

Global Corporations in the Greenhouse: Developing Equitable Accounting Measures

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The declining role of the state in world economic affairs and the increasing reach of transnational corporations to various parts of the world pose a serious challenge to the effectiveness and success of international environmental treaties. With the further integration of the global economy and the rise of economic actors that operate and conduct their business without regard to national boundaries, cost-benefit analyses of economic development and environmental impact become problematic. For instance, are national states responsible for the pool of carbon emissions within their borders or do the foreign owners of carbon-emitting infrastructure and production or the consumers of goods manufactured by transnational corporations in Third World countries hold a share of the responsibility for the emissions created? These and other related issues, such as the promotion of equity and justice, are the main themes of this article.

Key words: *Greenhouse effect, transnational corporations, environmental treaties*

Corporations headquartered in Organization for Economic Cooperation and Development (OECD) countries are becoming increasingly integrated in the economies of the developing world as markets open up and as state-owned enterprises are privatized. Global institutionalized trade policy as promoted by the General Agreement on Tariffs and Trade, the World Trade Organization (WTO), World Bank, and the International Monetary Fund (IMF), has made so-called free trade the model pursued in most parts of the world. While the Clinton administration incessantly touts the merits of the new global economy, its proposed greenhouse gas emissions trading regime appears to virtu-

ally ignore this new reality. This conceptual disconnect has far-reaching implications for the management of environmental problems that are now presenting themselves on a truly global scale (MacNeill, Winsemius, & Yakushiji, 1991). A greenhouse gas accounting and trading regime based on emissions by nation states ignores the fact that transnational corporations dominate the global economy and that their activities are not bound by national borders. It downplays the environmental impact of the transboundary movement of goods to meet the consumptive needs of individuals throughout the world. Most important, a conception of pollution as existing solely within the borders of individual nations and ostensibly being created for the primary economic benefit of domestic citizenry does not address the stateless nature of global capital, as well as the primary user of that capital, the transnational corporation. In fact, such a conception denies the highly concentrated and polarized global political economy within which economic, and therefore environmental, decisions are made.

Given the link between global energy and resource use, throughput and production, and economic growth and trade activity, we must begin to conceptualize global environmental impacts in the same manner. In addition, we must acknowledge the lack of economic democracy inherent in the global economy. Assigning a primary responsibility to nation states in managing global environmental pollution and emissions while simultaneously moving to usurp their power over economic and environmental decision making within their borders creates problems when attempting to address global environmental crises. We must acknowledge the lack of equitable distribution of political and economic power and decision making on



the part of nation states in an unequal world economy. A more equitable world environmental management scheme in the era of economic globalization must account for transboundary economic activity and must account for the energy embodied within products produced throughout the world. To simply monitor end-of-the-pipe pollution/emissions within national borders poses serious problems within the context of a highly integrated yet economically polarized global economy. Thus, equitable allocation of natural resources and responsibility for pollution and emissions becomes paramount in the era of globalization. Questions such as who benefits from pollution, environmental degradation, or greenhouse gas emissions, both from a producer's and a consumer's perspective, become critical (Daly & Goodland, 1994).

The Challenge of Kyoto

In December 1997, the world's nations met in Kyoto to grapple with the problem of global warming. The UN Framework Convention on Climate Change (FCCC), signed in 1992 in Rio de Janeiro, had drawn wide international attention to the danger of global warming from the use of fossil fuels and other activities. The FCCC committed signatory governments to reduce their levels of greenhouse gas emissions, which became a set of binding emissions targets agreed to in Kyoto by 24 members of the OECD and the European countries of the former Soviet Union. Developing countries did not sign, and in fact found the principles for allocating national greenhouse gas emissions targets unacceptable, making the success of the Kyoto agreement highly problematic.

Today's industrialized countries account for the majority of greenhouse gas emissions, but developing countries are expected to contribute 45% of total greenhouse gas emissions by the year 2010, and China and India alone will experience greater growth in emissions than all the OECD countries combined. Therefore, effective action will have to include all countries at some point in the near future. The question that arises is how this should be done.

