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Building a Market Economy in Poland

How is a previously centralized economy to be transformed? Poland's experience thus far offers lessons for other Eastern European nations and a challenge for the West

by Jeffrey Sachs

During the past two years, the nations of Eastern Europe have abandoned an economic system based on state ownership and the centralized control of production and prices. In its place they hope to construct free-market economies like those that have brought such visible prosperity to Western Europe during the postwar period. How is this transformation to be accomplished?

The changeover was made possible by the democratic revolutions that ended communist control in Eastern Europe, but the change in economic direction reflects more than political developments. By 1989 the perverse incentives of communist rule had led to near economic collapse. State bureaucrats expanded outmoded heavy industries far beyond sensible limits while neglecting the provision of consumer goods and services. The push to expand industrial production at all costs had led to environmental degradation well beyond that which sparked the environmental movement in the West. The average Czech, Pole or Hungarian enjoys—though that is hardly the word—a living standard far below the levels of even the poorer countries of the European Community and about on a par with the some of the developing nations of Latin America.

Although citizens want the benefits of a market economy, national leaders still face political and logistic challenges in implementing reforms. Last fall's parliamentary elections in Poland, for example, show the limits of people's patience for unemployment and lower real wages during the period of economic transition. (Architects of other restructurings, such as Germany's postwar economic miracle, were also widely criticized in early years for the turmoil they allegedly caused.) Meanwhile the sheer bulk of state-owned enterprises poses a task of unprecedented dimensions in turning them over to private hands.

Western aid will be essential to this restructuring. Not only are vast resources required to rebuild worn-out industries and crumbling cities, but the West must make it clear that the newly free economies, once established, will be welcomed into the community of European and global trade. Failure to do so could threaten not only the economic health of Eastern Europe but also its nascent democracy.

I have been most closely involved with the restructuring of Poland. Its economy is widely recognized as one of the worst-off of Eastern Europe. Its heavy industrial sector is overgrown, inefficient and completely protected from international competition. Light industry, services and distribution have been neglected, as has the nation's financial system. Millions of poor peasant farmers form the core of the agricultural sector. They work tiny plots of land, typically no larger than five hectares (2.5 acres).

To remedy these conditions, the country is aiming to put in place a political and economic system similar to that of members of the European Community. Its fundamental goal, like that of the other former Soviet bloc countries, is the closest possible integration with Western Europe. By the turn of the century this course should lead to full membership in the European Community. There is to be no "third way"—the mix of continued socialist ownership with market forces rather than central planning that some have called for as a compromise between the old system and modern capitalism.

Former finance minister Leszek Balcerowicz put it bluntly: "Poland is too poor to experiment. We will therefore follow working models. Let the rich countries experiment if they want."

The urge to harmonize with and eventually join the European Community has deep roots. Poland desires to regain its place in the mainstream of European society and culture. The slo-

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gan of the revolutions of 1989, after all, was "return to Europe." In addition, Poles are virtually unanimous in their admiration for the social and political accomplishments of postwar Western Europe in creating wealthy and largely equitable societies based on private ownership, social welfare systems and stable parliamentary democracies.

Not only do the Poles regard European Community nations as a model to emulate, but they also believe that free trade and financial relations with the European Community will directly help them catch up with Western living standards. Strong evidence indicates that the close ties of the European Community have helped poorer countries such as Portugal and Spain close the gap in living standards between them and richer nations such as Germany and France. More generally, the economic evidence suggests that outward-oriented trade regimes stimulate growth, and Western Europe is the logical trading partner for its Eastern neighbors.

Another advantage of early commitment to eventual European Community membership is symbolic. Many potential investors naturally fear that the enormous economic turmoil of restructuring could lead to domestic political demands for protectionism or other actions inimical to long-term growth. Treaty agreements with the European Community could irrevocably set Poland on a free-trading course and so make investment there more attractive. After Portugal and Spain joined the European Community in 1986, the rest of Western Europe increased its investment in those countries significantly, at least in part because of the increased assurances on long-term policies.

