedom through reduced dependencies that allows actors greater negotiating power and access to resources—garner higher levels of desired returns. Higher autonomy generates more “structural holes”—disconnections between actors in a network. Structural holes between actors can be exploited by third parties who serve as the broker between them.²

Burt's argument turns on a crucial behavioral claim: that the allocation of benefits—and no doubt burdens (Northcraft et al., 1995)—in both economic and social contexts seldom works according to the principles of neo-classical markets. Instead, *social* capital conditions allocation and returns beyond what an assessment of attributes of individual actors—*human* capital—can provide. The structure of relationships itself comprises varied features that create the possibility for advantage (or disadvantage).

STRUCTURAL AUTONOMY IN THE WORLD SYSTEM

In our work on world trade, structural autonomy is the aggregate of a nation's constraint (both primary and secondary) and opportunity conditions with its contacts. Primary constraint refers to the amount of time and resources a nation's contacts invest in relationships with that nation's other contacts. Secondary con-

Figure 3.1
Pure Autonomy (Autonomy = 1)

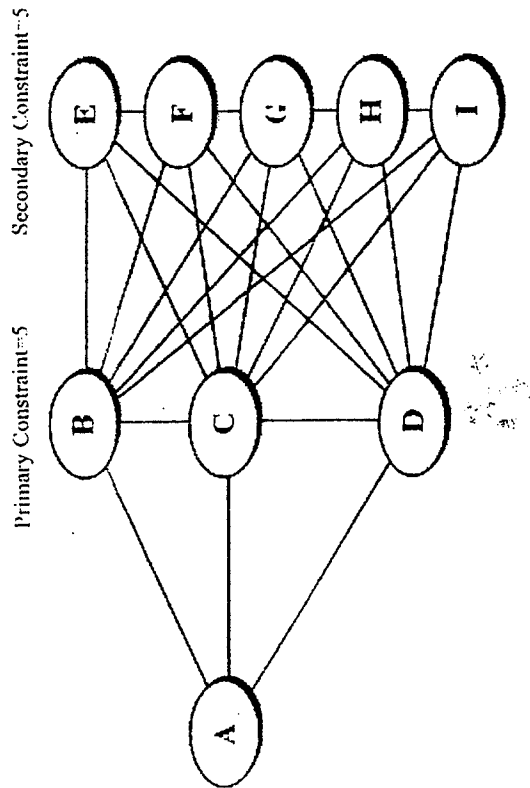


straint is the redundant ties that the nation's contacts' contacts have with one another. Constraint varies from 0 (where a contact has no common connections, primary or secondary, with the nation's other contacts) to 1 (where a contact has ties to all the other contacts of its trading partners). Opportunity refers to the extent to which other nations are not trading with one another. Opportunity ranges from 0 (where nations in the network all trade heavily with one another) to 1 (where nations aren't trading with one another, allowing many chances for a nation to dominate the terms of trade in that network).

We present the structural autonomy argument visually in Figures 3.1 and 3.2. Figure 3.1 is a situation of pure network autonomy for actor A. A's three network connections (B, C, and D) are not connected with one another (no primary constraint), and they do not share other connections through which they could exchange information (secondary constraint). They have no ability to compare information that A gives them, nor can they collude in any move against A. Furthermore, A has a choice among the three connections for resources, while B, C, and D have no alternative to A for information or resources. These facts give A a great advantage in gathering information and negotiating the terms of exchange for trade. In this case, A has a structural autonomy measure of 1—the maximum possible score for autonomy.

Figure 3.2 shows the opposite situation. In this case, A's three network contacts (B, C, and D) all have connections with one another (primary constraint), and they have mutual connections in their networks (secondary constraint). A cannot play one contact off another, as their connection provides them with

Figure 3.2
Pure Constraint (Autonomy = 0)



information on the actions of A on other actors in the network (i.e., pricing, terms of trade, costs, profits). Additionally, actors in the network can collude against A. A's information gathering and negotiating power has been significantly reduced through the highly constraining nature of the multiple ties within the network. In this case, A has an autonomy score of 0—the lowest possible autonomy score. A is in a highly disadvantaged position for trade.

