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Mexico's physical economy: the body that the debt cancer is destroying

by Dennis Small and Peter Rush

As useful as it is, both politically and economically, to study and expose the debt and other mechanisms that are looting Mexico and other nations, the *causality* behind a breakdown crisis such as today's lies elsewhere: in the realm of real, physical economic processes, a subject matter studiously avoided by virtually every trained economist today.

Yet, this is a science that traces its roots back to Gottfried Leibniz (1646-1716); has been applied in every case of successful industrial capitalist development known to man; and is the central subject of Lyndon LaRouche's scientific breakthroughs in the middle of the twentieth century.

It is from this standpoint that we can unequivocally state that the Mexican economy has been disintegrating since the early 1980s. We can say that the decisive parameters of consumption, production, and infrastructure have plummeted during this period by some 15-25%—from already unenviable levels. And we can therefore conclude that it is *physically impossible* to maintain the debt cancer any longer. Either the cancer is extirpated, or Mexico will end up "Africanized" and will disappear as a nation.

What is the science which enables us to make these assertions?

LaRouche's science of physical economy

LaRouche's method of physical economy (see box) rejects as useless any monetary measurement of the economy, such as Gross National Product (GNP) and balance of payments, none of which can distinguish between the value of a million dollars invested in a steel plant and the same million invested in the construction of casinos and whorehouses in Las Vegas or Acapulco. Instead, in order to determine which kinds of productive activity increase the technological power of each member of the workforce with respect to nature, the LaRouche method measures the *physical* production of consumer goods, of the means of production, and of basic infrastructure, which is useful for the reproductive economic process, and also measures its effects on the productivity of the labor force. All of this is measured by densities per capita, per household (the basic unit of social reproduction), and per square kilometer of total land and/or land in use.

Economic success is most clearly expressed by the exponential increase in the relative potential population density of a society, or by comparing it with that of another. As LaRouche explained in a recent commentary:

"The description begins with a simple requirement that the rate of increase of potential population density be greater than zero. This requires technological progress, which requires increases of production *per capita* and *per square kilometer*, and of labor productivity *per capita* and *per household*. Those conditions are expressed as improvements in the area used *per square kilometer* and *per capita*, and improvements in the tools and materials of production."

The fundamental source of such continuous improvements, LaRouche explains, is human creativity—that quality which distinguishes man from, and makes him superior to, all other animal species. It is precisely this distinction which the Venetian oligarchy disagrees with, and which they are determined to annihilate whenever and wherever it appears.

With this in mind, a properly growing physical economy must meet these four criteria:

1) The per capita and per household consumption of the workforce, and of the total population, must increase, as measured in terms of comparative quality and quantity of contents of its total "market basket" of consumer goods. Yet the total amount of time, and the proportion of the total labor force, which is required to produce that basket, must decline.

2) The "market basket" of producers goods must also increase, and at a more rapid rate than that of consumer goods—that is, production must become increasingly capital-intensive. This is closely associated with the rising urbanization of society as well.

3) Energy density per household and per square kilometer must also increase, as must the energy flux density of the power sources employed—i.e., they must become more *efficient*, as well as more *dense*, per unit area of economic activity. This latter is closely correlated with leaps in applied technologies in use—e.g., from biomass to hydrocarbon to nuclear energy sources.

4) The "free energy of the system" must increase relative to the total energy of the system. That means that even as the

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TABLE 1
Physical economy indicators

Country	1970 U.S.	1970 Germany	1970 India	1970 Japan	1970 China	Taiwan 1970	Taiwan 1990	Mexico 1970	Mexico 1980	Mexico 1990
1. Life expectancy	71.3	70.6	48.4	73.3	59.1	69.1	74.1	61.2	64.9	69.7
2. as percent of 71.3 years	100%	99%	68%	103%	83%	97%	104%	86%	91%	98%
3. × population per km²	22	245	170	279	85	408	571	25.7	34.2	43.1
4. = Lifetimes per km²	22	242.5	115	286	70	395	593	22.1	31.1	42.2
5. People per household	3.2	2.9	5.1	3.9	4.6	5.6	4.0	6.1	5.6	5.0
6. Km² used area per 1,000 households	72.7	6.8	15.5	2.8	22.1	6.6	3.4	11.8	8.2	5.9
7. 1,000s kwh consumed per km² used area	355.7	1,562	30.4	4,631	24.9	796	5,014	25.6	60.2	106.3
8. 1,000s m³ water consumed per km² used area	110	190	220	1,070	110	819		55*		
9. Tons food produced per km² crop area	345	2,167	323	1,505	243	1,094	1,015	159*	194	215†

* 1975 †1985

economy requires ever higher consumer and producers goods market baskets, the total output of the economic cycle must rise more rapidly still, making increased proportions of total output available for reinvestment and expansion. This latter requires constant technological progress, and therefore human creativity. In other words, there is no "steady state" economy: There is either growth, or decay and collapse.

Mexico's lost opportunity

We present here some of the preliminary results of a longer study under preparation, on the past 25 years of Mexico's physical economy. We have chosen for the current purpose indicative material which, although partial, nonetheless characterizes the entirety of the process under consideration.

Over the course of the 1970s, Mexico sustained moderate physical economic growth in the range of an average 2-3% per capita per year. The per capita production of consumer goods rose by about 16% between 1970 and 1981, for an average annualized growth rate of 1.4%; and the production of producers goods per household rose more rapidly (as should be the case in a healthy economy), growing by almost 60% in this period, for an annualized growth rate of 4.4%.

