

The New Dependency:

Technological Change and Socio-Economic Restructuring in Latin America

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INTRODUCTION

Dependency theory is still a useful analytical tool to understand our world. It is helpful as long as we remain rooted in the historical-structural approach that originated this school of thought (Cardoso and Faletto, 1967). This implies, on the one hand, rejecting the dogmatic, simplistic versions of dependency, often worded in the core-periphery language (see Cardoso, 1977: 7-24) and, on the other hand, being attentive and responsive to the new forms of dependency embedded in the social structures of Latin American societies (Evans, 1979).

Dependency refers to an asymmetrical, structural relationship between social formations, such that the dependent society(ies) is shaped to a large extent by the social dynamics and interests generated in the dominant society(ies). The process of dependency operates through the interplay of social actors that respond simultaneously to their specific historical conditions and to the larger framework of worldwide relationships in which they are included (Touraine, 1988). Dependency also means that the effects of new dominant trends on dependent societies will be mediated by a social structure that is itself shaped by the preexisting social organization, including a strong dependent component. New forms of dependency emerge under conditions shaped by older forms, thus constraining the degrees of freedom of the dependent social formation with respect to development strategies and political decisions.

In the last decade three major inter-related processes, all originating in the dominant societies of the capitalist system, have ushered in a new era (Castells, 1987):

- a technological revolution of historic proportions, with its basic nucleus in information technologies;
- the formation of an international economic system working as a unit in real time, supported by a technological infrastructure that makes such simultaneity possible; and
- a process of fundamental socio-economic restructuring, in both dominant and dependent societies, that has established a new basis for capital accumulation and political legitimacy at the center, while imposing significant social costs on both types of societies.

In recent years Latin America has endured dramatic social and economic crises, while struggling to restore democracy in most of the region, a difficult task under such precarious conditions. The most easily perceived economic difficulties come from the external debt problem and the austerity policies resulting from the need to service it. However, more fundamentally, we can observe a growing deterioration of the

position of Latin America in the international division of labor.

It is our contention that at the roots of the deteriorating economic and social situation in Latin America is the combination of new and old forms of dependency. The new forms of dependency are linked to the technological revolution that is driving the restructuring of the production system, while the old forms are now mostly expressed as financial dependency and the imposition of austerity policies by international capital. It is a combination where the emerging structural forces pull economies in one direction while the old financial and political powers pull governments towards a different one.

The technological revolution, while integrating most countries in a unified system under a market economy, has changed existing advantages and disadvantages by increasing the overall significance of the scientific and technological capacity of countries and firms. This is an area where Latin America is handicapped vis-a-vis the North as well as in relationship to the Asian NICs (Fanjzylber, 1986; Sagasti, 1981). Financial dependency, deepened by the interaction of financial capital with corrupt, inefficient political regimes during the 1970s, has greatly reduced the ability of Latin American countries to respond to the technological challenge and escape from their structural disadvantage in the current international competition (Schatan, 1987). The result is a fundamental economic crisis that redefines the terrain for socio-political processes in Latin America. While these processes are largely autonomous from economic conditions, they must cope with the structural constraints resulting from the position of a country in an increasingly internationalized economic system.

The old forms of dependency have been extensively studied, and both political elites and social movements seem to be aware of some of their effects on Latin America. However, autonomy and dependency are acquiring different meanings that have yet to be assessed. This article focuses on those emerging realities, emphasizing the interplay between technological change, the transformation of Latin America's position in the international economy, and socio-political processes aimed at managing economic restructuring. Particular attention is given to the role of technology, since we consider it the driving force of the current capitalist restructuring. Our analysis starts at the level of the region as a whole and then concentrates on Mexico and Bolivia, two countries representing the extremes on the scale of integration and disintegration in the new international system. We conclude by discussing the theoretical and political implications of our analysis.

TECHNOLOGICAL DEPENDENCY AND THE DECLINE OF LATIN AMERICA'S POSITION IN THE WORLD ECONOMY

The expansion of world trade has been the cornerstone of economic growth during the last 25 years. In that period the rate of growth of international trade systematically outperformed the rate of growth of industrial output, even when both rates were declining over the last decade (UNCTAD, 1987). The dynamic role of international trade has been particularly important for countries of the industrializing periphery, in a process epitomized by the Asian NICs. However, during this expansionary phase of world capitalism, Latin America as a whole has seen its position deteriorate in the international economy, losing substantial market shares. The Latin American share of total world exports fell from 12.42% in 1950 to 5.41% in 1985, while the corresponding figure for imports also declined from 10.14% in 1960 to 3.98% in 1985. (UNCTAD, 1986) Furthermore, the loss of competitiveness in the international arena has not been compensated by the expansion of domestic markets. Indeed, sluggish rates of growth, rampant inflation, and the austerity policies of the 1980s have actually shrunk domestic markets, reducing the purchasing power to the upper middle class sectors, which are too small to actually sustain growth on the basis of their demand.

Thus, with public spending limited by the need to curb inflation and to pay the interest on foreign debt, and with internal markets increasingly narrow because of the high concentration of income, Latin America is faced with the imperative of targeting new export markets as a way to break the vicious circle between the scarcity of demand and the lack of investment. In 1983, the proportion of exports over GDP for the whole of Latin America was about 19%, up from 12.2% in 1970. Over 39% of total exports were still destined to North America, a figure similar to that of the early 1960s (GATT, 1986-87). In other words, the role of the external sector in Latin America has grown, while its trade continues to focus on North America. However, with some exceptions to be noted below, the performance of the external sector has worsened, thus bringing into decline the whole Latin American economy.

This loss of competitiveness is crucial to understanding the restructuring process of Latin America and the new forms of its dependency, especially on the OECD economies. After all, by the mid-1960s the major Latin American countries had a much stronger industrial base than the Asian economies (with the

exception of Japan) that have taken on the world market with remarkable success (Fanjzylber, 1983).