Poland's economic transformation has two critical components: the reforms that convert a command economy to a market-driven one; and the actual restructuring of industrial and

OUTDATED HEAVY INDUSTRY is a major weak spot in Poland's economy. Newly unleashed market forces are shrinking industrial output rapidly. In contrast, employment in the nation's previously neglected service sector is burgeoning.

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The State of the Polish Economy

The breakdown of the communist regime during 1989 produced sharp inflation and a drastic fall in the value of the zloty (*right*), both arrested by the economic reforms put in place in January 1990. Since then, unemployment (previously illegal) has increased rapidly, as have the wages of those still employed.

SOURCES: Polish statistical bulletin; International Financial Statistics of the IMF

SOURCE: Polish statistical bulletin (various issues)

SOURCE: Polish statistical bulletin (various issues)

business activity that will take place as a result of the reforms. The reforms can and should be introduced quickly—within three to five years at most. Restructuring, in contrast, will necessarily last a decade or more, as investors build up new sectors of the economy in response to the resulting market signals.

While restructuring takes place, the government must make certain that a safety net protects the most vulnerable members of society—among them, farmers, pensioners and those working in outmoded industries. Much of the safety net consists of measures held over from the earlier government, such as health care, housing and the like. Other parts, such as unemployment insurance, are uniquely capitalist requirements. As in other democracies, public demand for such spending can easily outpace budgetary realities. Maintaining a proper balance between social needs and budgetary possibilities is a key economic and political challenge that has no easy solution in sight.

Although the Polish government faces pressure to modify policies that cause unemployment and other social dislocations, it is pressing forward with reforms. Three major kinds of measures dominate the policy landscape: liberalization, stabilization and privatization. Economic liberalization means introducing market competition and creating a legal framework for private property and privately owned businesses. Stabilization fosters a climate in which enterprise of any kind can survive. It involves limiting budget deficits, reducing the growth of the money supply and establishing a realistic, uniform currency exchange rate to promote stable prices and foreign trade.

Privatization, certainly the trickiest area of reform, transfers existing state property, such as factories, to the private sector. Under the communist regime, 3,000 government-held industrial enterprises accounted for 90 percent of industrial output. Another 5,000 state enterprises operated in areas such as transport, communications and trade. In addition to the privatization of state enterprises, the formation of entirely new firms made possible by economic liberalization will also act to privatize the economy.

As the economy moves toward market capitalism, comprehensive, rapid reforms can vastly reduce public confusion about the "rules of the game." Gradual introduction of new measures would create ongoing uncertainty, internal inconsistency and political resistance. The "big bang" approach, in contrast, sets clear incentives for the new economic system in place immediately. As one wag put it, gradual reforms would be the rough equivalent of the British shifting from right-hand to left-hand driving by just switching over the trucks at first.

In a strategy now being emulated more or less closely by other nations of Eastern Europe, Poland set in place the three main pillars of reform as rapidly as possible. On January 1, 1990, it introduced a convertible currency and other substantial elements of liberalization and stabilization. It has also begun the more complex process of privatization.

Before the big bang at the beginning of 1990, many economists and others expressed concern about liberalizing prices while the bulk of industrial production was in the hands of a few state-owned monopolies. Some insisted that price controls should remain until competitive producers had been established. Fortunately, they were wrong: free trade

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and the resulting availability of reasonably priced foreign goods proved a much quicker and more effective route to price competition in Polish markets than any attempt at administrative demonopolization could have offered.

Poland also achieved macroeconomic stabilization fairly quickly by eliminating its budget deficit and tightening monetary policy. The final breakdown of the old regime led to extraordinary financial instability and a brief period of hyperinflation, but as part of the big bang the government cut subsidies that had amounted to more than 5 percent of the gross national product (GNP), increased tax collections, put on wage controls and sharply devalued the currency. The budget shifted from a deficit of 7.4 percent of GNP in 1989 to a surplus of 3.8 percent in 1990.

These measures, together with the elimination of most price controls, caused the consumer price level to double during January 1990. Soon after this one-shot jump in prices, however, the new economic environment brought an end to high inflation and, even more remarkably, a rapid end to decades of chronic shortage and lines.