This positioned the country for potential significant industrial development in the years ahead—although it must be emphasized that where Mexico stood in 1980, by international standards, was still woefully inadequate on almost every front. In **Table 1** we have added calculations for Mexico in 1970, 1980, and 1990 to a table of important physical economic indicators first presented in the May 29, 1992 issue of *EIR*. The baseline year of 1970 was chosen in that study, because it represented the last year of general physical economic advance before the "post-industrial society" and other New Age dogmas took over and wrecked the world economy.

The first four lines are a calculation of comparative population densities, but with the more precise parameter of "lifetimes" per square kilometer, which takes into account the different life-expectancies in the countries under consideration. To put it schematically, an economy which can sustain 100 people per km^2 is more successful than one sustaining 70 per km^2, everything else being equal; and one sustaining 100 people per km^2 with an average longevity of 80 years is more successful than one sustaining 100 people per km^2 with an average longevity of 75 years. Mexico's population density, or "lifetimes density," is actually quite low, compared to most industrialized countries.

Line 7 is a measure of energy intensity in the economy, calculated per square kilometer of land in use. This includes that portion of the total national territory which is available to current economic activity: both arable and pasture lands, as well as transportation and urban land areas (where these data are available). In 1980, Mexico consumed only 60,200 kilowatt hours of electricity per km^2, which put it in the same ballpark as the underdeveloped nations of India and China, and was less than 20% of the U.S. figure. Compared to the highly energy-dense economies of Germany and Japan, Mexico had 4% and barely 1% of their levels, respectively.

Another crucial parameter reflecting the general state of infrastructure is seen in line 8, water consumed per km^2 of used area. Here the only available figures for Mexico are for 1975, which show that its 55,000 per km^2 compared poorly with the industrial economies shown. Mexico's use was less than 30% of Germany's, for example.

The evident conclusion to be drawn is that, despite moderate growth during the 1970s, Mexico's situation in 1980 was not good by international standards. But this by no means precluded successful industrialization in the years ahead, since sufficient potential was available. In fact, countries like South Korea and Taiwan also had physical economic parameters in 1970 in the same order of magnitude as Mexico's. But in these countries, a gigantic leap did occur over the next two decades, whereas Mexico went in the opposite direction: down.

The reasons for this are entirely political. In the late 1970s, Mexican President José López Portillo made policy decisions that were correct. He announced that the country's large oil reserves would be traded for modern technologies; that International Monetary Fund (IMF) austerity policies would be rejected; that 20 nuclear energy plants would be built, four entirely new port cities would be constructed, and an aggressive drive was undertaken to construct new public and private steel complexes and to build greatly increased refinery and petrochemical capacity. Moreover, a climate of intense national optimism began to prevail.

But the financial oligarchy would have none of this. Through their mouthpieces such as Henry Kissinger and Zbigniew Brzezinski—the latter at that time the national security adviser to President Carter—they announced bluntly: "We will not tolerate another Japan south of the border," meaning that Mexico would not be permitted to industrialize.

LaRouche's method of physical economy

The following excerpt from a May 8, 1994 memorandum by Lyndon LaRouche develops the core concepts of basic economics.

Let us describe a successful economy, one in which the per-capita physical productive powers of agricultural and industrial labor are increasing, and in which the per-capita physical standard of living is increasing. Let us consider only those inputs which affect the production of those elements representing that per-capita standard of physical consumption, and physical consumption which is necessary for that level of per-capita productivity of physical output.

Express this relationship as a *changing* one, in which that per-capita consumption and that per-capita physical productivity are both increasing.

This must be expressed in terms of relative rates of change. Thus, in the first approximation, the functional description is set up in the following terms. This makes clear the general nature of the required distinction between "productive" and "non-productive" activities. All measurements are made in terms of both the changes in the whole, and per-capita values of changes in the whole. It is relations among these changes, rather than relations among objects, which are to be studied.

Changing Rate of Output, in respect to Changing Rate of Input. Call the first F(y) and the second F(x). Hence, F(y)/F(x). All three functions are measured in terms of rates of change of whole magnitudes and rates of change in per-capita values of these whole magnitudes.

F(x) treats all of those physical elements of consumption necessary to sustain per-capita physical productivity at a given technological and related level. This includes households' (physical) goods, producers' goods, and basic (physical) economic infrastructure. To this must be added three essential components of maintenance and increase of the potential per-capita productive powers of labor: science and technology, education, and health care.

F(y) treats all of those classifications of physical and service products which are listed in F(x).

We next define growth as contingent upon some function of F [F(y)>F(x)]. This includes two principal terms:

1) $F(y_1)/F(x_1)<F(y_2)/F(x_2)$.

2) Let r signify per-capita value of population-density. Then $|F(x_2)|/r>|F(x_1)|/r$.

Let us name F(x) the "energy of the system," and $|F(y_i)-F(x_i)|$ the "free energy" of the process. Thus, we have the ratio of "free energy" to "energy of the system" as the first term, and per-capita-per-kilometer energy of the system as the second. We have a function in which $F(y_i)/F(x_i)$ is now a function of $[F(x)/r]_i$.

According to the generally accepted principles of current classroom mathematics, these constraints are impossible; yet, they occur in every successful economic process. This signifies to the competent mathematician that the formal representation of such processes has a higher cardinality than is provided by any presently generally accepted variety of classroom mathematics instruction. This was the core of the first phase of my original discovery, back during 1948-49.