Several factors help to explain the decline of Latin America in the world economy.

First, the transformation of the structure of world trade, with decreasing importance of raw materials and agricultural commodities and increasing importance of manufactured goods in terms of relative prices, has deeply hurt Latin American external sectors that traditionally have had a negative balance in manufactured goods (GATT, 1987). Only Brazil has reversed this tendency since 1982. An important element in the transformation of this trade structure is the technological revolution that has taken place in agriculture and in raw materials. In the former case, agricultural surpluses both in OECD countries and in the Third World have pushed prices down (World Bank, 1986). In the latter case, new synthetic materials, composites, and alloys have displaced traditional mining products, while new technologies have allowed for the recycling of the remaining metals. In the early 1980s, the supply of recycled metals represented about 48% of the market for lead, 38% of copper, 24% of zinc, and 19% of tin (Gonzalez Vigil, 1986).

As a result of these trends, along with the control of the world's commodities markets by the buyers, the index of relative prices between agriculture and manufacturing fell from 168 in 1950 to 81 in 1985; between mining and manufacturing, it fell from 124 in 1950 to 79 in 1985. Even the price index for oil, which had climbed in relation to manufacturing from 13 in 1970 to 107 in 1980, fell back to 101 in 1985. Thus, the concentration of Latin American exports in primary goods runs against the main trend of international trade, increasingly based on higher value manufactured goods.

The key question then becomes why Latin America has been unable to compete in the international markets for manufactured goods. Our hypothesis is that a fundamental element has been the weak performance of Latin America in the high technology sectors, particularly in electronics (UNCTAD, 1984). This is for several reasons. On the one hand, these sectors have been the fastest growing sectors in the world in the last twenty years. In 1985, the value of global output of electronics surpassed that of the steel industry, the flag bearer of earlier phases of industrialization, and equaled that of the automobile industry, the epitome of the Fordist model of industrial mass production (Kaplinsky, 1986). To be largely absent from these world markets means to renounce competing in a substantial proportion of the world economy, both in foreign and domestic markets. In addition, these are markets with high returns that

condition capital formation in national economies. Available data¹ show the generally poor performance of selected Latin American countries in international trade of key high technology sectors, again with the exception of Brazil and, to some extent, that of Mexico in the 1980s.

On the other hand, the main impact of inadequate levels of production of high technology capital goods is felt in the low technological level of a country's industrial facilities. Obsolete factories, unreliable telecommunications and communications, and weak informatics capabilities in management and distribution processes decisively undermine competitive capacity in an open world economy, both in terms of cost and of quality.

Without a minimum level of endogenous productive capacity in high technology capital goods, countries must import almost all the new productive machinery in a period of rapid technological change. Without such rejuvenation of their equipment, they cannot hope to compete in international markets solely on the basis of low labor costs. This is because the quality of the product is a necessary condition to penetrate the most important markets. Also, since many Third World countries are able and willing to produce at low cost, the competitive edge comes from the technological element added to a low-cost productive structure. Therefore, new, advanced machinery, together with the know-how, must be imported.

These imports, however, must be quickly matched by growing exports of manufactured goods to obtain the hard currency necessary for the imports. Given the low performance of Latin American economies in industrial exports, they are unable to sustain for long an import policy aimed at the technological rejuvenation industry. Thus, they cannot import high technology because they do not export enough industrial products, and they cannot export manufactured goods because their industrial base is obsolete without high technology imports. The way out of this vicious circle of underdevelopment seems to lie in the combination of a judicious import policy with the promotion of an endogenous technological capacity to ensure the best possible use of expensive equipment imports, as well as to reduce gradually the level and cost of technological dependency.

However, policies of technological development are constrained by the historical conditions of dependency that have shaped the Latin American economies (Furtado, 1983). The process of restructuring

¹ See, for example, the Yearbook of International Trade Statistics, published annually by the United Nations.

international economic relationships departs from a given structure in which Latin America is limited in its options and development strategies by its linkages with foreign economic agents and with the dominant economies, particularly the United States. This argument is fundamental to our analysis and hence will be developed in more detail.

In the first place, Latin America suffers from a dramatic technology gap vis-à-vis the OECD area. In 1980 Latin America represented about 8% of the world population and about 5% of global GNP, but accounted for only 2.5% of scientists and for 1.8% of total "R&D" spending (Fanjzylber, 1983). The gap is even greater with respect to the technological basis of the industrial structure. Given the cumulative character of the process of knowledge generation, the existence of a strong scientific and technological foundation in a given country tends to be self-reinforcing. Thus, the more economies become dependent on knowledge and technology (as is the case with the "postindustrial" or "informational" economies), the more the structure of international dominance tends to reproduce itself, since scientific knowledge and its technological applications are the most unevenly distributed factors in the world (Ernst, 1987).

In fact, the new unequal exchange in the international economy is not between primary commodities and manufactured goods, but rather between goods and services with different technological components (Mikesell, 1988). Of course there are exceptions, such as the Asian NICs, to this rule of cumulative uneven development in technological capacity; such exceptions are most relevant in evaluating alternative policies (Devo, 1987; Castells, Goh, and Kwok, 1989).

A second factor to be considered in explaining the loss of competitiveness in a world market transformed by the technological revolution is, precisely, the low technological performance of Latin America. This could be explained in part by the lack of technology transfer from multinational corporations (MNCs), which represent an essential part of the advanced manufacturing sector in Latin America. U.S. affiliated firms located in Latin America and other developing countries generate a negligible proportion of royalties and license fees for technology items (United States Department of Commerce). Also, nearly all essential research and development activities (R&D) are performed in the core countries, without transfer of the know-how to the industrializing periphery. An interesting exception to this rule is the case of agriculture. This is linked to the penetration of Third World agriculture by MNCs that develop new technologies adapted to the conditions of each area, dramatically raising

agricultural productivity. Often, however, such results are not integrated in the perspective of national development.

