RADICAL TRANSFORMATION OF A SOCIALIST ECONOMY;

POLAND 1989 - 1991

by

Andrew Gouinlock Berg

B.A. Applied Mathematics, Harvard University
(1986)

Submitted to the Department of Economics
in Partial Fulfillment of the Requirements for the Degree of

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ABSTRACT

The Solidarity government which assumed power in September of 1989 undertook to end the hyperinflation and radically transform Poland’s socialist economy. This thesis analyses various aspects of this first and so far most dramatic attempt by any country to jump from the chaos of a collapsing Soviet-style economy to the market. The first chapter places the reforms in the context of the disequilibria which characterized the Polish economy in 1989. After reviewing the initial conditions, policy measures, and outcome of the “big bang”, I show how the broad movements of relative prices and intersectoral adjustment are consistent with a simple model emphasizing the establishment of a convertible currency, price liberalization, elimination of excess aggregate demand and the end of the shortage economy.

The second chapter looks more closely at the dramatic decline in industrial production and measured standard of living that accompanied liberalization in 1990. Each of the reforming Eastern European countries has reported large drops in reported consumption, living standards, and output. We know how poorly Soviet-style economies functioned. They produced much non-market-driven, low quality output. Furthermore, they had too much industry and a repressed services sector. This chapter focuses on the question of how much of the output decline in Poland in 1990 should be attributed to mismeasurement associated with these characteristics of the Polish economy. I first examine potential sources of direct mismeasurement of output of individual goods and present alternate measures of real consumption and GDP in 1990 that try to control for some of these problems. I then review the idea that some of the measured output decline can be attributed to the production of which would have generated little or no value-added at proper shadow prices and confronts them with available evidence. Overall, I conclude that average real consumption fell little or not at all in 1990, real GDP fell by much less than official estimates, before adjusting for changes in variety, quality, and availability of goods.

Chapter 3 returns to the macroeconomic analysis of the stabilization program. I
assemble a variety of aggregate and sectoral data to address several specific questions left unanswered by the framework presented in the first chapter: (1) What were the causes of the output decline of early 1990? Were they primarily due to the dislocations implied by the move to a market economy, or instead to a demand contraction? (2) What were the causes of the other sharp decline in output at the beginning of 1991? What was the role of the CMEA collapse? Was the effect through dislocations or through a fall in external demand? (3) How should one think of the evolution of state firms over the last two years? Have we seen the orderly decline and transformation of a sector which was too large in the first place? Or have we seen an increasing paralysis of those firms, without much restructuring? (4) Where and how has the private sector grown? Is it filling some holes and not others, is it replacing or complementing the state sector? (5) Why did prices increase so much at the beginning, and why has inflation been so persistent since? To what failures of policy if any can it be ascribed?

Two years after the ‘big bang’, 11 percent of Polish state enterprises have been commercialized or privatized. The final chapter supplements the discussion about privatization strategies with a review of the actual attempts to implement them. Although much of the debate has focussed on optimal privatization schemes, in practice the issue has proved to be how to execute a minimally acceptable and feasible program. What is striking in Poland is that more than two years into the radical ‘big-bang’ program the vast majority of state enterprises have undergone no ownership transformation. The overthrow of the Communist regime, marketization of the economy, and legal and political revolution have changed all the ‘rules-of-the-game’, and in this environment the complexity of the privatization task overwhelms administrative capacity. More importantly, privatization requires a widespread rearrangement of ambiguous property rights. It is not clear who owns the firm, who is responsible for liabilities, and in particular what power remains with the state. The result has been a confused political debate, a paralyzed bureaucracy, and enterprises whose workers and managers control the enterprise without any certain long-term stake in the firm.

Thesis Supervisor: Dr. Olivier Blanchard

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Acknowledgements

My first thanks go to my PhD committee. Olivier Blanchard was the ideal advisor (and co-author), and I will always be grateful for his patience and guidance. I will always be proud to be a student of Rudiger Dornbusch, who has always honored me with his criticism as well as his praise. Richard Eckaus greatly improved the entire thesis through his careful and thoughtful reading.

This thesis is about the Polish economy, and much of my debt is owed there. Leszek Balcerowicz was an inspiration during my work in Poland. I learned much from him as well as a number of people who were both friends and colleagues, including Andrew Alexandrowicz, Joe Bell, Jakub and Anna Bierzynski, Klaus Hermann, Dariusz Jaszczynski, Stefan Pawalec, Tom Kolaja, Robert Konski, Jerzy Kozynski, Tony Levitas, Janusz Lewandowski, Larry Lindenberg, Kevin MacDonald, Jay Madigan, Blanka Maczkowska, Krzysztof Nowak, Majka Perkowska, Jan Rajski, Jacek Rostowski, and Stan Wellisz.

My friends and colleagues at Jeffrey Sachs and Associates provided an intellectual environment second to none as well as a home away from home: Mariusz Banaszuk, Zanny Minton Beddoes, Peter Boone, Pawel Dobrowolski, David Lipton and Malgorzata Zajaczkowska. Jeffrey Sachs has been a friend and teacher through several enormously rewarding years. The enthusiasm, vision and clarity with which he did economics showed me how well it could be done. Thanks to him we were able, I believe, to contribute something of lasting value to reform efforts in Poland.

Working for Martin Feldstein was always rewarding. Among many other things, he first taught me to focus on the important policy questions in my work.

The National Science Foundation, the World Institute of Development Economic Research, the World Bank, and the International Monetary financed some of the work which went into this thesis. I would also like to thank the National Bureau of Economic Research and its staff, for providing logistical and psychological help in time of need.

My greatest debt, of course, is to my parents, to whom this thesis is dedicated.
Table of Contents

Chapter 1: Stabilization and Liberalization of a Reformed Communist Economy: Initial Disequilibrium and Structural Change ................................................................. Page 9

Chapter 2: Measurement and Mismeasurement of Economic Activity During the Transition to the Market ................................................................. Page 43

Chapter 3: Stabilization and Transition: Poland 1990-1991 ....................... Page 91

Chapter 4: The Logistics of Privatization .................................................. Page 141
Chapter 1: Stabilization and Liberalization of a Reformed Communist Economy: Initial Disequilibrium and Structural Change.

1. Introduction

The economic transformation of Eastern Europe is one of the most important economic events of the century in terms of the number of people involved, the rapidity of policy change, and the magnitude of economic shocks. The Polish case is among the most interesting. It was the first to attempt to move swiftly from Communism to market, and its reforms were indeed among the most radical. Understanding this case is of special importance because of its relevance for events currently unfolding in the former Soviet Union. But an understanding of these events is needed for more than better policy formulation in the future, both in Poland and elsewhere; a variety of critical issues in modern macroeconomics arise in dramatic ways in the Polish context. As the study of disease can increase understanding of the normal functioning of the human body, we can hope that an analysis of events in Eastern Europe will shed some light on questions of more general interest.

This chapter introduces some of the factual background and conceptual structure required to understand recent Polish experience. It emphasizes the relationship between the economic disarray which greeted the first post-Communist government in late 1989 and the early results of the stabilization and liberalization program launched on January 1, 1990, particularly as revealed in the movements of relative prices and in the relative performance of industry and the service sector. In order to make these points, section 2 introduces a simple theoretical framework for discussing stabilization and liberalization in the context of pervasive shortage and severely distorted economy. Section 3 looks at the situation in Poland leading up to the "big-bang" in light of this framework, reviewing the macroeconomic and structural characteristics of the Polish economy. Section 4 reviews the measures taken in the "big-bang", while section 5 summarizes the outcome in 1990 and 1991. Section 6 discusses the issues raised by this experience. Section 7 summarizes the results of the following chapters, and section 8 concludes with a discussion of major unresolved questions.

2. A styled model of stabilization and liberalization

The broad patterns of the stabilization program and its results can be understood in the context of a simple model of stabilization and liberalization in the context of a monetary overhang, currency inconvertibility and a repressed service sector. This section explains how, despite an alleged deep recession, growth of the service and private sector have been rapid, and both imports and exports of manufactures have boomed. It also shows how convertibility of the Polish zloty was achieved not through a sharp real devaluation of the currency, but despite a real appreciation.

One key to understanding these anomalies is that Poland began its radical

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1This section draws heavily on Berg and Sachs (1992).
liberalization from a position of significant macroeconomic disequilibrium. Three aspects were paramount. First, as the result of price controls combined with highly expansionary macroeconomic policies, the overall price level was systematically below the level consistent with macroeconomic equilibrium. The result, of course, was a situation of chronic and generalized shortages. I will refer to this phenomenon as the pre-reform monetary overhang, even though the over-expansionary policies involved not just an excessive stock of money, but also large fiscal deficits and excessive real wage increases. Second, and consistent with the monetary overhang, there was a persistent and significant excess demand for foreign exchange at the official exchange rate. Specifically, foreign exchange was rationed, as the central bank did not make it automatically available to importers at the official exchange rate. This is a situation of currency inconvertibility, and more specifically, current account inconvertibility. Third, resources were systematically diverted from the service sector and into agriculture and manufacturing. This was accomplished through a complex system of price controls, limitations on the rights of individuals to start small businesses, the direct allocation of resources to the state sector and away from small private firms in the service sector, and extensive subsidies to industry.

The importance of these initial conditions is illustrated with a simple framework (elaborated in the Appendix) that describes an economy that produces just two kinds of outputs, industrial goods and services. The economy consumes these two goods, and also a foreign-produced import. The domestic industrial good is also exported. The administratively set prices for the three goods are typically not the market-clearing prices, and most markets are characterized by excess demand. The market clearing prices are established in unofficial parallel (or black) markets. While producers face the official prices, consumers may choose either to queue up for goods at the official prices, or to pay the higher parallel-market prices. On the margin, consumers are indifferent between joining the queue or buying the output immediately at the higher price.

For simplicity, it is assumed that all households pay the parallel market price, in effect buying the goods from "entrepreneurs" who wait in the queues and then resell the goods in the parallel market. As pointed out by many writers such as Kornai, and as recently modelled by Weitzman (1991) and Lipton and Sachs (1990), such queueing activity represents a deadweight loss to society. As an approximation, aggregate demand is determined by the nominal money stock, \( M \), so that excess aggregate demand becomes the same thing as a 'money overhang'. (In fact, excess demand may result not only from an excessively large stock of money, but also from a large budget deficit, excess wages and so on). Output by enterprises is a function of relative official prices, and resources are assumed to remain fully employed. For most of the discussion official prices will remain unchanged, so that the division of output between industry and services is fixed.

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2Convertibility refers to the automatic availability of foreign exchange in return for domestic money at the official exchange rate. When foreign exchange is freely available for current account transactions, but not for capital transactions, there is current account convertibility. When it is available at the official exchange rate for all transactions, there is full convertibility.

3Note that I am not assuming that enterprises maximize profits, but simply that supply curves slope up in official prices. This obtains if enterprises receive the official price for their output, insiders control the firm, and these insiders benefit from higher revenues net of non-wage costs. In what follows the relative official prices change only after liberalization, and in the post-liberalization environment of 1990, enterprise management was decentralized to insiders who benefited from higher income. See chapter 4 for more institutional detail and chapter 3 for evidence on the hardening of the budget constraint in state enterprises in 1990.
(Below, when the nominal price of industrial goods changes, for example because of a devaluation, we implicitly assume that the nominal price of services is adjusted proportionately, to keep intact the same real bias against the production of services).

(1) Basic Mechanics of Convertibility

When the country lacks foreign exchange reserves to run a trade deficit and capital flows are exogenously set, the quantity of imports depends on the fraction of the domestic production of the industrial good which is exported. Initially, the monetary and price structure is such that industry is a net exporter. More precisely, at the initial set of prices, the domestically produced industrial good is in excess supply on the domestic market, and this excess supply is exported. The exporter receives the world price for the export good multiplied by the official exchange rate. Similarly the official price of the importable good is the world price multiplied by the official exchange rate. When the currency is convertible, the parallel market price of the imported good will equal the official price. When the currency is inconvertible and there is an excess demand for foreign exchange (and for the imported good), the parallel market price of the imported good will exceed the official price. There may or may not be an excess demand for the imported good at the official price.

There is a unique level of money, \( M_* \), that would just produce monetary equilibrium with balanced foreign trade and currency convertibility, for a given nominal exchange rate \( E \). If the money stock exceeds this amount \( (M > M_*) \), demand for the imported good (and the foreign exchange to buy it) exceeds supply (which is constrained by overall exports). A parallel market for imports develops. Foreign exchange must be rationed at the official exchange rate, and in the parallel market the domestic currency is depreciated relative to the official rate. The ratio of the parallel-market exchange rate to the official exchange rate is increasing with the monetary overhang.

The domestic parallel-market price of the imported good is higher than the world price times the official exchange rate. The importers which are lucky enough to get the rationed foreign exchange from the central bank at the official exchange rate can purchase imports at the official price and resell them in the parallel market at the price (alternatively, they may in fact simply sell the currency in the parallel market to other would-be importers, and earn the spread directly). This spread between official and parallel-market prices cannot, of course, be eliminated by arbitrage because other would-be importers do not have access to the rationed foreign exchange at the overvalued official rate.

Some of the higher demand resulting from an increase in \( M \) above \( M_* \) will fall on the exported good. Exports will thus fall, and through the trade balance constraint (imports equal exports plus exogenous net capital flows), imports will have to fall as well.\(^4\) Since there is an initial excess supply of the exportable good on the domestic

\(^4\)The formal model presented in the appendix assumes that the exported good is not in excess demand in the domestic market. What is needed for the argument here is less restrictive: simply that higher domestic demand causes more of the exported good to be diverted to domestic use. This is plausible, for two reasons. First, by the end of the 1980s, many firms were able to choose between the domestic and foreign market, and prices were roughly arbitrated between the markets. Second, where central planning persisted, there was a tendency by planners to view exports as a "vent for surplus." That is, planners encouraged exports mainly for goods whose "needs" were already met on the domestic market. There were goods (such as high-quality coal) whose production was destined primarily for export, but even here
market, the increased aggregate demand leads to a reduced excess supply, but not to a situation of excess demand, unless of course the demand increase is so large as to choke off all exports. Assuming that some exports continue, the domestic price of the exportable good remains at the official price level (equal to the world price multiplied by the exchange rate), and does not rise. In the end, the increased nominal demand systematically raises the parallel-market price of importables relative to exportables. The money overhang lowers imports, lowers exports and raises the black market premium on the exchange rate and on services. Consumer welfare falls. The distortionary costs of the monetary overhang vis-a-vis international trade are the same as those of a tariff: both raise the relative price of the imported good relative to the exportable and result in underconsumption of imports relative to exportables.

The cost of currency inconvertibility is illustrated in Figure 1.1. Consumption of the import good is shown on the x-axis and of the industrial good on the y-axis. The international trade line CC corresponds to the relative world price of the import good relative to the exportable good. When the currency is convertible, the consumption point is found at the tangency of the indifference curve of a representative consumer and the international trade line at point A. When \( M \) rises above the level consistent with convertibility, the equilibrium moves northwest along the CC line to a point like B. At B, the steeper slope of the indifference curve is equal to the spread in the black market for foreign exchange. Obviously, the utility level at point B is less than at point A.

In the range of convertibility, for an unchanged exchange rate, a drop of \( M \) below \( M_c \) produces a trade surplus as spending on imports declines. (Although this is a static framework, note that over time the trade surplus caused by \( M < M_c \) would increase the money supply through the Hume mechanism: high-powered money would grow by the amount of the central bank's accumulation of foreign exchange reserves. This, in turn, would tend to eliminate the trade surplus.)

It is essential to realize that \( M_c \) depends on the nominal official exchange rate \( E \). As \( E \) rises (the currency is devalued) domestic official prices of imports and exportables rise. The amount of money consistent with equilibrium of supply and demand at official prices, hence convertibility, rises as well. Thus for a given level of nominal money stock, there is a nominal exchange rate consistent with convertibility, \( E_c \). If \( E \) is higher (more devalued) than \( E_c \), then \( M \) is below \( M_c \) and the currency is convertible.

It is interesting in this light to examine how imports are differently affected by a devaluation in the cases of inconvertibility and convertibility. In Figure 1.2, the stock of money \( M \) is constant. When the nominal exchange rate \( E \) is less than \( E_c \) (the currency is inconvertible), a devaluation (higher \( E \)) is tantamount to a narrowing of the monetary overhang, so that imports tend to rise. On the other hand, when \( E \) is greater than \( E_c \), an increase in \( E \) causes imports to fall. Starting with a monetary overhang, currency inconvertibility and a black market exchange-rate premium, monetary equilibrium can be restored by raising \( M_c \) or by lowering \( M_c \), or both, until they are equal. Raising \( M_c \) is accomplished by a devaluation of the nominal exchange rate. Exports and imports will both increase. If \( M_c \) is raised above \( M \), say by a large "overshooting" devaluation, the result will be not only convertibility, but a trade surplus. Exports will rise, while

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increasing domestic shortages tended to cause a reallocation of resources towards satisfaction of domestic demand.
imports may rise or fall, depending on the extent of the devaluation.

(2) Queuing, Inventories, and Shortages

A monetary overhang leads to underconsumption of imports and overconsumption of exportables. In a more general framework, in which there is an import-competing sector as well as an export sector, we would also find a distortion on the supply side, as resources are pulled out of the exportable sector and into the import-competing sector. There is another large category of real resource costs associated with the shortages caused by a monetary overhang: the waste of resources used up in queuing and in holding excessive inventories. Kornai pioneered in the study of these costs, and Weitzman (1991) has recently provided an elegant model. Lipton and Sachs (1990) applied the model in a simple setting, in which the real resources consumed in queues vary according to the spread between the official and black market prices of commodities.

Of most interest here is the tendency of households and firms to hoard inventories when shortages lead to queuing. Weitzman's argument (essentially that of the Tobin-Baumol framework for money demand) is that if each visit to the market is costly because of the need to wait in line for goods, and if real interest rates are low, then consumers will make large purchases on each visit to the market, and will, on average, hold large inventories between shopping trips. Producers, in turn, will hold large inventories of inputs to avoid running out of key supplies. Retail firms may also tend to hold large inventories to avoid "stockouts" (an inability to meet customer demand), since they know that they cannot rely on quick shipments from the producer.
As soon as prices are liberalized, however, the hoarding motivation is ended. Firms will tend to dump existing stocks of inventories onto the market, while households will cut their new market purchases while they live off of existing inventories. To the extent that the inventory stocks are easily tradeable, the dishoarding should contribute to a bulge in exports.\footnote{Table 3.1 of chapter 3 confirms that stocks of inventories of final goods fell sharply during 1990, after the initial shock.}

(3) The Service Sector

Two aspects of the service sector require attention: the implications of price control (and liberalization), and the impact of the monetary overhang. It was assumed that service-sector production is artificially restricted by price controls. This is a shorthand way of describing the bias of Soviet-type economies against services, and towards industry. Even when $M = M_e$, the market for services will not clear if the planners set the relative price at too low a level, a case which is empirically relevant. When the price control on services is eliminated, the relative price rises, causing an increase in service sector output and a fall in industrial good output. The effect of this shift of resources into the service sector and out of the industrial sector is to reduce consumption of all traded goods and to raise consumption of services. Both imports and exports will tend to fall as a result of the shrinkage of the industrial sector.

(4) Summary: the effects of stabilization and liberalization

Initially, the economy is characterized by a monetary overhang and service-sector price controls. The overhang is eliminated by a sharp devaluation, and the price control on services is simultaneously eliminated. What are the overall effects? We should expect: (i) a rise in the overall price level, with service prices rising more than export prices; (ii) a rise in official import prices and export prices by the same amount (equal to the percentage devaluation of the exchange rate), but a rise in the parallel market price of imported goods that is less than the increase in export prices and service prices; (iii) an increase in service sector production and a decrease in industrial production; (iv) a fall in inventory stocks as hoarding is eliminated; (v) an indeterminate response of exports and imports. Both will tend to rise as the result of elimination of the monetary overhang and as the result of inventory dishoarding. But exports and imports could fall as a result of the shift of resources out of industry and into services. As a practical matter, though, the shift to services will probably be more gradual than the direct effects on excess demand and inventories resulting from the end of the monetary overhang. For this reason, we should expect to see imports and exports rise.


The framework described in the previous section highlights many of the key issues faced by the first post-Communist government in Eastern Europe. The Mazowiecki government in September of 1989 took control of a Soviet-style economy characterized by currency inconvertibility, a repressed service sector, and severe macroeconomic imbalances. In later sections we will see how the policy package and the main patterns of the outcome reflect these factors. The framework just outlined is, however, only a crude basis for describing the structural adjustments in Poland, of course. To set the stage for a description of the policy package and its outcome, and for the economic analysis in the following chapters, we need to review the situation in the Polish economy.
Figure 1.2. The relationship between the exchange rate and imports

before the "big-bang" of January 1990.⁶

September 1989 was a time of profound disarray. The rules of the elections of the previous June had guaranteed that Solidarity could not command a majority in Parliament. An overwhelming desire for change and disgust with the previous system allowed the formation of a government centered around plans for radical economic reform under the leadership of Minister of Finance Leszek Balcerowicz. The Balcerowicz team faced enormous and, many observers thought, insurmountable economic problems. Despite a decade of reform programs in the wake of the first Solidarity revolution of 1980, the well-known deep structural problems of the Soviet-style economy remained.