This result, which is apparently anomalous from the viewpoint of today's generally accepted classroom mathematics, is the inevitable result of the nature, the characteristic feature, of the process considered: that the changes described by the sets of constraints come about as a result of fundamental scientific and related forms of discoveries, discoveries which appear in the functions as absolute discontinuities. This occurs to such an effect, that the func-

The oligarchy delivered on this pledge. In early to mid-1982, they launched a full-scale financial destabilization of Mexico, including capital flight and other forms of economic warfare. Ultimately, because of lack of support from other Ibero-American leaders, President López Portillo was destabilized and defeated. His successor, Miguel de la Madrid, took office in December 1982, and immediately began implementing the policies of the IMF and the bankers: austerity, free trade, and unquestioning servicing of the foreign debt.

The country has never since recovered.

The decade of disaster

Beginning with the economic warfare of 1982, there is first stagnation and then decline in most of Mexico's principal physical economic indicators. Then, with the implementation of neo-liberal economic policies in the late 1980s, under President Carlos Salinas de Gortari, leading up to the adoption of the North American Free Trade Agreement in the early 1990s, the decay turned into outright collapse. One of the clearest reflections of this is the shocking drop between 1980 and 1992 in the total number of workers employed in the manufacturing sector, which is a parameter that is of decisive overall importance, as explained above.

In **Figure 1** we show both the total number employed in manufacturing (including the *maquiladora* sector of assembly plants along the border with the United States, which,

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tions so defined bound externally, as higher cardinalities, all possible transcendental functions. My later work, during 1952, showed me that these are functions located within the higher domain of alephs.

We restrict the term "productive" to that general definition. We may add terms to the functional listing of products or services only insofar as they satisfy those same restrictions. This means that subtracting from an existing category of listing to add a new term, requires that the replacement itself increase the physical productivity of labor per capita for that society as a whole.

The other restrictions required are subsidiary to those given here. These definitions are supplied for a physical-economic process described without any consideration of the existence of money. The study of money and monetary systems should be conducted to show how different rules of the money game produce different modes of human economic behavior, either relatively sane ones, or, in the extreme, the kind of ever-worsening lunacy shown by governments and financial institutions generally during the recent decades.

The meaning of the term 'physical economy'

The following is excerpted from a memorandum by Mr. LaRouche, presented at a May 26, 1994 Washington press briefing:

The characteristic feature of successful physical economies is the increase of the potential population-density of society, in per capita, per household, and per square kilometer terms. The cause of this increase is predominantly those changes in the productive powers of labor which are typified by investment in improved technologies, as the possibility of such (physical) investment is conditioned by requirements for use of sources of power and improvements in the development of the environment used for this purpose.

This measurement defines individual productive labor in terms of biophysical and cultural demographic functions of households, and defines existence of households, of individual productive labor, and of output of productive and other labor in terms of per household, per capita, and per square kilometer terms. What is measured in the production of the per capita productive powers of labor by means of the process of production so defined.

The measurement to be made chooses any instant of a continuing process of production of the productive powers of labor through the medium of the reproduction of those products which are the essential inputs for the households and productive processes represented. The adequate parameter for measurement of these products and services is the total of physical products consumed by households and production entities, plus only three categories of services essentially (demographical and otherwise) to maintaining the rising productive powers of labor: science, health care, and education.

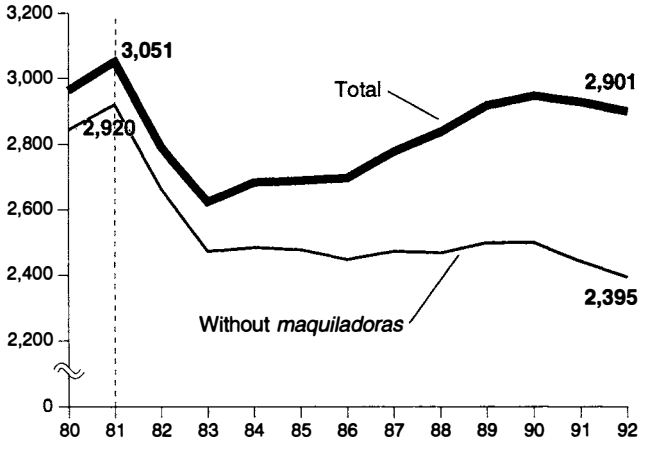
The input at any instant is a magnitude corresponding to "energy of the system." At that same instant, the net of output less input corresponds to estimated "free energy."

In these terms, the characteristic inequality, is:

That the continuing increase of the ratio of "free energy" to "energy of the system" is contingent upon a continuing increase of the intensity of "energy of the system" per capita, per household, and per square kilometer.

The increase in the productive powers of labor in this way, correlates with required increases in power- and water-density, with a shift from a primarily rural production, a continuing increase in basic physical infrastructure of production, and with a shift within the composition of the urban labor-force increasing relatively the ration of producers' goods over households', of machine-tool component of producers' goods, and with an increase in the ration of employment in "pure science and technology."

FIGURE 1
Employment in manufacturing
(thousands of employees)



economically speaking, is a foreign enclave unrelated to the productivity of the Mexican economy), as well as those employed in manufacturing in the Mexican economy proper. This last number plummeted from 2.92 million employed in 1981, to 2.395 million in 1992—an 18% drop in absolute terms. But as a percentage of the total labor force, employment in Mexican manufacturing dropped from a pathetic 13%, down to a catastrophic 7.7%—a 40% decline during the 1980s, which can rightfully be described as the decade of disaster. The reader should keep in mind that LaRouche has specified that a successfully developing economy should have about 50% of its total labor force engaged as industrial operatives. Mexico has less than one-sixth that number.