This behavior of MNCs in refusing technology transfer cannot be considered as immutable. In fact, in a number of instances there has been substantial transfer of know-how from U.S. MNCs to other countries, which have used such transfer for their own development. The most important case, of course, is Japan, which acquired U.S. technology in the 1950s and 1960s, particularly in electronics, and later became a most formidable competitor. Even in Third World countries, such as South Korea in the 1970s (Lee, 1988: 33-54) or China in the 1980s,² there have been cases of technology transfer, although certainly not for the newest technology.

It is clear, however, that MNCs do not transfer technology if such action does not serve their own interests, as is logical in any profit-oriented organization. In Asia, there have been two major reasons of self-interest for such transfer (Connor and Mueller, 1982). The most important one seems to be the use of technology as a bargaining chip to gain access to a promising market, as in the cases of Japan and China. The other is to raise the technological level of the local productive system in order to use it as an industrial platform integrated into the MNCs' world manufacturing network, as in the case of Singapore, Taiwan, and, more recently, in the automobile plants of some U.S. companies in Mexico. Thus the relevant question in the case of Latin America is why these two elements have not yielded a significant level of technology transfer.

With the exception of the Mexican border region, Latin America has not played a significant role in the decentralized productive strategy of U.S.-based MNCs (Sunkel, 1980), which have preferred Europe, because of its technological infrastructure and large market, and Asia, because of its capacity to control the social and political environment. Latin American markets were penetrated by U.S. companies either through political influence or simply as the result of much-needed investment in dollars, without negotiations concerning the technology-for-market swap. This is to say that the political capacity of a given country to control its own development conditions largely determines the level of concessions it can expect from the MNCs, but on one condition: the country is sufficiently attractive in terms of its market.

² For an analysis of the role of multinationals in technology transfer, see the study on China by P. Bianchi, M. Carnoy and M. Castells, 1988.

Hence the poorer a country and the greater the concentration of national income, the lower its bargaining capacity to acquire technology, which then undermines its capacity to move ahead in the development process.

Generally speaking, Latin America has been so closely controlled, politically and economically, by U.S. interests, that it has seemed unnecessary for MNCs to exchange technology for market penetration. Yet despite this domination, it has also been an uncertain terrain because of continuous social upheavals and political movements aimed at reversing the dependency situation (Calderon, 1986). This has discouraged efforts to further integrate Latin America in the world chain of production for world markets. At the same time, the small potential of domestic markets (with the exceptions of Brazil, Argentina, and Mexico), has not justified investment beyond the minimum required to control the modern manufacturing sector.

As for Brazil, Mexico, and Argentina, they are precisely the economies that have received substantial manufacturing investment, including some technologically advanced facilities, mainly in the automotive and electronics industries, during the last decade. Even in these three countries, however, the level of technology transfer has been minimal and hardly allows them to compete in the new technological environment of the international economy. The case of Brazil, though limited, is exceptional, in that a strong state erected an important industrial infrastructure and embarked on a program of technological development, including the closing of the microcomputer market to MNCs and the successful development of domestic industry in a key segment of informatics (Bornstein, 1988).

Another factor in the persisting low technological performance of Latin America is the significant brain drain it suffers in the science and technology field, particularly in relationship to the United States (Vasegh-Daneshvary et al, 1986; Agarwal and Winkler, 1984). With low technological levels, and with the modern sector dominated by multinational companies that conduct hardly any significant "R&D," the scarce scientific and engineering research personnel produced in Latin America at a high public cost is forced to emigrate to the scientific and industrial centers in the U.S., where they often excel in their work. Their emigration to the U.S. reinforces the productive capacity of the American economy as it closes the door on attempts at endogenous technological development in Latin America.

At the crucial turning point of the accelerated internationalization of the economy and technological

restructuring in the 1980s, therefore, Latin America has arrived with a clear disadvantage in its technological potential, which decisively undermines its capacity to compete in the international trade of manufactured goods, the key to sustained economic growth (Fanjzylber, 1986). It could be argued that a number of public policies and private strategies might rejuvenate its productive infrastructure, at least for the major countries, to adapt to the new competitive imperatives while developing and expanding its internal markets. In fact, such was the case in most of industrializing Asia (Chen, 1987), not only among the "Four Tigers," but also the other countries, such as Malaysia, Thailand, and increasingly China, that undertook a new industrializing process aiming at exports. However, Latin America not only faces a technological gap, but also suffers the burden of old forms of financial and political dependency. The current Latin American impasse could be explained by the fact that this fundamental effort of technological and economic restructuring comes at the very moment when the region has been immersed in one of the worst crises of the century.

The origins and evolution of this crisis are rooted in capital flows between Latin America and the dominant financial centers, particularly U.S. financial markets and institutions (Carnoy, 1985). The debt problem that has strangled the Latin American economies in the 1980s originated in the need of international banks during the 1970s to recycle the petrodollars and Eurodollars generated by the global cash economy and secure an edge against rampant inflation. Simultaneously, private savings in the Latin American economies fled abroad, precisely to participate in the speculative rush of global financial markets. During the 1980s, the borrowing needs of the Reagan Administration fed an even greater demand for foreign capital, thus drying up capital sources in much of the world (Carnoy and Castells, 1984), and with a particularly strong impact in Latin America. Thus, at the critical moment when Latin American economies needed productive public and private investment, private savings found better investment opportunities in international "paper capitalism," while public funds were heavily constrained by the debt service.