Decades of central allocation of labor, capital and other scarce resources had led to an economy overly dominated by industry, especially heavy industry, at the expense of services. Table 1.1 shows labor shares for Poland and some comparable countries in

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⁶I will not review in detail the economic history of Poland in the 1980s or before. There is of course a wide literature on the Polish economy in the 1980s and the post-Communist economic events. See for example Schaffer 1992a for a historical background and developments of the 1980s, Lipton and Sachs (1990) for further discussion of the state of the economy in 1989, and Kornai (1991) for Eastern Europe in general.
<table>
<thead>
<tr>
<th></th>
<th>Poland</th>
<th>Greece</th>
<th>Portugal</th>
<th>Spain</th>
<th>Costa Rica</th>
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<tr>
<td>Agriculture</td>
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<td>27.0</td>
<td>22.2</td>
<td>16.1</td>
<td>28.1</td>
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<td>21.6</td>
<td>26.0</td>
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<td>Construction</td>
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<td>8.6</td>
<td>7.6</td>
<td>5.9</td>
</tr>
<tr>
<td>Services</td>
<td>34.5</td>
<td>44.9</td>
<td>43.2</td>
<td>52.1</td>
<td>47.2</td>
</tr>
<tr>
<td>of which:</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Transport and</td>
<td>7.5</td>
<td>6.8</td>
<td>4.1</td>
<td>5.8</td>
<td>4.2</td>
</tr>
<tr>
<td>communications</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trade</td>
<td>8.9</td>
<td>16.5</td>
<td>14.0</td>
<td>19.0</td>
<td>15.7</td>
</tr>
<tr>
<td>Finance</td>
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<td>4.1</td>
<td>3.1</td>
<td>2.5</td>
<td>3.0</td>
</tr>
<tr>
<td>Other services</td>
<td>15.4</td>
<td>17.7</td>
<td>22.2</td>
<td>22.6</td>
<td>23.5</td>
</tr>
<tr>
<td>GDP per capita</td>
<td>1,719</td>
<td>5,244</td>
<td>4,017</td>
<td>8,668</td>
<td>1,638</td>
</tr>
</tbody>
</table>

*Source: Economist (1990), 196-197*

1987. The industrial structure was determined by bureaucratic imperatives, not final demands mediated by markets. Monopoly was thought to be widespread, as administrative officials had acted according to the principle that the most efficient structure, from the point of view of economies of scale and ease of administrative

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<sup>7</sup>See Winiecki (1988) and Kornai (1991) for the nature and sources of distortion in Soviet-type economies.
control, was one where each good had only one producer.⁸

The private sector was relatively small (perhaps a third of total employment at the end of 1989, of which 23% was in small-scale agriculture). Long-standing restrictions on private economic activity in services had been liberalized only gradually in the 1980s, and the sector was chronically starved for resources. Price controls prevented adequate growth, administrative allocations of resources in shortage were targeted to industry rather than services and the tiny private service sector found itself unable to compete for scarce commodities and credits with the established state sector. Often, the private sector developed as an artificial appendage of the socialized sector, particularly as a way of avoiding controls that applied to state firms. (Rostowski, 1989, provides a discussion of the private sector in Poland in the 1980s.) The result was a service sector whose weight in employment and GDP was considerably smaller than that of other developing countries and the poorer countries of Western Europe. As seen in Table 1.1, Poland’s service sector was considerably smaller than in the three low-income countries of the European Community (Greece, Portugal and Spain), as well as in Costa Rica, which is the country ranked just below Poland in the World Bank’s 1988 per capita income rankings.⁹ Long queues and poor customer service in pre-reform Poland resulted not only form non-market-clearing prices for consumer goods, but also from the insufficient number of workers in the distribution network.

The important agricultural sector, while private was in trouble. The communist regime had systematically supported the sector with large subsidies. Tiny, highly inefficient private farms were kept alive by producer and consumer subsidies that amounted to around 4.9% of GDP in 1989.

The economy was almost entirely insulated from foreign markets. Foreign trade was largely conducted through monopolistic state trading organizations, and the enterprises and the domestic economy generally insulated from world prices through a

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⁸In fact, the monopoly problem was much less severe than commonly believed, for a number of reasons. First, many of the goods produced monopolistically would not even be produced at all in a comparable country in Western Europe. Many of the monopolies, then, relied on closed borders for their existence. Lists of “monopolistic” enterprises therefore often include those such as bicycle manufacturers, whose domestic monopoly is not a cause for particular concern. Second, while only a small number of firms may have had their main activity designated as the production of a given good, the situation of pervasive shortage meant that in practice firms were enormously vertically and horizontally integrated. As a hypothetical example, a tractor factory would produce some of its own tools, as well as household radiators to use in building apartments for its workers. Thus official statistics indicating that there was only one radiator producer would ignore the production of the tractor factory. A different but related point is that an examination of government lists of purported monopolistic enterprises indicates that while they may be monopolistic in one or two goods, most of their production is in other areas. Thus when Western management consultants conduct industry studies in Poland, they seem to find more often than not that there are actually too many producers, rather than too few, in comparison with what a market economy can support and with comparable Western countries. (See McDonald and Sachs (1992) for a discussion of the structure and operation of Polish firms. I thank Tadeusz Boczek for useful information on some of these points.)

⁹A comparison with countries lacking an important tourist sector yields similar results. For example, the share of services in GDP for Poland for 1988 was 34%, compared to 48% for Brazil and Turkey, according to Polish and World Bank data respectively.
complex system of product-specific taxes and subsidies. About one fifth of foreign trade took place with other socialist economies under the rubric of the CMEA. As described in chapter 3, trade volumes and prices were negotiated between ministries and state trading organizations.

Most of the economic institutions were profoundly dysfunctional. The state-enterprises which dominated the economy were the product of their environment. Pure central planning had ceased to function since the 1950s (if it ever did), but even in 1989 Polish enterprises operated in an environment of pervasive shortage. Prices of inputs such as labor and capital and of most final and intermediate goods were set by the state at below-equilibrium prices.¹⁰ Bureaucratic control over the allocation of foreign exchange, capital, raw materials, and some outputs remained. Enterprises were subject to a 'soft budget constraint', in that ubiquitous enterprise-specific taxes and subsidies eliminated any close relation between enterprise performance and after-tax profits (see Schaffer (1990)). The result was an economy in which resources were allocated according to the outcome of bargaining between various administrative agents. The enormous allocative inefficiency and sheer waste generated by this system has been well described elsewhere.

The state enterprises were nominally self-financing and autonomous, with control in the hands of a worker-elected "workers' council", as a result of changes in the Law on State Enterprises enacted in 1981. In practice, however, the government and the party retained control of the economy through the ability to control scarce inputs, prices, and so on. The management of state enterprises and even cooperatives was still appointed by the Party in practice.¹¹

The financial system failed to play any role in allocating scarce capital towards productive uses. Rather, it remained largely a state-owned system for passively allocating state credits at negative real interest rates. There was no experience or capacity in the evaluation of prospective borrowers on economic grounds.

When the Solidarity government took power in September of 1989 it thus faced an enormous economic challenge. The gradual institutional reforms of the 1980s had failed to change the system. Moreover, the rising pressures on the Communist government had culminated in a situation of profound macroeconomic imbalance. Wage negotiations became the primary battle-ground between Solidarity and the last Communist governments. Partial liberalization, wage indexation and increasing worker power within the enterprises as the Party lost control led to large wage increases in the state enterprises and public sector, growing budget subsidies and sharply higher budget deficits. The real wage in June 1989 was 42.2% above the level two years before.¹² The budget deficit in 1989 was around 7.3% of GDP according to IMF estimates, and probably topped 10% in the summer before being reined in by the new Solidarity-led government fall. As of

¹⁰ Many prices were under less strict control, but generally speaking increases had to be linked to increasing costs.

¹¹ See Dabrowski et. al (1991), Kawalec (1992), Kornai (1992), McDonald and Sacha (1992), Schaffer (1992), and Winiecki (1991) for good descriptions of state enterprise characteristics in pre and post-Solidarity Poland.

¹² This is the "statistical real wage", calculated simply as the nominal wage deflated by the official-price CPI. See chapter 2 for a discussion of the inadequacy of this real-wage concept in a reforming Soviet-style economy.
the first half of 1989, open inflation was running at around 8% per month. It accelerated markedly in the second half of the year, averaging 28% per month, following the widening of the budget deficit at mid-year, the initiation of formal wage indexation, and a partial liberalization of food prices in August with a large compensatory wage increase. (See Table 1.3 following page 1.3 for basic macroeconomic statistics from the last quarter of 1989 through 1991).

The expansion of aggregate demand and the continuation most administrative price controls led to an intensification of (non-food) shortages in 1989, on the eve of the 'big-bang'. While there are no systematic measures of shortages and queues in the goods market, the widening of the gap between the black market exchange rate and the official exchange rate in 1989 is consistent with the view that monetary imbalances - already bad in 1988 - worsened considerably the following year, as shown in Table 1.2.

<table>
<thead>
<tr>
<th>Date</th>
<th>Real effective rate&lt;sup&gt;a,b&lt;/sup&gt;</th>
<th>Nominal rate (zloty/$)&lt;sup&gt;a&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Official</td>
<td>Parallel</td>
</tr>
<tr>
<td>88M6</td>
<td>70</td>
<td>252</td>
</tr>
<tr>
<td>88M12</td>
<td>69</td>
<td>465</td>
</tr>
<tr>
<td>89M6</td>
<td>67</td>
<td>362</td>
</tr>
<tr>
<td>89M9</td>
<td>52</td>
<td>371</td>
</tr>
<tr>
<td>89M12</td>
<td>99</td>
<td>142</td>
</tr>
<tr>
<td>90M1</td>
<td>105</td>
<td>103</td>
</tr>
<tr>
<td>90M3</td>
<td>81</td>
<td>82</td>
</tr>
<tr>
<td>90M6</td>
<td>77</td>
<td>78</td>
</tr>
<tr>
<td>90M12</td>
<td>67</td>
<td>68</td>
</tr>
<tr>
<td>91M6</td>
<td>51</td>
<td>51</td>
</tr>
</tbody>
</table>

Sources: Official and parallel market exchange rate GUS monthly statistical bulletin, various issues. Trade shares and foreign price data from the IMF.

Notes: <sup>a</sup> A decline in the index signifies a real appreciation. <sup>b</sup> The real effective exchange rate is calculated as \( \Sigma_{i} \frac{E_{i}P_{i}^{*}}{P_{i}} \), where \( s_{i} \) is the share of country \( i \)'s trade (exports plus imports) in Poland's total trade. Percentage shares are as follows: Austria, 7.5; Canada, 0.9; Denmark, 4.0; France, 8.6; Germany, 37.7; Japan, 3.5; Netherlands, 6.0; Norway, 1.8; Spain, 1.8; Sweden, 6.1; and Switzerland, 3.6.

The "monetary overhang" described in the model of section 2 should thus not be thought of literally as relating only to the stock of money. A monetary overhang exists when nominal aggregate demand exceeds nominal aggregate supply at the administratively controlled price level. This excess demand can result from an excessive stock of money, but it can result from overly expansionary "flow" conditions as well. In the case of
Poland, the "flow" factors (a large budget deficit in 1989, low real interest rates, and a sharp rise in real wages during 1987-89) were probably more important than the money stock. There is an obvious, yet sometimes neglected implication. In Poland, unlike in the framework described above, macroeconomic equilibrium could not be restored simply by devaluing the exchange rate and raising prices. The large budget deficit meant that there was a risk of an ongoing high inflation that had to be addressed through a sharp cutback in the budget deficit. For this reason, macroeconomic stabilization required not only a sharp devaluation of the currency and a one-time jump in the price level, but also sharp cuts in budget subsidies and a reversal of the real wage increases of the previous two years. It also meant that Poland had to pursue very restrictive monetary policies after the "big bang" to stop the momentum of earlier high inflation, and to prevent the one-time jump in prices from feeding through into higher nominal wages and continued high inflation.

4. The big bang

As the Balcerowicz team assumed power, the economy entered hyperinflation. The new government undertook some further partial liberalizing measures in the last half of 1989, and attempted with little success to undertake some structural reforms, such as demonopolization, prior to the implementation of the full program of liberalization and stabilization at the start of 1990. The macroeconomic part of the reform package, designed during the last quarter of 1989 and implemented on January 11990, had four main components:

- Fiscal consolidation. The budget was to move from a deficit of about 3% of GDP in the last quarter of 1989 (down from 7% of GDP in the third quarter) to rough balance in 1990, mainly through a decrease in subsidies.
- Control of inflation through the control of growth of domestic credit. This was to be achieved through high refinance rates for banks, 36% at a monthly rate for the month of January.
- A tight incomes policy aimed at limiting wage growth. A firm-specific wage-bill norm was established and only partially indexed to inflation, with heavy penalties for payments of wages in excess of the norm. No such restrictions were put on prices, allowing firms to make the required adjustments in relative prices.
- Convertibility of the zloty. In the absence of large international reserves, and without much knowledge as to how the shift to convertibility and changes in relative prices would shift exports and imports, the exchange rate was set and pegged low. At the initial exchange rate, the average Polish wage in industry was 40 cents an hour. Tariff rates were decreased to an average of 10% and made more uniform. And the pervasive quantitative restrictions and licensing requirements on trade were largely eliminated.

The main element of reform on the microeconomic side was price liberalization. Food prices had been freed in August 1989. The proportion of controlled prices was further decreased from 50% to 10%. Most remaining regulated prices, especially energy prices were sharply increased, although not to world levels and with further increases planned for later. The legal status of state firms remained unchanged, but with the government signalling a clear change in the rules governing relations between these firms and the state. Firms could no longer expect ad hoc transfers from the budget to make up for losses, through firm-specific tax reliefs, for example, as had been the case in the
previous regime. Attempts had been made to tighten these policies during 1989, but January 1990 was a clear break from the past. Bankruptcy rules for state enterprises were clarified and strengthened and firms widely feared that laws on the books for many years would now be enforced. The assets serving as the base for the "dividend tax" levied by the government on firms were revalued for inflation, and failure to pay the tax was made a trigger for starting bankruptcy proceedings. Definition and implementation of the more complex and politically delicate structural reforms, such as privatization, had to be left to later.

5. Results

(1) 1990.

The stabilization and liberalization programs succeeded in ending the chronic disequilibria in the economy. Shortages were ended; both exports and imports could grow as the result of the newly convertible currency; and the service sector could begin to expand at the expense of agriculture and manufacturing. Together with the virtually instantaneous elimination of rationing, the effects of the January program were a sharp increase in prices, the end of the hyperinflation, a sharp decrease in overall activity, and the beginning of a boom in services and the private sector. (Table 1.3 gives basic macroeconomic statistics from the last quarter of 1989 to the last quarter of 1991). The consumer price index rose by 80% in January.\(^{13}\) With nominal wages unchanged, measured real wages fell by 40%.\(^{14}\) Sales from industry were down by 20% in January.\(^{15}\) One surprise to many observers was a trade surplus, or at least a measured trade surplus, as some imports surely went unrecorded. Both exports and imports in convertible currency were up in the first quarter, and for the year as a whole the trade surplus was an impressive 4% of GDP, largely because of a boom in exports.

The reform had four major direct impacts on relative prices: a generalized end of price controls; a sharp cutback in subsidies; a rise of domestic energy prices; and the devaluation and making convertible of the currency. Table 1.4 illustrates the changes in relative prices in broad terms. First, the dramatic cutback of food price subsidies led to an increase in the real price of food for consumers and a sharp fall in the real producer price of foodstuffs received by farmers (relative to the overall CPI). Second, energy prices rose in real terms. Third, prices of the service sector rose more strongly than prices for non-food, non-energy commodities. Noteworthy but unsurprising in light of the model in section two is that convertibility has been sustained despite a real appreciation. On January 1, 1990 the government began with an "overshooting devaluation", in which the nominal exchange rate was devalued to a level above the prevailing parallel market exchange rate. At the outset, the real exchange rate therefore depreciated sharply. Over time, however, as domestic prices increased during 1990, the real exchange rate appreciated. By the end of 1990, the zloty was actually over appreciated in real terms than the average of 1988 (when the currency was inconvertible).

\(^{13}\)The CPI in Poland is here and usually measured as the change of the average price level from month to month. The PPI, in contrast, is measured as the change from the beginning to the end of the month.

\(^{14}\)Of course the elimination of shortages and the hyperinflation should inhibit attempts to draw implications about the standard of living or even real consumption from these changes in measured real wages. Below I discuss this critical point further.

\(^{15}\)Figure Figure 1.5 following page 30 shows the output decline from June 1989 to June 1990 by 1-digit industry.
<table>
<thead>
<tr>
<th>Table 1.3. Basic Macroeconomic statistics; 1990/1991.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td>Industrial Sales</td>
</tr>
<tr>
<td>89:4  90:1  90:2  90:3  90:4  91:1  91:2  91:3  91:4</td>
</tr>
<tr>
<td>1.00  0.77  0.72  0.74  0.75  0.65  0.57  0.57  0.57</td>
</tr>
<tr>
<td>Employment (State)</td>
</tr>
<tr>
<td>17.6  16.5  15.9</td>
</tr>
<tr>
<td>(Private)</td>
</tr>
<tr>
<td>11.7  10.0  8.8</td>
</tr>
<tr>
<td>Unemployment rate</td>
</tr>
<tr>
<td>0%  2%  3%  5%  6%  7.1%  8.4%  10.4%  11.4%</td>
</tr>
<tr>
<td>CPI inflation</td>
</tr>
<tr>
<td>31%  32%  5%  3%  5%  8%  3%  2%  3%</td>
</tr>
<tr>
<td>Exports</td>
</tr>
<tr>
<td>Dollar 2412  2182  2705  3133  4000  2751  3459  3196  4182</td>
</tr>
<tr>
<td>TR 3910  2688  3110  2305  3011  561  560  84  175</td>
</tr>
<tr>
<td>Imports</td>
</tr>
<tr>
<td>Dollar 2182  1573  1465  1825  3391  3050  3457  3047  4692</td>
</tr>
<tr>
<td>TR 2725  1706  1505  1443  1985  558  163  68  47</td>
</tr>
<tr>
<td>Markups</td>
</tr>
<tr>
<td>40%  31%  29%  28%  24%  16%  14%  19%  13%</td>
</tr>
<tr>
<td>Govt surplus (% of GDP)</td>
</tr>
<tr>
<td>-3.6  1.6  3.4  1.7  -3.9  -2.4  -3.6  -3.8  -3.1</td>
</tr>
<tr>
<td>Refinance rate</td>
</tr>
<tr>
<td>12%  22%  5.8%  2.8%  4.3%  5.5%  5.3%  3.8%  3.3%</td>
</tr>
</tbody>
</table>

Notes: The index of real sales is measured in the last month of each quarter. Employment is measured in thousands at the end of the year. Private employment does not include agriculture. Unemployment is in the last month of each quarter, expressed as the share of the labor force. CPI inflation is the average monthly inflation for the quarter. Exports and imports are for the quarter, in millions of transferable rubles (TR) and dollars. The markup is defined as (Sales - Costs)/Costs for the quarter, for the socialized sector. Government surplus is for the quarter, as a percent of GDP. It is computed as the surplus as a share of expenditures, multiplied by the ratio of expenditures to GDP for the year. The refinance rate of the NBP is the average for the quarter in monthly rates. Some data is not (yet) available on a comparable basis for 1992. Real sales in industry are seasonally adjusted in 1992.
The real exchange rate, calculated using the parallel market exchange rate, appreciated quite significantly after a series of policies. The high level of price inflation of early 1989 of the two main parallel markets in 1988 and 1989 reflected the excess aggregate demand at the time, rather than the long-term disequilibrium of purchasing parity of the currency.  

Overall, relative prices seem to have approached much more closely those of Western countries since liberalization. Using data from 30 consumer goods, the simple correlation between the Polish relative prices and the West German relative prices was 0.28 in 1985, 0.29 in 1987, 0.79 in November of 1989 and 0.81 in January 1990. Using a different set of 103 consumer goods and services, the Poland-West German correlation was 0.89 in July 1989 and 0.93 in April of 1990.

To get a better idea of the price dynamics the dynamics of price adjustment, we can

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16The fact that convertibility has been maintained despite a real appreciation is, of course, consistent with the above framework. It stresses that convertibility is achieved not mainly through a real depreciation, but through a nominal depreciation which helps to bring the overall price level back into line with nominal aggregate demand (and particularly, with the money supply). Inconvertibility signals an overall price level and an official exchange rate that are too low compared with aggregate nominal demand. Either nominal aggregate demand must be cut (most drastically, through a monetary reform), or nominal prices must be allowed to rise (through a devaluation and end of price controls), as in fact occurred in Poland.

17That is, 0.28 is the simple correlation between the price vectors for the two different periods, where the components of the vectors are the prices for the various goods in the basket.

18See FTRI (1990) and Jasinski (1990).
Table 1.4. Relative Prices, 1989-91, various indicators
(all prices relative to consumer price index)

A. Real food prices, consumer and producer*  

<table>
<thead>
<tr>
<th>Year</th>
<th>Cereals</th>
<th></th>
<th>Meat</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Consumer</td>
<td>Producer</td>
<td>Consumer</td>
<td>Producer</td>
</tr>
<tr>
<td>1989M1-7</td>
<td>100</td>
<td>100*</td>
<td>100</td>
<td>100b</td>
</tr>
<tr>
<td>1990M1-7</td>
<td>408.7</td>
<td>67.9</td>
<td>159.1</td>
<td>74.9</td>
</tr>
<tr>
<td>1991M1-7</td>
<td>289.6</td>
<td>37.5</td>
<td>135.7</td>
<td>55.1</td>
</tr>
</tbody>
</table>

B. Consumer prices, main categories  

<table>
<thead>
<tr>
<th>Year</th>
<th>Foodstuffs</th>
<th>Non-foodstuffs</th>
<th>Services</th>
</tr>
</thead>
<tbody>
<tr>
<td>1989M1-7</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>1990M1-7</td>
<td>125.0</td>
<td>86.9</td>
<td>97.9</td>
</tr>
<tr>
<td>1991M1-7</td>
<td>110.5</td>
<td>89.5</td>
<td>132.3</td>
</tr>
</tbody>
</table>

C. Consumer prices, selected services  

<table>
<thead>
<tr>
<th>Year</th>
<th>Residential rent</th>
<th>Personal care</th>
<th>Culture and arts</th>
</tr>
</thead>
<tbody>
<tr>
<td>1989M1-7</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>1990M1-7</td>
<td>125.0</td>
<td>86.9</td>
<td>97.9</td>
</tr>
<tr>
<td>1991M1-7</td>
<td>110.5</td>
<td>89.5</td>
<td>132.3</td>
</tr>
</tbody>
</table>

Source: Biuletyn Statystyczny, various issues  
Notes: * Producer grain price is thousand złoty per dt of wheat; producer meat price is złoty per kilogram of cattle for slaughter; consumer price of cereal is the index of bread prices. b First half of 1989.
examine the correlation between 3-digit producer price vectors in Poland at different points in time. Figure 1.3 shows this correlation between consecutive months and between each month and June 1991, for producer price indices for 85 branches of industry. The lesson is that the biggest movement in relative prices took place in August of 1989, when food prices were liberalized, and in January of 1990, when prices and trade were liberalized. If we assume that the later price vectors better reflected international prices, as the above correlations suggest, then most of the convergence towards international prices took place in August of 1989 and the first quarter of 1990, though it should be noted that the change in relative prices in November of 1989 also was in the direction of world prices, probably because of adjustments in energy prices. Figure 1.4 clarifies the pattern by excluding food processing industries from the price vector. Three points emerge: (1) leading up to and during the hyperinflation, relative non-food prices actually diverged from world prices, except for November of 1989; (2) the largest relative price movements were in January of 1990; (3) after liberalization in January of 1990 price movements were small and in the direction of world prices.