Manufacturing has not been the only area where real employment has fallen. In early 1993, *EIR* calculated that total real unemployment in Mexico then stood at about 50% of the labor force, and that real wages had also plummeted since 1980 by 50%. The result has been a devastating spread of the official category of "poverty," which now affects 40 million Mexicans, of whom 17 million are suffering "extreme poverty," out of a total population of 85 million (according to official statistics).

These conditions of the labor force speak volumes about what has happened to Mexico's physical economy over the last decade, a reality which is confirmed when we take a more detailed look at some of the components of productive activity.

Table 2 presents a summary overview of the evolution of 11 sectors of consumer goods, and 8 of producers goods. The data presented run from 1970 through 1991, which in most cases is the last year available. Where data for 1991-94 are available, they indicate that the process of economic decay has, if anything, worsened. The principal source for the table and the following graphs is the Statistical Appendix to the Nov. 1, 1994 State of the Union address presented by outgoing Mexican President Salinas de Gortari, which was cross-checked against various international sources, including the United Nations, the U.N.'s Food and Agriculture Organization (FAO), Economic Committee for Latin America (ECLA).

Although usable series for physical production—as measured in physical, not monetary, units—were by and large available, no equivalent adequate data for exports and imports were found, with few exceptions. It is therefore not yet possible to show statistically what *EIR* otherwise knows to be the case: that production has in general dropped more sharply than consumption, because throughout the late 1980s and early 1990s, Mexico has been flooded with foreign imports that have replaced domestic production, for example, textiles and food products. It should be noted that Mexico will now be forced to cut back drastically on its imports, and therefore consumption, as part of its commitment to cut its current account deficit in half, in order to be able to pay its foreign debt.

One instance where reliable trade data were available was

TABLE 2
Production indices
(1981=100)

	1970	1981	1991
I. Consumer goods			
Wheat	115	100	94‡
Corn	82	100	94‡
Sorghum	60	100	38‡
Beans	86	100	63‡
Meat	63	100	102†
Milk	76	100	78†
Fruits and vegetables	82	100	116†
Tires	61	100	106
Stoves	65	100	87
Soap	95	100	111
Cloth	157	100	30
Total	*86*	*100*	*84*
II. Production goods			
Cement	60	100	98
Processed crude oil	56	100	70‡
Caustic soda	85	100	72
Iron	80	100	51*
Steel ingots	78	100	73
Compressors	29	100	7
Fertilizers	38	100	104*
Tractors	74	100	130*
Total	*63*	*100*	*76*
III. Employment in manufacturing (excluding maquiladoras*)*		*100*	*82†*

* 1990 † 1992 ‡ 1994

FIGURE 2
Grain consumption and production
(kilograms per capita)

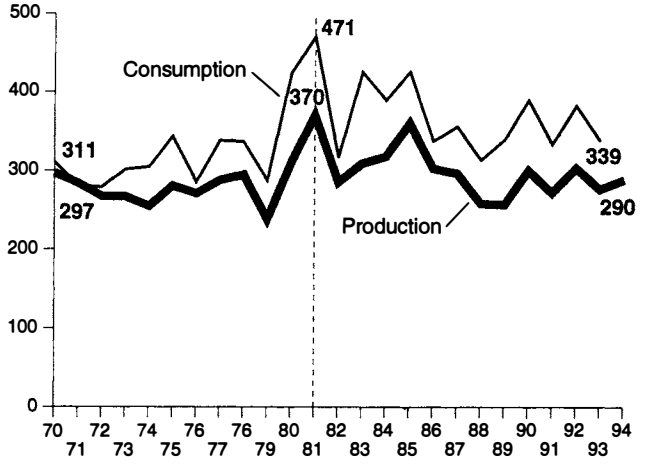


FIGURE 4
Meat production
(kilograms per capita)

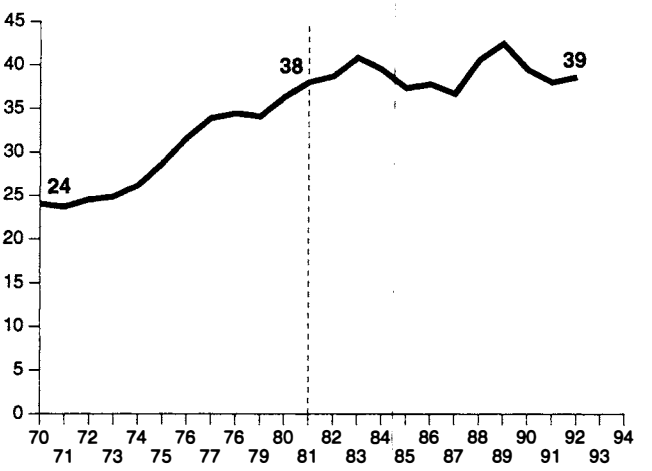


FIGURE 3
Bean production
(kilograms per capita)

