7. Networks and chains
Trade, unequal exchange, global commodity chains

World-system structure and economic development

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Introduction: Unequal exchange

The question of what determines the wealth of nations is a very old and basic issue in social science (Smith 1776). Almost as ancient is the discussion of how nations might gain some “comparative advantage” in trade (Ricardo 1817). Skepticism about the idea that countries will automatically benefit and experience economic growth and development if they specialized in trading the products in which they have a putative advantage led to the formulation of the idea of “unequal exchange” by the progenitors of the world-system approach.

In contemporary sociology and social science, these questions are more familiarly framed as issues of economic “development” and a bundle of other social changes that are often presupposed to accompany this process. Why did certain countries and regions become wealthy and “industrialized” over the past two centuries, while others fell behind? In the twenty-first century we still see yawning chasms of material inequality between different parts of the world (as well as within them). What explains these world inequalities? And, perhaps more pertinently, what can be done to overcome them? Is “industrialization” still a viable economic growth strategy for poor countries in today’s era of globalization and worldwide “restructuring”? Or does the contemporary conjuncture demand new strategies that go beyond a transition to manufacturing and increasing “value added” production? Do the experiences of some large and very “successful” nations (like China and India) tend to obscure the continuing economic stagnation in many other underdeveloped countries and areas? This brief essay examines these debates about the dilemma of development and the perpetuation of global inequality in today’s world-system, with a particular focus on trade, global commodity chains, and unequal exchange.

Emmanuel (1972) and Amin (1974) argued that the essence of core exploitation of the poor, underdeveloped regions of the periphery is transmitted through the unequal trade of low-value and less-processed goods from the periphery in exchange for expensive finished products from the core. Mandel (1975) accepted the idea that “the average productivity of labor” between countries is crucial, but categorically rejected the claim that particular commodities are intrinsically important, since it is not the material product itself that is crucial, but the labor process that
produces it. Later, Stephen Bunker (1984) directly challenged this labor-based approach to unequal exchange, arguing that the environmental costs in peripheral economies dependent on resource extraction should also be considered:

I believe that the unbalanced flows of energy and matter from the extractive peripheries to the productive core provide better measures of unequal exchange in a world economic system than do flows of commodities measured in labor and prices.  

(Bunker 1984: 1018)

This approach re-emphasized particular commodities, claiming that extractive product flows are important in core exploitation of the periphery for the extrinsic reason that they led to environmental drain and depletion.

**Industrialization and the NIDL**

Another late twentieth-century turn in the debate on the nature of unequal exchange came from arguments about an emergent “new industrial division of labor” (NIDL) (Frobel et al 1980). Consistent with the main contours of this argument were descriptions of a new “global assemblyline” (Feuntes and Ehrenreich 1984) arguing that there was a de-industrialization of the previously advanced core nations (Bluestone and Harrison 1982; Caporaso 1981) through “capital flight” to the low-wage peripheral or semiperipheral areas beginning as early as 1960 (Ross and Trachte 1990; see also Dicken 2007). Today the existence of a NIDL in the late twentieth century is a widely accepted fact. Poor countries are the now the undisputed centers for manufacturing, particularly for low-cost consumer goods (with China as the veritable “workshop of the world”); there is little doubt that there has been a meteoric rise in industrial production, employment, and exports from these regions in recent decades.

But what does this mean for economic growth in these places? Post-World War II era “modernization theory” uncritically assumed that industrialization was the motor of economic development—modernization and industrialization were inextricably intertwined. But today the idea that more investment and/or employment in manufacturing signals the beginning of some sort of “take off” into development (cf. Rostow 1960) seems increasingly implausible as the search for low-wage workers for export production to cost-conscious US consumer markets seems more like a “race to the bottom” (Chan 2003; Korten 1995). Instead, some see empirical evidence that the rise of manufacturing in non-core regions of the world since 1960, instead of leading to “manufacturing miracles” of economic growth and material convergence between the First and Third World, resulted in a persistant North–South divide in per capita income (Arrighi et al 2003). Others suggest that data show poor countries are closing the gap between themselves and rich nations (Firebaugh 2003; but see Korzeniewicz and Moran 2009 for a counter argument) and claim that industrialization is, indeed, still a key generator of economic growth (Firebaugh 2003). The problem with measuring global shifts in manufacturing is that everything from garment sewing factories to semiconductor production, shipbuilding and aerospace, or chemical processing is conflated into the “manufacturing” category. But, of course, we know that the global geography of these disparate industries is very distinct (see Dicken 2007); presumably their developmental impacts where they are located are also very different. Perhaps because of data limitations, there is a tendency to oversimplify this debate (is industrialization good or not?) when the real issue concerns the qualitative nature of industrialization as it occurs in historically poor countries.