With the jump in the price level, real zloty money balances fell by 33% in January, though they recovered to 96% of the December level by March. And the budget surplus was much larger than anticipated, some 2% of GDP in the first quarter. The source of the windfall was large reported profits by state firms and thus large revenues from the profit tax; these profits were however in part paper profits coming from high inflation and the use of historical costs for inputs of firms.

Political pressures from the recession, the large decrease in measured real wages and the initial budget surplus combined to encourage a less restrictive macroeconomic policy during the second half of 1990 (see for example Dabrowski(1991)). Nominal interest rates were lowered, leading to negative ex-ante real rates. The initial parity of the zloty proved however easy to defend, and the nominal exchange rate was maintained throughout the year.

Progress on microeconomic reform was slower. Privatization in particular, advanced unevenly, both in 1990 and 1991. Once new local governments were in place in the spring of 1990, privatization of retail shops proceeded steadily, mostly through leasing. Two years later, it is largely achieved. A comprehensive privatization law was passed in July 1990, after intense political debate. As a result 416 small and medium-sized firms employing a total of about 150,000 workers had been privatized largely through lease-to-buy arrangements negotiated by current workers and managers by the end of 1991. But, in sharp contrast, there has been in effect no progress in the privatization of large firms. The law envisaged privatization of these large firms mainly through case-by-case sales and led to sales of a grand total of 26 firms by the end of 1991. As a result, the treasury has remained the de jure owner of state firms; but it has been an absentee owner.

Despite the loosening of macroeconomic policy in the second half of the year, overall economic activity remained relatively flat. But this aggregate result masks an important transformation. There has been a decline in industrial production and an increase in services, mainly via private sector growth.

Thus, by the end of the year, employment in the state sector stood at 10 million, down by 1.7 million workers; employment in state firms in industry was 3.6 million, down by about 0.9 million. The proportional decrease was however less than the decrease in output, so that, at the end of the year, labor productivity in industry was still
only equal to 90% of its pre-stabilization value. Profit rates were also steadily lower throughout the year. Markups, defined as profits over accounting costs, were down from 40% in the last quarter of 1989 to 24% in the last quarter of 1990. This had direct fiscal implications through the fall in profit taxes. By the last quarter, the budget surplus had turned into deficit.¹⁹

Employment decline in the state sector was partly offset by the growth of private employment. Measured private non-agricultural employment, grew by 31% to 2.3

¹⁹This deficit was in part due to a decision by the government to increase expenditures in the second half of the year in an attempt to achieve the “target” of yearly budget balance despite the initial surplus.
<table>
<thead>
<tr>
<th>Table 1.5. Employment by ownership type</th>
<th>1989</th>
<th>1990</th>
<th>1991</th>
<th>June 1992*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thousands of workers</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>17558</td>
<td>16477</td>
<td>15861</td>
<td>15900</td>
</tr>
<tr>
<td>Non-agriculture</td>
<td>13148</td>
<td>12140</td>
<td>11556</td>
<td>11600</td>
</tr>
<tr>
<td>Public</td>
<td>9278</td>
<td>8244</td>
<td>7046</td>
<td>6821</td>
</tr>
<tr>
<td>private</td>
<td>8280</td>
<td>8233</td>
<td>8815</td>
<td>9079</td>
</tr>
<tr>
<td>Agriculture</td>
<td>4410</td>
<td>4336</td>
<td>4306</td>
<td>4300</td>
</tr>
<tr>
<td>Cooperatives</td>
<td>328</td>
<td>261</td>
<td>231</td>
<td>225</td>
</tr>
<tr>
<td>Other</td>
<td>4083</td>
<td>4075</td>
<td>4075</td>
<td>4075</td>
</tr>
<tr>
<td>Non-agriculture</td>
<td>3870</td>
<td>3897</td>
<td>4510</td>
<td>4779</td>
</tr>
<tr>
<td>Cooperatives</td>
<td>2104</td>
<td>1568</td>
<td>1468</td>
<td>1276</td>
</tr>
<tr>
<td>Other</td>
<td>1766</td>
<td>2329</td>
<td>3041</td>
<td>3503</td>
</tr>
<tr>
<td>Shares in total employment</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Public</td>
<td>52.8%</td>
<td>50.0%</td>
<td>44.4%</td>
<td>42.9%</td>
</tr>
<tr>
<td>Private</td>
<td>47.2%</td>
<td>50.0%</td>
<td>55.6%</td>
<td>57.1%</td>
</tr>
<tr>
<td>Agriculture</td>
<td>25.1%</td>
<td>26.3%</td>
<td>27.1%</td>
<td>27.0%</td>
</tr>
<tr>
<td>Non-agriculture</td>
<td>22.0%</td>
<td>23.7%</td>
<td>28.4%</td>
<td>30.1%</td>
</tr>
<tr>
<td>Private nonagricultural</td>
<td>33.3%</td>
<td>38.9%</td>
<td>44.9%</td>
<td>47.7%</td>
</tr>
<tr>
<td>Agriculture</td>
<td>23.3%</td>
<td>24.7%</td>
<td>25.7%</td>
<td>25.6%</td>
</tr>
<tr>
<td>Non-agriculture</td>
<td>10.1%</td>
<td>14.1%</td>
<td>19.2%</td>
<td>22.0%</td>
</tr>
<tr>
<td>Shares in the non-agricultural economy</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Public</td>
<td>70.6%</td>
<td>67.9%</td>
<td>61.0%</td>
<td>58.8%</td>
</tr>
<tr>
<td>Private</td>
<td>29.4%</td>
<td>32.1%</td>
<td>39.0%</td>
<td>41.2%</td>
</tr>
<tr>
<td>Cooperatives</td>
<td>6.0%</td>
<td>12.9%</td>
<td>12.7%</td>
<td>11.0%</td>
</tr>
<tr>
<td>Other</td>
<td>13.4%</td>
<td>19.2%</td>
<td>26.3%</td>
<td>30.2%</td>
</tr>
</tbody>
</table>

Notes: The definition of the private sector was changed during 1991. Here the private sector is divided into "cooperatives", which were formerly considered socialized but now are grouped by GUS into the private sector, and "Other", which is the pre-1991 definition of the private sector.
* Preliminary.
million at the end of 1990.²⁰ This was, however, insufficient to prevent a steady rise in unemployment, and the unemployment rate at the end of the year stood at 1.1 million, or about 6.5% of the labor force. Finally, as is often the case in stabilization episodes, inflation was down but not out. Excluding the January price adjustment, inflation remained at a relatively high average rate of about 5% for the rest of the year.

Thus, the first year of reform was characterized by a sharp contraction at the beginning, and divergent evolutions of the state and private sectors thereafter. Because of the many statistical and conceptual problems involved, the magnitude of the fall in GDP is controversial. Official numbers put the decline at 12%.

(2) 1991.

At the beginning of 1991, the Polish economy was hit by a severe external shock, the collapse of the CMEA trade regime. The first year of the stabilization program, 1990, was a transitional year for the CMEA. The scope of the trade protocols was reduced, and Poland set an appreciated exchange rate between the zloty and transferable rouble to try to cut back the exports to the Soviet Union. Starting in 1991, however, there was a watershed. The CMEA countries disbanded the barter arrangements with the intention to move to "dollar-based trade at world prices." In the event, the Soviet Union fell into a debt crisis, and also failed to establish a market mechanism for allocating foreign exchange to enterprises. Also, the monetary overhang in the Soviet Union worsened considerably, thereby exacerbating the anti-export bias of the Soviet economy.

The end of the CMEA was associated with both a large terms of trade shock and, more importantly, a large decrease in the volume of trade. The increase in import prices from former CMEA countries for the first two quarters of 1991 over the first two quarters of 1990 was 161%, the increase in export prices only 23%. Decreases in import and export volumes with former CMEA countries over the same periods were 39% and 40% respectively.²¹

The collapse of trade coincided with a tightening of macro policy, in response to what was perceived as too lax a stance during the second part of 1990. Refinance rates were increased to 6% monthly from February on. The results of the CMEA shock and tighter policy were a further sharp drop in output, and another sharp increase in prices. Sales from industry were down another 20% over the first quarter, inflation equal to 12% in January. In May 1991, in order to slow down the real appreciation of the zloty, the

²⁰ Here we exclude cooperatives from the private sector. The private sector here includes so-called "cooperatives", which accounted for some 29% of total employment at the end of 1989, mostly in trade and other services. Their legal autonomy was then a fiction; in fact they were arms of the state and the Party, which controlled their prices and activities and appointed the management. Just as liberalization allowed the legal autonomy of the state enterprises to become a reality, the cooperatives lost their extra-legal connection with the state during 1990 and 1991. Partly in recognition of this, the statistical authorities reclassified cooperatives as "private". The data in the text and Table 1.5 consistently follow the new definitions.

Cooperative labor flowed rapidly to new private enterprises in 1990 (cooperative employment fell by about 25% in 1990), but this flow is not captured in the data presented above. Thus the data significantly underestimate the growth of the private sector to the extent that the cooperative sector was effectively state-controlled in 1989 but not in 1991. The share of the non-agricultural private sector in total employment went from 8% to 25% between the end of 1989 and the end of 1991 if the change in the status of cooperatives is considered "privatization".

²¹ Figure 1.5 following page 30 shows the decline in industrial production by 1-digit industry between June of 1990 and June of 1991.
exchange rate was moved to a slow crawling peg, implying a depreciation vis a vis the dollar of about 1.8% a month, smaller than inflation.

The rest of the year was broadly a replay of 1990, with a decline in the socialized sector, especially in industry, and rapid expansion in the private sector, especially in services. Employment in state firms declined by another 1.2 million, to 8.8 million. Again, the decline in employment was not enough to reestablish labor productivity, which at the end of 1991, stood at only 78% of its pre-stabilization level. In contrast, non-agricultural private employment was up another 31%, to about 3 million workers. Overall, then, between the end of 1989 and the end of 1991 the private share of in total employment went from 47% to 56%. The share of the private non-agricultural sector in total employment went from 22 to 25%. Services went from 11% to 14% of total employment.

There was limited action on microeconomic policy reforms. In particular, large state enterprises remained in limbo as almost none were privatized and the state did not exert ownership rights. By the end of the year, the unemployment rate was equal to 11.4%.

Profit rates declined further throughout the year in the socialized sector, to the point where in the fourth quarter aggregate net profits were -6.5% of sales for the economy as a whole. The direct implication was a growing fiscal deficit, both because of lower accrued taxes and because of arrears. The budget deficit for the year was running at 4.5% of GDP, and arrears equalled 85% of the deficit.

Official estimates are that the decrease in GDP for 1991 was roughly 7%. According to official data, real consumption appears to have grown by some 6%, while fixed investment fell about 10%. And the trade position, which had shows a surplus of 4% of GDP in 1990, was roughly in balance in 1991. Total real imports (including trade with former CMEA countries) were up 39%, and total real exports were constant. Inflation for the year was still a high 60%.

The national elections in November 1991 lead to a fractured Parliament, with 29 parties represented. Leszek Balcerowicz, who had been the architect of the economic reform under both the Mazowiecki and the Bielecki governments, was replaced as minister of finance. The post-election Olszewski government failed to find the strength to carry out coherent economic policy and especially to control the fiscal crisis triggered by the near disappearance of profits in state firms. Indeed, after the first two finance ministers resigned, the post remained vacant until a new government, headed by Hanna Suchacka, took control in July of 1992.

The Suchacka government is still faced with a fiscal crisis, as the budget deficit appears to amount to some 8% of GDP, much of the state industrial sector is technically bankrupt, and institutional reforms in the financial system and privatization of large enterprises await execution. On the other hand, the overall economy appears to be turning around, and the years since January of 1990 appear to have been ones of far-reaching adjustment.

As of the middle of 1992, signs of structural adjustment and recovery in the real economy are accumulating. The private sector has continued its phenomenal growth of some 35% per year; more than half of total employment is now private. The reorientation of trade towards the West has been completed; the trade balance is positive and both exports and imports remain strong. While employment in industry continues
to fall, sold output has begun recovering from the CMEA shock. Figure 1.5 presents changes in real sales in industry over the previous year for June of 1990, 1991 and 1992. The twin shocks of 1990 and 1991 and, strikingly, the recovery of 1991/1992 are evident. On the other hand, the macroeconomic situation is perilous. Predominantly, this is a fiscal problem, as the 1991 deficit of 5% of GDP is an overly optimistic goal for 1992. This is largely the result of a collapse in the financial situation of state enterprises, leading to sharp declines in accrued taxes and increases in tax arrears, which by the end of 1991 amounted to 84% of the annual budget deficit.

6. Unanswered questions.

Many of the broad features of the outcome in 1990 and 1991 are easily explicable in the context of the simple framework in section 2. The contraction in nominal aggregate (flow and stock) aggregate demand halted the hyperinflation. Service prices increased and the newly convertible exchange rate appreciated, with an increase in both imports and exports. The private sector and services expanded rapidly while manufacturing declined. Several puzzles remain, however. The changes, both in policy and especially in outcomes, have been radical and indeed higher than many initially expected. Most obviously, the output decline, on the order of 45% of industrial production, of which some 30% took place in January and February of 1990 and most
of the rest in January of 1991, raises serious questions, both normative and positive.\footnote{Output loss in the (state) industrial sector seems to be among the most serious obstacle to reform in Russia.}

Most work to date has focussed on policy questions: should a certain policy be (have been) adopted? The time has come, however, to develop the understanding that is required before such questions can be answered satisfactorily. This thesis represents an attempt to begin developing that understanding.

The most important analytic questions revolve around the relation between economic outcomes and the particular initial conditions faced in Poland. Why did the policy measures taken lead to the dramatic results we have seen, and in particular what difference did the peculiar institutional structure make? This matters for the design of economic policy, both in Poland, other former Soviet-style economies such as Russia, and even other developing countries with some similar characteristics. The question also reflects an approach to macroeconomics which emphasizes the need for micro foundations to macroeconomic propositions. If micro foundations matter, then a close look at the Polish case, in which both the micro structure and the "experiment" performed on that structure are extreme, is worthwhile.

The question as discussed in policy debate in Poland, and to a lesser extent in the economic literature, revolves around whether fairly standard prescriptions of macroeconomic policy, such as the usual IMF recipe for controlling inflation, are appropriate in the peculiar context of the reforming Soviet-style economy, as described above. As has been well documented\footnote{See Dornbusch and Edwards (1991) and Sachs (1989).}, economists in many countries tend to believe that their economy is different and that therefore IMF-style recommendations do not apply. The fact that they are generally wrong, however, does not mean that this might be at least partly the case, at least in economies so unusual as those of Eastern Europe. A related question, also discussed in the following chapters, revolves around the special policies actually adopted to reflect the distinctive nature of the system, such as incomes policies for state sector workers.\footnote{For policy-oriented discussions see Blanchard O. et. al. (1990), Calvo and Coricelli (1992), Dabrowski (1991), Frydman et. al. (1990), Gomulka (1992), Lipton and Sachs (1990), for example.}

A closely related analytic issue arising from the Polish experience is whether the desired structural change is taking place. Are appropriate changes in relative prices, privatization, and more generally the institutions of a market economy such as ownership structures and a proper financial system taking place? And does the application of market signals to post-Communist economic institutions results in the kind of structural change that is desired at an acceptable cost?

7. Summary of results.

This thesis does not answer all these questions; it does, however, attempt to focus on some of the most important. Chapters 2 and 3 discuss the nature and causes of the recession in Poland. Chapter 2 analyzes the data to understand better to what extent the output collapse is a function of measurement problems, especially an underestimate of the private sector and problems in the valuation of declines in production of low-quality goods that are peculiar to Soviet-style economies in transition. Chapter 3 takes the official data as given, and looks more closely at macroeconomic events. It focuses
primarily on what caused the output decline in 1990 and 1991. Chapter 4 turns to the question of pri'atization, outlining the constraints on the process, especially the initial distribution of ownership rights.

We know how poorly Soviet-style economies functioned. When they liberalize and decentralize, we observe a sharp decline in measured real consumption, socialized sector output, especially in industry, and overall GDP. The question addressed in chapter 2 is: How much of the measured output and standard-of-living decline should be attributed to measurement problems, such as a neglect of the private sector and the halt in the production of low-quality output?

The various sorts of data problems can be divided in two: direct mismeasurement, where activity is under- or not recorded, and valuation/index number problems. Indications that mismeasurement here can be important are available. The clearest evidence that these sorts of issues are of real significance is provided by comparing official data on "supply" and "consumption" from official statistics. For example, butter supply in 1990 is reported to have fallen by 16% from 1989, while consumption of butter reportedly increased by 4%. An estimation of changes in private consumption and GDP in a way which controls for some of these problems, described in chapter 2, implies that overall consumption fell by some 5%, when no adjustment is made for quality, variety, end of queuing, and so on. GDP fell by some 5% according to demand-side estimates and perhaps 9% from the supply side, not 12% as GUS has said. Most of the decline is in inventory decumulation.

A commonly expressed idea is that much of the output decline took place in "negative-value-added" industries, industries in which the output, valued at world prices, was worth less than the inputs at world prices. This can be reformulated as an index number problem. In general, there are two major difficulties with standard quantity indices to Poland from 1989 to 1990:

• The pre-reform prices were not market clearing, so that under certain conditions the increase in output of goods in previously short supply is undermeasured while declines in surplus goods are given too much weight.

• It is also the case, however, that post-liberalization prices are also not always the market-clearing prices that usual index number theory expects. In particular, the decline in production may derive in part from a halt in production of certain types of goods which benefitted from forced substitution in the pre-reform shortage regime. If the price used to value the output of these goods is the pre-reform price, or perhaps the cost of the unsold goods, the value of the decline in output will be exaggerated.

Even after accounting for measurement problems, it appears that there were indeed significant declines in aggregate output in 1990 and 1991, especially in the state industrial sector. Chapter 3 addresses the macroeconomics of these declines, and asks and answers five specific questions:

(1) What were the causes of the output decline of early 1990? Were they primarily due to the dislocations implied by the move to a market economy, or instead to a demand contraction?

This question has received a great deal of attention in the burgeoning literature on transition and in Poland itself. A wide variety of evidence is brought to bear to distinguish, where possible, among competing hypothesis, including survey evidence of enterprise managers, aggregate evidence on inventories, and industry-level data on real
sales and final goods inventories. For example, the industries which had the sharpest real
sales decline in the first quarter of 1990 had the largest accumulation of final goods
inventories. This is inconsistent with the Calvo and Coricelli (1992) hypothesis that a
policy-induced credit crunch in a highly segmented credit market caused firms to have
insufficient liquidity to finance production. Another conclusion is that the rapid trade
liberalization was not a cause of the initial output collapse.

(2) What were the causes of the other sharp decline in output at the beginning of
1991? What was the role of the CMEA collapse? Was the effect through dislocations
or through a fall in external demand? Industry-level data on real output and trade flows
suggests that a dependence on CMEA export markets, but not imports, was a strong
predictor of output decline in 1991.

(3) How should one think of the evolution of state firms over the last two years?
Have we seen the orderly decline and transformation of a sector which was too large in
the first place? Or have we seen an increasing paralysis of those firms, without much
restructuring? The evidence from a variety of sources suggests that in general these firms
are functioning poorly, as their control structures imply. While there has been some
recovery in real output since the CMEA shock, financial performance is poor, with dire
consequences for the budget. The budget constraint has gradually softened since the
initial big bang.

(4) What is the degree of structural adjustment? In particular, have the distortions
characteristic of the Soviet-style economy been reduced? How has the private sector
grown? Is it filling some holes and not others, is it replacing or complementing the state
sector? Many of the patterns of relative price and quantity adjustment are those that were
hoped for, particularly the phenomenal rise of the private sector, and the relative decline
in industry and growth in services and construction. Furthermore, the change in the size
distribution of firms is in the right direction. But only recently has there been any
indication of the expected move away from heavy and towards light industry. And the
economy is still dominated by dysfunctional large state industrial enterprises.

(5) Why did prices increase so much at the beginning, and why has inflation been
so persistent since? To what failures of policy, incomes, micro- or macroeconomic if
any can it be ascribed? The evidence suggests that the initial jump represented largely
a pass-through of costs, with little role for the exercise of monopoly power. Persistence
can be explained in an accounting sense by several factors, varying over time. The most
important, though, is the gradual increase in the real wage with partial pass-through into
prices and the increase in the cost of material inputs associated with the CMEA shock of

Chapter 3 concludes by emphasizing the danger of the current ownership status of
the state-owned enterprises and the problems that have resulted from their behavior.
Thus the importance of reforming ownership structures in state-owned industries should
be clear. Yet little privatization has taken place. The now voluminous debate in the
economic literature is misguided in its search for optimal privatization schemes in that
the question is evidently not how to create the best scheme but how to do anything
acceptable at all.

Chapter 4 examines privatization efforts to date in an effort to draw lessons for
future thinking about privatization. It explains some of the reasons for the difficulty with
privatization. The overthrow of the Communist regime, marketization of the economy,
and legal and political revolution have changed all the ‘rules-of-the-game’, and in this environment the complexity of the privatization task overwhelms administrative capacity. Most importantly, privatization requires a widespread rearranging of ambiguous property rights. It is not clear who owns the firm, who is responsible for liabilities, and in particular what power remains with the state. The result has been a confused political debate, a paralyzed bureaucracy, and enterprises whose workers and managers control the enterprise without any certain long-term stake in the firm.

The development of ownership rights during the 1980s is reviewed. While the state has largely given up control of the enterprises, it has not relinquished the legal right to dispose of the assets of the enterprise. As a result, the current control rights of workers and managers are unreliable. Any one of the stake-holders in the firm (the workers’ council, unions, management, the government, and even creditors such as the banks) can block change, while action requires consensus.

This peculiar ownership and control structure has unfortunate implications for privatization:

- the current situation is extremely dangerous and probably unstable;
- the withdrawal of the state has left current insiders with a powerful informational advantage over the government as well as a strong incentive to try to preserve their current rights during privatization;
- Insiders will resist disenfranchisement except where the firm is in financial distress.

The next section reviews privatization efforts to date. The lesson that emerges is that efforts to case-by-case traditional privatization methods have failed and that only methods which harness the energies of insiders have succeeded. The problems in implementation of mass privatization are explained in light of the constraints discussed in the earlier sections.