So far, the debate has focussed on national targets. When quantitative targets are discussed, recent history and allocation of emissions based on present fossil fuel use become the guiding principle. However, developing countries—having foregone their share in economic development in the past but hoping to catch up soon—are clearly at a disadvantage when these allocation schemes are used (Byrne, Hadjilambrinos, &

Wagle, 1994). It was for these reasons that developing countries did not commit themselves to reduce greenhouse gas emissions under FCCC agreements. Allocation of greenhouse gas emissions based on population size, as suggested by some developing countries, might benefit them but would be unacceptable to the industrialized nations. Therefore, setting national targets to which all countries of the world can agree, becomes a real challenge and warrants the search for alternative approaches to the problem (Dunn, 1998).

Developing countries have taken the position that global environmental problems are mainly the fault of industrialized countries and that in all fairness, developing countries should not be called upon to foot the bill. As a result, international negotiations for mitigating global warming have been painfully slow and complex. The U.S. Senate has vowed that they will not pass a greenhouse gas emissions reduction plan if developing nations are not participating. Meanwhile, stiff OECD penalties imposed on countries/firms that do not take action to reduce greenhouse gas emissions might actually lead to relocation of energy-intensive industries to countries that have not yet committed to fight global warming, undermining the overall objective of reducing global greenhouse gas emissions. This possibility forces us to consider crucial aspects of the global economy and the role of the transnational corporation in this economy. The very idea of an American economy is becoming meaningless given the primacy of the transnational corporation (TNC), calling standard national economic accounting practices into question. If this is the case, it would appear that emissions allocations tabulated solely on the basis of national accounts would be equally suspect.

The Transnational Corporation and the Global Commons

The rapid growth of transnational corporations is one of the most significant developments of the past few decades. Just as individual national economies are dominated by a small number of giant firms, so is the world economy dominated by transnational corporations. Conventional international trade theory assumes that producers and consumers are confined within respective national borders. Thus, international trade results from production in one country and consumption in another. The activities of multinational corporations significantly complicate this conventional model. Since TNCs are, by definition, located in more than one country and operate their own eco-

conomic subsystems of spatial interaction, each functional unit of a multinational corporation is both a potential global producer and consumer. This distinction severely complicates the tracking of international trade flows and the attendant material and energy flows embodied in finished products (Daly, 1993). The fact that these corporations are referred to as transnational indicates that they are viewed as enterprises that transcend and frequently compete with the interests of individual countries (Korten, 1995).

Trade within TNCs, or intrafirm trade, has been increasing along with the global scope of transnational corporate activities. Within the context of the global corporate economy, the domestic product of an American-based firm is tallied as domestic production, as is the gross product of the domestic subsidiary of a foreign-based TNC. Correspondingly, the imports and exports of these firms are calculated on the basis of cross-border movement of goods and services, regardless of the geographic location of ownership, strategic managerial control, or the ultimate flow of economic benefits. As a result, simplistic national accounting systems obscure the real impacts and benefits of globalized economic activity. Given an equitable economic playing field, such accounting nuances would be of little concern. However, within a polarized global political economy, the tracking of such beneficial flows is a fundamental precursor to equitable international environmental management.

A snapshot of the global economy demonstrates that the rhetoric in support of “free trade” does not mesh with the ideal. Given the political and economic relationships, an increase in trade liberalization and economic integration will foster increased economic and political inequity. Consider the following compilation of data from the United Nations’ Human Development Report (1996), and the World Bank’s World Development Report (1997):

- Developing countries, comprising 80% of the world’s population, account for only 20% of economic output.
- The 1996 sales of the 500 largest global corporations were equivalent to approximately 40% of world economic output.
- The top 50 global corporations had 1996 revenues that easily dwarfed the combined gross domestic product (GDP) of the world’s poorest

49 countries, and nearly equaled the combined GDP of the world’s 57 middle-income countries.