In addition, austerity policies imposed by the International Monetary Fund, creditor institutions, and the U.S. government considerably limited public investment, making it impossible to upgrade the productive infrastructure. Since, at the same time, real wage increases were curtailed and domestic markets collapsed, the Latin American economies were propelled into an export strategy without the minimum technological

means (Tokman, 1983). The general result has been an increasing deterioration of the situation, both social and economic. In economic terms, three countries have been able to increase their exports: Brazil, precisely the only country that for years has engaged in an ambitious program of endogenous technological modernization; Mexico, on the basis of an alliance with U.S. companies and under very specific socio-political conditions that have reached their political limit in the crisis of the regime, as we will discuss below; and Chile, whose agricultural and primary commodity exports are obtained at such a high social cost, and with such environmental destruction, that they cannot be politically sustained in the post-Pinochet years.

Thus the financial crisis, reflecting the persistence of old forms of dependency, has created a major obstacle to the technological upgrading of the industrial system, without which Latin America cannot compete in the international economy. Because of this competitive disadvantage, and because of high interest rates in U.S. financial markets, the debt crisis has deepened, tightening up the economic dependency of Latin America vis-à-vis the United States in the context of a deteriorating social and economic situation.

The temptation is great for some Latin American countries to break all ties, renounce the debt unilaterally, and construct a new social and economic system around a different political foundation. However, this strategy seems to be somewhat utopian, not just because of the international conditions and threat of military coups, but also because of the own limitations of specific Latin American societies. Technological dependency demands access to foreign know-how and hardware for most of the infrastructure of the society to function. Financial dependency is still indispensable to be able to import essential items, from military equipment to basic food supplies. And the powerful middle classes will hardly be ready to renounce their consumption patterns, modeled after those of U.S. society, thus implying imports and access to the world networks.

In the absence of a total revolutionary breakdown, highly unlikely in the region because of both domestic and international conditions, the alternative for most of Latin America seems to be between the renegotiation of dependency to escape from the current deteriorating process, and the slow decomposition of the existing social and economic structure, becoming increasingly irrelevant for the dominant actors of the world economy and for the system as a whole.

Two major issues are at stake. One concerns the conditions and the identity of the actors of the renegotiation process. The other is the process by which, as societies and economies in the periphery become quasi-irrelevant from the point of view of the center, new forms of "perverse integration" between center and periphery emerge, particularly illegal economies, which now constitute a fundamental mechanism of rearticulation in the new dependency.

The issues we have raised are too complex to be treated at such a high level of generality. A more specific discussion of the recent evolution of two countries in the new dependence, resulting from the process of techno-economic restructuring, will help to sharpen the terms of our analysis.

THE SOCIO-POLITICAL SPECIFICITY OF RESTRUCTURING: MEXICO AND BOLIVIA

Analysis at the level of Latin America as a whole provides a global perspective on the current trends of techno-economic restructuring, but it overlooks the specificity of societies and political systems. There we can observe the interaction between the global process and historically given socio-economic systems. We have chosen to focus on two countries that appear to be placed at the two extremes of the scale of integration in the new international division of labor, fostered by economic restructuring and technological change.

On the one hand, Mexico is increasingly integrated into the new economic space, reinforcing more than ever its close connection to the U.S. economy, through a number of processes that we will summarize here. On the other hand, Bolivia's historic articulation in the world economy, mainly through production and export of tin and other metals, has diminished, while new exports, such as oil, gas, and agricultural commodities for the Brazilian market) have been unable to compensate. Given Bolivia's low technological level, and the scarce interest it evokes in terms of the expansion of world markets or as a productive location, this case allows us to study the economic and social consequences of disarticulation in the new international system. In both cases, the interplay of technological, economic, and political factors in a

given historical context explains the diversity resulting from a common matrix of structural change at the world level.

Technology and the Internationalization of the Mexican Economy

The debt crisis of 1981-1982 forced a long overdue restructuring of the Mexican economy that was undertaken by the De la Madrid Administration from its very first moment in 1983. The main features of this restructuring were an anti-inflationary policy of economic austerity and an emphasis on exports, in order for Mexico to renegotiate its foreign debt and regain its international credit. To a large extent, Mexico succeeded in such policies, albeit at a very high social and political cost, winning the praise of the International Monetary Fund while receiving the punishment of Mexican voters.

Both on economic and political grounds, restructuring and its social consequences have opened up a new era for Mexico. By joining GATT, Mexico has ended a long period of economic protectionism, characteristic of the CEPAL-inspired pattern of import substitution policies in Latin America. This process of internationalization of the economy has an important technological dimension that has created new interdependent linkages between Mexico and the U.S., which provides two-thirds of Mexico's technology imports (Thorup, 1987). On the one hand, new technologies allow for the process of productive decentralization of U.S. firms into Mexico, a key element in the restructuring process. On the other hand, Mexico's competitiveness in the world economy, including in its newly opened domestic market, depends on its ability to upgrade the technological basis of its firms and of its infrastructure, including that of education (Maria y Campos, 1987: 67-82).

Mexico was able to engage in this process of technological upgrading and economic internationalization because of a number of favorable conditions. First, U.S. firms and institutions have a fundamental interest in Mexico at several levels. It is a very convenient productive location for factories decentralizing from the U.S. or setting up shop directly in Mexico to aim at the U.S. market. Lower production costs and greater regulatory flexibility combine with geographical proximity and favorable tariff arrangements, both from the U.S. and the Mexican governments. Enhanced communications and telecommunications, as well as the improvement of Mexico's educational and technological potential may well provide an ideal location for the new round of American industrialization connected to new products

and processes of the microelectronics-based technological revolution.

In addition, Mexico has a potentially large domestic market that, once economic austerity ends, could offer substantial rewards to companies positioning themselves in the market under current circumstances. Mexico continues to be endowed with energy and natural resources that provide substantial breathing space to the North American economy. Mexican agriculture, particularly in the Northwest, continues to increase its productivity and functions as a key subcontracting element for the dynamic agriculture of California. Last but not least, Mexico's geopolitical value for the U.S. Government seems to guarantee unlimited support from the U.S. to prevent any major political or economic breakdown, thus providing the feeling of stability that is essential for foreign investment and foreign lending. In spite of all its difficulties, Mexico has much greater international credit than any other Latin American country.