8. Policy conclusions

Now that we have reviewed some of the results of the following chapters, we can address some of the policy questions that have arisen in connection with the Polish experience. Many of the issues revolve around the question of whether a more gradual approach would have been more effective than the “big-bang” approach that was arguably followed. As Bruno (1992) points out, this question must be answered differently for different types of policies. There seems to be no case for more gradualism in the stabilization policy. Little in the Polish case suggests an amendment to the standard prescription that hyperinflations need to be ended quickly. In particular, there is no evidence that tight credit played a role other than that usually played in stabilizations, or that looser credit would have been effective in stopping the hyperinflation with less output impact. The incomes policy was flawed in its implementation and not particularly effective, but the special nature of Polish state enterprises only strengthens the case for this heterodox component of the standard package.

Much has been made of the size of the initial devaluation and whether it could not have been smaller. As is argued in chapter 2, there is little evidence that the devaluation was an important factor in the initial output decline, and while overall inflation might have been less with a smaller devaluation, guessing what would happen to aggregate demand, the trade balance and capital flows in January 1990 was at best a difficult exercise, and credibility required erring, if anything, on the side of excess.
More serious questions about timing of policy arise when the discussion turns to trade liberalization. Many have argued that trade liberalization should have proceeded more slowly, on the grounds that there are adjustment costs for economic agents and that adjustment will not be speedier with more quick policy change. To this is added the claim that the credibility of the reform might be enhanced by slower reform which generated less resistance and backsliding. Indeed, there has been a partial return of trade barriers after the initial liberalization. Finally, the costs of trade liberalization for output are argued to be high.

As is argued in chapter 3, there is little direct evidence that trade liberalization contributed much to the output decline either in the first quarter of 1990 or the first quarter of 1991, when most of the decline took place. Most importantly, imports from the West rose well after output fell in 1990, while the 1991 decline was not associated with a sharp increase in imports from the West but with the CMEA shock. Finally, the rapid liberalization fulfilled one of the goals of the policy: relative prices seem to have moved towards world prices. This is in contrast to a decade of partial and failed attempts to adjust relative prices throughout the 1980s.

One major policy question remains: was the cost of the reforms higher than it could have been because of incorrect sequencing of reforms? Specifically, should the big-bang have awaited successful structural reforms, such as privatization, demonopolization, reform of the banking system, and so on? Evidently the question here is not actually about the advisability of a "big-bang" as such in terms of structural reforms; despite avowed government intentions to proceed quickly, most structural reforms have taken place extremely slowly. Privatization of state enterprises has not been rapid. In retrospect, an imprudent reliance was placed on traditional privatization methods which have proven as slow in Poland as elsewhere, while excess caution has been exercised in choosing the best possible scheme of mass privatization. While the dangers of recentralization of control of state enterprises were and are real, the threat of financial collapse which now exists could possibly have been mitigated, and the recovery made stronger. A window of opportunity may have closed: the political honeymoon of the post-Communist era is over, and the financial predicament of the state sector and the budget continues to worsen.

Chapter 3 makes clear some of the difficulties involved in managing an economy dominated by state enterprises, especially in wage and most importantly fiscal policy. There is little evidence, however, that special characteristics of the financial system combined with excess credit tightness to cause the output decline, as has been alleged. Furthermore, the private sector seems to have access to credit. Finally, the private sector seems to be able to get assets from the state sector. It remains plausible that some of the output decline in the state sector could have been avoided, and a return to growth faster, if the financial system functioned efficiently to allocate credit and if state enterprises behaved more effectively.

But even if the budgetary pressure exerted by the state enterprises proves to lead to another high inflation period, the enormous progress to date suggests that the economy as a whole has responded strongly and positively to the new environment. The switch to services and private sector activity continues to be rapid. output in all the major

\[\text{\textsuperscript{2}}\text{See Bruno (1992) for a clear discussion.} \]
sectors of the economy now seem to be growing, even industry.

Within industry, the evidence is mixed. As reported in chapter 3 and further analyzed in Borensztein and Ostry (1992) and Borensztein et al. (1992) there is as yet little statistical evidence that the movements in industrial production between industries have been consistent with value-added calculations. Nonetheless, large structural changes have taken place. Monopoly has not proved to be a major factor. Trade with the West has expanded sharply and the entire CMEA apparatus has collapsed. In the recovery that began in the middle of 1991, there have been important movements between sectors, as Figure 1.5 above shows.

The narrowly economic cost of the transformation, especially in terms of consumption, does not seem to have been nearly as high as is sometimes argued, as chapter 2 explains. Personal consumption, for example, seems to have risen from 1989 to 1991. The source of the political weaknesses that have arisen since the Mazowiecki government, and the related lack of action on microeconomic reforms such as privatization and financial system reform, does not seem to have been directly related to a decline in the standard of living. More research is needed on the relationship between economic outcomes, voting behavior, and the political process in the context of radical reform.

There remain key gaps in our understanding of policy issues. The hypothesis that much of the output decline is a function of mismeasurement, either because assets are slipping surreptitiously into the private sector or because lost output was essentially worthless, deserves more detailed investigation at the enterprise level. The relationship between the financial system and the macroeconomic deserves more research. There have been few actual bankruptcies of large enterprises, yet many are in extremely poor financial situation. The budget deficit is clearly a partial response to this situation, as taxes are deferred. How the monetary transmission mechanisms operates in the peculiar credit markets of Poland is little understood. The most important question for the future is whether the private sector can continue to grow and whether the state sector can be privatized before the macroeconomy undergoes a financial collapse.

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20Borensztein et. al (1992) show that for Bulgaria, Czechoslovakia and Romania changes in real output in a given industry comove more with country-specific factors than with movements in the same industry in the other Eastern European countries, and present some similar evidence for Poland. This tends to suggest that there is no overall structural adaptation towards, for example, comparative advantage, which might be expected to be similar in the three countries.
Appendix. Some Theoretical Aspects of Stabilization and Liberalization

Consider an economy which produces just two kinds of outputs, industry and services, in the amounts $Q_i$ and $Q_s$ respectively. The economy consumes these two goods, and also a foreign-produced import, in the amounts $C_i$, $C_s$, and $C_f$ respectively. The domestic industrial good is also exported. The official exchange rate is $E$, in units of zloty per dollar.

The official prices for the three goods are $p_i$, $p_s$, and $p_f$. As described in the text, we shall assume that the market clearing prices are established in unofficial parallel (or black) markets, and designate the parallel-market prices as $P_i$, $P_s$, and $P_f$. Consider a very simple situation, in which nominal aggregate demand by households is given by $Y^d$, so that macroeconomic equilibrium requires:

$$Y^d = P_{Q_i} + P_{Q_s} + P_{Q_f}$$  \hspace{1cm} (A1.1)

In the simplest monetarist case, we can write:

$$Y^d = MV$$  \hspace{1cm} (A1.2)

where $M$ is the money stock, and velocity $V$ is a constant. More generally, of course, $V$ is not constant, and $Y^d$ is a function not only of $M$, but also of fiscal deficits, the real wage, and so on. Consumption is governed by a Cobb-Douglas relationship, in which:

$$P_i C_i = a Y^d = a MV$$
$$P_s C_s = b Y^d = b MV$$
$$P_f C_f = (1-a-b) Y^d = (1-a-b) MV$$  \hspace{1cm} (A1.3)

Output by enterprises is a function of relative prices, with:

$$Q_i = Q_i(p_f/p_i)$$
$$Q_s = Q_s(p_f/p_i)$$  \hspace{1cm} (A1.4)

Now, we will assume that the economy starts with a monetary and price structure such that industry is a net exporter. That is, $Q_i > C_i$. There is no excess demand for the industrial good on the domestic market, and the parallel market price equals the official price.\(^2\) Moreover, the official price is simply the exchange rate multiplied by

\(^2\) The crucial assumption here is that there is an excess supply of the exportable good in the domestic market. In a market economy, in which domestic prices are set according to supply and demand, and in which producers are free to choose between supplying the domestic market and exporting, the assumption is unexceptionable. Exports occur because there is an excess of supply over domestic demand at the domestic price, with the domestic price being set by the world price converted into domestic currency at the official exchange rate. In a non-market setting, however, it is possible that exporters are commanded or induced to export even in the face of intense domestic shortages.
the world price index \( p_i^* \):

\[
p_i = E p_i^* = P_i
\]  \hspace{1cm} (A1.5)

The official domestic price of the foreign imported good is similarly given as the world price multiplied by the exchange rate:

\[
p_f = E p_f^*
\]  \hspace{1cm} (A1.6)

Of course, for this good, we expect a situation of excess demand on the domestic market, so that \( p_f > p_r \). For simplicity, we set \( p_r = p_f = 1 \), so that \( P_i = p_f = E \).

Since the price of services is set exogenously at \( p_s \), and \( p_i = E \), the relative official price of services in terms of output is fixed, so that output in the export sector is also fixed, at the level \( Q_s(p_i/E) \). Similarly, output in the service sector is fixed at the level \( Q_s(p_i/E) \). By our assumptions, these output levels will not be affected by the monetary equilibrium.

We assume that the country lacks foreign exchange reserves to run a trade deficit, so that international trade must be balanced or in surplus.

\[
C_f = Q_f - C_i
\]  \hspace{1cm} (A1.7)

Let us now find the combination of the money supply and exchange rate that would just produce monetary equilibrium with balanced foreign trade and currency convertibility.

From (A3) and (A5) we know that \( C_i = aMV/E \). Assuming currency convertibility, the parallel market price of imports must equal the official price, so that \( P_f = p_f = E \). Thus, \( P_f C_f = EC_f \), so that from (A3), we have \( C_f = (1-a-b)MV/E \).

Thus, from (A7), we find:

\[
(1-a-b)MV/E = Q_f - aMB/E
\]  \hspace{1cm} (A1.8)

By simply rearranging, we find the level of \( M \) that is consistent with balanced trade and currency convertibility at the exchange rate \( E \), and we denote that level of \( M \) as \( M_c \):

\[
M_c = EQ/[V(1-b)]
\]  \hspace{1cm} (A1.9)

When \( M \) is equal to \( M_c \), the exchange rate \( E \) is convertible. When \( M \) rises above \( M_c \), however, the exchange rate \( E \) becomes inconvertible, because it becomes

The model points in the right direction for Poland, even though surely some goods were exported that were also in excess demand. The model's plausibility rests on two points. First, by the end of the 1980s, many firms operated in roughly the market environment of the model (i.e., they were able to choose between the domestic and foreign market, and prices were roughly arbitrated between the markets). Second, where central planning persisted, there was a tendency by planners to view exports as a "vent for surplus." That is, planners encouraged exports mainly for goods whose "needs" were already met on the domestic market.
impossible to satisfy the demand for imports out of export earnings. Specifically, exports fall since \( C_i \) rises (causing \( Q_i - C_i \) to fall). This also causes a fall in the domestic availability of imports, according to the balanced trade condition (A7). At the same time, the nominal demand for imports rises, since \( P_f C_f = (1-a-b)MV \). Thus, at the initial domestic price \( P_f = E \), there is an excess demand for the import good. Assuming that the monetary authorities leave the nominal exchange rate unchanged, foreign exchange would have to be rationed.

As a result of rationing, the domestic parallel market price of the import good rises above the world price multiplied by the exchange rate, so that \( P_f > E \). Specifically, the parallel market for the import good clears when \( P_f C_f = (1-a-b)MV \).

Since \( C_f = Q_i - C_i = Q_i - AMV/E \), we find:

\[
P_f = (1-a-b)MV/[Q_i - aMV/E]
\]

(A1.10)

Note that equation (A10) is derived under the assumption that exports are positive, which applies only for \( AMV \leq EQ_i \). This is equivalent to the condition that \( Am \leq (1-b)M.c \). For \( M \) higher than this amount, imports are zero, \( C_i = Q_i \), and \( P_f \) is equal to \( AMV/Q_i \), which would be greater than \( E \).\(^{28}\) Henceforward, we will always assume that we are in the range in which exports are positive.

Using (A9) and rearranging, we find the following interesting relationship:

\[
P/E = (1-a-b)(M/M_e)[(1-b-a)(M/M_e)], \text{ for } M > M^e
\]

(A1.11)

Equation (A11) can be interpreted as follows. The expression \( M/M_e \) is a measure of the monetary overhang, since it is the ratio of the actual money supply to the level consistent with balanced trade and convertibility. When a monetary overhang exists, the domestic parallel-market price of the imported good is higher than \( P_f = E \), because foreign exchange must be rationed at the official exchange rate. The importers which are lucky enough to get the rationed foreign exchange can purchase imports at the price \( P_f \) and resell them in the parallel market at the price \( P_f \).

Under certain assumptions (mainly that the imported good can be costlessly imported and exported on the parallel market, using parallel, or black, market dollars), \( P/E \) is not only the premium on the imported good, but is also the premium on foreign exchange in the parallel (or black) foreign currency market. That is, the ratio of the parallel (or black) market exchange rate \( E^b \) to the official exchange rate \( E \), is equal to \( P_f/P_{E^b} \), which in turn is an increasing function of the monetary overhang:

\[
E^b/E = P/P_f = (1-a-b)(M/M_e)/[1-b-a(M/M_e)]
\]

(A1.12)

Consider the real trade consequences of the monetary overhang. The higher is the money overhang, the smaller is the level of exports and imports, and the lower is consumer welfare. This can be seen as follows. Exports \( X_i \) are equal to \( Q_i - C_i \), and the percent of output that is exported, \( X_i/Q_i \), can be calculated as follows:

\(^{28}\)The domestic price rises above the world price multiplied the exchange rate. International price arbitrage no longer holds since domestic firms no longer export to the world market.
\[
\frac{X_i}{Q_i} = 1 - [a(1-b)](M/M_f) = C_i/Q_i \\
\]

(A1.13)

The equation also reflects the fact that when the currency is inconvertible, the rate of import equals the rate of export. When \( M < M_c \), the currency remains convertible and the trade balance moves into surplus. In particular, we have \( P_f = p_f = E \), and \( C_f = (1-a-b)MV/E \). At the same time, \( Q_i - C_i = Q_i - AMV/E \). Combining these two expressions, we find an expression for the trade balance, which is equal to \( TB = Q_i - C_i - C_f \). In particular, we find:

\[
TB = [(1-b)V/E](M_c - M), \quad \text{for } M < M_c
\]

(A1.14)

This expression is the counterpart of (A13) for the case in which the money supply is less than the level consistent with convertibility and balanced trade. For an unchanged exchange rate, a drop of \( M \) below \( M_c \) produces a trade surplus. In effect, the low level of the money supply evaluated at world prices, \( M/E \), restricts imports and produces the surplus.

As described in the text, our maintained assumption for the service sector is that service-sector production is artificially restricted by price controls. Specifically, when nominal demand for services, \( BMV \), is greater than the nominal supply, \( p_fQ_i(p_f/E) \), a parallel market for services will develop. The parallel market equilibrium is reached when nominal consumer demand \( BMV \), is equal to the value of output measured at the black market price: \( BMV = p_fQ_i \). Thus,

\[
P_fp_s = BMV/(p_fQ_i) = (M/M_c)(bQ_i/[(1-b)p_fQ_i])
\]

(A1.15)

As with the imported good, the black market premium in the service sector is an increasing function of the monetary overhang.\(^{20}\)

\(^{20}\)It is obviously possible that the money supply could be so low that \( P \) would fall below \( P_c \). That would in fact be a situation of excess supply in services at the official price, a situation which we take to be outside of the relevant range of our analysis.
Bibliography.


Borensztein, E., and Ostry, J. (1992) "Structural and Macroeconomic Determinants of the Output Decline in Czechoslovakia and Poland", mimeo, IMF.


Chapter 2. Measurement and Mismeasurement of Economic Activity During the Transition to the Market

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1A previous version of this paper was presented at the IMF/World Bank conference on the macroeconomic situation in Eastern Europe, July 3-4 1992. I would like to thank the participants and especially my discussants for many useful comments.
Each of the reforming Eastern European countries has reported dramatic drops in consumption, living standards, and output.¹ Interpretations of these reforms now abound.³ With some important exceptions, however, most work has taken tried to explain the outcomes as reported, rather than analyze the data itself. Yet we know how poorly Soviet-style economies functioned. They produced much non-market-driven, low quality output. Furthermore, they had too much industry and a repressed services sector. This study focusses on two central questions: How much of the output decline in Poland in 1990 should be attributed to mismeasurement, such as that related to these characteristics of the Polish economy? And what does available evidence say about declines in real consumption and standard of living?

These questions are of general interest. Indeed, the fact that each of the reforming Eastern European countries has suffered severe output declines with liberalization suggests that explanations should depend on special characteristics of these countries as a group. The two outstanding candidates are the CMEA trade shock and measurement problems associated with the transition from the Soviet-style economy of shortage to the market. The Finnish example suggests that the CMEA shock alone is a powerful explanatory factor: Finland possessed a Western-style economy dependent on trade with the USSR and suffered a sharp GDP decline in 1991 when CMEA trade collapsed, without any liberalization program. The Polish case, on the other hand, illustrates the fact that this shock cannot be the only important explanation of the phenomenon, as this shock hit Poland roughly one year after the ‘big bang’ of January 1990.

The focus here is exclusively on Poland, partly because of the ability to isolate the CMEA shock and partly for reasons of data availability: taking the official data seriously cannot be done by reading the standard monthly and annual publications.

This paper is not concerned with criticizing the performance of the Polish Central Statistical Office (GUS) nor, more sadly, with making direct suggestions for improvements in data collection. In fact, the problems result from the revolutionary

¹See, for example, Bruno in this conference.
²Examples which study the Polish case include Berg and Sachs (1992), Lipton and Sachs (1990), Gomulka (1992), Frydman et. al. (1992), Schaffer (1992).
changes underway in the economy, and methods of statistical collection are being reformed more rapidly than most institutions in Poland. The problems I discuss have to do with the use and interpretation of official statistics, rather than with their production. Indeed, unless specifically mentioned otherwise all data sources in this paper are from GUS itself.

The first section examines potential sources of direct mismeasurement of output of individual products. Section two discusses alternate measures of real consumption and the standard of living in 1990 that try to control for some of these problems. The main point is that measurement problems in standard consumption indices are significant in the context of the revolutionary transformation undergone in 1990. An alternative measure is constructed from data which is less likely to be subject to these biases.

I then broaden the inquiry to discuss the overall fall in output and GDP. Section three presents and discusses alternative estimates of the GDP change from 1989 to 1990. Section four reviews the idea that the output decline is overestimated because official statistics place excessive weight on goods the production of which would have generated little or no value-added at proper shadow prices. I then confront the available evidence. The fifth section concludes.

1. Direct Mismeasurement of Output and Consumption Declines

Two general sorts of mismeasurement problems can be distinguished. One, having to do with the problem of valuing output during the transition from a Soviet-style economy to a market economy, is covered further below. Another has to do with direct mismeasurement of output, especially of inventories and the private sector, and is reviewed here.

(1) State sector.

Potential mismeasurement in the socialized sector relates primarily to changed reporting incentives during the transition. The enormous production distortions arising in Soviet-style economies were once well known. The imperatives of bureaucratic control combined with pervasive shortages and price controls to encourage manipulation

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*See Winiecki (1991) for an excellent discussion of this and related measurement issues associated with the decline of output in Soviet-style economies following liberalization.*

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of both information and actual production in a number of ways. First, simple falsification of output was widely observed. It is true that in Poland by 1989 the plan was important for less than a quarter of sold output, but scarce inputs such as foreign exchange, energy, bank credit and others were still under significant bureaucratic control, and it may still have been the case that increases in reported output would help the firm obtain them.

The set of incentives operating on the managers who report data changed radically in 1990. The process of decentralization of the state-owned enterprise (SOE) was completed: they became more fully self-financing, with the end of firm-specific taxes and subsidies. As the budget constraint was hardened tax avoidance became a more powerful incentive for underreport, while incentives to keep bureaucrats or get access to inputs by maintaining or increasing production lessened.

Probably more importantly, the ability of various stake-holders to 'privatize' income streams through unrecorded activity increased sharply. Anecdotal reports of side-dealing by management, whereby they siphon-off output through, for example, selling product out of the back of the factory to the private sector and, presumably, do not report it, are widespread.

One type of direct mismeasurement results from privatization transactions, which generally involve retail and service establishments, small firms, or small pieces of larger firms being transferred to private hands. As discussed below, the private firm is probably more likely than the same firm as a cooperative or state-owned firm to underreport. It is difficult to assess the magnitude of this phenomenon. Many privatization transactions are such that the participants all have an interest in keeping things quiet. In a typical deal, a state manager would lease a workshop to a private firm. Some of the workers from the state firm would work in the new private firm, perhaps without quitting the state firm and therefore keeping social insurance benefits without having to register their private sector incomes. The state managers interest in the private firm would encourage him to sell at a low price. Note finally that such an arrangement would be most likely at a firm which benefitted from strong demand for its products and high

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See the discussion in chapter 4.
profits, as such firms would have had the most incentive to escape from the punitive tax on increases in the wage bill of the enterprise which applied most stringently on the state sector. (In 1991 the basis for the tax became the average wage, and the tax was lifted entirely for the private sector.)

The nature of these transactions is thus such that they are best kept quiet. Such evidence as there is comes from surveys, which indicate that roughly one third of large socialized firms report selling or leasing productive assets by the middle of 1991. The share of assets released is reportedly small - under 10%.

Among the main reasons given for not doing more are fear of accusations of conflict of interest against the managers and unrealistically high book values for assets. These are also reasons for under-reporting such activity, suggesting that the surveys may greatly underestimate the size of this effect.

(2) Private Sector Data.

The collection of data on the private sector represents a great challenge. Private sector activity was until shortly before the reform actively discouraged, and much of what was carried out was of uncertain legality. For example, getting inputs in a shortage economy required bribes. Furthermore, the goals of statistical collection were linked with the traditional goals of centralized economic control. Thus, the system of data collection through regular reporting by each economic agent lent itself to some government control and to an economy based on a relatively small number of large units.

As a result, mechanisms for collection of data on the private sector were highly undeveloped. Incorporated domestic businesses and joint ventures with employment over 20 (50 in industry and construction) reported monthly, medium-sized businesses filled out forms twice per year, and small firms annually. In 1989, collection was sparser.

The private sector was and remains dominated by very small operations. For incorporated private firms, which in the end of 1990 represented 9% of total employment in the private sector had an average of 13.6 employees (including proprietors, consultants, etc.), while the individual business which account for 82% of employment

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6See Dabrowski et. al. (1991), for example.