- Four hundred sixty-nine of the world’s largest corporations are headquartered in OECD countries (308 within the United States, Japan, France, Germany, and Britain alone)—only 25 of the largest global corporations are headquartered within the developing world (of these, 11 are located in South Korea, which has recently joined the OECD); practically all TNCs are controlled by shareholders within industrialized countries.
- Transnational corporations control 70% of global trade and hold 90% of technology and product patents.
- Income disparity between the richest 1 billion and the poorest 1 billion has doubled over the last 30 years from 30:1 in 1960 to 61:1 in 1991, and it currently stands at 78:1.
- The net worth of the world’s 358 billionaires is equal to the combined income of the poorest 45% of the earth’s population.

It quickly becomes obvious that the largest global economic actors are not countries, but companies and wealthy individuals. Thus, the consolidation of strategic economic resources and decision-making structures within the global economy is immense. As the global economy liberalizes international investment and trade policy, the ability of these economic actors to dictate national economic and environmental policies to the detriment of democratic civic society increases in turn.

Global economic liberalization obviously favors certain societies over others. With the removal of trade barriers, those that hold the disproportionate share of the world’s capital will be able to exploit internal national markets to the disadvantage of smaller domestic producers. As the leaders of the developed world constantly reiterate the need for developing countries to participate in global environmental agreements, citing projections that demonstrate drastic increases in Third World economic output and greenhouse gas emissions, transnational corporations within the developed countries are banking on the exponential growth of these economies to provide them with long-term growth opportunities. Thus, there is a major policy disconnect—OECD leaders point to the increasing environmental responsibility of the

developing world as they simultaneously advocate policies that seek to institutionalize the strategic penetration of Third World economies by Northern global corporations. The possibility that the activities of OECD companies may be promoting unsustainable development patterns in the developing world is never even considered.

Moreover, the central question of who stands to profit from certain development patterns within the Third World and whether the financial imperatives of transnational corporations are engendering the development of unsustainable economic and environmental systems is not in question. If it were, the North would be forced to accept a substantial degree of responsibility for the environmental and economic consequences of Third World development patterns. These key questions are conveniently hidden by focusing on global trade between nations rather than the global economic integration of transnational corporate production and the extraction of national economic and environmental policy concessions to achieve the goals of transnational capital. Thus, although international trade has often been emphasized when speaking of globalization, it is actually the transnationalization of the investment and productive capabilities of multinational corporations that comprises the true architecture of economic globalization (Kahler, 1998).

Much of international trade actually represents the movement of goods within the integrated global production apparatus of multinational corporations (Knox & Agnew, 1994; Taylor & Thrift, 1986). As a result, the term *trade* is a misnomer. Yet, economic analysts constantly invoke the trade mantra when speaking of the benefits of globalization. The buzzword these days is the maintenance of global competitiveness. However, reality for most U.S. production workers is different. As American labor unions compete with Mexico for jobs, they are often competing against the transnational operations of American companies. Just as economic production in developing countries is often foreign, or more specifically stateless, so are the environmental problems engendered through such productive activities. Thus, as the global economy—that is, the transnational activity of increasingly stateless corporations—is commonly characterized as competition between nation states, such a conceptualization masks the economic and managerial dynamics at work, as well as the responsibility for the environmental results of corporate production and development patterns.

Foreign Economic Activities of Transnational Corporations

When measured by value added, the geography of manufacturing around the world is heavily concentrated. By far the largest share of manufacturing activity is found in the high-income countries of the Northern Hemisphere, more specifically, North America, Western Europe, and Japan, known as the economic triad. These mature industrialized market-based economies hold the vast majority of wealth, technological know-how, and production capacity in the world and can be appropriately referred to as the manufacturing core of the world economy. Until the mid-1980s, the economic triad accounted for approximately 75% of the world's total value added (Dicken, 1992). Since then, two regions in particular have seen a significant increase in their percentage of manufacturing value added; the rapidly industrializing nations, or newly industrializing countries (NICs) of South and East Asia, and Latin America (Brewer & Young, 1998). Eastern Europe, currently in transition toward a market economy, may be the third region to see dramatic increases in the percentage of global manufacturing value added (Meyer, 1998).