ORIENTING ARGUMENTS

We argue that nation status is contingent on location in the structure of the world system: complex political, social, and economic phenomena in the world foster imperfect competition and help produce a stratified international economy. Specifically, we argue that nations that serve as brokers between international trading partners will benefit from this role. Furthermore, changes in the institutional features of global trade—regime governance, volume, composition, and participation—during the period 1965–1980 impacts the extent to which there are advantages to reap and for whom. Because the contingent value of social capital rests in part on the number of actors involved in the core of trade (Burt, 1997), we predict that the value of structural autonomy decreases over time as the volume of trade and number of nations actively involved increases.

Dynamic shifts in the world system over time dramatically shape the institutional conditions in which nations prosper (Chase-Dunn, Kwano, and Brewer,

2000). The structure of trade from 1965 to 1980 is a challenging empirical site in which to develop Burt's arguments for two reasons: (1) overall volume of trade increased dramatically and the composition of trade shifted; and (2) more actors came to participate and more varied trading relationships developed. Early in the period, 1965, hegemonic world economic (and political/cultural) relations and immediate legacy of colonial experiences maintained an effect on world trade structure. Regime studies of international trade show major shifts in the early 1970s, marked by the establishment of UN agency mandates that promoted trade in and among developing countries in the postcolonial period, the proliferation of multilateral trade agreements, and the initiatives of global financial actors like the IMF to regularize and monitor export/import activity and in effect to promote it (Krasner, 1985). By 1980, substantial differences in patterns and participation in world trade emerged, due in part to the role of global trade regimes in defining "rules of the game," meaning, and mechanisms of trade. We argue that these shifts in the governing regime describe important changes in the institutional context, redefining foundational rules of trading activity at the global level and having diverse effects on countries located at different positions in this system.

We predict that for each time period, higher scores on the structural measure will vary directly with increases in nation status, and we expect this to hold across the three periods. Second, we argue that other factors will vary in their effects on nation status due to changes in the international trade regimes that govern trade. We use the presence of a government trade ministry or similar bureaucratic agency to capture the effects of such changes. Institutional arguments and the contingency of social capital arguments combine to suggest that in the 1965 period, when trade is subject to fewer international regime arrangements and where trade remains the province of a relatively few countries, the presence of a trade ministry marks either state intent, capacity, or "modern state" status in the world polity understanding. The 1970 period is a time when more countries are participating in world trade, most states of the world have become independent, and there are beginnings of global trade regimes. This is a transitional period, but we would expect ministry age to still contribute to nation status. By 1980, the global trade regimes are well established and patterns of trade incorporate a wider group of countries in routine ways.

DATA AND METHODS

Dependent Variable

Researchers have focused empirical attention on a number of general outcome variables such as nation status, national prosperity, well-being, and even human misery (Ragin and Bradshaw, 1992). As such, many dependent variables have been used as proxies for these varying outcomes. We use GNP/capita as a proxy for nation status. The concept and its measures are much debated. We use it to

be consistent with much prior world-systems research, including network studies (Nemeth and Smith, 1985; Smith and White, 1992).

Control Variables

We control for political-geographic region, population size, modernization level, and education quality in efforts to take into account the key features of the modernization/comparative advantage arguments. Our first three control variables capture effects of internal nation characteristics that figure in standard modernization models of nation status. These are industrial development, domestic investment, and education. We utilized kilowatt consumption per capita as a proxy for the level of industrial development or modernization for a nation. We took the log of this variable to control for the large range and skew of data within our sample. Second, we used domestic capital rates to control for internal expenditures that nations invest for the improvement and vitalization of their infrastructure. The distribution of this variable was relatively normal and required no transformation. Third, the secondary education variable captures the extent to which nations have a labor force with advanced training and expertise. It is measured as a percentage of the population that had been enrolled in secondary education during any particular year. This variable was highly skewed and required a log transformation for the purposes of creating a more normalized distribution.