Hundreds of thousands of small businesses started operation in 1990, creating in a matter of months a network of shops, service establishments and firms engaged in international trade, construction and transport. The development of the service and trade sectors was particularly dramatic in an economy that had long been starved of them. In the first few months, most start-up capital came from unofficial sources rather than from the official banking sector. Households invested hard currency (as opposed to zlotys) that they had accumulated in earlier times. Entrepreneurs' neighbors and families contributed money, as did relatives living in the West. In addition, capital was spun off either formally or informally from state enterprises: for example, municipalities leased tens of thousands of shops to their workers. Many operations started informally (for instance, by selling meat from the back of a truck) and quickly expanded to full-fledged small businesses. By the end of 1990 and throughout 1991, the formal banking sector began to provide an increasing flow of credit to new small private businesses.

The economy also adjusted quickly to the opening of markets to international trade. Thanks to the new convertibility of the zloty and the favorable exchange rate after devaluation, Polish exports to the West surged from around $8.5 billion in 1989 to $11.5 billion in 1990. This surge continued in 1991 and has helped pay for a sharp rise in imports. The import boom reflects the eager purchase of Western durable goods previously unavailable and a substantial increase in imported machinery as well as energy to offset the loss of supplies from the Soviet Union.

Although efforts at liberalizing and stabilizing the Polish economy have been largely successful, privatization, especially of large enterprises, lags dangerously. This is the nation's key problem: unremedied, it could lead to the return of profound economic instability.

The privatization of small enterprises (those with fewer than 500 employees) has moved forward rapidly. Trucking, construction and small industrial units are now largely in private hands, most either auctioned off or sold to their employees. By mid-1991 more than 40,000 shops had been sold or leased to private operators; combined with the growth of private firms in the service sector, this has privatized an estimated 80 to 90 percent of all retail trade.

In contrast, only a small fraction of Poland's large industrial enterprises has been privatized. The sheer magnitude of the task is daunting. Under the aggressive privatization campaign of the Thatcher regime in the 1980s, for example, the U.K. succeeded in privatizing about five state-owned enterprises a year. Even at that rate—which in the U.K. relied on a sophisticated capital market and a private sector capable of absorbing state-owned firms—privatization would take the Poles several hundred years. Without a long history of performance in an open market, it is difficult to estimate the value of the state-owned enterprises, and without a large stock of private capital, few can buy at plausible prices. Although foreign investors might have the resources to snap up Polish firms (assuming they wanted to), such a course would be politically unacceptable.

In the face of such difficulties, a decision was made last summer to privatize several hundred large industrial enterprises by giving shares to all Poles. The so-called Mass Privatization Plan calls for distributing shares among several private investment funds, each of which will have a diversified portfolio of enterprises. In turn, the shares of the investment funds will be distributed to adult citizens, free of charge. Foreign managers will be recruited to help oversee each of the investment funds, although the funds will be owned by Polish households. At the same time, a fraction of each enterprise's shares, around 10 percent, will be distributed free of charge to its workers and managers.

Once the shares are in private hands, the reasoning goes, a market for them will develop. Workers and managers may trade their shares to other investors, and the investment funds may also trade the shares among one another or to other investors, both domestic and foreign. The households may trade their shares of the investment funds, thereby putting market pressure on the

POLISH AGRICULTURE is still inefficient and labor intensive. Most farmers work plots no more than five hectares in size. Sharp cuts in subsidies are expected to force consolidation into larger, more efficient farms.

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ECONOMIC LIBERALIZATION has led to a wider availability of consumer goods (albeit at higher prices). Photographs above show a butcher shop in 1989 (*top*), when price controls were still in force, and in 1990 (*bottom*), after they had been lifted.

investment funds to manage their portfolios wisely. Meanwhile the investment funds will appoint members to the board of directors of each enterprise that they own. These board members will scrutinize management as they do in the West.

Enterprise managers will therefore face several kinds of scrutiny and incentives that do not exist for state-owned firms. In addition to being motivated by their own share holdings, the managers will be watched by the directors of the enterprise, many of whom will be appointed by the investment funds. They will also face the market test of the value of the shares traded in the stock market. Enterprises whose prospects are bleak will find their shares falling in value, rendering them liable to takeover, or at least to a change of management. The value of well-run enterprises, in contrast, will climb, potentially making additional capital available for investment. Furthermore, once firms are in private hands, the political consequences of restructuring will be reduced, because the private sector rather than the government will be doing the work. Call for subsidies and protection should also be easier to resist.