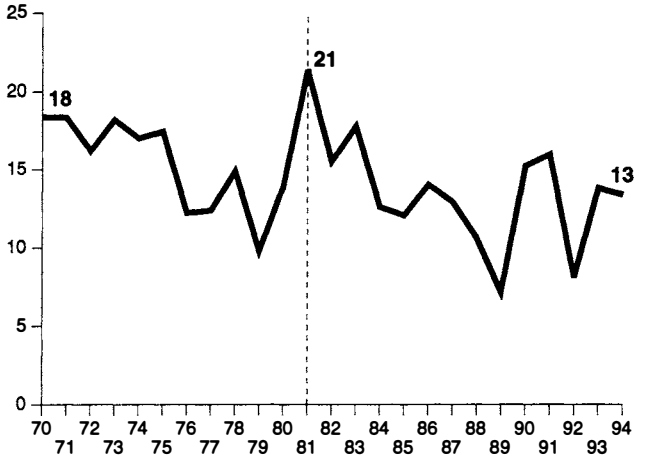
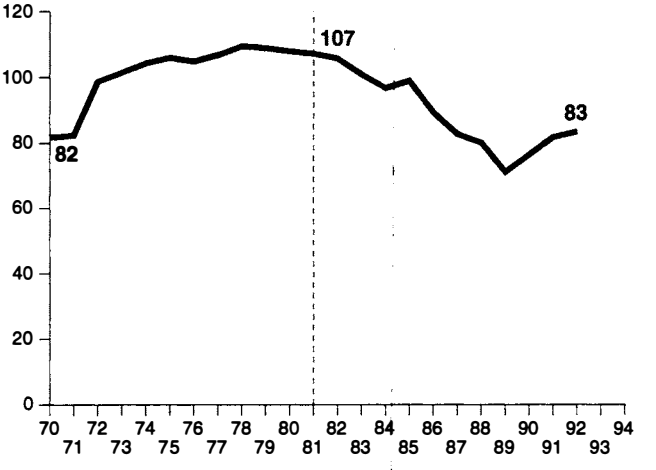


FIGURE 5
Milk production
(kilograms per capita)



for total grains, where production dropped by 22% between 1981 and 1994, but part of that shortfall was made up by imports (**Figure 2**). Of the grains, sorghum had the sharpest production drop, as seen in Table 2; but perhaps more significant politically is the 6% drop in per capita production of corn between 1981 and 1991. Corn is one of the food staples in the Mexican diet, as are beans, whose production plummeted by 37% over that 10-year period (**Figure 3**). Mexicans simply produced, and ate, less of their principal food products after 1981.

The same holds true for those items which the average Mexican rarely sees, but which are nutritionally excellent, such as meat (up 2% in a decade), eggs, and milk (down by 22% over 11 years). See **Figures 4** and **5.**

The remaining non-food items which we considered for our representative market basket of consumer goods, including household items such as stoves (**Figure 6**) and soap, showed similar per capita stagnation (which of course portends a coming drop) or outright decline. The case of cloth production—cotton, wool, and synthetics—deserves particular mention, because it has suffered continuous collapse since 1970. But from 1981 to the present, it has virtually

FIGURE 6
Production of stoves
(units per 1,000 households)

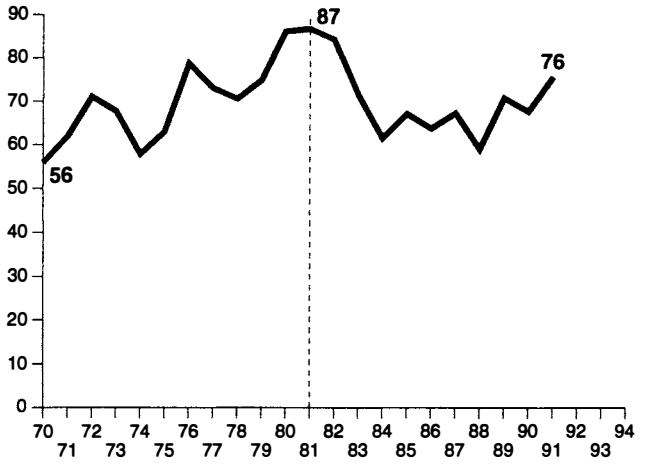


FIGURE 8
Production of steel (ingots)
(kilograms per household)

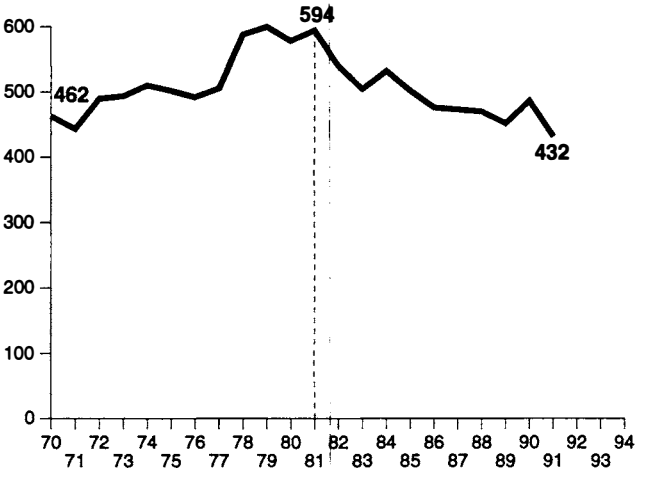
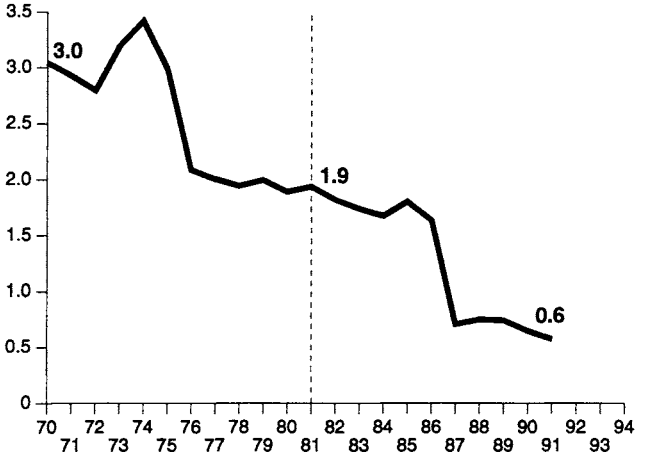


FIGURE 7
Production of cloth
(kilograms per capita)



disappeared, dropping by 70% in that time period (**Figure 7**). This is an example of an entire sector of domestic industry—and its employees—being wiped off the map, victims of the IMF's free-trade dogma.