The remaining two control variables represent features of the nation in relation to international location and commitment to global trade, which provide alternative explanations for nation status. The first distinguishes among countries by region and historical relation to international state systems. We used six categories to control for linkage type effects (Meyer, Ramirez, and Soysal, 1992): 1 = Sub-Saharan Africa; 2 = European Periphery; 3 = Asian and Pacific Rim; 4 = North Africa and Middle East; 5 = Latin America; and 6 = European and Anglo-Saxon Core. We omit category 1 as the reference category. The second is the presence and age of state ministries of trade or their bureaucratic equivalent (commission, trade council, etc.). This captures the effect that the existence and endurance of a trade ministry provides a formalized institutional link to the core of global trade and promotes international mobilization around trade (Kim, 1996). Note that the central role played by governments in economic activity and, in particular, trade in countries around the globe (Evans, 1995) is an additional motivation to incorporate measures of presence and experience of state ministries in this arena. In effect, it is a crude measure of state attention and intent with regard to trade. It is simply a count of how many years a nation has had a trade ministry prior to the year of study. No transformation was needed for this variable, as it was relatively normally distributed.

Constructing the Structural Autonomy Measure

Studies of international trade have used yearly import/export trade flows for a wide range of commodities compiled by the United Nations Commodity Trade

Statistics (Delacroix, 1977; Nemeth and Smith, 1985; Smith and White, 1992; Steiber, 1979).³ These data report relational dyadic exchange matrices for each commodity, for example, the amount of wheat (in U. S. dollars) traded between France and Japan, and so on. They are widely considered the most accurate and complete among international trade statistics. We utilize data from years 1965, 1970, and 1980.

Our sample comprises only countries with a population of one million people or more. This reduces potential concern that smaller nations are disadvantaged simply by population size from being equipped to participate in international trade. In addition, nations that failed to report commodity trade data for any of the three time periods were eliminated from consideration. The sample of nations available for analysis is sixty-three.

The next step was to choose a sample of specific commodities from the thousands available in the dataset. Previous research on world trade patterns (Chase-Dunn, 1989; Hirschman, 1945; Rau and Roncek, 1987; Rubinson and Holtzman, 1981) finds a global division of labor where core nations export more processed commodities, whereas periphery nations export raw materials. Thus, following the logic of Nemeth and Smith (1985), we chose commodities that represent different levels of processing, from raw materials to "finished products." We used two-digit SITC (Standard International Trade Classifications) categories to capture a broader array of commodities. SITC codes vary from five-digit (very specific) to one-digit (very general) classifications; using two-digit categories allows for a more heterogeneous examination, without the complete loss of commodity flow homogeneity in the one-digit codes. This reduces the concern that a nation's strength in a specific commodity (through using five-digit SITC codes as the unit of analysis) would be overgeneralized in an analysis of global trade, as the two-digit SITC codes encompass many specific types of commodities within them.

Smith and Nemeth (1988) performed a factor analysis of all the bilateral exchanges between nations to find five bundles of commodities that tend to move together in the global economy: High Technology and Heavy Manufacture, Sophisticated Extractive, Simple Extractive, Low Wage/Light Manufacture, and Food Products and By-Products. Three commodities that "consistently loaded most highly on each of the five factors" were selected from each grouping (Smith and White, 1992: 866). These are the fifteen commodities for our investigation (see Appendix 1 of this chapter for a listing of categories and commodities). They represent the major types of global commodity exchange. The dataset compiled the dollar value of trade between nation dyads for each category for each of the three time periods. This resulted in forty-five commodity trade tables of size 63×63 , with missing diagonals (the diagonals represent the point at which a nation's position on the vertical and horizontal axes meet). These tables served as the raw network data we used in generating the structural autonomy means.