Based on evidence presented in the United Nations' World Investment Report (1997), the large majority of TNCs are headquartered in the United States, Europe, and Japan. As of 1994, there were 44,508 transnational corporations. Of these, only 7,932 were headquartered in developing countries. The 44,508 transnational corporations managed approximately 280,000 foreign affiliates, and the parent companies of the foreign affiliates held worldwide assets of \$8.4 trillion and global sales of \$6.4 trillion (gross product of \$1.557 trillion). According to the World Bank's World Development Report (1997), this is equivalent to approximately 25% of the global economic output. In terms of gross product of foreign affiliates (the value added through the productive activities of these companies), the direct production of foreign affiliates accounted for approximately 6% of global economic output in 1994 (9% of world gross product when considering the international investment underlying international production). The relative importance of foreign affiliate production is much greater for developing countries, with the productive activities of the foreign affiliates of transnational corporations accounting for 9% of the GDP of the developing world, in comparison to 5% of the industrialized world's GDP. Of these foreign affiliates, 129,000 are located in developing countries

(99,522 in South, East, and South East Asia; 24,267 in Latin America and the Caribbean), 61,902 in Western Europe (54,862 within the European Union [EU]), 53,260 in Central and Eastern Europe, 18,608 in the United States, and 3,405 in Japan.

By comparison, the majority of parent companies were headquartered in Western Europe, Japan, and the United States. Of the transnational parent companies, 26,161 were located in Western Europe (22,111 in the EU), 3,967 in Japan, 3,470 in the United States, 1,099 in Latin America and the Caribbean, and 6,242 in South, East, and South-East Asia.

The value of foreign direct investment (FDI) and the gross product of foreign affiliates has been increasing exponentially during the last two decades. Between 1982 and 1994, FDI stock increased fourfold, reaching a value of \$3.2 trillion in 1996. In 1996, the total annual investment in the foreign affiliates of transnational corporations was \$1.4 trillion; of this, \$350 billion represented direct foreign investment by parent companies (a 10% increase from the previous year). As a result, the weighted relevance of international production is much larger than evidenced by direct investment flows. According to the World Bank, expressed as a ratio of world gross fixed capital formation, about one fifth was undertaken (in 1996) by foreign affiliates (World Bank, 1997, p. 4).

Moreover, these international investment dynamics represent a net shift of foreign-controlled productive assets from the developed to the developing world. Developed country hosts are becoming relatively less important venues for FDI, with FDI inflows having shown a steady percentage decline since 1989. During 1995-1996, 34% of FDI inflows were to the developing world. This represented \$129 billion in total global FDI, of which \$81 billion was invested in South, East, and South-East Asia (\$42 billion going to China and \$9 billion to Singapore). Outflows of FDI from developing countries to other countries totaled \$51 billion, \$27 billion of which emanated from Hong Kong alone.

Outward foreign FDI stock is dominated by the largest transnational corporations. The top 100 TNCs, ranked on the basis of foreign assets, control an estimated one fifth of total global foreign assets. As of 1995, 51% of U.S. FDI was controlled by the 25 largest U.S. transnational corporations. This dynamic was much the same within much of the OECD. The top 50 TNCs based in Australia, Canada, France, Germany, United Kingdom, Norway, Sweden, and Finland controlled 50% or more of the outward FDI of these nations. Moreover, this ownership was even more con-

centrated within the hands of the top 10 largest corporations in each of these countries. The share of outward FDI controlled by the top 10 domestic corporations in 1995 was United States (33%), United Kingdom (40%), Germany (29.3%), France (23%), Canada (33.5%), Australia (57%), Sweden (37%), Norway (75.2%), and Finland (47%). China, South Korea, Hong Kong, and Mexico are home to 56% of the top 50 developing country TNCs, which account for two thirds of these countries' foreign assets.