In sum, the physical output of consumer goods dropped by about 16% per capita from 1981 to the early 1990s—a sure sign of a very sick economy. But things were even worse on the producers goods front.

Deindustrialization takes hold

In a healthy economy, the production of producers goods will tend to grow more rapidly than that of consumer goods—as occurred in Mexico during the 1970s. Lawfully, when an economy *decays,* producers goods will as a rule *decline* more rapidly than consumer goods, exacerbating the rate of collapse of the entire economy. This is what happened to Mexico over the last decade, where overall production per capita in this area plunged by 24%, as Table 2's market basket shows.

Iron ore and steel ingots fell by 49% and 27%, respectively (**Figure 8**), as the governments of De la Madrid and Salinas strangled, asset-stripped, and then sold off ("privatized") the respectable beginnings of a national steel industry that Mexico had begun to build up under López Portillo. The same kind of thing happened with petrochemicals and refinery capacity that were either planned or already under construction, such as the impressive Los Pajaritas complex—the results of which can be seen in **Figure 9.** After a healthy 245% increase of the production of processed crude oil per household between 1970 and 1981, the following 13 years saw a 30% decline. The production of petroleum proper showed a similar trend, although in this case it is probably best explained by the conditions on world oil markets—i.e., by the economic depression which has reduced the demand for oil, and its price, worldwide.

Even cement—whose production can often rise even under conditions of real economic decay, since it is used in the construction of both productive and unproductive projects (e.g., luxury tourist hotels, office buildings for bankers and drug-runners)—dropped slightly over the 1980s (**Figure 10**).

But the greatest horror story is reserved for the sector of machinery and equipment, which preliminary data indicate has plunged even more rapidly than the average. Characteristic of the problem is what happened to industrial compressors, an important capital good, which dropped by 93%,

FIGURE 9
Production of crude and processed petroleum
(m^3 per household)

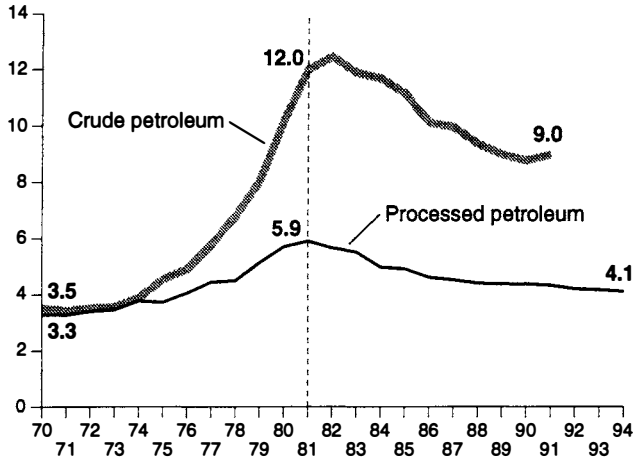


FIGURE 11
Production of compressors
(units per 1,000 population)

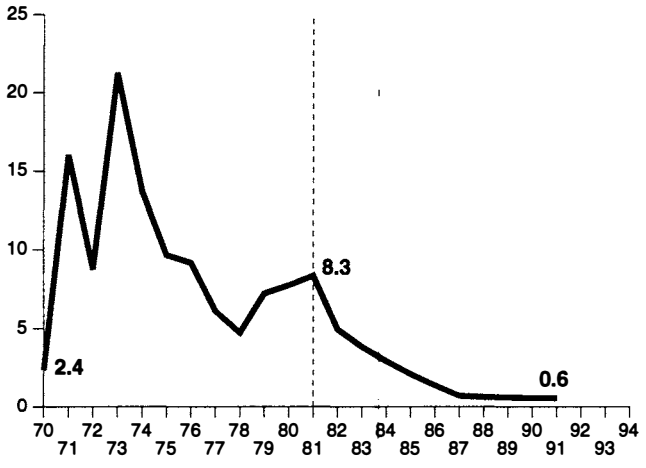


FIGURE 10
Cement production
(kilograms per household)

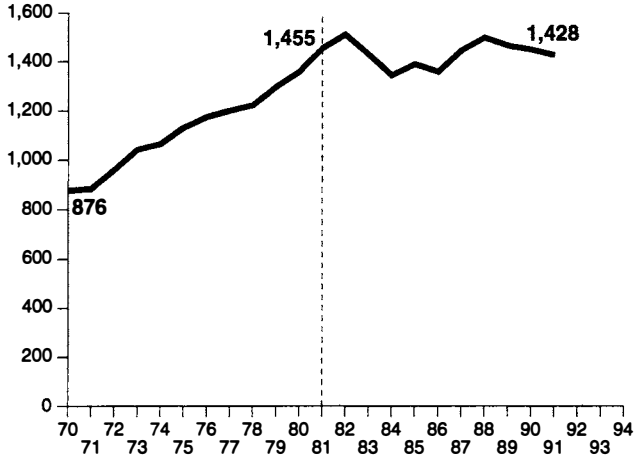
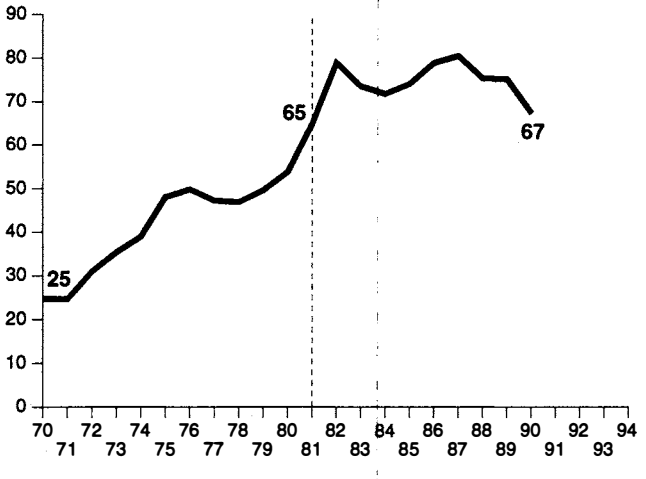