For all these reasons, the dominant economic agents of the world economy were willing to incorporate Mexico in the dynamic core of that economy, although certainly in a subordinate position, in accordance with its level of development. On the other hand, Mexico itself had a much greater political capacity to restructure its economy and society. This resulted from the political control, uncontested until very recently, exercised by the PRI, both for historical reasons and because of an efficient clientelistic system embracing the entire set of relationships between state and society. Thus, Mexico was able to embark on the restructuring of its model of economic growth, and hence of its relationship to the international system, on the basis of its bargaining assets in the system, as well as the state's capacity to act upon society.

The most important consequence of the restructuring process in the long term is the full integration of the Mexican economy into the international economy. This integration takes place along three main lines, in all of which the technological dimension plays a fundamental role (Arjenilla, 1988).

The first of these integrative processes is the growing role of Mexico as an export platform of manufacturing goods aimed at the U.S. market. The "maquiladoras" are the main, though not the only, form of this export-oriented industrialization strategy.

The phenomenon of the "maquiladoras" is known well enough that it need not be described at

length here.³ What is relevant from the present analytical perspective is the substantial development of the maquiladoras during the period of restructuring of the 1980s, and the role played by high technology in such expansion. Foreign currency earnings from the maquiladoras represent now the second largest source of such earnings for Mexico, after oil exports.

Maquiladora employment represented less than 1% of manufacturing employment in Mexico in 1970 and still only about 5% in 1980. However, during the 1980s, employment in the maquiladoras grew substantially, while manufacturing employment in Mexico dropped. Thus, during 1981-86, 68,000 jobs were lost in large-scale manufacturing in Mexico, a loss of 11%, while the maquiladoras gained 118,000 jobs, an increase of about 50%. The trend has accelerated in recent years: in 1985-87, manufacturing employment in Mexico lost 38,000 jobs, while the maquiladoras added 96,000 jobs. In July 1987, there were over 307,000 maquiladora jobs in Mexico (Yanez).

Although most of these jobs are located in the Border Region, there is a growing tendency for the maquiladoras to locate in other areas of Mexico, where production costs are even lower. Three sectors concentrate most of the maquiladora investment: electronics and electrical equipment, clothing and textiles, and automobile production. The prospects are for electronics and automobiles to dominate the picture. Most of the work consists of unskilled, assembly type of operations. Yet there is a rapid process of upgrading of the technological level, as automation is introduced into the factories, and workers acquire different skills.

Technology plays a major role in the development of maquiladoras at three levels. First, telecommunications and computer systems allow direct linkages to other units of the firm, as well as to the U.S. market. Secondly, some of the key sectors in the maquiladora expansion are precisely the high technology manufacturing sectors, particularly electronics, whose expansion as the most dynamic industries in the American economy led to their location in low cost areas. Studies on the locational patterns of high technology industries (Castells, 1989; Markusen, Hall, and Glasmeier, 1986) have shown that the spatial

³ In the official definition of the Mexican government, maquiladora is an industrial firm that "...1.- with temporarily imported and bonded machinery and any other factors of production, exports its total production or 2.- any industrial plant, permanently established to supply the domestic market, which directs a part of or the totality of its production to exportation" (Article 321 of the Mexican Customs Code, quoted in Pena, 1981). Although somewhat dated, the bibliography of Pena (1981) is still useful. For a detailed study from an international perspective, see Waas (1981).

decentralization of assembly operations is characteristic of these industries, because of varying labor requirements for the phases of the production process: design, fabrication, assembly, and testing. For many years Southeast Asia was the favorite location for offshore American electronics, but the growing importance of proximity to the market for an industry whose products are increasingly customized enhances the potential role of Mexico on the doorstep of the American market. With the improvement of Mexico's infrastructure and educational level, there is a clear tendency for Mexico to join Southeast Asia as a regional component of American electronics firms.

Thirdly, technology is crucial in the expansion of the maquiladoras, because recent developments in "CAD/CAM" and flexible integrated manufacturing allow for the enhancement of the complexity and quality of manufacturing in Mexico at a lower cost and within a more flexible regulatory environment. This is particularly important in the automobile industry, where Mexican exports of engines to the U.S. (manufactured by the major U.S. auto makers) have boomed in recent years.

This trend contradicts the predictions of Womack (Womack, 1987) and Walsh Sanderson (Sanderson, 1987) concerning the potential impact of automation on the offshore American automobile industry. Given that increased automation of automobile factories would reduce the importance of unskilled workers, while requiring a more sophisticated labor force able to deliver quality products and handle technologically complex production processes, it was assumed that these factors would undermine the comparative advantage of Mexican workers. Yet, as Hinojosa and Morales have demonstrated (Hinojosa and Morales, 1986), during the 1980s the production of American car makers in Mexico increased substantially and the technological level of the products was upgraded, with engines becoming the main product. As they argue, two factors account for these trends: improvements in the productivity of Mexican factories, and the growing role of Mexico's domestic market. Thus American firms can operate on both targets, yet at a significant lower cost. In other words, automobile firms do automate, but they automate in Mexico, enhancing the benefits of automation with a more profitable environment in terms of costs and regulations.

These findings converge with those of the study by Shaiken and Herzenberg on the productivity of three automobile plants of the same American firm using advanced automated equipment in the U.S., Canada, and Mexico (Shaiken and Herzenberg, 1987). His shop floor observations show that the

productivity of Mexican workers reached 80% of their North American counterparts within 18 months, at one-tenth of the cost. The technological possibility of decentralizing production without losing quality or the benefits of automation (flexibility of production in particular) reinforces the tendency to locate American factories offshore (Castells, 1989), not just to any location, but to those with a secure institutional environment, acceptable technological level, and relative proximity to main markets, at a lower production cost. Few countries fit these requirements; Mexico is certainly one of them. Thus, within the limits of its ability to upgrade its technology infrastructure, Mexico can foresee the expansion of MNC plants within its borders, spearheaded by the maquiladora formula, but increasingly geared to markets on both sides of the border.