This plan was still moving toward implementation at the end of 1991, although the inconclusive results of the parliamentary elections rendered its future uncertain. At least some funds will be established, but the method of distributing their shares to households remains a matter of debate. The number of firms that will eventually participate in the program is also open to question. Around 200 have been designated, and policymakers intend to distribute shares in additional groups of firms if the program shows signs of success.

In the meantime, most of Poland's large state-owned industry is left rudderless or worse. Under the communist regime, managers were controlled by state administrators or the Communist party, their commands backed up by the threat of state violence. In the West, and under the plans of mass privatization, managers are governed by a board of directors that is legally obliged to act on behalf of shareholders. (Although that does not always happen, at least the basic legal responsibilities and economic incentives are in place.)

As matters now stand in Poland, however, most managers answer neither to administrators nor to their nominal owner, the Treasury. They operate on their own behalf or under the control of a council of workers. Only in a small minority of cases has the government appointed a supervisory board to represent the interests of the Treasury as the legal owner of enterprises, a measure known as commercialization.

As a result, managers are all too ready to pay out enterprise profits in the form of higher wages, making industrial plants even less competitive than they already were. What wage control there is in Poland comes from highly unpopular centralized income policies, which are both economically inefficient and politically debilitating.

In addition, reports indicate widespread self-dealing and conflicts of interest among managers of state-owned enterprises. Managers have been accused of intentionally bankrupting firms in order to buy them out cheaply or establishing private firms that then receive preferential contracts with the state-owned enterprises. They have accepted unfavorable joint-venture and takeover offers that provide personal benefits while rejecting better offers that might put their jobs at risk. In short, all the ills

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of unbridled laissez-faire capitalism that plagued the West in the 19th century are running amok in Poland.

There are also the "zombie" enterprises, whose incompetent managers have failed to adjust to new market conditions. Many of the Polish firms hit by the collapse of the Soviet market, for example, simply continued to produce goods at normal rates and build up inventories while waiting for a miracle. In mid-1991 the money ran out, and a spate of politically and economically troubling insolvencies struck the country.

As long as the privatization of large industrial enterprises is delayed, wider use of commercialization is imperative. Although appointing a supervisory board to represent the interests of the Treasury does not establish private ownership, it does bring in some modicum of oversight of managerial behavior, and it does subject the enterprise to normal rules of corporate behavior.

Even this step, however, is being applied only slowly. Some policymakers underestimate the importance of establishing a clear legal framework for state enterprises, whereas others point to the real (but surmountable) logistic difficulty of finding qualified individuals to sit on supervisory boards. Some critics of commercialization offer concerns that abuse of power by supervisory boards could in effect return enterprises to centralized government control.

The structure of the Polish economy is already changing under the influence of the market forces that have been unleashed during the past two years. As additional reforms such as large-scale privatization take effect, those changes will accelerate. Ultimately, the pressure of international competition will probably play the largest role in restructuring.

Although it is impossible to predict long-term effects precisely—which industrial sectors will flourish and which will decline—some basic trends are already emerging. The industrial sector as a whole is shrinking, while the heretofore neglected service sectors (notably shops, restaurants, banking and personal services such as plumbers and mechanics) are growing. Indeed, although Poland is often characterized as being in a sharp recession, that is true only of the industrial sector. The service sectors of the economy are booming. Between December 1989 and June 1991, individuals started 460,000 businesses, operating mostly in services, and the payrolls of all small private firms grew by an estimated 860,000 workers.

Major changes are also afoot in agriculture. Poland never completed the great demographic shift from agriculture to industry and services that has been traversed by nearly every advanced industrial country. Agriculture still accounts for about 20 percent of total employment and 10 percent of GNP. Many small farmers are now under financial pressure as a result of the sharp cuts in Polish agricultural subsidies during the past two years. In the coming decade or two, most smaller farms will be consolidated into larger, more efficient operations.