Of course, the rise of non-core manufacturing for export, albeit in specific industrial niches, did create a very different pattern of worldwide commodity trade in the past half century, with low-
wage manufacturing goods, in particular, tending to flow from the poor peripheral regions of the world-economy toward the core markets. It was during the emergence of this NIDL that we saw the rise of a number of newly industrializing countries (NICs). Manufacturing for export was hailed as the secret to rapid economic growth of countries like South Korea and Taiwan in the so-called East Asian economic miracle (Gereffi and Wyman 1990; World Bank 1993). However, we need to closely examine the nature of the manufacturing activities occurring in particular economies and the specific linkages between manufacturing enterprises, global markets, and local, state and transnational capital. Some of the NICs (particularly in East Asia) successfully engaged in “industrial upgrading” in which there is a shift from commodities like textiles, apparel, and footwear to “higher value-added items that employ sophisticated technology and require a more extensively developed, tightly integrated local industrial base” (Gereffi 1992: 92). This might include production of computers, semiconductors, numerically controlled machine tools, VCRs, televisions, etc. However, many peripheral countries remain primarily export platforms for simple low-technology, labor-intensive goods made by low-wage unskilled workers.

**Global commodity chains**

This focus on an increasingly integrated global economy where countries fill distinct export niches and where industrial upgrading seems to be the only viable option, led Gereffi to argue that global commodity chains (GCCs) should be the key analytical construct (Gereffi 1990; Gereffi and Korzeniewicz 1990). There are parallels between the idea of GCCs and the value chains of economist Michael Porter (1990) or the production chains of geographer Peter Dicken (2007). But Gereffi grounds his initial conceptualization in world-system analysis, drawing on Hopkins and Wallerstein’s (1986: 159) definition of a commodity chain as “a network of labor and production processes whose end result is a finished commodity.” Elaborating further, “A GCC consists of sets of interorganizational networks clustered around one commodity or product, linking households, enterprises and states to one another within the world-economy … (it is) the sequential stages of input acquisition, manufacturing, distribution, marketing and consumption” (Gereffi et al 1994: 2).

A thorough GCC analysis of particular commodity chains requires some detailed knowledge of the specific qualities of the commodity itself, which is why much research on commodity chains are case studies (see Gereffi and Korzeniewicz 1994 op. cit.; similar for case studies of extraction in “the Bunker vein” see Cicantell et al 2005, op. cit.) In network terms, these commodity chains are described as consisting of a number of “nodes” that comprise the pivot points in transformation sequences: extraction and supply of raw materials, the stages of industrial processing, export of goods, and final marketing (Gereffi and Korzeniewicz 1990). Each node is connected to other nodes of related activity and the local, regional, and world economies are seen as ever more intricate web-like structures of these GCCs, creating spatially bounded structures of varying scales.

Some commodity chains are simple: the production of a soft drink can involves extraction of bauxite from a mine, a smelting sequence that produces first alumina, then aluminum, and the fabrication of the container itself. Others, however, are complex. In an early illustration of a commodity chain, Hopkins and Wallerstein (1986) detailed the raw materials and processes of industrial transformation necessary to build an eighteenth-century wooden sailing ship. The process involves the procurement of several key raw materials that make up the hull, mast, sail, ropes, etc.—and then production sequences of varying complexity and length to make the components, leading to final assembly in a shipyard, and distribution to various end users. Of course, the commodity chain (now assuredly “global”) for something like a modern automobile is even more intricate.
Most recent research on production networks and commodity chains tends to focus on consumer goods sold in retail stores (Appelbaum and Smith 2001; Gereffi 1994). Shining the spotlight on these final stages of particular GCCs has been extremely fruitful, as scholars have learned a great deal about the promise and perils of industrial upgrading strategies. But we also need to go back to the beginning of the commodity chain process and focus on the initial procurement of raw materials. Bunker reminded us that extraction (via either mining, harvesting of forest products, or agriculture) is extremely critical since this not only provides essential inputs to all finished goods but is also the source of basic energy production and infrastructural construction in contemporary society (Bunker 1985; Bunker and Ciccarelli 2005). The emerging “modes of extraction” in peripheral areas of the global system also promotes a form of unequal exchange and leads to what Bunker calls “progressive underdevelopment” (Bunker 1985). John Talbot (2004) recently provided a particularly comprehensive and elegant argument about how the political economy of global coffee production could be grounded in precisely this sort of “from the beginning” global commodity chain analysis.