The computations involved in a structural autonomy network analysis rest on the measurement of network constraint and opportunity. The structural auton-

omy calculation is often, but not always, weighted by an oligopoly measure.⁴ In the present analysis, the oligopoly measure has been set to 1 throughout the computations. This follows the logic that as the number of actors increases in a network, the concentration ratio becomes less important in the overall autonomy measures, as they have multiple network contacts with whom to engage in negotiations (Burt, 1992). In the present study, the use of two-digit SITC codes—broad categories of a wide array of commodities—helps ensure that there are many producers and consumers in all of the commodities under investigation. Additionally, the factor analysis described earlier provided commodities that are traded most heavily in the world system. These facts lead to the conclusion that concentration ratios are less useful in the present case. This would be a very different situation if five-digit SITC codes were being used as the units of investigation.

Forty-five network analyses were conducted to produce a mean of structural autonomy for each nation in each commodity category (during each of the three time periods). Following the previously stated logic that these commodities are broadly representative of the larger patterns of global trade, we aggregated the specific commodity level autonomy scores to an overall nation-level autonomy score for each of the three years. After this, we began the fourth step, which was to add theoretically relevant control variables into the regression equations.

Modeling Strategy

To assess the arguments and claims we put forward, we ran three robust regression analyses to test the effects of autonomy and our control variables on GNP/capita as the dependent variable. A robust regression is similar to a regular regression, except that it does a better job controlling for the effect of outliers by testing around the median, not the mean, of a sample. It is wise to use a robust regression when theoretical concerns validate that outliers may overestimate the significance of the overall equation. We then took a closer look at the distribution of the autonomy score within each of the three time periods. This allowed us to contrast the overall autonomy changes with an explicit focus on which portions of the autonomy distribution were changing over time.

RESULTS

Table 3.1 presents the results from robust regression analysis of the factors affecting nation status. Model 1 provides robust regression results for the period 1965, model 2 for 1970, and model 3 for 1980. In Model 1, autonomy is positive and significant—that is, a relatively advanced position in the flow of world trade increments the nation status measure. The variables that would support modernization arguments post few significant results, with the exception of the overall industrialization measure, which is positive and strongly significant. Secondary enrollment rates have no effect; neither do the rates of domestic capital invest-

Table 3.1
Regression Estimates of Structural Autonomy in Trade as a Determinate of
Nation Status, 1965, 1970, 1980

Year Model	1965 Model 1	1970 Model 2	1980 Model 3
Independent Variables:			
Autonomy	1.345** (-0.531)	1.123* (0.53)	1.518 (0.84)
Ministry Age	0.014** (0.005)	0.011* (0.005)	0.005 (0.004)
Domestic Capital Investment Rate	0.004 (0.011)	0.038* (0.012)	-0.017 (0.011)
Secondary Education	0.042 (0.123)	0.137 (0.128)	0.128 (0.161)
Kilowatt/capita	6.392** (1.3)	5.608** (1.414)	9.29** (1.244)
Euro. Periphery	0.256 (0.271)	0.25 (0.305)	0.228 (0.342)
Asia & Pacific Rim	-0.133 (0.251)	-0.546* (0.27)	-0.396 (0.287)
North Africa	0.221 (0.234)	0.243 (0.253)	-0.051 (0.297)
Latin America	0.237 (0.203)	0.04 (0.235)	-0.093 (0.26)
Euro. Core	0.726* (0.295)	0.786* (0.333)	0.452 (0.392)
Constant	-4.045** (1.5)	-3.061 (1.61)	-6.62** (1.504)
Pseudo R-squared	0.91	0.9	0.88

*p < .05; **p < .01

Model 1-3 = Robust regression estimates for years 1965, 1970, and 1980, respectively

ment. We find the expected results for region/linkage in this period: being a country in the developed European core/Anglo-American world increases nation status relative to countries in sub-Saharan Africa, the omitted category; countries in other regions do not differ significantly from the omitted group. The effect of trade ministry age is also positive and significant, supporting our expectations.

We turn to Model 2, for the 1970 period. The results of Model 2 repeat the general pattern for the 1965 period, but with two exceptions. The autonomy measure is positive and significant, overall industrialization is positive and significant, the European core is positive and significantly different from the omitted category, and trade ministry age is positive and significant. The 1970 results vary in that the domestic capital investment measure produces a positive and highly significant effect, countries in Asia begin to return negative and significant results, and the autonomy measure is less significant than in 1965.