Most important for the long term, however, is a complete restructuring within what remains of the industrial sector, away from energy-intensive heavy industries such as steel and shipbuilding and toward more labor-intensive and skill-intensive industries that can compete in world markets. Poland offers low-cost skilled labor, particularly in engineering, that should make it an attractive place to produce high-value-added goods for export to Western Europe. Already some important restructuring is under way: the number of private industrial corporations grew by about 25,000 between December 1989 and June 1991.

Western firms are likely to set up operations in Poland to manufacture for export in the same way European firms are now investing in Spain, American firms in Mexico and Japanese firms in Korea, Taiwan and the rest of Southeast Asia. Thus far, however, concerns about unclear property rights and the political sustainability of Polish economic reforms have kept foreign direct investment at a low level. If the reforms are sustained, investment should increase markedly in the coming years.

Despite the accomplishments to date, Poland's situation remains decidedly fragile. Average citizens appear less taken by the fact that the burgeoning of firms promises future economic growth than by the rate at which existing industrial enterprises are going bust. Although they appreciate the end of shortages and queues, they are having trouble making low monthly earnings cover the higher market prices. Many are confused—they do not understand why the end of communism has not brought prosperity, why they have both free markets and low living standards and why economic reform's most visible product is unemployment. In a survey last summer, approximately 60 percent of Poles said they feared losing their jobs in the near future.

Significant parts of the population have lost ground in the first two years of reforms. The hundreds of thousands of farmers working tiny, inefficient plots, for example, have lost the subsidies that helped them stay afloat. Similarly, hundreds of industrial enterprises employing hundreds of thousands of workers are unable to compete under the new market conditions. The unemployment rate had risen to around 11 percent at the end of 1991.

Not all of the measured rise in unemployment is a result of reforms. Some people were always unemployed, but their numbers were not recorded by a regime that considered unemployment a crime rather than a misfortune meriting compensation. Many labor economists also suspect that a fair proportion of the unemployed hold jobs in the informal economy. Furthermore, the collapse of the Soviet economy and the breakdown of trade relations with the Soviet Union (now the Commonwealth of Independent States) have led to a rapid decline in its imports from

EXPLOSIVE GROWTH OF PRIVATE BUSINESSES has in effect privatized significant parts of Poland's economy even as large enterprises remain in state hands.

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the Eastern bloc. Hundreds of enterprises in Poland and elsewhere are being forced to close their doors or scale back production dramatically. Insofar as enterprises can shift their exports from the East to the West, the reforms may in fact help cushion Poland from such external shocks. Nevertheless, much of the increase in unemployment is real, and the fears of unemployment are indisputable.

Although Poles blame the reforms for an alleged steep fall in living standards, this decline is almost surely overstated. Average wages have risen less than prices since the start of the reforms, thereby reducing measured real take-home pay. But, in general, goods were never actually available at pre-reform prices, at least not without the buyer waiting in a long queue or paying a bribe or paying extra amounts in the black market. According to survey data, average Poles are now consuming somewhat more meats, fruits and consumer durables than they did before, suggesting that greater availability has more than compensated for higher prices. Furthermore, people are saving millions of hours per week that used to be wasted standing in queues.

Some kinds of expenditures, however, do seem to have been cut back on average. One important area of reduced consumption is clothing. Particular social groups such as industrial workers and farmers have been hard hit by the reforms. And with the collapse of Soviet trade with Poland in 1991 and the end of subsidized sales of Soviet petroleum, the society suffered a significant loss of income, albeit not as the result of the economic reforms themselves.

In the current turbulent climate, the fate of policies for economic restructuring is uncertain. In postwar Germany, for example, Ludwig Erhard, now remembered as the father of the postwar German economic miracle, was widely criticized as the creator of high unemployment rather than high living standards. Not until several years after the start of his reforms did prosperity arrive. The Adenauer government of which Erhard was a member just barely survived the first difficult years, in large part thanks to the money flowing into Germany through the Marshall Plan.

In Poland, Balcerowicz will be remembered as the father of his country's economic miracle only if his reforms are given time to work. And time may be very scarce indeed, given the limited patience of the population and the powerful political forces supporting protection and subsidy of failing industries.