The second process of integration of Mexico into the international economy refers to the enhancement of its ability to compete in that arena, including its own domestic market, as it becomes more open to foreign goods. A fundamental pre-condition for this process is the technological modernization of Mexican firms and institutions. The upgrading of telecommunications and the introduction of computers in the management processes appear to be a priority.

These arguments seem to have been crucial in the government's policy toward the development of the computer industry in Mexico. In 1981, the Secretaria de Comercio y Fomento Industrial presented a "Development Program for Manufacture of Electronic Computer Systems, their Main Modules, and Peripheral Equipment." Although initially the program was in line with the traditional protectionist policy of market reserve, in practice it represented an opening of the Mexican market to international firms producing in Mexico, both for domestic consumption and for exports. In 1985, and for the first time in Mexico, IBM was allowed to retain 100% equity of its new Mexican plant, following hard negotiations with the direct participation of the U.S. government, according to Stanford researcher Margaret Miller, an expert on the Mexican computer industry (Miller, 1986). In fact, the Mexican market is not negligible, representing 25% of the entire Latin American computer market. The development of the computer industry during the 1980s in Mexico was spectacular: where in 1981 there was only one company producing microcomputers in Mexico, in 1985 there were 70 firms producing microcomputers and peripherals, to which about 100 software companies should be added (Miller, 1986). Interestingly, even though the prices for computers made in Mexico by foreign producers were higher than those of Mexican

companies, the price differentials were falling drastically; this emphasizes the growing importance of Mexico as a market for the MNCs, not just as a low cost productive location.

To be sure, there is little evidence of significant technology transfer to Mexico from the development of the computer industry, mainly dominated by foreign firms that were already in Mexico as commercial distributors. Yet the presence of computer manufacturing in Mexico, the development of the software industry, and the increasing trade in high technology manufactured goods between Mexico and the U.S. are trends that point toward an increasing technological component in the production and management processes in Mexico. While we cannot assess here the full impact of this process on Mexican competitiveness, it is clear that government's motivation in giving priority to information technology industries is linked to the opening up of the economy to a more competitive environment, where the position of Mexico has indeed improved in recent years.

The third process of Mexico's techno-economic integration into the international economy concerns the prospects for international cooperation, both in terms of governments and firms, to enhance the country's growth potential in line with the interests of U.S. companies and institutions. Although there are as yet few instances of this process, it could well contribute to dynamic international development in the near future. If Mexico is going to become a key player in the restructuring of the world economy, while reinforcing its asymmetrical interdependence with the U.S. along the lines of current policies, it needs technical assistance so that its comparative advantages can be updated through an adequate technological medium.

An interesting illustration of this possibility is the potential of a collaborative effort between Mexico and the U.S. in the growth and application of biotechnology industries in Mexico, with particular focuses on agriculture and on health (Fernandez, 1987). Mexico does have some scientific potential in the field of biotechnology that could be put to use in a number of key applications. However, the cooperation of U.S. research centers and biotechnological firms will be indispensable to ensure substantial technology transfer and to train scientists and technicians in the quantity and quality required by the new industry, one of the most promising industries in the next 20 years.

Why should U.S. firms be interested in such technology transfer? Several reasons may be cited: the richness of the Mexican germ-plasm, making it a most fruitful terrain for experimentation and

subsequent production; the potential for joint ventures between U.S. and Mexican firms in opening up new markets in Third World areas, for which Mexican products could be more appropriate and better tested; the much greater institutional flexibility that can be found in Mexico for experimentation and testing of new biological products, a fundamental obstacle to the development of the new industry in the U.S.; and, finally, the most important reason for U.S. firms to engage in technological cooperation with Mexico could be the possibility of obtaining U.S. government support for programs of technological cooperation in a country of fundamental importance for U.S. strategic interests.

Mexico is proceeding with a fundamental process of techno-economic restructuring along a variety of fronts that we have outlined here. Inevitably, however, the cost of this process seems very high, particularly in social and political terms. Entire sectors of the economy are being destructured, living conditions for the majority of the population have worsened in the short term, and fiscal austerity has been imposed. Meanwhile the state is unable to absorb social demands and to create jobs (Mertens and Richards, 1987).

The impacts of the social costs are being felt not only in Mexico, but also in the U.S., demonstrating the close interdependence between the two countries. Job losses in both agriculture and manufacturing are sending millions of new migrants toward the American border, and no immigration law will be able to stop the renewed flow. The dynamism of impoverished Mexican immigrants will probably be a major asset for the American economy, while reinforcing the bilingual and multicultural character of many American states. The destruction of local economies throughout Mexico is also providing the basis for a booming drug economy targeted at the American market. Thus the integration between the two countries is growing not only through the explicit policies of productive decentralization of U.S. firms and internationalization of the American economy, but also through the implicit results of such policies for the Mexican people, whose survival strategies will deeply affect the U.S.

The most important impact of this restructuring process, however, is the shake-up of the Mexican political system, which is endangering the whole strategy of international integration and creating, for the first time in several decades, major uncertainty in the political future of Mexico. We would reject the economic assumption that social conflicts and political events merely reflect the economic restructuring process. The crisis of the Partido Revolucionario Institucional (PRI) was latent for a number of years, as

the new social groups emerging in the Mexican society did not feel represented by the party apparatus and its channels of cooptation and integration. However, the harshness of adjustment policies in recent years, along with the scope and dimensions of the restructuring, has generated a variety of powerful currents of discontent accelerating the previous processes and intensifying the social and political crisis. This situation became quite apparent in the presidential election of 1988.