The primary driver of this global investment expansion is mergers and acquisitions and interfirm agreements. In 1996, the value of cross-border mergers and acquisitions totaled \$275 billion, an increase of 16% from the previous year. Of these, \$163 billion involved majority-interest transactions, the equivalent of 47% of global FDI inflows. The number of cross-border interfirm agreements (defined by the World Bank as equity and nonequity agreements other than strategic research-and-development partnerships) has also increased dramatically. In 1995, nearly 4,600 such agreements were reached between companies, a substantial increase over the 1990 total of 1,760. These arrangements primarily consisted of formal ties between United States, European Union, and Japanese firms. Of these agreements, U.S. firms were involved in 80%, EU firms in 40%, and Japanese firms in 38% of the cases.

This internationalization of production has been aided and often promoted through the liberalization of national FDI regulations and policies. From 1991 to 1996, there were 599 changes in national FDI regulatory regimes. Most of the changes concerned streamlining or abolishing approval procedures and the provision of incentives. The Multilateral Agreement on Investment (MAI) currently being negotiated by the OECD behind closed doors would institutionalize these liberalized investment practices between the industrialized countries, with the hope that such a regime will be generalized throughout the rest of the world under the auspices of the WTO.

The result of world trade liberalization is that control over global economic activities by transnational corporations headquartered in the developed world is increasing rapidly. Most of this activity is being managed by the largest and most powerful global firms. This underscores the true dynamic of globalization, which is the internationalization of productive activities and networks by transnational corporations, rather than an increased reliance on global trade. According to the World Bank, international production out-

weighs exports as the dominant mode of servicing foreign markets (World Bank, 1997, p. 1). Overall, the cross-border movement of capital and formal cooperation between transnational corporations has become much more important than the cross-border movement of goods. However, much of the offshore productive activities of TNCs in developing countries are geared toward export. In the case of Mexico, exports of goods manufactured by majority-owned foreign affiliates (MOFAs) as a percentage of total production steadily increased with the passage of the North American Free Trade Agreement (NAFTA). The MOFAs of U.S. multinational corporations located in South Korea, Indonesia, Malaysia, Philippines, and Thailand exported 62.9% of their output in 1994 (United Nations Conference on Trade and Development, 1997). By economic sector, exports from manufacturing firms dominated, accounting for 62.1% of production in Malaysia and 62% of production in Thailand. In Korea, exports were centered in the electronics sector, accounting for 30.2% of U.S. MOFA production. Japanese affiliates in Indonesia, Malaysia, Philippines, and Thailand exported 38.3% of their combined output. By economic sector, the percentage of Japanese affiliate production exported was highest in primary materials (86.6%), electrical machinery (74%), and manufacturing (42.8%).

Relocation of Environmental and Energy-Intensive Manufacturing

Although various considerations play a role in location decisions, a significant factor recently noted by manufacturers and scholars alike is differential environmental considerations and regulatory burdens across national boundaries (Esty, 1994; Vogel, 1995). Throughout the history of industrialization, manufacturers have externalized the vast majority of the environmental costs of production. Increasing environmental regulation within the developed economies is now forcing a partial internalization of these costs. Although the U.S. Census Bureau (1988) estimates that the costs of pollution control compose only roughly 1% of value added for the majority of industries, this percentage is much higher for energy-intensive industries such as copper smelting (22%), oil refining (9%), and steel production (7%).

With the establishment of institutionalized international free trade regimes, environmentally and energy-intensive manufacturers may be increasingly induced to relocate to countries where environmental

regulations are less stringent and that simultaneously allow the exportation to nearby developed or home markets. Some developing countries have set up free trade zones or export platforms to explicitly serve these environmental needs of transnational corporations and developed markets as well as cheap labor. The maquiladora system in Mexico is a good example.