Model 3, for 1980, presents some striking differences from the earlier periods. First, the autonomy measure is positive but no longer significant. In addition, the European core no longer differs significantly from the omitted regional group, and the ministry variable no longer has an effect. Finally, among the modernization measures, only the overall measure of industrialization continues positive and significant; neither rates of secondary enrollment nor rates of domestic capital investment have an effect. As more nations have engaged meaningfully in trade, and as the volume of trade has grown, system-based factors seem to have dissipated in their influence on nation status.

The results for each period provide evidence for the overall importance of the autonomy measure for the first time periods, but not the final one. There is also support for the importance of the overall industrialization measure, which is consistent with much previous research on the determinants of nation status and development. The pattern of results for the region variables also confirms that in the early period, being among the developed countries of the core is beneficial for nation status, but by the 1980 period, being part of the European core no longer distinguishes countries in terms of nation status. The early importance of the trade ministry variable and its subsequent lack of effect provide evidence that the shifting institutional context of trade affects the benefits that can be reaped and who can attain them in the global structure of trade.

A more in-depth examination of the distributions of the autonomy scores for each year further reveals important shifts in the context of global trade over this time period. Table 3.2 shows the frequency distribution statistics for the autonomy scores within each year. The 1965 and 1970 autonomy distributions were not statistically different from one another, but both the 1965 and the 1970 distributions were statistically different from the 1980 distribution. However, the mean autonomy score rose (1970: 0.439; 1980: 0.480), while the standard deviation declined (1970: 0.118; 1980: 0.092). This suggests a trend of higher autonomy scores arranged in a more tight distribution than in 1970. The finding is supported by the range of the autonomy scores in the time periods (1970: 0.525; 1980: 0.442), verifying a tightening of the distribution in addition to its overall higher mean.

Table 3.2
Distribution Statistics for the Autonomy Variables

	AUTO65	AUTO70	AUTO80
N	63	63	63
Mean	0.44	0.44	0.48
St. Dev.	0.12	0.12	0.09

	AUTO65	AUTO70	AUTO80
Max	0.696	0.706	0.689
95%	0.6	0.597	0.608
75%	0.527	0.517	0.545
Median	0.458	0.449	0.495
25%	0.352	0.342	0.406
5%	0.247	0.245	0.328
Min	0.186	0.181	0.247
Range	0.51	0.525	0.442
75%-25%	0.175	0.175	0.139

Most revealing are the cumulative percentage points across the autonomy distributions. These show where most of the change is taking place within the distribution. There was very little change in the top 5 percent of the distribution of autonomy scores between 1970 and 1980 (0.597 vs. 0.608), but there was a significant change in the bottom 5 percent of the distribution (1970: 0.245; 1980: 0.328). Importantly, this finding suggests that nations with very low autonomy scores in 1970 had increased autonomy scores in 1980, while those with higher autonomy scores remained essentially constant. We initially suspected that this shift was due to an increase in the number of network ties among the poorer nations of the world. Any increase in the number of ties would almost certainly raise the autonomy scores of nations with very few ties to begin with. If this was a general trend among poorer nations during the 1970s, then this rationale was likely to be a big part of the explanation. However, the difference in the mean number of ties from 1970 to 1980 (a ten-year time period) was about twice that of the difference between 1965 and 1970 (a five-year time period). So the rate of increase in network ties remained relatively constant across the time periods. This suggests that while the autonomy scores of core nations remained somewhat stable over time, peripheral nations experienced an improvement in terms of network position.

CONCLUSION

The regression results provide substantial support for our claims about the general relationship between structural autonomy and nation status. In addition,

the pattern of results across the three time periods offers evidence for the decreasing effects of social capital benefits and the consistent importance of industrial capacity. In this empirical case, these changes reflect the growing volume of trade as nations more meaningfully participate in that global exchange.