At the risk of oversimplifying, we may hypothesize that there is a relationship between the techno-economic restructuring and the social interests that organized against the PRI under the opposite banners of Partido de Accion Nacional (PAN) and Cardenas' Frente Democratico Nacional (FDN). On the one hand, the increasing integration of the Mexican economy and the U.S. economies in the border regions has convinced a growing number of business groups and Northern political elites that they no longer need the central state as an intermediary between themselves and U.S. sources of investment and economic growth. On the other hand, the gradual dismantling of the protectionist system, and the diminished role of the state vis a vis the business groups acting in the international economy (with multinational corporation spearheading the integration process) has hurt the traditional nationalist ideology of the PRI. It has also threatened the bureaucratic middle class, whose control over the state, including the apparatus of organized labor, has been the major source of its power and privileges.

It is probably the linkage between popular discontent over the deterioration of living conditions (expressed in terms of left-wing ideology), and the disaffection of the threatened middle class, that provided the major basis for Cardenas' success in the election. Caught between the criticism of some of the most dynamic business groups, the massive uprising of the bureaucratic and professional middle class, and facing challenges from some popular sectors, the PRI system will have to transform itself profoundly in order to survive. The major obstacle for such a transformation, however, is that the economic strategy of restructuring and internationalization contradicts the political need for reconciling the interests of social groups that stand to lose much of their privileges with the end of protectionism, while imposing the social cost of austerity policies on workers and the poor.

Thus, in the last analysis, the political process will condition the fate of the process of techno-economic restructuring in Mexico. Mexico can become fully integrated into a more dynamic world economy, closely linked to the evolution of the U.S. economy, only if the PRI manages the transition

toward this new system. Power and privilege will have to be shared with the old and new elites both mobilized and threatened by the prospects of the new system.

Bolivia: Between "Switch-off" and "Perverse Integration" Into the New International System

Bolivia epitomizes the position of many Third World countries that are increasingly marginalized by the logic of the emerging techno-economic division of labor. The diminishing importance of primary commodities (tin in the Bolivian case), the reduced potential of domestic markets, and scarce possibilities of new industrialization make countries like Bolivia largely dispensable for the dominant center, except in geopolitical terms. Counting on the allegiance of anti-communist armies, dominant forces will be content to leave the country on "automatic pilot" when faced with social and economic situations where the cost of resolving problems outweighs the potential reward.

Furthermore, corrupt military dictatorships have made things worse, using scarce resources for private benefit, as well as in support of clientelistic systems of political control. Such was the case of Bolivia in the 1970s (Zavaleta, 1983; Laserna, 1986), when authoritarian regimes enjoyed not only favorable prices in commodity markets but were also nourished with foreign lending, adding Bolivia to the long and painful list of heavily indebted developing economies. When tin prices collapsed after 1982, signifying the technological end of that metal's strategic role, Bolivia confronted a dead end with respect to the world economy on which it continued to depend for survival (Laserna, 1986; Laserna, 1985; Mayorga, 1986).

Under these conditions, a logical alternative for Bolivia would be what could be called a "switch-off," as in Burma. Largely cutting its ties with the world economy, Bolivia would reorganize its society and its economy around its fiercely affirmed cultural identity. Yet recent historical experience shows the impracticability of the Burmese model, including, of course, the case of Burma itself. On the contrary, the general trend seems to be toward growing integration of countries and economies at the world level, even where such integration is partial, segmented, and even disruptive for other national societies.

The main reason for this trend is that an environment many decades behind the technological and cultural levels of the dominant countries is ideologically and politically unacceptable for most social elites. Thus the material and symbolic connections of the elites to the dominant centers of the international system

provide the concrete social basis for projects of development that can only succeed as dependent articulation to the dynamic elements of the international economy. This has been the case in Mexico, in spite of extremely high social costs and political challenges.

In the Bolivian case there is a little chance for the country to define its articulation on the basis of information, technology, and potential markets, since those are absent qualities. At the same time, the social and political conditions of Bolivia do not favor the success of fundamentalist movements like "Sendero Luminoso," despite some echoes in the indigenist Katarist movement striving to dismantle the entire connection to the international system. Thus Bolivia apparently faces a situation that, left to itself, could evolve toward the decomposition of the entire society, notwithstanding the rich culture and vitality of Bolivian social movements. To a great extent, these have been mobilized against an elusive enemy whose main weapon is the historical possibility of indifference.

However, like other societies and economies, Bolivia has found an unexpected new connection to the international economy. In the midst of the economic crisis, the coca-cocaine complex is fueling the national economy and reorganizing the social and political system. Coca leaf cultivation and the production and export of coca paste form the backbone of a dynamic underground economy, which in turn is linked to the international traffic in cocaine, mainly oriented to the U.S. market, but also to Europe and urban areas in Latin America.

There are no reliable estimates, but the consensus among policy makers and researchers puts cocaine-related exports from Bolivia in the mid-1980s at about twice the level of total legitimate Bolivian exports (Samuel, 1986; Blanes, 1989). Entire regions, particularly the Chapare lowlands in the Cochabamba Province and large areas of Santa Cruz, Beni and the "yungas" in the eastern La Paz Province, are the sites of the coca production system. Migrant peasant families from the deprived valleys and highlands cultivate coca leaves, while some, as well as the urban unemployed, work in small and dispersed factories to transform leaves in basic paste. From there they transport it to the shipping centers where it will depart for Colombian refineries.⁴

The capital flow generated by these operations controlled and organized by international drug

⁴ This information was directly provided to the authors during visits to the Cochabamba region. See also Canelas and Canelas (1983); Healy (1986); and Sage (1988).

traffickers fuels a large criminal economy, which also includes smuggling, black market for hard currencies, and money laundering. Including the bribes necessary to make the whole system work and the payment of intermediaries at different levels, the revenues generated from coca production and distribution have an increasing importance for the Bolivian economy. The overall performance is an improvement over the former tin-based economy, even allowing for the fact that only a small fraction of the cocaine profits remain in Bolivia (Medina, 1986).