7In 1991 estimation through sampling began in earnest, with quarterly sampling for small firms.
reported an average of 1.7 workers per enterprise.

The 1.9 million people working in individual businesses were generally not included in monthly statistics of any sort in 1990. More generally, care must be taken in evaluating any data such as wages, employment, sales, and so on. In the widely used official bulletin of the Polish Central Statistical Office (GUS), at least, units under 20 employees (50 in industry and construction) are often not included. In principle, annual numbers for the components of national income are based on imputations.  

Information regarding individual businesses in 1989 and 1990 came from the tax offices of the Ministry of Finance, where these firms had to be registered. Data on sales, costs, profits and so on were not generally collected, in part because some of these firms were not liable for a tax on income. Individuals businesses must present books to the tax offices once per year. In principle, these books can be sent to the central tax office for verification, but this is extremely rare in practice.

For large operations, the incentives to register are stronger, as contracts can more easily be entered into, bank credit obtained, and so on with registration. Incentives to avoid taxes are still strong, however. The incentives to register as an individual business and not a corporation are nonetheless powerful (as Johnson(1992) describes). Capital requirements are lower, taxes could be lower if correctly handled, and the procedures took days instead of months. Incentives to underreport employment might be high: various social insurance charges and payroll taxes could be avoided. Nonetheless, statistics on employment are generally more useful than those on production, income, or sales, not least because they cover more types and sizes of firms.

Little weight should be put on information about type of activity pursued by individual businesses. They were required to register in a certain activity, but it is not clear that there was any reason for them to register correctly. Furthermore, tax treatment varied greatly across sector. For example, new businesses in wholesale trade were given a 1 year tax holiday in 1990, and the "handicraft" sector businesses were generally able

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8This paper will focus almost exclusively on annual data because problems of coverage of various data series (private sector, small firms, and so on) are intractable at higher frequencies.

9This section draws heavily on Johnson (1992) and Guzman (1991).

10This applies in 1989 and 1990. The tax system has changed sharply, particularly starting in 1991 with the introduction of a personal income tax.
to pay a lump sum tax while those in industry were liable for an income tax) and anecdotes of tax-based registration behavior were widespread. Similarly, individuals could register several businesses and transfer income in the way designed to minimize liabilities. (In the above example, income from manufacturing could be transferred to a tax-exempt wholesale trade business.)

Foreign trade provides an example of a number of aspects of the problems in recording the activities of private businesses. First, the data collection methods were not geared to their measurement. Indeed until the second half of 1990 trade data was based primarily on reports by foreign trade enterprises of their activities. Private traders apparently had no legal requirement to report. Second, the rapid growth of the private sector in 1990 causes biases in growth rates as well as levels. As Berg and Sachs (1992) demonstrate, the volume of imports to Poland as reported as exports by EEC trading partners in 1990 was 43% higher than that reported by GUS, compared to a discrepancy of 14% in 1988 and 18% in 1989. For exports the rate of underreporting to GUS, also measured by comparing with partner data, was 7% in 1990 compared to -1% in 1989 and 0% in 1988. (This does not capture smuggling in terms of reporting in partner countries. Again, since much of the activity was carried out by individuals, this may have been sizable.) Third, the data collection methods have changed in response to this problem. A customs-based trade data collection system was implemented starting in the last half of 1990, and indeed in 1991 the discrepancy between partner data and Polish data seems largely to have disappeared.

How much activity is totally unrecorded is difficult to estimate. Casual observation and anecdotal evidence suggests a fairly large degree of unreported activity of various sorts. Reports of in-depth interviews with some 80 private traders in several cities in Poland (SMG/KRC (1992) suggest that while most people engaged in small-scale trade are registered in some fashion, under-reporting of sales and employment is the rule rather than the exception. On the other hand, a national random survey of 1000 adults conducted in 1991 which asked extensively about various sorts of economic activity found that the percentage engaged in some sort of private non-farm activity in November was the same as in official data for the end of the year (29%).

A sense of the potential importance of mismeasurement of private sector activity is
given by a comparison of the growth of reported employment in the private sector with
the growth in reported GDP. For example, the private sector component of construction
fell by 7% in 1990 while reported employment grew by 4%. In trade, private sector
GDP grew by 102% according to GUS, while employment grew by 408%. Some clear
evidence that direct mismeasurement was of real significance in 1990 is provided by
comparing official data on ‘supply’ and ‘consumption’ from the GUS monthly bulletin.
In principle, ‘supply’ measures total domestic production + imports - exports of a
particular commodity, in physical units. This can be compared to data from household
surveys on consumption in physical units, and consumption generally falls far less than
supply. For example, butter supply in 1990 is reported to have fallen by 16% from
1989, while consumption of butter increased by 4%. The number of pairs of leather
shoes supplied is supposedly down 42%, while consumers report a 30% fall in purchases.
We observe a 22% decline in bread supply and a 5% decline in bread consumption.

2. Consumption and the Standard of Living.

Perhaps the most pressing question about the Polish reforms is whether they have
been unnecessarily costly in causing an excessive decline in living standards. It is often
asserted that the economic reforms have sharply reduced Poland’s living standards, with
a frequent estimate of a drop of "real incomes" of around one third. In this paper I will
not focus on whether the reforms were necessary or the strategy proper but on the more
mundane question of how large a drop in living standards there actually was. As the last
example suggests, measurement problems are clearly of potentially significant magnitude
here.

The comparison of the welfare of a society at two points in time is extremely
difficult. As Samuelson (1950) makes clear, we can learn nothing meaningful from
observed prices and quantities about changes in real incomes or welfare without making
interpersonal comparisons of utility and strong "ethical" assumptions about the
distribution of income. Furthermore, a fully satisfactory evaluation of a policy change
and its outcome in terms of welfare should compare the entire future paths of
consumption (see Samuelson (1961). These observations should be kept in mind as
qualifications for what follows. As discussed below, however, ad hoc welfare
comparisons are carried out constantly in the political dialogue in Poland and implicitly
or explicitly in academic discussions about the outcome of reforms in Eastern Europe.

In this paper, then, I combine a variety of imperfect proxies for welfare. Most importantly, I examine "real consumption", or consumption of goods and services adjusted for changes in relative prices. It will occasionally be important, however, to discuss the "standard of living" more broadly defined to include factors such as the availability and variety of goods and changes in the dead-weight loss of queuing. Finally, I briefly address issues of changes in expectations and uncertainty about future income and the distribution of income.

To give away the punch line, there was probably not a significant drop of real consumption or living standards in 1990, certainly not of the magnitude suggested by official measures of decline in real consumption.

Early in Poland's stabilization program it became a point of conventional wisdom that real living standards had declined precipitously as a result of the stabilization and liberalization measures. This idea was largely based on a single, and misleading, datum, the measured decline in real wages between 1989 and 1990. Table 2.1 shows the basis of the calculation. From June 1989 to June 1990, the average industrial wage deflated by the consumer price index fell by 37 percent (from an index value of 1,304 to 822). What this datum failed to reveal, however, was that the 1989 real wage level was itself anomalous, since real wages had risen explosively since 1987 in the course of the collapse of the communist regime. Between June 1987 and June 1989, real wages measured on the same basis rose by 42.2 percent (from an index value of 917 to 1304).

The high level of the real wage in 1989 did not reflect an improvement of living standards from earlier years, much less a sustainable one. The expansion of nominal aggregate demand as a result of the wage increases and large budget deficits worsened the shortages in the country considerably, so that goods were not available at the official prices. Not only could the "real" wages not be turned into real purchasing power, but to get the limited amount of goods available required standing in longer queues or paying a higher premium on the black market. For this reason, a reversal of the real wage increase after 1989 is not dispositive concerning the direction of change of real living standards.

As part of its calculation of GDP, the GUS has estimated that real private
Table 2.1. Average Monthly Wages in Industry, 1987-1991

<table>
<thead>
<tr>
<th></th>
<th>Nominal</th>
<th>Real(^a)</th>
<th>Dollar(^b) (market)</th>
<th>Dollar(^c) (official)</th>
</tr>
</thead>
<tbody>
<tr>
<td>June, 1987</td>
<td>30722</td>
<td>917</td>
<td>na</td>
<td>119.91</td>
</tr>
<tr>
<td>June, 1988</td>
<td>50661</td>
<td>969</td>
<td>32.68</td>
<td>118.37</td>
</tr>
<tr>
<td>June, 1989</td>
<td>130454</td>
<td>1304</td>
<td>28.24</td>
<td>153.65</td>
</tr>
<tr>
<td>June, 1990</td>
<td>946822</td>
<td>822</td>
<td>98.38</td>
<td>99.67</td>
</tr>
<tr>
<td>June, 1991</td>
<td>1713300</td>
<td>945</td>
<td>149.48</td>
<td>150.4</td>
</tr>
</tbody>
</table>

Notes: From GUS monthly statistical bulletin, various issues. Exchange rate data from IMF.
\(^a\): deflated using the CPI
\(^b\): wage in dollars using the market (parallel) exchange
\(^c\): wage in dollars using the official exchange rate

Source: nominal wage index and consumer price index, from GUS monthly statistical bulletin, various issues. Exchange rate data from International Financial Statistics of the IMF.

consumption fell in 1990 by 15.3% compared with 1989. This estimate, however, is perhaps the least reliable of all GUS numbers. The primary source of information used by GUS to estimate consumption in the national accounts in 1990 came from on data collection from state-owned retail establishments, supplemented with newly implemented surveys of private sector retail activity. This measure is not likely to capture well the overwhelming transformation from state to private retail trade during 1990. With the private sector share of retail rising dramatically, and with much of the trade going unmeasured in very small firms, under-estimation of the rapidly growing and elusive private sector is very likely. ¹¹

A different way to proceed is to try to measure actual consumption of items in the consumer basket by the "representative" household using evidence gleaned from GUS

¹¹In 1990, the unusual uncertainties and difficulties in estimation of many of the components of national income lead seems to have lead to the calculation of consumption essentially as a residual. GDP was calculated from the supply-side, then estimates are made of the other demand-side components of GDP: government expenditure on goods and services, exports and imports, and investment. While independent information on consumption was used, as described above, consumption seems to have been the item that adapted when one of the other categories was corrected. In particular, and as described in more detail in footnote 16 below, calculation of inventory investment has recently been subject to enormous errors, perhaps on the order of 10% of GDP in 1989.
household expenditure surveys, rather than from surveys of retail firms. This is obviously a imperfect approach as well, given the difficult of identifying an "average" household, and distinguishing its real purchases from real consumption of items (particularly of durables), but enough direct evidence on consumption exists to make the effort interesting. Most importantly, this measure is less likely to be vulnerable to some of the measurement problems discussed below, especially those associated with increased underreporting of output and under-measurement of the private sector.

The survey consists of a rotating random sample of some 8000 households, and excludes households of self-employed persons as well as police and military. This results in a downward bias in the estimates of changes in consumption since the self-employed sector experienced a boom in 1990.

Table 2.3 presents estimates of physical volume changes for a detailed breakdown of the household consumption basket. (Table 7 shows stocks of consumer durables in the 1980s from the same source, one of the components of Table 2.3). For each item, I attempt to use survey data to estimate the percent change in physical units of consumption, and then weigh the volume changes by the consumption shares of each item in 1989 to come up with a Laysperes measure of aggregated change in real consumption between 1989 and 1990. Poland's household surveys use a four-way population breakdown, among workers' households, farmers' households, agricultural workers' households, and pensioners' households. Rather than weighing up each of these categories, I simplify by taking the workers' household category as our base for measurement. For easily identifiable consumption items, mainly the food category, this simplification does not appear to introduce a systematic bias. Workers represent about 55% of the groups covered by the survey. Retirees and farmers represent about 20% each. The income of retirees relative to workers rose by 25% in 1990, while that of farmers fell by 5%.12

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12 Here I use reported nominal incomes to calculate the shares and changes in relative incomes. I do not use the nominal income data to construct a time series of real consumption because the measure is distorted by misreporting, especially of private sector activity, and more importantly because the non-market-clearing pre-reform economy renders such indices meaningless. To the extent that the different groups faced similar consumption markets, however, the distortions due to the non-market environment in 1989 presumably cause second-order distortions in the measures of shares and changes in relative income derived from the nominal income data. Note finally that I am ignoring the important distinction between income and consumption, which are meant to be indicative only.

53
## Table 2.3. Real Consumption in 1990 Compared to 1989

<table>
<thead>
<tr>
<th>Budget expenditure Category</th>
<th>Expenditure Shares 1989</th>
<th>Effective Weight</th>
<th>Real index 1990/1989</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>1.00</td>
<td>1.00</td>
<td>0.952</td>
</tr>
<tr>
<td>Food</td>
<td>0.44</td>
<td>0.45</td>
<td>0.98</td>
</tr>
<tr>
<td>Bread</td>
<td>0.02</td>
<td>0.03</td>
<td>1.02</td>
</tr>
<tr>
<td>Flour</td>
<td>0.00</td>
<td>0.00</td>
<td>0.97</td>
</tr>
<tr>
<td>Cereals</td>
<td>0.00</td>
<td>0.00</td>
<td>0.79</td>
</tr>
<tr>
<td>Pasta</td>
<td>0.00</td>
<td>0.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Potatoes</td>
<td>0.01</td>
<td>0.02</td>
<td>1.03</td>
</tr>
<tr>
<td>Vegetables</td>
<td>0.03</td>
<td>0.04</td>
<td>1.02</td>
</tr>
<tr>
<td>Fruits</td>
<td>0.03</td>
<td>0.04</td>
<td>1.01</td>
</tr>
<tr>
<td>Meat</td>
<td>0.08</td>
<td>0.09</td>
<td>0.96</td>
</tr>
<tr>
<td>Meat products</td>
<td>0.08</td>
<td>0.10</td>
<td>1.01</td>
</tr>
<tr>
<td>Fish and products</td>
<td>0.01</td>
<td>0.01</td>
<td>0.83</td>
</tr>
<tr>
<td>Animal fat</td>
<td>0.01</td>
<td>0.01</td>
<td>0.92</td>
</tr>
<tr>
<td>Plant oils</td>
<td>0.01</td>
<td>0.01</td>
<td>1.10</td>
</tr>
<tr>
<td>Butter</td>
<td>0.03</td>
<td>0.03</td>
<td>1.00</td>
</tr>
<tr>
<td>Milk</td>
<td>0.01</td>
<td>0.01</td>
<td>0.93</td>
</tr>
<tr>
<td>Cream</td>
<td>0.01</td>
<td>0.01</td>
<td>0.82</td>
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<tr>
<td>Cheese</td>
<td>0.01</td>
<td>0.01</td>
<td>0.83</td>
</tr>
<tr>
<td>Egg</td>
<td>0.02</td>
<td>0.02</td>
<td>0.91</td>
</tr>
<tr>
<td>Sugar</td>
<td>0.02</td>
<td>0.02</td>
<td>0.92</td>
</tr>
<tr>
<td>Sugar goods</td>
<td>0.02</td>
<td>na</td>
<td>na</td>
</tr>
<tr>
<td>Honey</td>
<td>0.00</td>
<td>na</td>
<td>na</td>
</tr>
<tr>
<td>Other food articles</td>
<td>0.03</td>
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<td>na</td>
</tr>
<tr>
<td>Restaurants</td>
<td>0.01</td>
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<td>na</td>
</tr>
<tr>
<td>Cakes</td>
<td>0.00</td>
<td>na</td>
<td>na</td>
</tr>
<tr>
<td>Other dairy</td>
<td>0.00</td>
<td>na</td>
<td>na</td>
</tr>
<tr>
<td>Rice</td>
<td>0.00</td>
<td>na</td>
<td>na</td>
</tr>
<tr>
<td>Alcohol</td>
<td>0.03</td>
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<td>na</td>
</tr>
<tr>
<td>Cigarettes</td>
<td>0.01</td>
<td>na</td>
<td>na</td>
</tr>
</tbody>
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Continued on next page.
### Table 2.3 continued. Real Consumption in 1990 Compared to 1989

<table>
<thead>
<tr>
<th>Budget expenditure Category</th>
<th>Expenditure Shares 1989</th>
<th>Effective Weight</th>
<th>Real index 1990/1989</th>
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<tbody>
<tr>
<td>Total Other Non-Food</td>
<td>0.53</td>
<td>0.55</td>
<td>0.93</td>
</tr>
<tr>
<td>Clothes and shoes</td>
<td>0.16</td>
<td>0.24</td>
<td>0.80</td>
</tr>
<tr>
<td>which textiles</td>
<td>0.01</td>
<td>0.02</td>
<td>0.52</td>
</tr>
<tr>
<td>Outer wear</td>
<td>0.02</td>
<td>0.09</td>
<td>0.90</td>
</tr>
<tr>
<td>Attire</td>
<td>0.06</td>
<td>na</td>
<td>na</td>
</tr>
<tr>
<td>Shoes</td>
<td>0.04</td>
<td>0.13</td>
<td>0.77</td>
</tr>
<tr>
<td>other</td>
<td>0.04</td>
<td>na</td>
<td>na</td>
</tr>
<tr>
<td>Housing</td>
<td>0.10</td>
<td>na</td>
<td>na</td>
</tr>
<tr>
<td>Electro/mechan.</td>
<td>0.02</td>
<td>0.03</td>
<td>1.03</td>
</tr>
<tr>
<td>Rents and payments</td>
<td>0.02</td>
<td>0.03</td>
<td>1.00</td>
</tr>
<tr>
<td>Textiles and carpets</td>
<td>0.02</td>
<td>na</td>
<td>na</td>
</tr>
<tr>
<td>Other</td>
<td>0.05</td>
<td>na</td>
<td>na</td>
</tr>
<tr>
<td>Fuel, heating and hot water</td>
<td>0.02</td>
<td>0.02</td>
<td>1.07</td>
</tr>
<tr>
<td>Personal hygiene and health</td>
<td>0.03</td>
<td>na</td>
<td>na</td>
</tr>
<tr>
<td>Leisure</td>
<td>0.10</td>
<td>0.14</td>
<td>1.05</td>
</tr>
<tr>
<td>Cultural articles</td>
<td>0.06</td>
<td>0.09</td>
<td>1.17</td>
</tr>
<tr>
<td>Newspapers</td>
<td>0.00</td>
<td>0.01</td>
<td>1.17</td>
</tr>
<tr>
<td>Schoolbooks</td>
<td>0.00</td>
<td>0.00</td>
<td>0.91</td>
</tr>
<tr>
<td>Other published matter</td>
<td>0.00</td>
<td>0.01</td>
<td>0.79</td>
</tr>
<tr>
<td>Writing/painting material</td>
<td>0.00</td>
<td>na</td>
<td>na</td>
</tr>
<tr>
<td>Electronic equipment</td>
<td>0.03</td>
<td>0.07</td>
<td>1.22</td>
</tr>
<tr>
<td>Other</td>
<td>0.02</td>
<td>na</td>
<td>na</td>
</tr>
<tr>
<td>Sports/tourist equipment</td>
<td>0.00</td>
<td>na</td>
<td>na</td>
</tr>
<tr>
<td>Services: education</td>
<td>0.01</td>
<td>na</td>
<td>na</td>
</tr>
<tr>
<td>Services: culture and art</td>
<td>0.01</td>
<td>0.02</td>
<td>0.88</td>
</tr>
<tr>
<td>Tourism/sport activities</td>
<td>0.02</td>
<td>0.04</td>
<td>0.72</td>
</tr>
<tr>
<td>Transport and communication</td>
<td>0.06</td>
<td>0.09</td>
<td>1.01</td>
</tr>
<tr>
<td>Travel and transport</td>
<td>0.01</td>
<td>0.02</td>
<td>0.85</td>
</tr>
<tr>
<td>Means of transport</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>of which oil and gas</td>
<td>0.01</td>
<td>na</td>
<td>na</td>
</tr>
<tr>
<td>Other</td>
<td>0.03</td>
<td>0.06</td>
<td>1.08</td>
</tr>
<tr>
<td>Post, telephone and telegraph</td>
<td>0.00</td>
<td>0.00</td>
<td>0.93</td>
</tr>
<tr>
<td>Other</td>
<td>0.07</td>
<td>na</td>
<td>na</td>
</tr>
<tr>
<td>Balance</td>
<td>0.05</td>
<td>na</td>
<td>na</td>
</tr>
</tbody>
</table>

Source: Various GUS data. See text and Appendix for explanation.
As explained in the appendix, I try to identify quantity measures for as many categories of items as possible. In the end, I am left without any direct evidence for about 40 percent of the basket, and some "guessimates" for another part. I simply drop the items I cannot identify, and raise the weights proportionately on the included items, so that the new effective weights sum to 1.0.

Aggregate food consumption is measured to fall by 2.2 percent between 1989 and 1990, while non-food items fall by around 7 percent. A weighted average indicates a real fall in consumption volume of about 4.8 percent. A welfare-based measure of real consumption probably fell by less, for several reasons. I put conservative estimates on the level of 1990 consumption in cases where there was conflicting evidence. Moreover, the index uses fixed weights based on 1989 prices and hence, like any Laysperes index, understates real consumption in 1990 by neglecting second order effects due to substitution in response to relative price changes. The index does not reflect at all the rise in quality and variety of goods available on the consumer market due to the opening of trade with the West, nor does it measure the savings in real work time and leisure time made possible by the end of queuing and search for scarce commodities caused by the chronic shortages before 1990. Similarly, it cannot capture the new ability of consumers to choose the good they want among the varieties available. This is not the increase in overall variety already mentioned, but a question of matching between goods and consumers. Because goods were available when desired in the shops, it no longer became necessary to buy whatever was available whenever it was available, irrespective of whether it was exactly the right good (think of shoes of different sizes). In focus group interviews Polish consumers often mentioned a new ability to ‘plan shopping’ as one of the most important improvements.

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13By "welfare-based index" I mean an index derived from a utility function of a representative consumer.

14Roberts(1992) derives preliminary empirical estimates of the relative importance to utility of the gain due to decreased queuing and the loss in real consumption as usually measured. To do this he assumes a particular form for the utility function (linear in consumption and 'effort' spent on getting goods) and derives a supply function for goods provision in the parallel market based on convex risks of punishment for pilfering. There is then a relationship between effort spent on consumption ('queuing') and the ratio of black-market to official prices. Using data from surveys of this ratio for 1987 (it averages about 1.2) and estimates of the share of state-sector purchases in the total, he estimates the ratio of the utility gain associated with the elimination of queuing to the (absolute value of) the loss due to declines in real consumption. He finds this ratio to be greater than 1 if, for example, the fall in real income was 7% and the share of the state sector in trade was 50%, or if the fall was 12% and the share of state-sector in trade was 75%.