Although not tied solely to issues of environmental compliance, a partial result of tighter environmental standards in the developed nations is the migration of energy-intensive industry to the developing world. From 1975 to 1991, the developing world's share of global iron and steel production doubled from 10% to 20%. By comparison, the developing world's share of manufacturing exports increased from 4% to 19% over the period 1955-1989, according to a recent Worldwatch report (French, 1998). Evidence suggests that the environmental incentives to relocate are strong even when free trade regimes explicitly mandate environmental protection and/or parity. Over half of the largest 100 U.S. corporations operate assembly plants in Mexico (French, 1998, p. 32). Since the passage of NAFTA, maquiladora employment has increased by over 215,000, while the U.S. trade deficit with Mexico has mushroomed to \$16 billion, according to *NAFTA Index* published by Public Citizen (January 16, 1997). Although Mexico's environmental laws are ostensibly as stringent as American laws, enforcement is lax. A General Accounting Office spot survey of six U.S.-owned maquiladoras in 1992 found that none had obtained the required environmental permits required by Mexican law (U.S. General Accounting Office, 1992). Moreover, although maquiladora plants are expected to return all hazardous wastes produced to the United States, it is widely acknowledged and documented that this is the exception rather than the rule. The Mexican environmental ministry estimated that in 1991 only 35% of U.S.-owned factories along the border were in compliance with Mexican environmental laws (U.S. General Accounting Office, 1992, p. 32).

The increased geographical mobility of capital means that national states' efforts to attract and retain industry (and jobs) increasingly involve global competition. If Mexico were to actually enforce its environmental laws, it might lose jobs and employment opportunities. Globalization, thus, means a significant reduction in the ability of the state to influence public policy and to enforce environmental and labor laws (Harris, 1986).

The Role of U.S. TNCs in U.S. Global Trade

The majority-owned, nonbank foreign affiliates of U.S. transnational corporations (MOFAs) had a combined gross product of \$462.96 billion in 1995 (Mataloni, 1997). This represented 25% of the global gross product of U.S. transnational corporations of \$1.8 trillion, 24% of capital outlays and 24% of global employment. However, MOFA activities accounted for 32% of U.S. TNC profits in 1995. By way of international comparison, if the foreign gross product of U.S. transnational corporations in 1995 is conceptualized as a single economy, its GDP would easily exceed that of India, South Korea, or Russia (World Bank, 1997). Because this includes only the value added of the MOFA offshore firms, while ignoring external inputs that would be included in sales receipts, it is the best conservative indicator of the impact of U.S. TNCs on foreign economies and, by association, the environmental resources that support these economies. This impact estimate does not include the indirect financial contributions by U.S. transnational banks and other finance, insurance, and real estate investments.

The investments of U.S. MOFAs are heavily concentrated in energy/greenhouse gas-intensive economic sectors, with manufacturing accounting for \$289.6 billion (including chemicals [\$67.9 billion], primary and fabricated metals [\$13.8 billion], and transportation equipment [\$51.3 billion]) and the energy sector (petroleum) accounting for \$95.8 billion of U.S. MOFA gross product (Mataloni, 1997, p. 56).

The activities of U.S. nonbank MOFAs have a significant effect on a wide range of national economies. The gross product of U.S. MOFAs in 1995 constituted at least 2% of the GDP of 29 countries, 15 of which were developing nations. In many cases, the impact is much greater. Within the developing world, 1995 U.S. MOFA gross product accounted for 9% of the GDP of Singapore, 5% of Malaysia, 4.8% of Hong Kong, 5.6% of Panama, 6.1% of Costa Rica, and 7.9% of Honduras (Mataloni, 1997, Table 13, p. 56). Within the industrialized world, U.S. MOFA gross product accounted for 16.1% of the GDP of Ireland, 9.1% of the GDP of Canada, and 6.4% of the GDP of the United Kingdom.

Overall, the impact of MOFAs on foreign economies may be considered much greater than indicated by gross product. In 1995, gross product accounted for only 26% of total MOFA economic output, whereas 8% was imported from U.S. parent companies and 1%

from unaffiliated U.S. interests. The remaining 65% of MOFA total economic output originated from within the domestic economy of the host country, indicating that MOFA activities have a large impact in shaping the economic and productive networks of foreign economies (Mataloni, 1997, p. 57).