Ultimately, global inequality and Third World development/underdevelopment are defined by the positions societies (or their firms, localities, extractive reserves, or “industrial districts”) occupy in these multiplex networks of worldwide economic production and exchange. All commodities undergo a sequence of transformation from raw materials to finished products. Heavy industrial products (like metals) may end up as girders in buildings, the bow of a ship, the foundation of a highway, or the pilings of a deep-water port. Some strategic raw materials may be processed into military hardware or weapons systems. For consumer products (the overwhelming focus of the existent GCCs literature), commodities end up as packaged and marketed goods. In all of these cases, the processes of transformation and transportation lead to geographic linkages and connections that in a real material sense create a spatially bounded structure for the world-economy. In the global economy of the late twentieth century, these “export networks and export niches are becoming key units of analysis in the contemporary global manufacturing system” (Gereffi 1992: 90).

Differential profit and surplus are generated at various nodes along these commodity chains. But these patterns are not uniform. While there may be a tendency for the highest profits and the most surplus extraction to occur at the later points along the commodity chain, this is not always the case. Instead, this pattern can vary across particular commodities (or even across nodes producing the same commodities in different ways). There may also be a tendency for the production nodes with the highest process technologies, turning out the most sophisticated and innovative products, to be the places where the most profits/surplus are captured. However, while this may have been the assumption of some early conceptual approaches to “the commodity question” and unequal exchange (Emmanuel 1972) and some efforts to measure “levels of processing” in international trade (Firebaugh and Bullock 1986; Jaffee 1985), Gereffi and other recent proponents of global commodity chain approaches, claim that things are not quite this simple. Global commodity chains are more than just sequences of production. There is a need to understand how both marketing of products (particularly to highly profitable core consumer markets) and coordination and control of the integrated global production/marketing networks are crucial. Indeed, it is now clear that for leading edge consumer goods, the marketing and “command and control” functions are where the big profits are made, while actual manufacturing is much less lucrative. On the other hand, it is also important to understand that there are a number of “logistical” processes that must be coordinated and controlled for those heavy industrial goods that, in a very concrete sense, make up the foundation of the contemporary global economy. Here “marketing” may not be critical in the same way—but “command and control” (tempered by things like the physical properties of the materials, the cost of transporting them, business strategies to “corner the market,” and ensure supply of strategic commodities, etc.) may still be paramount.
Levels of processing and structural inequality in the world-system

World-systems and dependency theorists argue that the structure of the world-economy creates international inequality. Generalizing from a long-term macro historical comparison, Immanuel Wallerstein claimed that dominant (core) countries rose to ascendency as a direct result of their exploitation of non-western (peripheral) regions. Through colonization, core states enriched themselves and simultaneously retarded the growth of peripheral states by forcing them onto political and social paths that made technological advancement and competition with the core difficult, if not impossible (Wallerstein 1974). The contemporary mechanisms of growth (or the lack thereof) are bound to the notion that the world-system is composed of hierarchically organized zones (core, semiperiphery, and periphery) that perform different functions in the international division of labor.

The defining characteristic of world-system zones is the extent to which they are involved in core or periphery production processes. According to Chase-Dunn, the underlying analytic basis of this territorial hierarchy is the distinction between core production and peripheral production. Core production is relatively capital intensive and employs skilled, high wage labor; peripheral production is labor-intensive and employs cheap, often politically coerced labor.

(Chase-Dunn 1998: 77)

Thus, historically, core countries’ production regimes are the ones that pioneered the move into industrial production and are primarily capital intensive, while peripheral countries regimes are primarily labor-intensive or based on the export of raw materials. Conceptually, the core/periphery distinction is one of a continuum, such that those countries that have a relatively equal mix of core- and peripheral-production processes are labeled semiperipheral and reside between core and periphery countries in the hierarchical structure.