56
From a psychological point of view, however, these calculations neglect one heavy cost of the changes since 1989: the undoubted rise in anxiety and uncertainty in the Polish population as the result of the collapse of the old economic system. There are widespread fears of involuntary unemployment and job layoffs, a largely novel phenomenon, and even a sense of doom or despair among parts of the population. There may also be a loss of the hope that was held by some during the worst times of the 1980s, that getting rid of the Communists would quickly and painlessly give Poland a Western-European economy.\textsuperscript{15}

Departing finally from the assumption of a representative consumer, we observe that there also seems to be a widening of economic inequality, so parts of the population are surely worse off while other parts are better off as a result of the changes. Many small farmers have suffered as the result of the end of a high level of agricultural subsidies, while many new businessmen in the private sector are earning several times the average wage in industry.

This is not the place to investigate the relationship between economic changes and political outcomes. But it is worth noting that answers to the survey question "Is your own material standard of living good, bad, or neither good nor bad?" are roughly consistent with the consumption evidence described above, as Table 2.4 shows.

\textsuperscript{15}This is just one aspect of the fact that the reforms changed the entire path of expected consumption, which should in principle be captured in a measure of the change of welfare but which is largely beyond the scope of this paper. It is worth noting, though, that opinion surveys reflected an increase in hope for future prosperity with the onset of radical reforms.
Table 2.4. Material Standard of Living from Survey Data

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Nov</td>
<td>Nov</td>
<td>Jan</td>
<td>Feb</td>
</tr>
<tr>
<td>Bad</td>
<td>37</td>
<td>42</td>
<td>34</td>
<td>45</td>
</tr>
<tr>
<td>Average</td>
<td>48</td>
<td>46</td>
<td>54</td>
<td>46</td>
</tr>
<tr>
<td>Good</td>
<td>15</td>
<td>12</td>
<td>13</td>
<td>9</td>
</tr>
</tbody>
</table>

Source: CBOS, various reports.
Note: This table reports the respondents' answers, in shares, to the question: "What is your (your family's) material standard of living?", from various national random samples of Polish adults.

3. Alternative Estimates of the Output Decline

In addition to the decline in living standards, the output costs of Poland's rapid liberalization of prices and trade cause widespread concern. Without doubt, physical production in industry has declined significantly, though the size of this decline, and the size of the overall decline of GDP remains in doubt. GUS estimates a 12% decline of real GDP. I find that while there is an important range of uncertainty, due particularly to the difficulty of measuring the change in inventory investment and the growth of the private sector, the actual decline in real GDP seems to be considerably smaller than the 12 percent estimate, and even conservatively, is closer to 8 percent.

The share of industry in GDP in 1989 (at constant 1984 prices) was 36% and the reported drop in output from this sector was 22% (GUS from World Bank); this sector accounts for the bulk of the drop - some 9 percentage points out of the total official decline of 12. According to official data there were sharp and across-the-board declines in real sales in January of 1990. Sold industrial production fell some 32% from December 1989 to January 1990 (ignoring firms of below 50 employees, not a significant factor in this case). According to official data, 85% of 3-digit industries reported sales declines in the first quarter. For the rest of the year, sales and production were roughly flat.

It is worthwhile making an attempt to control for some of the measurement problems
mentioned above and measure the change in real GDP from 1989 to 1990. This effort is illustrative of both the problems with the official data and the difficulties involved in alternatives. In attempting to measure the real output decline I make several key assumptions which differ from those of GUS. Throughout the estimates described below and in the appendix try to make conservative assumptions (that is, assuming a larger fall) when faced with a variety of plausible choices. In other words, I only differ with GUS where the change seems clearly warranted. The two most important such changes are, first, that the change in real consumption is estimated from consumer surveys, as described above, and, second, much greater reliance is placed on employment data in measuring changes in value-added, especially in services and in the private sector.

The measurement of GDP change can be approached from the demand side, by adding up changes in real consumption (C), investment (I), government current expenditure on goods and services (G), and exports of goods and non-factor services (X), minus imports of goods and non-factor services (M). Alternatively, changes in estimates of real value added by sector of the economy can be added, to get an estimate from the production side. Each method has its limitations. On the demand side, there are major gaps in estimates, especially regarding inventory investment, while on the production side, there are major limitations in measurement of private sector activity. I try both approaches, and compare the results. Both suggest that the actual decline in GDP is considerably less than has been reported by GUS.

Table 2.5 presents the breakdown of the GDP growth estimates by category of final demand. The estimate for changes in real consumption (−4.8 percent) has been described above. Changes in real exports (29.4 percent), and real imports (3.3 percent) are derived from official data, except that partner data is used where possible to correct for underreporting (especially) of private imports in 1990. It remains to estimate the changes in real government consumption, real fixed investment, and real inventory investment. Real government consumption is estimated according to the number of employees in public administration. On this basis, we calculate a slight increase in real government consumption, of about 1 percent between 1989 and 1990. The estimates take as given the official government estimate of a drop of 9 percent in real fixed investment spending.
The harder problem is to measure the change in inventory investment. There are two major problems in measuring inventory investment. First, there are no clear ground rules in Poland for cost accounting for inventories, so it is unclear how to measure real inventories based on the nominal inventory figures reported by enterprises. The contribution of inventory investment to nominal GDP until 1990 was measured by GUS as the change in nominal stocks of inventories from the beginning to the end of the year. This greatly overstates real inventory investment in a hyperinflationary environment, as increases in the value of inventories due to inflation appear as positive real investment.

The estimates use the overall producer price index for industry as the price index for inventories and assumed that firms use FIFO accounting. They also assume that

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16GUS has recognized the potentially enormous errors implicit in its pre-1990 methodology but has not published corrected inventory investment data. I have thus made my own estimate of the contribution of inventory investment to GDP in 1989. It is similar to World Bank/IMF estimates and differs by some 10 percentage points of GDP from the published GUS estimates.
inventories are held for five months, and that at any time, the age of the inventory stock is uniformly distributed between 1 and 5 months. Based on these assumptions, they take as the inventory deflator a backward-looking five-month moving average of producer prices, with uniform weights on past months.

It may seem excessive to assume 5 months' of inventories, either a priori or because estimated inventory/sales ratios are much smaller. The reasons are related to the fact that assuming a lower number does not change much the overall decline in inventories from 1988 to 1991, but does result in more of the inventory decline taking place in 1989 and less in 1990. For example, if a 4 month lagged average of prices to deflate inventories implies a fall in inventories of 3.0% and not 8.7% as reported in the text. Instead of the 1.1% increase in inventories as a percent of GDP in 1989, we get a fall of 4.3%. It seems plausible to assume that the decline in inventories took place in 1990 and not 1989. Most importantly, the assumption of the 5 months lag is conservative in that it leads to a high estimate of GDP decline in 1990.

The second problem is that there is virtually no information on inventory stocks held by small private firms. This is particularly distressing, since the big drop in measured inventories is in the trade sector, which is exactly the sector in which private firms are developing most rapidly. As of early 1989, it is estimated that the private sector accounted for less than 10% of retail outlets. By the end of 1990 private sector employment accounted for some 80% of employment in trade. In view of the fact that tens of thousands of small shops in retail trade were privatized together with their inventory stocks, and in view of the fact that official inventory statistics cover the socialized sector, much of the drop in measured inventories might simply represent a transfer of inventory stocks to private firms. But it was not possible to find data to measure this effect. Certainly, new private establishments had inventory holdings not measured by the GUS statistics.

The evidence is reported in Table 2.6 and may be summarized as follows. In the non-trade socialized sector (mainly industry), inventories of materials tended to fall significantly while inventories of finished goods tended to fall slightly. This is consistent with the idea that industrial firms responded to a cutback in final demand by using up their accumulated stocks of materials. There is direct evidence marshalled by Schaffer
(1991) that sales of industrial firms fell in advance of production, consistent with the idea that inventories of finished goods would tend to rise after the onset of the stabilization and liberalization program, and then be reduced afterwards, following a cutback in production. The overall net change in non-trade inventories, taking into account both materials and finished goods, seems to be a fall of about 3 percent of GDP in 1990, following a fall of inventories of about 3 percent of GDP in 1989.

The situation in retail trade is more dramatic but more difficult to interpret. The estimate presented suggests that the unmeasured rise in inventories in the private sector amounted to around 3 percent of GDP, in other words, less than half of the measured decline in trade-sector inventories.

Based on these "guesstimates," I end up with an estimated overall drop in inventories between end-89 and end-90 of 6.2 percent of GDP. This enormous (and perhaps overstated) drop in inventories should be added to the other changes in final demand. Using the methodology described in the appendix, I come up with an overall drop in GDP of 4.9 percent for 1990, as shown in Table 2.6. This is obviously much less than the usual estimate, and it would be lower still if I accepted that more of the inventory decline is really a transfer to unmeasured private stocks, or used a less conservative assumption with regard to the pricing of inventory stocks.17

The alternative approach to measuring GDP is to add up changes in real value added by sector, as is done by GUS. The main problem here is incorporating the important growth of the private sector in overall estimates of sectoral growth. We believe that the GUS methodology has probably understated the actual growth of the private sector, both by under-measurement of very small businesses (including self-proprietorships) and the underreporting of private sector income.

There was a marked increase in the share of employment in the private sector (from around 34 percent of employment in 1989 to 38 percent of employment in 1990), particularly in private trade (where employment rose by 308 percent). The share of employment in industry (socialized and private) fell from 41 percent to 39 percent, while

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17This huge decline in inventories was presumably in large part a result of the end of the shortage economy and resulting need for large inventories. See Kornai (1992) and Winiecki (1991) for general discussions and Berg and Sachs (1992) for further discussion of the data.
<table>
<thead>
<tr>
<th></th>
<th>1989</th>
<th>1990</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>All socialized and private enterprises</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total inventories</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Change as percent of GDP</td>
<td>-2.1</td>
<td>-6.2</td>
</tr>
<tr>
<td><strong>All non-trade socialized enterprises</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total inventories</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percent of GDP</td>
<td>20.1</td>
<td>18.4</td>
</tr>
<tr>
<td>Months of sales</td>
<td>1.7</td>
<td>1.81</td>
</tr>
<tr>
<td>Changes as percent of GDP</td>
<td>-4.1</td>
<td>-3</td>
</tr>
<tr>
<td>of which:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Goods and finished products</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percent of GDP</td>
<td>4.1</td>
<td>4</td>
</tr>
<tr>
<td>Months of sales</td>
<td>0.35</td>
<td>0.39</td>
</tr>
<tr>
<td>Change as percent of GDP</td>
<td>0.7</td>
<td>-0.4</td>
</tr>
<tr>
<td>Materials</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percent of GDP</td>
<td>12.3</td>
<td>10.7</td>
</tr>
<tr>
<td>Months of sales</td>
<td>1.03</td>
<td>1.05</td>
</tr>
<tr>
<td>Change as percent of GDP</td>
<td>-4.1</td>
<td>-2.3</td>
</tr>
<tr>
<td>Socialized Trade</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total inventories</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percent of GDP</td>
<td>11.2</td>
<td>5.3</td>
</tr>
<tr>
<td>Months of sales</td>
<td>2.22</td>
<td>1.32</td>
</tr>
<tr>
<td>Change as percent of GDP</td>
<td>1.6</td>
<td>-6.3</td>
</tr>
<tr>
<td>GDP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trade inventories in private sector</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Change as percent of GDP</td>
<td>0.3</td>
<td>3.1</td>
</tr>
</tbody>
</table>

Sources: GUS data.

Notes: See text for explanation.
the service sector employment grew from nearly 30 percent to nearly 32 percent.

Employment data, and assumptions described in the appendix, imply an estimate for growth of the service sector of 6 percent in 1990. Schaffer's (1992) index of industrial production in the socialized sector provides an estimate of a 21.2 percent decline in that subsector. A 5 percent increase in private industry is a conservative estimate (less than the 9 percent measured growth of employment). According to official data, in 1989 private industry accounted for 7.4 percent of the total production in the sector. These estimates combine to imply a drop of 19 percent of industrial production. GUS estimates of real changes are maintained for the other sectors.

Once again, these individual estimates are combined in order to arrive at an estimate of the change in GDP, shown in Table 2.7. Using the estimated shares of each sector in 1989 as weights, the weighted average of the estimated changes yields a drop of 8.7 percent of GDP, more than the estimate from the demand side of 4.9 percent, though less than the GUS estimates of 12 percent drop.

The demand-side estimates should be given more weight. The consumer survey data is the least susceptible to the danger that it mismeasures private-sector activity, and the inventory decline is if anything mismeasured. The use of partner data on trade implies an increase in imports much larger than that suggested by official data. The supply side estimates place the greater reliance on data coming from traditional methods of measurement which emphasize socialized sector production.

The data thus suggest a serious drop of GDP but much less than that usually suggested for Poland in 1990. Furthermore, negative inventory investment was probably a large component of this fall, and real consumption probably fell by considerably less than the overall GDP.¹⁸

4. The Measurement of Output Decline During Liberalization

The above exercise is of necessity based on alternative interpretations of available official data. While underestimation of the growing private sector and increased underreporting by the socialized sector are investigated, an important source of potential

¹⁸Preliminary estimates of the change in real consumption for 1991 compared to 1990 suggest an increase in real consumption of some 2%, whether using methods similar to those described in the text for 1990 or simply deflating nominal household consumption expenditures from the household survey deflated by the appropriate price index provided by GUS.
<table>
<thead>
<tr>
<th></th>
<th>1989 Shares</th>
<th>Growth 1990/89</th>
<th>Contribution to 1990 growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>1</td>
<td>-8.7</td>
<td></td>
</tr>
<tr>
<td>Industry</td>
<td>0.57</td>
<td>-17</td>
<td>-9.8</td>
</tr>
<tr>
<td>of which:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Manufacturing</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>and mining</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.41</td>
<td>-21</td>
<td>-8.6</td>
<td></td>
</tr>
<tr>
<td>Socialized</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Private</td>
<td>0.03</td>
<td>5</td>
<td>0.2</td>
</tr>
<tr>
<td>Construction</td>
<td>0.08</td>
<td>-16</td>
<td>-1.3</td>
</tr>
<tr>
<td></td>
<td>0.04</td>
<td>-14</td>
<td>-0.6</td>
</tr>
<tr>
<td>Transportation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agriculture</td>
<td>0.13</td>
<td>-2</td>
<td>-0.2</td>
</tr>
<tr>
<td>Services</td>
<td>0.31</td>
<td>6</td>
<td>1.7</td>
</tr>
</tbody>
</table>

Notes: Industry here includes construction and transportation, unlike usual GUS practice.

Source: GUS data and own calculations. See text and Appendix for explanation.
mismeasurement is not addressed. This second general source of error relates to the measurements of prices themselves. Construction of price series are always complicated by the need to adjust for quality changes, but incentives built into the system have made that especially problematic for Soviet-type economies. Ziekowski (1991) reports that GUS has had great difficulty constructing time-consistent indices of physical production and prices for individual products. This problem is especially severe during the transition from a shortage-based to a market economy.

It is commonly suggested that the output decline in Eastern European countries following price liberalization is over-estimated in official statistics because much of what was being produced before was of very low quality and of limited usefulness. Indeed, the nature of the pre-reform economy implied that this would be the case.¹⁹ Pervasive shortages in the Soviet-style economy before 1990 meant that almost anything that was produced could be sold. There were thus incentives to reduce quality of goods to raise both physical output and revenue while lowering costs. Winiecki (1991) recalls the example of steel mills that typically produced as few sizes and grades of steel as possible. The low quality and durability of many pairs of shoes is another often-cited example.

A related aspect of this sort of phenomenon was the tendency of Soviet-style economies to produce for production's sake, so that "the coal was mined to produce energy to produce steel to mine some more coal" (Bierzynski, 1992).

With price liberalization and the end of the soft-budget constraint of the enterprise, the situation changed radically. Goods of inferior quality sold with difficulty. Moreover, there was a dramatic movement of relative prices towards world levels, with an increase in the relative price of energy. Thus a large part of output decline may have come from a cessation of production of goods with pre-liberalization prices which were too high relative to higher quality goods. Or, to put it another way, many activities carried out in Soviet-style economies may have added no value, or at least significantly less than other activities for given resources employed, when measured at correct shadow prices. To the extent that the measured output decline fell on these sorts of activities, it is overestimated.

The general proposition, then, is that 'low-quality' or 'surplus' goods had a decline in output more severe than did 'high quality' goods, and that because the price system did not correctly reflect scarcity or value added, standard data overstate the decline.\textsuperscript{20} The rest of this section will attempt to make clear what this proposition means, and in particular how its empirical implications compare with the data. The numerical example in the appendix outlines the senses in which this proposition can be true. These issues can be framed as index number questions.\textsuperscript{21} In a situation where initial and final prices are market clearing, the usual quantity indices are the Paasche (end-period weighted) and Laysperes (initial period-weighted) indices. These bracket the benchmark constant-utility index of volume change. The accuracy of the approximation depends in part on the size of the changes: the larger are the changes in quantities between the two periods the more the Paasche index is likely to understate the actual utility gain in the case of positive growth (overstate the loss in the case of decline) and the more the Laysperes index is likely to overstate the gain (understate the loss). This approximation problem is likely to be especially acute in a case such as Poland because the magnitude of the changes is so large.\textsuperscript{22} In addition to this general problem with quantity indices, two special sorts of effects that are particular to a liberalizing Soviet-style economy like Poland's can change this situation. (Appendix A presents several cases in the context of a simple model to illustrate the following points).

First, initial prices are not market-clearing, so the good which is highly valued in the initial period is priced too low compared to the shadow-price assumed by standard index-number theory. In the (reasonable) case where the good that is relatively short supply initially is also the one that expands most in the second period, the expanding good had a higher marginal utility than that suggested by the initial price. A Laysperes

\textsuperscript{20}See Osband (1992) and Schaffer (1992) for very useful discussions of these issues.

\textsuperscript{21}I am ignoring here issues involving income distribution and redistribution by assuming, in the appendix, that there is a "representative consumer". See the discussion on page 50 above.

\textsuperscript{22}The violence of the changes in relative prices between 1989 and 1990 may have combined with mark-up pricing over average total costs to generate even larger changes in the quantities of various goods produced, compared to the case where the industries/enterprises with excess capacity price as if labor, for example, were sunk. This is in part a real output loss, not an index number effect, of course, but the fact that the output swing is sharper means that a Paasche index understates the growth (overstates the decline) compared to the shadow-price index.
growth indices (case 1 of Appendix A) give too much weight to the good which is in relative initial surplus, compared to an index using shadow prices (case 2), which has the usual attractive characteristics of a Laysperes index. This is a general result that does not depend on linear utility or CRTS production functions, as are assumed in the example.

Consider, as an illustration, an industry which destroys value-added at world (shadow) prices but seems profitable at domestic pre-reform prices (industry 2 in the examples). A decline in its production in the second period would reduce output at official prices but increase it using shadow prices, measured by a Laysperes index. In the simplified examples, similarly, at shadow prices there is an output increase (case 2) while using official prices there is no change (case 1).

We have not so far discussed carefully the possibility that the pre-reform economy made excessive use of intermediate inputs of various sorts. In the examples in section 4 of Appendix A, this is the case because excessive quantities of labor and capital were allocated to these sectors. One possibility is that with liberalization and associated changes in management incentives an important part of the measured output drop consisted of this sort of inefficient activities.

Indices of industrial production are indeed vulnerable to this sort of bias, as Appendix A section 4 shows. That is, any of the standard indices will overstate the true fall in industrial production, and more generally the fall in industrial production will overstate the fall in value-added in industry. The Laysperes index using official prices gives too much weight to the intermediate good as it was priced above its shadow value, while the Paasche index is even lower, as it suffers from the usual downward bias of any Paasche index where price and quantity movements are negatively correlated. Correctly calculated estimates of value-added, however, are not subject to this sort of error in measuring declines in intermediate input production, since an increase in efficiency in the use of intermediate inputs should result in a transfer of value added from the intermediate goods sector to the final goods sector.

All our examples so far have considered market-clearing, full-employment situations in which price controls are eliminated. Unsurprisingly, such price liberalization results in an increase in output when measured at shadow prices. And, as we have seen, it
appears to result in no total change using official prices. In the Polish case, however, overall measured output seems to have fallen, not stayed constant or increased as in cases 1 and 2. As section 3 of the Appendix shows, one way of explaining this would be to introduce adjustment costs for the movement of labor between the contracting and expanding sectors. Thus if there is slow adjustment of labor there may be a fall in output according to the Laysperes index and no change using initial shadow prices (as shown in cases 7 and 8).20

Thus we have seen how the existence of non-market clearing pre-liberalization prices introduces potential mismeasurement. A second and independent effect has to do the accounting for the complete cessation of production of some goods after liberalization. Consider a company which produces two types of shoes with the same technology: 'good shoes' and 'bad shoes'. After liberalization, demand for the bad shoes declines sharply. But costs of the two pairs of shoes are the same, and have not changed. Thus the price of the bad shoes remains the same, and sales fall to zero. Any standard quantity index will record this fall in bad shoe production as a decline in real sales, when in fact the

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20One potentially relevant modification to the examples we have considered so far is the situation in which the government subsidized the low-quality goods through taxes on the high-quality goods, as a way of partly reducing the excess demand for high-quality goods. In this situation, the underestimate of growth by an official-price Laysperes index is attenuated or reversed. Cases 4 to 6 of the appendix make this point by calculating Laysperes indices using official prices, like case 1, but with different assumptions about the degree of cross-subsidization. In case 6, with a relatively large subsidy towards the low-quality good, the Laysperes index actually overstates the growth compared to the shadow-price index. The official price of the "low-quality" good pre-liberalization is so low because of the subsidies that the loss of this output in the second period is understated using the pre-liberalization official prices.
shadow price of these shoes, and their marginal utility, may be close to zero. 24

The examples illustrates this point. The correct shadow-price Paasche index shows a 33% increase in utility with liberalization and resulting cessation of production of good 2 and increase in production of good 1 (case 2). The quantity index which includes a price of 1 (the cost) of the unsold units of good 2 in the second period, shown in case 3, shows no change in real output.