Governments have reacted with varying vigor against these activities, generally stimulated by the rhetorical drug war and subsequent political pressures from the U.S. government. The more democratic the government, the more it has tried to control coca production and cocaine traffic. It is widely acknowledged, however, that short of massive chemical defoliation, which could trigger an ecological catastrophe and a cultural war, coca production cannot be eradicated. The country is too vast and the production system is too flexible. In addition, for democratic Bolivian governments trying to find alternative paths of development, it is the very presence of the cocaine traffic that gives them bargaining power to obtain some support for their economy from the U.S. government. Bolivia, at this point, seems to exist on the map of the dominant powers because of the cocaine traffic, both as a supplier of core drug markets and as a government of some interest for its potential role in helping to reduce the cocaine supply.

This visibility has been achieved at a high price, as society and institutions have fallen gradually under the control of the international underworld, with its tireless efforts and violent methods of exercising power. The very social structure of Bolivia is being transformed by the process. For instance, the historic Bolivian labor movement based upon the tin miners is fading away, stricken by the collapse of the mining industry. To survive, many workers are migrating to the subtropical area of eastern Bolivia to engage in activities ultimately related to the economic boom of coca production and distribution. The informal sector of Bolivian cities, a major source of urban employment, relies heavily on services related to smuggling and money laundering. Also, much of domestic capital investment comes from funds generated through the underground economy. Thus the Bolivian economy has been reconnected to the world economy, providing a new commodity in response to the demand of core markets.

Bolivian democracy, restored in 1982, has been trapped in a contradictory logic. On one side, to recover political sovereignty and legitimacy for the national state and to respond to international pressures,

the government is investing much needed resources to fight drug trafficking by reducing legitimate coca production, thus alienating the support of a vast sector of the population. On the other side, to obtain hard currency for imports and debt service, it must turn a blind eye on the underground economy and its financial flows. To a great extent, the success of stabilization policies since 1985 is based on the integration of "illegal" cash flows into the official functioning of the economy.

Thus, in a paradoxical twist of historical processes, economies that have been marginalized by the techno-economic restructuring of an international system based upon information processing, have been rearticulated through a forbidden commodity whose characteristics seem to fit well with new cultural and mental pressures in the core countries.⁵ Bolivia exemplifies, at the same time, the new marginality fostered by the internationalization of the informational economy, and the nightmarish transformation of many developing countries by underground economies. The new dependency expresses both techno-economic dynamism and socio-cultural perversion.

CONCLUSION

Our world is characterized by the simultaneous integration of economies and disintegration of societies. In between, national states must cope with the crisis of legitimacy of the political system as well as with the economic crisis of the developmental process.

Under such historical conditions, dependency theory can claim some validity by pointing out the asymmetrical structural relationships between societies that condition both the development process and socio-political movements. The current process of techno-economic restructuring, which is integrating and reshaping economies and societies throughout the world, has originated in the interests and values of the dominant centers of the system. The technological revolution has arisen from the scientific institutions and

⁵ In the diverse world of drugs, cocaine has special characteristics, as its consumption is differentially concentrated among defined social strata. The professional middle class of the information society is one of them. The effects of cocaine as an active mental stimulant seem well suited to an economy and society that reward informational creativity while putting pressure on the speed and power of such information processing. We might speculate that cocaine is a primary commodity culturally and chemically suited to new mental needs generated by what we call the informational mode of cocaine consumption, while providing the illusion of being part of incorporation in this affluent society to its hopeless marginal population. Unfortunately, we lack empirical sociological research on drug use, an area heavily dominated by bureaucratic and political interests.

leading companies of the major industrial countries, and taken shape in products and applications suited to the most profitable markets in these countries.

While science and technology are universal, their trajectories and applications are not. The process of socio-economic restructuring that took place during the 1980s was a deliberate public and private response aimed at restoring the basis of profitable capital accumulation in the core countries, in the aftermath of the structural crisis of the 1970s. Yet it has actually reshaped the whole international economy. Therefore, the effects of these changes on dependent economies and societies were determined by the values, needs, and interests of the dominant societies, although mediated by the specific social structure of each country.

The response of each country to the restructuring was conditioned by its relative position in the international division of labor, itself the product of previous social situations marked by dependency. While countries (and the social forces within them) always have some level of autonomy to react and reorient their behavior, it is also true that their freedom is greatly constrained by the need to deal with the major consequences of the broader process of techno-economic restructuring. It follows that dependency theory, understood in its original, dialectical version, is a necessary starting point to analyze the current processes of social domination and social change. It must be able, however, to comprehend new historical processes, particularly the fundamental challenge represented by the current technological revolution.

Our analysis has serious political implications that can only be mentioned, without elaboration, in the context of this article. Forces struggling for social change in Latin America have oscillated for decades between the dead end of populism and the artificial paradise offered by dogmatic readings of Marxism. In the 1980s, when democracy was painfully and partially restored in most countries, a series of pragmatic reformist attempts tried to pave the way for the reconstruction of the social fabric, a precondition for development and social change. But the difficulties imposed by the broader process of international restructuring, along with the older forces bedeviling Latin America politics, such as the anti-popular military, have halted most of these reformist efforts. This has endangered democratization, opening the way for the old cycle between demagoguery and repression.

Nevertheless, despite the limitations of current leaders and political parties, a program of cautious but deep social reforms, involving not only economic and technological aspects, but also political,

institutional and even cultural dimensions, seems to be the only way out in the midst of the dramatic transformation of the world system. The challenge for Latin America is certainly enormous considering that it comes when, as a whole, the region is weaker and more vulnerable than ever. To counteract the pernicious effects of the new dependency in a lasting historical perspective will require a new politics made up of social reform and technological modernization within a democratic framework. This new politics, alert to popular demands and expectations and open to the creative potential of social movements, also requires a leadership humble enough to learn the lessons of the new world we are entering.

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