FIGURE 12
Fertilizer consumption
(kilograms per hectare)



down to about 0.6 units per 1,000 people in 1991—i.e., the sector virtually disappeared (**Figure 11**).

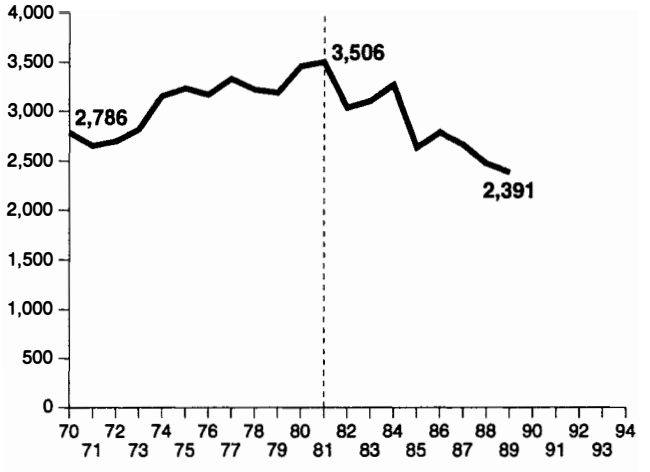
This trend is particularly ironic, because the Salinas government frequently defended the country's out-of-control trade deficit and scandalous speculative capital inflows, by arguing that the latter were being used to pay for imports of capital goods, which would in turn allow the country to produce lots of manufactured goods for export. Of course, nothing of the sort ever happened.

We conclude our brief survey of producers goods by referencing two critical inputs to agriculture: fertilizers and tractors. The former stagnated in use per hectare over the decade (**Figure 12**), while the latter grew by an unimpressive 3% per year. Mexico's agricultural sector remains correspondingly unproductive.

The infrastructure gap

In his discussions of the principles of physical economy, Lyndon LaRouche has repeatedly emphasized the importance of investment in infrastructure projects, of both the "hard" variety (energy, water, transportation) and the "soft" (health, education). This is because, although investment in

FIGURE 13
Railroad traffic
(ton-kilometers per household)



infrastructure does not produce tangible output as such, it does something even more important: It *produces productivity*. In other words, it raises the overall efficiency of the productive process as a whole.

The absence of investment in infrastructure will ultimately sink even a growing economy; when it is absent in a sickly one, the problems will rapidly worsen. When there is *net disinvestment,* as there is in a number of critical infrastructure areas in Mexico (such as transportation), it is a virtual death sentence.

It is hard to exaggerate how bad Mexico's rail infrastructure is. Outmoded and decrepit, the total kilometers of track are extremely low by international standards. Ton-kilometers transported by rail are quite low, and they fell by nearly a third during the 1980s (**Figure 13**). Some might argue that this is because most of Mexico's freight is shipped, not by rail, but by highway, on trucks—which is true enough, but merely proves the point. Outside of water, rail is the most efficient form of freight movement, while trucking is among the most inefficient and costly for everything other than short, local runs. The fact that Mexico relies on trucking rather than rail simply shows how deficient its transportation infrastructure is.

What adds insult to injury, is the fact that in 1993 and 1994, Wall Street bankers and others forced Mexico to set up a system of privatized toll roads, which the bankers effectively took over through bonds and so forth. They then hitched the value of these bonds to a projected future income stream of toll collections, which were then raised to exorbitant levels—such as charging $5 each way for the 45-minute drive from Mexico City to Toluca.

Not surprisingly, almost no one—and especially not truckers—can afford the new toll roads, and so they have stayed on the old, increasingly decrepit public highways. So now Mexico's transportation is even worse than it was three years ago, raising the costs of all national production and consumption, while the bankers' bond issuances have collapsed in value, much to their dismay. This is a classic example of what LaRouche has referred to as the bankers' floating milk bonds, and then killing the cow.

The situation regarding water supply is also quite bad, but much harder to document, given the lack of current data. The last available information is from 1975, as shown in **Table 3.** Mexico is a relatively water-rich nation, as seen in the fact that its ratio of *available* water to total area is the same as that of the United States. But most of Mexico's water resources are in the southeast of the country, where the water runs to the sea unused, whereas water is most urgently needed for agriculture in the arid center and north of the country. Although two great hydraulic resource projects have been on the books for years, the Plhino and the Plhigon, which would vastly improve this situation, the Mexican government has never gone ahead with them, because of heavy financial pressure from its credit banks, the IMF, and others.

Thus, although Mexico has a lot of water available, the amount of it that is actually *withdrawn* or used is a mere 15%—about half the proportion that prevails in the United States and Germany.