In 1965, when international trade was dominated by the central, prosperous nations, autonomy and trade ministry existence are significant factors in nation status. In 1970, which emerges as a transitional period, autonomy and trade ministry remain significant, though not as strongly so. By 1980, neither has a significant effect on nation status. To make sense of this pattern, we apply Burt's arguments (1997) about the contingent value of social capital. Burt argues that as networks comprise more and more participants in dense network relations, social capital effects are contingent. The history of the time periods within this study encompasses just such shifts: more and more countries participate in global trade as standard state members; trade itself expands and more countries trade in more complex ways. By 1980, autonomy and trade ministry establishment do not return significant advantages to any group of countries. As more nations "do" international trade, the advantages from network position or formalized trade ministry dissipate.

This study generally validates arguments about the positive value of structural autonomy, but shows that this value is clearly contingent on: (1) positions within a social structure, and (2) the nature of that social structure itself. Actors within a social structure are differentially able to reap benefits based on their network position, and unique social structural conditions provide different types of benefits to distinct kinds of actors. This study of the structure of world trade shows how changing contexts within the global economy affect what the broader social structure has to offer and who benefits from those structural arrangements.

Our results suggest important trends for the structure of global trade in the new millennium. The shift in number of nations trading and the quantity of trade between 1965 and 1980 had grown even more substantially in the 1990s. Additionally, international trade has become increasingly systematized as global regimes routinize the ways in which trade is conducted. Our results imply that as these trends continue, the benefits of social capital are likely to further diminish. This project supports the continued use of novel methodological and social network theory to examine future trends in global trade. One such avenue for this would be to explicitly study how changes in composition and content of trade affect nation status outcomes. Our work aggregates various levels of trade into a larger trading category per nation. Future studies can disaggregate this data to examine how *what is traded* changes over time, and how these changes are experienced by different nations.

The evidence that benefits of structural position are dissipating also argues for conceptual attention to identify new sources of global advantage, in a world system marked by substantial political and cultural redefinition of opportunity and constraint. Trade itself may change in its value as an indicator of relevant

world system position. Research attention to these issues—changes in the composition of trade, the social structures at the international level that organize and routinize trading, and the participants in global trade—all point to new contingencies that will reshape the value of social capital and its impact on nation status and prosperity. The political and policy consequences of such research are vivid in contemporary press accounts and policy discussion about issues as disparate as contested membership in the WTO, IMF funding criteria and debt-forgiveness schemes, emerging conventions that guide global capital flows, the integration of new economic enterprise zones, and the cultural redefinition of trade activity by international experts. These are some research opportunities that deepen our understanding of linkages between structure of trade, economic outcomes, and nation status in the emerging twenty-first century world-system.

NOTES

1. Portions of this chapter are excerpts and selections from an article forthcoming in *American Behavioral Scientist*. We gratefully acknowledge grants in support of our work from the Center for International and Comparative Studies, the Institute for Policy Research, the Department of Sociology, and the Department of Organizational Behavior, all at Northwestern University. We thank Cindy Aitken and Michelle Nattziger for editorial assistance.
2. A structural hole does not imply the complete absence of a relationship between two actors. Rather, a third party can serve as a broker between two moderately connected actors by forming a stronger tie with each actor than they have with one another.
3. We benefit from the generosity of David Smith and Douglas White, who have made available for us the dataset they analyzed in Smith and White (1992).
4. This is important in assessing the competitiveness of the network, as a network with a high oligopoly measure is one where a few players have a high amount of control within the network. This oligopoly measure is often described using a concentration ratio, which describes a nation's freedom in their network as measured by the extent to which they are central and not easily replaced by another contact. Specifically, this is operationalized as the extent to which a proportion of all network exchanges comes from a limited number of sources within the network. The fewer the sources and the higher the degree to which a resource is concentrated in these few sources, the higher the concentration measure.