This idea is more general than it may seem. When output represented by a given index consists of a large number of heterogeneous goods or services, a fall in this index may represent a cessation of production of a fraction of goods or services in the index, and the type of over-valuation of this decline discussed above would result. Consider, for example, the phenomenon of the use of a helicopter to transport spare parts from factory to factory because of the shortage situation. After liberalization, the cost of fuel and so on makes this more expensive, and in any case it is not needed because the parts are freely available. Thus the activity stops. This activity at pre-reform prices was valuable and contributed to value-added. At post-reform prices, it is not carried out. The value of the foregone activity, at post-reform prices, however, would be calculated at cost by GUS. Thus it is overvalued.

This effect depends on the complete cessation of production of the "low-quality" good in the post-liberalization period. Otherwise, the price of the good will be the

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24 The following hypothetical example illustrates the point:
(consumer) market-clearing price in the second period, and the standard indices retain their usual properties. Thus the examples assume linear production functions and utility. More generally, any combination of production functions and utility function such that one good ceased to be produced and sold would suffice. Thus, for example, CES utility would eliminate this effect since both goods would be produced in the second period. As mentioned above, to the extent that state enterprise priced as a mark-up over costs, including sunk costs such as (immobile) labor, many more products may have been unsalable in the post-reform environment.\textsuperscript{25}

Having looked at the potential measurement problems in Poland in 1990, we now turn to the evidence. Where we look for evidence of index number problems depends crucially on the level of aggregation of the two products discussed in the examples. First of all, the ‘goods’ may be interpreted as different two or three-digit industries. It is difficult, however, to find aggregate or industry-level evidence which is consistent with this interpretation of events in 1990.\textsuperscript{26}

There is in fact little evidence in 1990 for the type of inter-industry restructuring implied by this interpretation.\textsuperscript{27} All the index number effects rely on variance of output changes across industries. As described above, if the sort of reallocation between industries modelled in the examples was a dominant effect, we would expect to see a large variance in the change in real output across industries, with some experiencing increases or at least reaching capacity constraints if there are adjustment costs. Evidence in Berg and Blanchard (1992) shows, however, that the variance at the industry level in 1990 was fairly low. In 1990, for example, all 2-digit industries experienced declines in real sales. Furthermore, sales of 527 out of 591 industrial products in the socialized

\textsuperscript{25}This sort of pricing behavior seems pervasive, even after liberalization. Western management consultants working with Polish managers report that while managers may not be able to identify the cost of an individual product nor to distinguish between variable and fixed costs, the general pricing strategy of selling to cover total average costs persists. For example, firms are reluctant to liquidate inventories at below (total average) costs even if otherwise they cannot be sold. Thus output and sales may have been more likely to be zero in some goods in 1990.

\textsuperscript{26}Schaffer (1992) makes this point.

\textsuperscript{27}As mentioned in chapter 3, evidence is emerging of some restructuring and growth in industry since the middle of 1991. In this paper I am primarily interested with interpreting the decline in 1990, rather than events since the CMEA shock. For the latter period, however, the decline itself is clearly strongly related to the CMEA shock (see Berg and Blanchard (1992), while the recovery has not yet been carefully investigated.

71
sector fell in 1990 in physical terms. As these numbers suggest, while mismeasurement of the types we have discussed may have caused some exaggeration in industrial output, there was undoubtedly a significant decline.

If the dominant effect were inter-industry adjustment, one might expect some relationship between the pattern of output decline across industries and some measure of comparative advantage. Hughes and Hare (1991) calculate by industry the domestic resource costs of a unit of value-added at world prices, for Poland and other Eastern European countries. Attempts to find a relation between this measure and output changes have not been successful.

Most importantly, GUS data should in principle correct for this problem, since GUS uses a Paasche quantity index in its calculations of industrial indices of industrial production and changes in GDP. In other words, end-period prices (in this case 1990) are used in aggregating the contribution of each good to overall growth. Thus, GUS methodology should produce quantity indices which do not rely on 1989 prices. Furthermore, there was no cessation of production of any entire industry, so the possibility that non-market-based 1990 contaminate Paasche price indices seems remote.

There is mixed evidence on the possibility that there was an increase in efficiency in the use of raw materials and intermediate goods. Overall energy intensity of production seems to have fallen. For example, the use of energy (in giga-joules) per unit of real GDP fell by 1%, though it rose in socialized industry by 18%. More generally, "material costs" (cost of physical inputs including energy) as a share of sales in industry rose from slightly between 1989 and 1990. Nonetheless, according to GUS value-added in industry fell by slightly less than industrial production, by 22% instead of 24%. For the whole economy, gross sales fell by 15%, while use of intermediate goods fell more,

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29See Hughes and Hare (1991) for a description of this data. See also Borenstain et. al in this volume, who find that declines in individual industries in Bulgaria, Czechoslovakia, and Romania are more strongly correlated with individual country macroeconomic factors than with cross-country industry-specific effects, as might be implied by a region-wide pattern of structural inter-industrial structural adjustment. See footnote 26, 27 for a discussion of this issue.
30There is one wrinkle to this story. GUS makes its calculations in constant 1984 prices. If the changes in quantity between 1989 and 1990 are negatively correlated with the changes in prices between 1984 and 1989 across goods, the GUS index will understate real growth.
by 17%, and the reported GDP decline was 12%. As emphasized above, the value-added estimates should capture this effect.

It is clear why this effect is likely to be small. In any case, there was an almost across the board decline in gross sales. Only an even sharper decline in imports or purchases from the private sector would be consistent with smaller decline in value-added. Total dollar-denominated imports of intermediate goods fell only some 5.4%, while ruble imports fell some 34.5%. The share of ruble-denominated imports in total sales in socialized industry in 1989 was 8.8% measured at domestic prices and value-added was about 46% of total sales of industry in 1990, together suggesting that the fall in ruble imports may have accounted for a fall of value added 1 to 2 points less than the declines in sales. Purchases by the industry from the private sector would seem to be small, nor is there any reason to suppose that they fell relative to sales.

Schaffer (1992) provides a careful analysis of official data on industrial sales and production, based in part on physical production data for some 570 individual products in the socialized sector. He shows that the Paasche output index declines more than the Laysperes index. That is, the goods which had the largest declines in output were those that had increases in relative prices. This is, as he argues, inconsistent with the view that the declines in production were in those industries which were producing "low quality" goods, in that enterprises should have decreased production of those goods whose prices fell with liberalization, presumably those of "low quality".

And indeed, cases 1 and 2 of Appendix A show that where price liberalization and the end of forced substitution is the dominant effect, the correlation between shadow price changes and quantity changes is zero (and would be negative if there were declining marginal utility of consumption in each good), while the correlation between official price changes and quantity changes is positive, and therefore that the Paasche index would be larger than the (official-price) Laysperes index. Similarly, if the dominant effect were a decline in excessive production of intermediates, as in section 3 of Appendix A and as discussed above, then the relative price (using official pre-reform prices) and output of the final good would go up relative to the intermediate good.

This is thus a crippling argument against the proposition that the decline is largely due to a flight from relatively overpriced low-quality industrial goods towards other
industrial goods, as in section 1 of Appendix A, or due to a decline in excessive production of intermediates as in section 4. If, however, movements in relative prices were dominated by relative supply (cost) shocks and not the effect of the removal of price controls, then the correlation between changes in price and quantity could still plausibly be negative. In fact, relative movements in 1990 seem to be dominated by movements in cost factors.\textsuperscript{31} In particular, the relative price of energy rose significantly in 1990. Thus, the Laysperes index would be expected to show a smaller decline than the Paasche.\textsuperscript{32} However, Appendix a shows that in this case the Laysperes index actually understates the output decline compared to a utility-based measure, since the initial price of the declining, "bad" product is lower than the shadow price, because of the subsidies.\textsuperscript{33}

The Schaffer result that a Laysperes index of industrial production declines more than a Paasche index can be interpreted as evidence that there was some rationalization in the use of intermediate goods. The final good relative price falls intermediates are more sensibly used, and the quantity produced increases relative to the output of the intermediate (as in section 4 of Appendix A).

Overall, the evidence presented above is inconsistent with the idea that a large part of the output decline 1990 was due to index number problems associated with the calculation of value-added during inter-industry adjustment. The indications are that there was some more efficient use of intermediate goods, but this does not explain the official data on decline in value-added. This does not mean that the sorts of structural transformation which would have engendered these problems in 1990 are not now underway. Indeed, as discussed in chapter 3, data for the first half of 1992 suggest that there is now more structural transformation even within industry.

An alternative to the industry-level aggregation of the 'low quality'/'high quality' example is perhaps more interesting. The service sector and the private sector were repressed in pre-reform Poland. After liberalization, the socialized sector and especially

\textsuperscript{31}The correlation between rates of change of relative prices between 1989 and 1990 and the share of energy costs in sales in 1990 (the only available data), across 20 2-digit branches of industry, was 0.69.

\textsuperscript{32}Section 2 of Appendix A demonstrates this effect, modeling the cost shocks as the removal of cross-subsidies between the two industries.

\textsuperscript{33}The Paasche index is unaffected by the degree of pre-reform subsidies.
industry did decline, while services and the private sector grew rapidly. The standard growth indices produced by GUS would overstate the decline to the extent that pre-reform official prices were relatively low in services, and if there was direct undermeasurement of growth in the service sector.

Table 1.4 presents evidence that the relative price of services indeed rose in 1990. GUS implicit deflators implied by the constant and current price shares of trade in GDP, however, suggest that the relative price of output in the trade sector fell sharply. Estimating value-added in trade is particularly difficult given the rapidity of transformation and the fact that this was certainly the most repressed sector in the pre-reform economy. Ziekowski (1991) uses employment as a proxy for output in trade in the private sector, where direct measures of value added are most difficult due to the small size of the firms and lack of mandatory data reporting, while he uses standard firm-reported data on gross trade margin to calculate real output of the socialized sector. He finds that growth in GDP in trade from 1989 to 1990 is some 20% by this calculation. If, on the other hand, employment is used as a proxy for both state and private sector trade, there is no growth in 1990. GUS, in contrast, finds a decline of some 2% in total value-added in trade. The source of GUS estimates for trade, in particular how they captured output from individual businesses engaged in trade, is worth investigating further.  

Finally, it may indeed be that within individual firms (and even product lines) there was a mixture of "low-quality" and "high-quality" goods, even some which had negative value-added at world prices, as suggested by the "good shoes/bad shoes" example above. This would certainly not be captured in standard GUS price and quantity indices. The size of the effect is, however, also difficult to estimate directly. As mentioned above,

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34One way to get at this problem is to use information from pre-reform black market prices, as Osband (1992) points out. Where service sector output increases and industrial production decreases because of an elimination of price controls and forced substitution, as in cases 1 and 2 of the Appendix, the Lysyveres quantity index using black market prices should be higher than that using official prices. Preliminary results using 1987 ratios of parallel market to official prices suggest somewhat surprisingly that the parallel market premium was on average slightly higher for the goods whose output declined more in 1990. (GUS stopped publishing this information after 1987. These data were from Roberta (1992)). The example of shoes emphasizes the vulnerability of this sort of data to biases due to variation in quality within a product category. Furthermore, there is little information available on service prices. What there is suggest a relatively high premium (5.3 for dental services, 3.7 for preschool care) compared to 1.4 on average.
when account is taken of the heterogeneity of goods, such as transportation services, it is apparent that this outcome may be quite common.

Ziekowski (1991) constructs alternate estimates of the GDP decline in 1991 that partially address these issues associated with heterogeneity of goods and mismeasured prices. He constructs two physical indicators of production. The first relies on products grouped at a fairly high degree of aggregation so that a ‘product’ would in general have different quality characteristics over time. This resulted in the indices covering a large fraction of industrial production. The second method relied on measuring physical quantities of products at sufficiently low aggregation that each product has in principle the same technical characteristics. The disadvantage here is that the coverage of some sub-branches is fairly low. A variety of methods of weighing these physical indicators are used. For sectors outside of industry, he also uses a method based on construction of new physical indices and price series and finds increases higher than official estimates, which use in principle a similar method. For trade, he conservatively estimates the change in value-added as the change in total employment, private plus state. This leads, somewhat implausibly, to a tall in total GDP in trade in 1990. His most dramatic result is that the overall decline in GDP in 1990 compared to 1989 is from 7 to 8%, compared to the official 12%.

5. Conclusion.

There was a large real output decline in socialized sector industry in 1990. The suddenness of the shock renders implausible attribution of the initial decline to differences in reporting strategies of managers, and under-measurement of privatization. But measurement problems suggest that much of any increase in overall activity in 1990 may have been underestimated. It seems that while there was a sizable GDP decline, it was probably more in the range of 5 to 8% than the 12% reported in official statistics, even neglecting index-number related effects. Demand-side estimates suggest that a large part of the GDP decline is due to a reduction in inventories. As emphasized by Winiecki(1991) this will not in general be associated with a decline in welfare. There is little convincing evidence of a decline in real consumption, though with no adjustment for reduction of queuing costs, increases in variety, or improvements in quality there does seem to have been a real decline on the order of 5%.
The decline in industrial production and GDP should be interpreted with great care. The evidence does not suggest a larger decline of industries with negative value-added. But to the extent that many individual products were of little value yet persist in being priced at cost, the output decline is overestimated. Furthermore, the expansion of services and the private sector and the decline of the state industrial sector, which is precisely the sort of transformation which was widely recognized to be necessary, suggests that the value of lost output in industry as a whole may be exaggerated by standard measures.
Appendix A: A Numerical Example

(1) Forced substitution in final goods.

In this simple two-period general equilibrium example, there are two ‘industries’. Industry 1 produces a ‘high-quality good’, while industry 2 produces a ‘low quality good’. Depending on the context, the ‘goods’ could be thought of as two different types of shoes, as industries with different levels of energy intensity, as socialized and private sectors, or as industry and services respectively.

Both industries use labor to produce goods at constant returns to scale, so

\[ F_1(L_1) = L_1 \]

and

\[ F_2(L_2) = L_2 \]  

(A1.1)

Firms follow cost-plus pricing, with a margin of zero. The wage \( w \) is normalized to 1. Thus official prices are: \( P_1 = P_2 = 1 \).

Suppose there are two units of labor, and before liberalization \( L_1 = 1 \) and \( L_2 = 1 \), and from A1, \( Q_1 = 1 \) and \( Q_2 = 1 \). Turning to the consumers/workers, they have a utility function of the form:

\[ U(Q_1, Q_2) = 2Q_1 + Q_2 \]  

(A1.2)

Each worker maximizes \( U(Q_1, Q_2) \) subject to \( P_1Q_1 + P_2Q_2 = Y \), where \( Y = wL_1 + wL_2 = 2 \). (We can solve for the two workers together by symmetry.) Pre-reform shadow prices are then:

\[ P_1^* = \frac{4}{3} \quad \text{and} \quad P_2^* = \frac{2}{3} \]  

(A1.3)

Consider now what happens after liberalization, taking first the case where there are no frictions associated with labor mobility. In the post-price-liberalization equilibrium (indicated by the ‘*’) the first order conditions of utility maximization still imply that \( P_1^*/P_2^* = 2 \). Since \( F_1L_1(L_1) = F_2L_2(L_2) = 1 \), profit maximization implies that \( L_2 = 0 \)
and $L_1' = 1$. Thus, $Q_1' = 2$.

If we maintain $w' = 1$ as the normalization (the price level is indeterminate in the absence of some exogenous nominal anchor such as money) then $P_1' = 1$. The price $P_2'$ is not observed, since $Q_2' = 0$. The marginal utility to consumers of some hypothetical low-quality good would be $1/2$, so the standard price and quantity indices assume a price of $1/2$.

We will also consider an important alternative, when the second sector persists in applying cost-plus pricing in the post-liberalization economy. In this case of excess supply of good 2 after liberalization the post-liberalization price of the second good also equals 1. (Note also that if the statistical agency uses the last price available, or eliminates this good from the index, the conclusion will be similar).

The constant-utility benchmark growth index is $4/3$; real output grows as labor shifts to industry 1, which produced a more valued good with the same linear technology.

Consider now the standard price and quantity indices:

<table>
<thead>
<tr>
<th>Case</th>
<th>Paasche</th>
<th>Laysperes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Case 1: Official Price indices</td>
<td>$4/3$</td>
<td>$1$</td>
</tr>
<tr>
<td>Case 2: Shadow (pre-reform) prices</td>
<td>$4/3$</td>
<td>$4/3$</td>
</tr>
<tr>
<td>Case 3: Zero output of good 1 (post-reform)</td>
<td>$1$</td>
<td>$1$</td>
</tr>
</tbody>
</table>

Thus we the standard results that the Paasche and Laysperes indices bracket the constant utility index, and that given the initial disequilibrium the use of official prices lowers the Laysperes but leaves the Paasche index unchanged. (This is the result emphasized by Osband (1992). Finally, note that if the price of the 'low quality' good stays high in the second period, the Laysperes index is unaffected while the Paasche index falls. In this example the Paasche and the Laysperes indices are below the constant utility index and below what they would be if market prices were used before and after.

Note that the correlation of official price changes with quantity changes is positive in case 1, while the correlation of black market prices and quantity changes is zero (case
2). In case 3, the correlation is zero.

(2) Pre-reform Cross Subsidies.

In the above model, first period relative prices were fixed at 1 by the assumption of linear production functions and fixed relative wages. This led to one good, the ‘high quality’ good, being in short supply. Here we modify this set of assumptions by assuming that the government attempted to partially alleviate the shortage situation by taxing the high-quality good and subsidizing the low-quality good, in a budget-neutral way. These subsidies have the effect of bringing official prices closer to black market prices.

Thus,

\[ P_1 = (1+T) \cdot W \quad \text{and} \quad P_2 = (1-T) \cdot W \]  \hspace{1cm} (A1.4)

The ratio of relative official prices is therefore:

\[ k = \frac{(1+T)}{(1-T)} \]  \hspace{1cm} (A1.5)

Note that the assumption that \( L_1 = L_2 \) assures that such a scheme is neutral for the budget.

The second period is unchanged from above.

The resulting official price indices (corresponding to case 1 above) are:

<table>
<thead>
<tr>
<th>Official price indices with subsidies such that:</th>
<th>Paasche</th>
<th>Laysperes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Case 1: ( k = \frac{3}{2} )</td>
<td>4/3</td>
<td>6/5</td>
</tr>
<tr>
<td>Case 2: ( k = 2 )</td>
<td>4/3</td>
<td>4/3</td>
</tr>
<tr>
<td>Case 3: ( k = 3 )</td>
<td>1</td>
<td>3/2</td>
</tr>
</tbody>
</table>

The correlation of official price changes with quantity changes is now negative if \( K > 2 \). In this case the Laysperes index actually overstates the production decline.

\[^{35}\text{It is negative when there is declining marginal utility of consumption in each good.}\]
(3) Costly Adjustment

Suppose now that adjustment of labor between sectors is not frictionless. Specifically, suppose that only quantity $1/2$ of labor can adjust find a new job in the ‘high-quality’ sector in the second period, as opposed to 1 unit as assumed so far.

The only other assumption we must make concerns relative wages in the two sectors. I will assume here that there is downwards relative wage rigidity. We know that in fact the real wage has fallen somewhat in industrial sectors which have been in relative decline, but there is still surplus labor in these sectors and productivity has fallen sharply. This is thus an informative extreme case.

The only difference from the first case is that second period output of the ‘high-quality’ good is now $3/2$, not 2 as before. Specifically, the constant-utility growth benchmark is now 1, since the efficiency gain in moving some labor into industry 1 is balanced by the unemployment of some labor which has yet to make the switch.

Consider then the standard price and quantity indices:

<table>
<thead>
<tr>
<th>Case</th>
<th>Paasche</th>
<th>Laysperes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Case 7:</td>
<td>1</td>
<td>3/4</td>
</tr>
<tr>
<td>Case 8:</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Case 9: Zero output of good 1 (post-reform)</td>
<td>3/4</td>
<td>3/4</td>
</tr>
</tbody>
</table>

(4) Intermediate Goods

Consider again a simple two-period economy with two industries. Industry 1 produces a final good ("cars") using labor and good 2 while industry 2 produces an intermediate good ("steel") using labor.
\[ Q_1' = F_1(Q_2', L_1') = Q^* L^\beta, \quad \text{where} \quad \alpha + \beta = 1 \]
and
\[ Q_2' = F_2(L_2') = L_2' \]

Output of industry 2 is linear in the labor input, while industry 1 is Cobb-Douglas with constraint returns to scale.

In contrast to the earlier example, only good two is consumed; the entire output of industry 2 is used as an input to industry 1. With only one final good, there are no index number problems in calculating real value-added in the economy. We concentrate here on problems with indices of "industrial production".

One can easily solve for the optimal allocation of the fixed amount of labor between the two industries, as will obtain after liberalization. As in the above examples, there are 2 units of labor to allocate. The market outcome maximizes the output of industry 1, yielding the following solution:

\[ P' = [P_1', P_2'] = [1, \alpha^{-\beta}; \beta^\alpha] \]
\[ L' = [2\beta, 2\alpha] \]

and
\[ Q' = [2\alpha^\beta, \beta; 2\beta] \]

As above, the pre-reform equilibrium is characterized by an arbitrary allocation of labor and hence output, and price setting to cover costs. This example illustrates a situation where there is initially 'too much' of industry 2 output, as we will see. Since \( \alpha < 1/2 \) by assumption, this is consistent with an allocation such as:

The government thus sets prices to cover costs:

Consider now the shadow prices which support the government allocation. From
\[ L = [1, 1] \]
\[ Q = [1, 1] \]  \hspace{1cm} (A1.8)

\[ P = [1, 1] \]  \hspace{1cm} (A1.9)

profit maximization and equilibrium in the final good market it is easy to show that the shadow price vector is:

\[ P^* = \left[ \frac{1}{(1-\alpha)}, \frac{\alpha}{(1-\alpha)} \right] \]  \hspace{1cm} (A1.10)

We can draw three conclusions from this example:

(1) The initial allocation is inefficient, in that too much of good 2 is produced and used. Unsurprisingly, then, the liberalization and reallocation from industry 2 to industry 1 increases total output. If \( \alpha = 1/4 \), for example, output of the final good increases by 14%.

The pre-reform equilibrium must be supported by incentives for enterprise management and government officials to maximize output at the expense of profit. For \( \alpha = 1/2 \), the official price of good 2 is above the shadow price, and if industry 1 were maximizing profit then good 2 would be in excess supply. In the equilibrium described above, industry 1 purchases more than the profit maximizing amount of good 2. Note that if the enterprise/industry faced a 100% tax rate and the decision makers were encouraged to maximize output, then good 2 would have been in short supply even at the relatively high official price which characterizes the equilibrium.