The greatest risk in Poland is that populist concern over short-term hardships, confusion over property rights and a splintering of political power in parliament will lead to a weak government unable to take the last decisive step to private ownership. In that case, the economic situation will almost surely deteriorate further, and as has happened in Latin America, democratic government could be as thoroughly discredited as its totalitarian predecessor.

The "valley of tears" that intervenes between the institution of reform and later prosperity has been observed in nearly every country that has undergone a radical economic transformation, from postwar Germany and Japan to Chile and Mexico in the 1980s. Passing quickly through the valley depends on political leadership and a social consensus to maintain a stable set of policies. If there is inconsistency or wavering, it is easy to get lost—Argentina, for example, has been wandering for 45 years.

Peculiar electoral traditions and social divisions increase the chance that the country will "wander in the wilderness." Poland organized its parliamentary elections in October 1991 according to a system of nearly strict proportionality that gives representation even to small parties receiving a small fraction of the overall vote. The election law amplified inherent divisions between peasants and workers, church followers and anticlericists, urban and rural voters, and so on; as a result, Poles elected representatives of no less than 29 parties. No party received more than 15 percent of the vote. The new government will therefore surely be based on a large coalition, and history suggests that such governments are easily paralyzed by internecine disputes.

And even if the Poles can forge a solid internal consensus, that will not be enough for the new economic policies to succeed. Attractive as the hope might be that Poland and the other Eastern European nations can get back on their feet by themselves, that view is simply not realistic. The West has a crucial role to play. The former Soviet satellites are in dire need of financial assistance for restructuring now and in the next few years. The U.S. and Western Europe must help assure that resources are available for the modernization of factories, roads and other utilities during this delicate period.

Perhaps just as important as ready cash and technical assistance, however, is the West's symbolic role. The "return to Europe" is the glue that so far has held the social consensus for reform together. If Western Europe shows no interest in the return of Poland (or the rest of Eastern Europe), then the intense pressures already facing the new democracy are likely to undermine the course of reform and restructuring. Worse yet, given the stingy attitude of the West to date and the undoubted cases of rapacious Western investors intent on profiteering, a xenophobic backlash may already be taking shape.

To aid restructuring, the European Community should signal Poland that it can indeed return to Europe. It should make it absolutely clear that Poland can expect European Community membership after it has passed the key hurdles of economic reform. Nothing would so much channel energies and political passions for reform.

The signing of association agreements between the European Community and Czechoslovakia, Hungary and Poland at the end of 1991 marked an important move in this direction. These agreements foresee free trade between the three countries and the European Community in industrial goods by the end of the decade. Unfortunately, the agreements stop short of what is needed, both in regard to membership and on the important issue of agricultural trade. The European Community made some concessions, but its protectionist framework remains intact. Clearly, Western Europeans still have deep anxieties about closer links with the East, and these misgivings could lead to considerable political trouble.

Europe stands at a crucial point in its history. The cold war between democracy and totalitarianism that divided the continent for half a century is over. Communism has lost. But unless all Europeans work together to help build market economies in the nations of Eastern Europe and to integrate them on an equal footing in international trade, the victory over communism could be followed by chaos and confusion rather than economic renewal and growth.

FURTHER READING

CREATING A MARKET ECONOMY IN EASTERN EUROPE: THE CASE OF POLAND. David Lipton and Jeffrey Sachs in *Brookings Papers on Economic Activity,* No. 1, pages 75–147; 1990.

THE ROAD TO A FREE ECONOMY: SHIFTING FROM A SOCIALIST SYSTEM: THE EXAMPLE OF HUNGARY. Janos Kornai. W. W. Norton & Company, 1990.

ACCELERATING PRIVATIZATION IN EASTERN EUROPE: THE CASE OF POLAND. Jeffrey Sachs. Washington, D.C., World Bank Annual Conference on Development Economics, 1992.

STRUCTURAL ADJUSTMENT AND INTERNATIONAL TRADE IN EASTERN EUROPE: THE CASE OF POLAND. A. Berg and J. Sachs in *Economic Policy* (in press).

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