APPENDIX 1: COMMODITY BUNDLES WITH SPECIFIC COMMODITIES

SITC Code	High Technology & Heavy Manufacture
46	Machinery-nonelectrical
35	Artificial resins, plastics, cellulose esters and ethers
45	Manufactures of metal, not elsewhere specified

SITC Code	Sophisticated Extractive
40	Paper, paperboard, and articles of paper pulp
16	Pulp and wastepaper
23	Gas, natural and manufactured
	Simple Extractive
13	Oil seeds and oleaginous fruit
25	Animal oils and fats
04	Cereals and cereal preparations
	Low Wage/Light Manufacture
52	Articles of apparel and clothing accessories
53	Footwear
51	Travel goods, handbags, and similar containers
	Food Products and By-products
01	Ment and ment preparations
02	Dairy products and bird's eggs
20	Crude animal and vegetable material, not elsewhere specified

APPENDIX 2: FULL DESCRIPTION OF STRUCTURAL AUTONOMY NETWORK ANALYSIS

Entrepreneurial opportunities are constrained to the extent that one of a nation's (*i*) contacts (*q*) has invested in a relationship with another of the nation's contacts (*j*). This can be expressed in the following manner:

$$P_{iq}P_{qj}$$

where P_{iq} represents the proportional strength of *i*'s relationship with *j* (in terms of time and resources spent in the maintenance of the relationship), and P_{qj} represents the proportional strength of *q*'s relationship with *j*. A high product of this equation represents a high degree of constraint that *j*'s relationship with *q* places on *i*'s relationship with *q*, making it harder for nation *i* to serve as a bridge between *q* and *j*. An aggregate of the product of the above equation across all of the contacts in the network (excluding nation *i*) shows the overall extent to which nation *j* constrains nation *i* in the network (excluding nation *i*) to the direct connection *i* has with *j* produces a figure that defines the constraint that nation *j* places on nation *i* directly and indirectly:

$$P_{ij} + \sum P_{iq}P_{qj}$$

The sum of the above equation across all contacts *j* measures the aggregate constraint on nation *i*'s entrepreneurial opportunities within the network:

$$C = \sum (P_{ij} + \sum P_{iq}P_{qj})$$

The second part of the structural autonomy computation involves the opportunities other nations have to exploit disconnections between nation *i* and its contacts within the network. This is because *i* must also spend time protecting itself from other nations that wish to serve as the bridge between *i* and its contacts. We begin the process of deriving the sum opportunity for other nations to exploit the relationship between nation *i* and its contacts by examining the extent to which another nation (*j*) is able to fill a structural hole between *i* and another of its contacts (*q*):

$$P_{ij}P_{jq}$$

where P_{ij} represents the proportional strength of *j*'s relationship with *i* (in terms of time and resources spent in the maintenance of the relationship), and P_{jq} represents the proportional strength of *q*'s relationship with *j*. When the product of this equation is high, nation *i* would have to spend more time and resources connecting with *j* and *q* in order to counteract the efforts *j* maintains to serve as a broker between them.

The next step is to measure the extent to which nation *j* can exploit the relationship between nation *i* and its contacts with other nations in the network. To do this, we appropriate the product of the above equation across all of *i*'s contacts in the network (excluding nation *i*) and add in the direct connection that *j* has with *i*:

$$P_{ij} + \sum P_{iq}P_{qj}$$

The resulting sum is the total extent which *j* can exploit the disconnections between nation *i* and its contacts. The last step is to determine the extent to which all nations *j* can fill structural holes between *i* and its contacts. This is done by aggregating the above equation across all of the other nations in the network:

$$O = \sum (P_{ij} + \sum P_{iq}P_{qj})$$

Thus, *O* represents the total opportunity other nations have to exploit *i*'s connections with other nations in the network.

Understanding the components of *O* and *C*, we can now turn to the overall structural autonomy calculation. The functional form of structural autonomy is:

$$A = \alpha(1 - O)^{B_0}C^{B_c}$$

where *O* is the sum of other nations' opportunities to fill structural holes between the focal nation and its contacts, and *C* is the sum of the focal nation's constraints. Estimates of B_0 and B_c are negative fractions, which illustrates that structural holes are most effective at lower levels of constraint.