U.S. global trade is dominated by TNCs. In 1995, 62% of all U.S. exports and 39% of all imports involved sales and/or purchases by U.S. TNCs. Within this U.S. TNC-controlled subset of U.S. global trade (\$288 billion), 41% of exports represented trade between U.S. parents and their foreign affiliates and 44% of imports represented trade between foreign affiliates and their U.S. parent companies (Mataloni, 1997, p. 50). Of the remaining nonintrafirm trade controlled by U.S. TNCs, 17% (\$27.7 billion) represented imports shipped by U.S. foreign affiliates to U.S. interests other than their parent companies. A substantial portion of the remainder of U.S. trade involves economic transactions between foreign multinationals and their U.S. affiliates. In 1995, 34% of U.S. imports and 23% of U.S. exports involved the U.S. affiliates of foreign corporations.

The growth of global trade of U.S. TNCs is largely represented by the planned transfer of resources within corporations that happens to cross national borders in the process. The fact that much of global trade actually entails the transfer of goods from one division to another within the same multinational corporation is a little discussed fact often obscured by hyperbolic free trade rhetoric. Such a scenario is typically referred to as intrafirm trade.

Intrafirm trade accounted for nearly 50% of the international trade conducted by U.S. multinationals in 1993 (Zeile, 1997, p. 26). From 1982 to 1994, intrafirm trade within transnational corporations has accounted for between 36% and 43% of total U.S. imports and from 32% to 40% of total U.S. exports. In 1995, the intrafirm trade of U.S. multinationals accounted for 25.6% of U.S. exports and 16.9% of U.S. imports. This trade was dominated by the manufacturing sector, which accounted for 82.9% of imports from U.S. MOFAs and 59.5% of exports to U.S. MOFAs in 1994. Wholesale trade accounted for 9.8% of imports and 36.6% of exports.

Various tariff provisions encourage intrafirm trade within TNCs by allowing low-duty or duty-free importation of goods sent abroad for processing or final assembly. In the United States, two tariff schedules exist under the Offshore Assembly Provision (OAP), which encourage U.S. companies to assemble

goods for domestic consumption in countries with low labor costs. Tariffs are collected only on the foreign value added of the re-entering goods. If cheap labor represents the bulk of the value added, the tariffs are correspondingly low, whereas the environmental and social costs to the host country may be correspondingly high. This is evidenced in the maquiladora export zone in Mexico along the U.S. border.

A significant portion of TNC intrafirm trade is also conducted with tax avoidance in mind. Most countries collect income taxes but apply variable rates and types of deductions and credits so as to attract foreign investment. A TNC can play off one country's tax system against another through the exercise of transfer pricing, a system of preferential pricing of intrafirm transfers. Transfer pricing allows a TNC to shift taxable income from a high-tax country to a low-cost country, or to hide taxable income altogether. In some instances, tax havens are used to eliminate a wide range of tax liabilities (MacCharles, 1987). It would seem that financial advantage, as opposed to fundamental economic advantage, may be more useful in explaining the particular geographic patterns of intrafirm trade of TNCs in many instances.

The Political Economy of Production and Consumption

The above analysis demonstrates that the global environmental policy debate is being conducted within narrow conceptual parameters and fails to fully address the realities of the current global political economy. Transnational corporations, not nations, are the primary economic actors. Moreover, while free trade apologists point to the benefits of the increasing liberalization of markets in increasing product choice and economic opportunity, they fail to address the growing centralized integration of global production networks. Although production may be taking place in more corners of the world and more goods are crossing national borders, the nexus of global economic governance is becoming more consolidated and concentrated. As a result, economic decision making is becoming less democratic. Corporations are autonomous, centrally planned, ostensibly autocratic organizations. As their power increases and cooperative networks between corporations increase, the threat to effective democratic participation in economic affairs becomes more acute. As governments increasingly cede strategic economic decision making and planning to corporations and markets, citizen participation

in environmental affairs is severely marginalized. Correspondingly, the ability of transnational corporations to externalize environmental costs within less developed and less democratic economic markets is increased.

Given these macroeconomic dynamics, economic policy can no longer exist in a vacuum, disconnected from environmental and social policy. The failure to integrate these policy realms will preclude effective and equitable global environmental management.