Electricity is the one relatively bright spot in the "hard infrastructure" picture, with consumption rising steadily from 1970 through 1994, both in terms of domestic and industrial use (**Figure 14**). But these relatively modest

TABLE 3
Water availability and withdrawals
(million m^3/km^2)

Country	United States	Germany	India	Japan	China	Mexico
Water available/total area	180	320	560	1.460	280	181
Water withdrawn/used area	110	190	220	1.070	110	55
Withdrawals as percent of water available	30.8%	37.3%	20.5%	15.1%	17.2%	15.2%

FIGURE 14
Electricity consumption, by sector
(kilowatt-hours per capita)

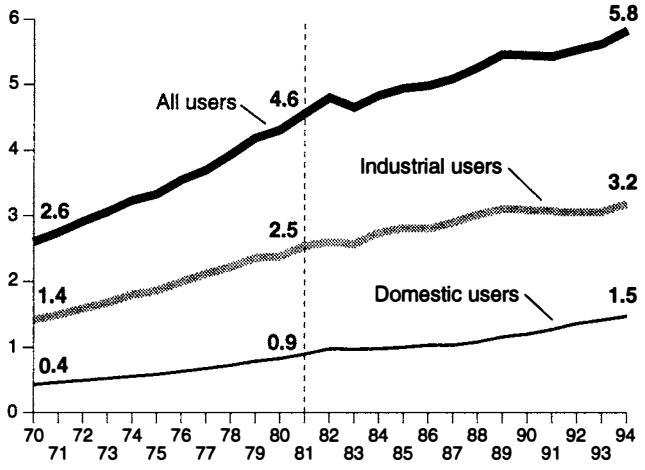


FIGURE 15
Schools
(per 1,000 population)

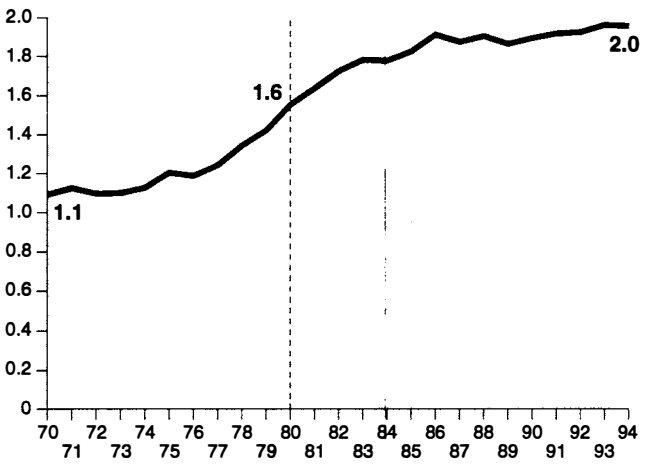
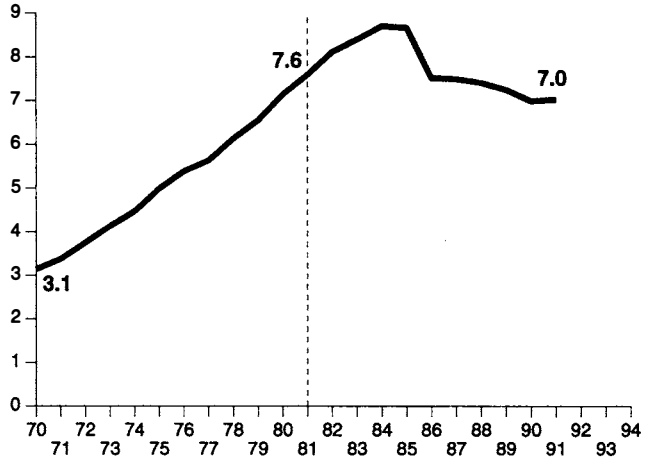


FIGURE 16
High school students
(per 1,000 population)



growth rates should be compared to those achieved by Taiwan, for example, to see how far Mexico is from the leaps in energy density that are required to achieve real development. Referring back to Table 1, Mexico's consumption of electricity rose from 25.6 kwh per km^2 of used area in 1970, to 106.3 twenty years later—for an average annual growth of about 5.5% for the first decade, which then dropped to a little over 3% for the second decade. Taiwan, on the other hand, leapt from 796 kwh per km^2 of used area, to 5,014 in 1990—an average annual growth of nearly 10%.

As for the "soft" infrastructure, including health and education, it is safe to say that the impact of the decreasing investment in these areas over the course of the 1980s has still not been fully felt. Thus, infant mortality has continued to decline (dropping from 68.5 per 1,000 live births in 1970, to 35.7 in 1981, to 17.5 in 1993); life expectancy has risen (from 67.1 in 1981 to 71.5 in 1993); and reported illiteracy had dropped (from 15.8% of the 12-and-over population in 1981, to 12.4% in 1990). But as **Figure 15** shows, the number of schools per capita has levelled off, which will soon enough take its toll. And enrollment for all levels of students, per thousand population, has also begun to decline. **Figure 16** shows the case for high school students, but the same pattern applies to primary and university students as well. Although part of the drop in enrollment rates is a "demographic" effect—i.e., it is due to the fact that population growth rates have declined sharply and there are therefore relatively fewer school-age children—it nonetheless does show that society is by and large "producing" relatively fewer primary, high school, and university students and graduates, which clearly bodes ill for the future.

Is the physical economic collapse reversible?

The answer is yes, but only if Mexico changes course radically, and immediately. Despite 13 years of systematic destruction, there are still sufficient human and capital resources to turn the situation around—especially if done in a coordinated way with other Ibero-American nations.

But there is no time to spare. At a certain point, physical economic devolution becomes a Frankenstein monster that cannot be stopped, even by those who unleashed it. This is, unhappily, the case for many nations in Africa today, which have been pushed into the abyss. And it was done by the very international oligarchy that would now do the same to Mexico.