Prior to 1960, this international division of labor was relatively simple: core countries specialized in manufactured goods that were exported abroad, and peripheral countries specialized in raw materials and foodstuffs for core markets (Dicken 2007; Mittelman 2000). The effects of this international division of labor were also relatively simple. Countries that specialized in manufacturing remained on the cutting edge of technological innovation and industrial capacity, which gave them an advantage in generating wealth through product innovation. Countries that specialized in raw material and agricultural extraction were disadvantaged in terms of their ability to generate wealth and develop modern industry, and were vulnerable to highly fluctuating prices for raw materials on the world market (Galtung 1971).

But with the rise of the NIDL this long-term historical pattern was fundamentally altered. Today the spread of manufacturing to peripheral areas is very uneven, and the consequences of industrialization in the places where it occurs are less likely to lead to sustainable economic growth and development than in the past. While “manufacturing” is a variegated phenomenon, the spread of factories to peripheral areas of the world-system is often associated with low wages in these regions, perpetuating a “race to the bottom” rather than industrial upgrading.

My colleagues and I have used formal multiple network analysis to analyze the structure of the world-system, in general, and the patterns of international commodity trade, in particular, beginning with data from the 1960s. Some of the earliest network analyses of international trade yielded empirical confirmation of the core-periphery hierarchy (Nemeth and Smith 1985; Smith and White 1992; Snyder and Kick 1979). These and other studies also found a positive relationship
between structural position in the world-system and economic growth (Kick and Davis 2001; Kick et al 2000; Nemeth and Smith 1985; Snyder and Kick 1979). They also demonstrated empirically that a country’s structural position in trade networks is related to its specific economic role in the international division of labor (Nemeth and Smith 1985; Smith and White 1992).

More recent findings suggest that the structure of the world-economy still conforms to this overall core-semiperiphery-periphery layering (Mahutga 2006; Mahutga and Smith 2011). In these analyses, the structure of international trade conforms to a clear core/periphery structure from 1965 to 2000. Contrary to claims that globalization is primarily characterized by the homogenous spread of “industry” to historically poor countries, the main dimension of core/periphery hierarchy continues to be differentiated by relatively advanced industry at the upper end of the hierarchy versus less advanced industry at the lower end. Confirming world-system expectations, upward mobility is exceedingly rare, even during recent decades of massive change and global restructuring. Indeed, there are also changing mobility patterns over time. During the last two decades of the twentieth century there appears to be less upward mobility than occurred in the 1960s and 1970s, suggesting that “globalization,” rather than spreading wealth and facilitating development, may be creating barriers for nations that are at the lower rungs of the global economy (Mahutga 2006; Mahutga and Smith 2011).

In fact, we find two types of “peripheralization” in recent years: first, there is one based on a specialization in low-wage, labor-intensive manufacturing (as predicted by the NIDL thesis and the idea of a global assemblyline). But we also find that some peripheral areas are becoming increasingly specialized in raw material exports. Like the light manufacturing regimes highlighted in the NIDL literature (Frobel et al 1980), these peripheral extractive economies can be very exploitative, underpinning a particular pernicious form of unequal exchange (Bunker 1985; Bunker and Ciccantell 2005).

Conclusion

Our results also have implications for broader debates about industrialization’s effectiveness as a development strategy across the peripheral zone of the world-system. One of the current “hot” debates within comparative sociology is over the trends and directions in global inequality (Firebaugh 2003; Korzeniewicz and Moran 2009). Consistent with some research focusing specifically on China and India (Hung and Kucinskas 2011), our results suggest that the rapid growth of these two countries may distort the overall picture of attenuated world-system polarization and inequality—and may not be very practical “models” for other so-called “less developed countries.” Indeed, the trade profiles of China, India (and a few other East Asian NICs) demonstrate that they could become obstacles to the growth of other poor countries by effectively “out-bidding” them for inclusion into the global production chains of transnational corporations (Choi and Smith 2010; Gereffi and Memedovic 2003; Schrank 2004). While it may be possible to statistically manipulate available data to show that there is declining “total world inequality” or at least, some overall reduction in between–country GDP per capita (Firebaugh 2003), it is almost certain that the effect disappears when China and India are removed from consideration (Hung and Kucinskas 2011). And by promulgating a rosy image of “declining world inequality,” we are potentially obscuring the fact that recent globalization has been characterized by very slow economic growth in most poor countries (Milanovic 2005). The dynamism of the few should not be confused with the stagnation of the many, otherwise sociologists become apologists for the global neoliberal project, which is essentially about corporate profits, not about genuine sustainable development.
References


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