This being the case, certain critical questions need to be addressed when considering the environmental effects of global economic activity: (a) Who is benefiting from specific economic activities and therefore bears primary responsibility for the attendant use of global resources and creation of pollution? (b) Who controls the decision-making apparatus that determines development patterns, resource use, and pollution control measures within nations, both ostensibly and in reality? (c) To what degree can pollution within national borders be connected to the internal economic activity of individual nations within a globalized economic context? (d) Who bears the primary responsibility for a nation's resource use and pollution emissions: the domestic producing nation, the foreign countries that consume these products, or the companies and investors who directly or indirectly benefit from production (wherever they may be located)?

Solutions that do not address these key questions stand to be incomplete and potentially inequitable. As such, acceptance of such policy proscriptions will continue to be contentious and may preclude widespread support.

Any Mexican living within 15 miles of the American border is well aware of the fact that the vast majority of pollution in his or her backyard is a direct result of the consumptive habits of Americans and the productive activities of transnational corporations striving to meet these "needs." Yet under a national accounting framework, these environmental impacts are considered "Mexican." A greenhouse gas emissions trading regime based on national emissions fails to properly attribute the embodied energy, greenhouse gas emissions, and pollution inherent in consumer products destined for foreign markets to those who benefit from them: offshore owners of productive capital that profit from commodity production as well as the minority of global consumers responsible for the majority of world consumption. This begs the question, Should offshore emissions resulting from the

production of products destined for U.S. or European markets be considered U.S. or European emissions?

Nation-based environmental accounting regimes also ignore the fact that the profits from production in various countries in the global economy are monopolized by TNCs and that these profits accrue to a wealthy class of OECD investors. The question, therefore, is, Should foreign owners of pollution-producing capital be responsible for these emissions based on a "polluter pays" principle? More specifically, Should emissions "owned" by U.S. or European companies be tabulated as U.S. or European emissions? For instance, international investment by American utilities in foreign electric power generation would seem to blur the line of who is responsible for even such an easily accountable category as point source emissions. Furthermore, should net trade debtor economies such as the United States be forced to account for a portion of the embodied energy inherent in their imports as "beneficial emissions"?

Such concerns would be irrelevant if the global market, comprising distribution of capital, production, and consumption patterns, were equitably distributed. However, it is not. As a result, proposed environmental accounting and trading regimes that merely account for U.S. emissions within its borders at the tail pipe and power plant, but do not account for the political-economic power that U.S.-based TNCs exercise in the world economy, will fall short of reaching their goal. In fact, these accounting/trading schemes significantly undervalue the overall impact that American capital, productive assets, and lifestyle has on the global environment. In dealing with an economic geography that is hegemonic in many respects and increasingly disconnected from nation states, questions of responsibility and accountability become highly problematic. Thus, the question is political: What percentage of their emissions are industrialized nations willing to take full responsibility for?

Conclusion

One alternative to present proposals of emissions targets and emissions trading schemes is to focus the frame of reference to a larger degree on the primary global economic actors: the transnational corporations. Environmental management proposals sensitive to the impact of multinational corporations would remove a certain degree of accounting complexity while offering additional benefits. Most notably they would require greater transparency of corporate activi-

ties. Full disclosure of ownership, as well as a full accounting of corporate activities would be imperative under such a framework. Moreover, it would also acknowledge the unmentioned premise that with increasing corporate power and legal rights (as promoted by WTO) come substantial responsibilities. As national economic and environmental regulation loses its primacy with the advent of multilateral trade agreements that institutionalize the legal rights of transnational corporations to export profits, no countervailing environmental rule of law has emerged to regulate the activities of these corporations. As economic globalization makes it more difficult to track the operations of these firms, regulated oversight becomes increasingly necessary. To date, the connection between economic structure and environment has been underplayed when crafting environmental management policies. To the extent that economic form and dynamics have been considered, the policy measures devised have been lacking the complexity and subtleties needed to sufficiently address the environmental impacts of the globalization of the world economy.

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