(2) Neither of the available quantity indices correctly measure this increase, for different reasons.

The Laysperes index using shadow pre-reform prices registers only a 1% increase in real industrial production. This is simply because it gives weight to the intermediate

\[ w^* = \left[ 1, \frac{\alpha}{(1-\alpha)} \right] \]

\[ 83 \]

\[ ^{36} \text{Note that:} \]

\[ w^* = \left[ 1, \frac{\alpha}{(1-\alpha)} \right] \]
good 2, emphasizing the point that these indices do not purport to measure real value-added.

The more interesting lessons come from looking at the indices which use official prices. The Laysperes index using official pre-reform prices registers a 7% fall in real industrial production. This is because the official price of good 2 is too high compared to the shadow price, as described above. Thus, too much weight is given to the fall in good 2 output compared to the increase in good 1 output.

Finally, the Paasche index registers an even bigger 9% fall, despite using post-liberalization market prices. Here the problem is the standard one with a Paasche index: the marginal value of good 2 is higher in the second period because of the decline in production, so the weight given by the index, based on this marginal value, is higher than the Laysperes.

(3) This analysis applies only to indexes of industrial production, such as those computed in Schaffer (1992) and the GUS index of industrial production, not, in principle, to GUS estimates of value-added (GDP) in industry.
Appendix B: Data and Methodology for Estimates of Real Consumption and GDP Change

1. Estimation of the change in real consumption, 1989-1990

1.1 Sources

The most important source of data is the GUS household budgetary survey. This survey consists of a rotating random sample of over 8000 households in Poland. Through 1990 it excluded those working on their own account as well as households of persons involved in military or police service.

1.2 Weights

The change in real consumption is calculated using weights based on the results from the budgetary survey for 1989 and indicators of change in real consumption for each category.

One of the principle problems with this approach is that the base-year weights are unsatisfactory. First, this method ignores substitution in consumption, which is likely to have been important. This standard method therefore tends to overstate the real consumption decline. Second, it essentially ignores the services from housing, since rents and payments for housing were highly subsidized in 1989 and hence had a very small weight. Since housing services fell only slightly if at all, again this tends to overstate the real consumption decline by using fixed, based-period weights.

1.3 Food and clothing/shoes

Consumption of physical quantities is taken directly from the survey.

1.4 Housing and related expenditures

The most important sub-category for which there is data is electrical/mechanical goods for the home. The data comes from the GUS survey information on consumer durable stocks. Services derived from these goods are assumed proportional to stocks, and the indices for the relevant types of durables (washing machines, vacuum cleaners, sewing machines, refrigerators and freezers) are weighted by retail sales in 1989, with weights covering 40% of total retail sales in this category.

1.5 Rents and payments
These are assumed to be constant (in real terms). This should in principle represent services from housing, which has presumably remained roughly unchanged.

Note that housing is an exception to the procedure of using the available information from subcategories to calculate an index for the category, then aggregating the categories using the full weights. Because of the size of the missing categories and because the sub-categories we have covered have been perhaps unusually positive, we reduce the effective weight of ‘housing’ to the weight of the covered sub-categories only.

1.6 Fuel, heating, and hot water

Data on tons of gas, watts of electricity, and gallons of hot water used by households comes from GUS (1991b). Separate indices for each are averaged.

1.7 Leisure

Newspapers are measured as the number of titles published. The number of schoolbooks and other books published (‘other published matter’) are published by GUS.

1.8 General electronic equipment

Consumption is derived from household budgetary survey data on stocks of durables, with consumption assumed proportional to the stock. (Of course, no allowance is made for the quality improvements which must have taken place). Indices for radios, stereo radios, black-and-white and color televisions, and tape recorders were combined with weights derived from retail sales data for 1989. The goods used cover 70% of retail sales reported for this category for 1989.

1.9 Services

Culture and art are measured as the number of concerts and performances given. Tourism and sport activity corresponds to data from the household budgetary survey.

1.10 Transport and communication

Travel and transport indices come from total passenger miles. PTT derives from an simple average of intercity telephone conversations (with an index of 1.00) and number of ordinary letters sent (with an index of 0.86).

2. Inventories.

GUS provides nominal end-of-year stocks of inventories as well as sales. 1989
GDP, used to calculate changes as a share of GDP, comes from GUS estimates, except for inventory investment itself.

Inventory change as a percent of GDP and months of sales are calculated by deflating the end-of-period stocks by a 5-month backward moving average of the producer price index (where average prices in 1989 = 1), then comparing to 1989 GDP and current year sales respectively.

Trade inventories in the private sector result from assuming that the share of the private sector in trade at the end of the year is equal to the end-of-year share of the private sector in employment in trade. The private sector is assumed to hold 50% of the inventories per worker of the state sector.

3. Calculation of change in real GDP from supply side.

3.1 Shares

1989 levels and hence shares come straight from GUS according to the SNA system, except for the breakdown of industry into private and socialized sectors. This is inconsistent with the shares used for the demand-side estimation of change in real GDP, where we adjusted 1989 inventory investment as described in section 4 below. This is unavoidable because we did not have enough information to make the adjustment by sector.

Shares for the private and socialized sector in industry come GUS data on levels of sold production by sector.

3.2 Growth rates

3.2.1 Industry

Estimates for the socialized sector are from the index of industrial production in Schaffer (1992). The growth of real private sector industry is simply assumed to be 5%, a conservative estimate given corresponding employment growth of 9% according to GUS.

3.2.2 Construction, Transportation, Agriculture

GUS estimates of change in value-added in constant prices are used.
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Papers (US).


Chapter 3. Stabilization and Transition; Poland 1990–1991

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1An earlier version of this chapter was written with Olivier Blanchard and presented at the NBER conference on Eastern Europe, February 1992. I thank Mark Schaffer for his many comments, and Mariusz Banaszuk, Pawel Dobrowolski and Jan Rajski for their help with the data.
Poland has had two tumultuous years. Since stabilization and price liberalization in January 1990, it has been hit by two large shocks. The first, in early 1990, was associated with stabilization. The second, in early 1991, was associated with the collapse of Soviet trade. Those shocks have shaped the process of transition. State firms, which had a lot of adjustment to do, have not done well. In contrast, the private sector has grown fast, but from a narrow and uneven base. The issues for the future are clear: how and how much of the state sector will adjust and survive, and whether the private sector can grow fast and wide enough.

Chapter 1 has shown how the broad movements of relative prices and inter-sectoral adjustment are consistent with a simple model emphasizing the establishment of a convertible currency, price liberalization, elimination of excess aggregate demand and the end of the shortage economy. Chapter 2 looked more carefully at the vital question of the measurement of output and standard of living during liberalization. It concluded that while official data significantly overstate the decline in output and real consumption and the standard of living, there remains a large decline in industrial production in early 1990. A fuller understanding of this and some of the other related macroeconomic issues discussed in chapter 1 is the goal of this chapter. Thus, having sketched the landscape, I now ask five more specific questions. (1) What were the causes of the output decline of early 1990? Were they primarily due to the dislocations implied by the move to a market economy, or instead to a demand contraction? (2) What were the causes of the other sharp decline in output at the beginning of 1991? What was the role of the CMEA collapse? Was the effect through dislocations or through a fall in external demand? (3) How should one think of the evolution of state firms over the last two years? Have we seen the orderly decline and transformation of a sector which was too large in the first place? Or have we seen an increasing paralysis of those firms, without much restructuring? (4) Where and how has the private sector grown? Is it filling some holes and not others, is it replacing or complementing the state sector? (5) Why did prices increase so much at the beginning, and why has inflation been so persistent since? To what failures of policy if any can it be ascribed? The answers to these questions are critical not only in helping design reform plans for other countries, but also in assessing
the issues facing Poland in the near and medium term. We take these five questions in turn.

2. The Initial Decline in Output

(1) With the implementation of the reform program in January 1990, there were many reasons to expect a drop in output, surely more so that in most stabilizations:

It was plausible to expect a large drop in aggregate demand. In addition to conventional reasons, in particular the fiscal consolidation and the decrease in money growth central to the stabilization program, there are others specific to stabilization in this unusual type of economy. Dishoarding not only of traditionally high inventories in Soviet-type economies, but also of inventories accumulated by firms and people in anticipation of price liberalization might lead to a fall in sales, and a further fall in production given sales. Unusually high uncertainty as to what the future holds may lead workers to increase saving and firms to suspend investment plans. Despite the low exchange rate, the sudden availability of foreign goods might lead to a sharp increase in imports and a fall in domestic demand. And, in contrast with the situation in other Eastern European countries at the time of stabilization, partial price liberalization and the high inflation of 1989 had left little if any "overhang": the ratio of financial assets to income for households was only 3.7 months in December 1989.

But there were also reasons to expect that the large reallocation of demand implied by the change in relative prices and the elimination of rationing also would lead to a decline in aggregate output: sectors facing a decrease in demand would decline, sectors facing an increase might be unable to respond. There were even good reasons to fear widespread supply constraints, as the reform program might lead for example to large dislocations in the distribution system, preventing inputs from going to firms, or goods from getting to consumers. ²

(2) In the event, there was indeed a sharp drop in output. At least in the state sector — for which reliable monthly data are available — the decrease in sales was nearly

²As emphasized in chapter 1, one of the goals of the reforms was the growth of the private and service sector. The question of interest here is the reason for output decline in the state sector, particularly industry. The hypothesis that the decline in demand for state sector output discussed here was the counterpart of increases in demand for services and private sector output is addressed in chapter 2.
instantaneous. Sales from industry were down by 20% in January, by 27% for the first quarter. The decrease was across the board: 93% of all 3-digit branches had declines over the first quarter\textsuperscript{3}. Within industry, the decrease was largest in consumer goods, and smallest in heavy manufacturing and mining.\textsuperscript{4}

That there was also a large reallocation of demand is not in doubt. The standard deviation of sales changes across 3-digit branches in industry in the first quarter of 1990 was 14%, a large number by normal Western standards.\textsuperscript{5} And the standard deviation of relative price changes was 23%. But the evidence, to which we now turn, suggests that the output drop was mostly due to a shift in aggregate demand.

(3) First, firms themselves surely perceived a sharp drop in demand. Surveys of several hundred state enterprises reported in Gorski et al (1990) show that, whereas in November 1988, 87% of firms had perceived their market as being either balanced or in "excess demand", in February 1990, 97% perceived it as either balanced or in "excess supply", with 48% in the category of "State of relative surplus: relative lack of demand in relation to real possibilities of production; inventories being amassed; price discounts, etc." Only 9% indicated any inability to meet demand\textsuperscript{6}. Firms in a survey of about 700 industrial enterprises carried out every few weeks from 1989 to 1991 (Business Survey (1990)) stated that of the "factors limiting the growth of output in the enterprise", supply and employment shortages were the limiting factors in 62% of firms in October 1989, 37% in January 1990, and 10% by April. There is little qualitative evidence that intersectoral shocks were a dominant factor: again from the same survey, there was no increase in the fraction of firms reporting increases in orders or supply constraints on output in January. Finally, in their study of 9 Polish firms, Jorgensen (1991) summarize the managers' perceptions of the initial output drop as coming nearly entirely from demand, with dislocations, credit and other factors as "irritants".

(4) Had supply bottlenecks and other disruptions been prevalent, many firms would

\textsuperscript{3}This is 79 out of 85 branches in industry. The sample of branches excludes branches with growth either below minus 60% or above 50%, in which case we suspect the change to reflect reclassification rather than actual change, and branches with sales of less than 100 billion zloty in the last quarter of 1989.

\textsuperscript{4}See Figure 1.5 in chapter 1.

\textsuperscript{5}The sample of branches is the same as in the previous footnote.

\textsuperscript{6}This survey was conducted once in November 1988 and once in March of 1990.
have operated along the vertical portion of their supply curve, and thus prices would have risen to clear markets. Given incomes policy and the resulting sharp constraints on wage increases, not only prices but also markups of prices over costs should have gone up. Also, an increase in the exercise of monopoly power would of course have increased markups. It turns out that while prices were indeed sharply higher in January, something we shall look at in detail in section 6, the increase is more than accounted for by the increase in costs, and markups of prices over costs were sharply down. The average markup of prices over accounting costs for state firms was down from 40% in the last quarter of 1989 to 31% in the first quarter of 1990. And the markup was down in 66 out of 85 branches at the 3-digit level.

(5) A cleaner test along the same lines is provided by the behavior of finished goods inventories rather than markups. If production bottlenecks were behind the decrease in output, one would have expected firms constrained in production to satisfy sales as much as possible out of inventories, thus inventory to be decumulated. But if demand contraction was the proximate cause of the output decline, one would have expected instead firms at the beginning to both cut production and accumulate inventories.

Thus we look at both the aggregate and the cross sectional evidence on inventories. The examination is fraught with measurement problems, the main one being the issue of proper deflation of existing stocks. Two main conclusions emerge:

- While the evidence is ambiguous on the movement of inventories in trade at the beginning of the year, there clearly was a large increase in finished goods inventories in industry at the beginning of 1990, followed by decumulation later in the year. Turning to the cross sectional evidence, 90% of 3-digit branches in industry had an increase in finished goods inventories in the first quarter.

- A cross section regression of changes in inventories on initial inventories and changes in sales shows a clear relation between sales declines and inventory accumulation. This suggests that decline in demand and not difficulties with production

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7This conclusion is consistent with the evidence from data on quantities produced. Schaffer (1992b) constructs a production index for industry directly from quantity data and concludes that the decline in sales was much larger than that in production in January 1990.
was the proximate cause of the fall in sales. The sector where the relation appears not to hold is the food processing sector, where indeed anecdotal evidence suggests that there were serious distribution problems in early 1990.\(^8\)

Because a number of researchers have looked at the behavior of finished goods inventories in early 1990 and have reached surprisingly different conclusions, a careful examination of this issue is worthwhile. There are two reasons why inventory data in 1990 are hard to interpret. The first is a standard measurement issue. Inventories are not valued at current but at historical cost. Thus, the level of inflation affects the reported value of inventories, and changes in inflation affect the reported value of inventory investment. And there were indeed large changes in inflation during 1989 and 1990. The second is also a measurement issue specific to the transition. There has been a steady privatization of the trade sector. As inventory numbers cover only the state sector, part of the measured decrease in trade inventories was in fact a transfer to the private sector.

With these two points in mind, Table 3.1 reports finished goods inventories in trade, industry, for December 1989 and January, March and December 1990. It gives two numbers for each case. The first gives inventories deflated by the current producer price index. The second gives inventories deflated by the average producer price index over the last 2 months, including the current one. The first number adds trade and industry inventories obtained using the current deflator, the second adds trade and industry inventories obtained using \( n = 2 \). Inventories in trade, industry and total are normalized by sales in trade, industry and total respectively, for December 1989 (not by current sales, which were sharply lower in 1990). The last column gives unnormalized inventories for December 1990.

One main conclusion emerges from the table: there was an increase in finished goods inventories in industry, with accumulation in January and partial decumulation later. The evidence of an initial accumulation of finished goods inventories is an indication that industry, at least, was hit primarily by an adverse demand shock. What

\(^8\)This sector is also the only one where the private sector was sufficiently developed initially to seriously encroach on the state firms within the first quarter. A rapid collapse of the state sector through small-scale privatization and invasion by private actors could cause a positive correlation between real sales and inventory changes as inventories are liquidated to the growing private sector.
Table 3.1. Finished goods inventories.

<table>
<thead>
<tr>
<th></th>
<th>$I/S_{1989-12}$</th>
<th></th>
<th></th>
<th>$I_{1990-12}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industry</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>n=1</td>
<td>0.16</td>
<td>0.28</td>
<td>0.26</td>
<td>0.22</td>
</tr>
<tr>
<td>n=2</td>
<td>0.17</td>
<td>0.36</td>
<td>0.24</td>
<td>0.22</td>
</tr>
<tr>
<td>Trade</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>n=1</td>
<td>1.15</td>
<td>0.72</td>
<td>0.79</td>
<td>0.78</td>
</tr>
<tr>
<td>n=2</td>
<td>1.34</td>
<td>0.97</td>
<td>0.79</td>
<td>0.79</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>n=1</td>
<td>0.60</td>
<td>0.53</td>
<td>0.54</td>
<td>0.50</td>
</tr>
<tr>
<td>n=2</td>
<td>0.70</td>
<td>0.71</td>
<td>0.54</td>
<td>0.51</td>
</tr>
</tbody>
</table>

Notes: The first four columns give inventories in a given month normalized by sales in 1989-12. n refers to the method of deflation of inventories. n = x indicates deflation by the average producer price index over the last n months, including the current month. The last column gives inventories in trillions zl in December 1990.

happened to total inventories (including trade) is less evident. It is not clear whether in the Polish data final goods inventories were revalued each month. Given the January inflation of some 100%, measurement of real inventories through deflation of nominal stocks is extremely sensitive. My understanding is that this was not generally the case, and that some sort of one or two-month distributed lag deflator is the most accurate.\(^9\) In this case, as the last line of Table 3.1 shows, total final goods inventories fell slightly even in January of 1990.

Because of the sensitivity of estimates of total inventories to assumptions about deflation, other approaches are useful. One is to look at data on physical inventories in

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\(^9\) This reflects conversations with World Bank and GUS staff as well as Mark Schaffer. It should be emphasized, however, that there seems to be no clear answer to this question.
trade, since that is where the uncertainty lies. The available evidence, patchy as it is, suggests strongly that real inventories of consumer goods rose sharply in January, before falling quickly as retailers adjusted stocks in response to the new environment. In a monthly survey of nine state trade enterprises used to monitor developments in early 1990, stocks of TV's were up by 30% in January over December, refrigerators by 23% and washing machines by 11%. The same survey also shows a large decumulation later in the year. By May, stocks were 27%, 27%, and 40% respectively below their December levels. This evidence, then, suggests an initial, quickly reversed, accumulation of inventories in trade, followed by large decumulation later in the year. The aggregate data from Table 3.1 also suggest a steady decline in trade inventories throughout the year, with or without the inflation adjustment. The initial surge in inventories suggests that the initial shock was not to industry from the supply side. Calvo and Coricelli (1992a and 1992b) have emphasized the potential importance of high interest rates and credit restrictions in explaining the inventory decumulation that took place during the year. Such effects were no doubt at work.

The difficulties in measuring real inventories in January combined with the very partial nature of the physical inventory evidence render the above conclusion about the initial surge in inventories quite uncertain. Therefore I now turn to the cross sectional evidence, which is more powerful. The question is whether branches in industry which had larger declines in sales had, ceteris paribus, larger accumulation of finished goods

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10The source for this data was the Ministry of Domestic Markets.

11The data on industry alone and on aggregate inventories do not rule out the possibility that the dominant event in January of 1990 was a supply shock specific to the trade sector, such as the increase in transportation costs due to higher gasoline prices or the sharp rise in the cost of trade credit upon which trade enterprises were particularly dependent. One piece of evidence that is suggestive of this possibility is the apparent fall in total trade inventories in early 1990, though of course the above-mentioned problems with this measurement, as well as the contradictory physical inventory data, make conclusions particularly difficult here. Further examination of this question is justified, including a close examination of trade margins and the importance of the interest rate and credit shock to the trade sector. Note, however, that this possibility is distinct from the type of general supply shock to industry on which I focus in the text. The policy implications, for example, are quite different. The policy discussion in the literature about credit policy has focused on the cost and quantity of credit granted to industry, and the conclusions in the text about the nature of the shock to industry are independent of the issue of bottlenecks in trade. Finally, the rapid transformation and privatization of trade was one of the earliest and most important gains from the liberalization, and a policy of support for existing trade units might have jeopardized these gains.

12In chapter 1 it was calculated that the bulk of the national income decline in 1990 could be accounted for by inventory decumulation.
inventories, using data on sales and inventories of state firms for branches at the three-digit level, for the last quarter of 1989 and the first quarter of 1990. The regression is specified as:

\[ (I_u - I_{u-1})/S_{u-1} = aI_{u-1}/S_{u-1} + b(S_u - S_{u-1})/S_{u-1} + e_i \] (3.1)

\( I_u \) stands for inventories in branch i at the end of 1990-1 and \( S_u \) for sales during 1990-1, both deflated by the price of the output of branch i at the end of 1990-1. \( I_{u-1} \) and \( S_{u-1} \) stand for the same variables in 1989-4. The specification allows for two effects. The first is the desire by firms to decrease inventories from their previous level due to the elimination of the pervasive excess inventories held in the pre-liberalization shortage economy of 1989.\(^{13}\) We expect \( a \) to be negative. The second reflects the effects of sales on inventory accumulation. If firms were primarily affected by an adverse shift in demand, we expect a larger decrease in sales to lead to larger accumulation, thus \( b \) to be negative.\(^{14}\) If firms were primarily affected by supply constraints, we expect tighter constraints to result in low sales and more decumulation, thus \( b \) to be positive. The results of estimation are given in Table 3.2:

The first regression in Table 3.2 establishes the basic cross sectional fact about inventory and sales, and offers support for the hypothesis that industries were primarily affected by an adverse shock in demand. It shows that larger sales declines were associated with inventory accumulation. The result holds across subsamples, except for the food processing industries, where supply disruptions appears to have played a role as both sales and inventories decrease. The second regression excludes food processing and shows a much more significant relation. Thus, the interpretation of the data is that while firms wanted to decrease inventories (\( a \) is negative), the decline in sales was such as to lead, on net, to an increase. For the branches in our sample, the increase in real inventories from 89-4 was equal on average to 12% of monthly sales, and more than 90% had an increase in inventories.

\(^{13}\)See, for example, Kornai (1992) on the pervasiveness of excess inventories in Soviet-style economies.

\(^{14}\)I am assuming here that the change in sales in early 1990 was unexpected by the enterprise managers. Surveys of Polish managers conducted in late 1989 and reported by the Center for Research on Economic Tendency and Markets (1990) indeed suggest that they expected no particular change in sales through the big bang.
Table 3.2. Sales, inventories and credit.

<table>
<thead>
<tr>
<th>Dependent variable: ((I_{it} - I_{i,t-1})/S_{i,t-1})</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th>(R^2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>(I_{it}/S_{i,t-1})</td>
<td>((S_u - S_{u,t-1})/S_{u,t-1})</td>
<td>((C_u - C_{u,t-1})/S_{u,t-1})</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OLS</td>
<td>0.07</td>
<td>-0.36</td>
<td>-0.07</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(5.0)</td>
<td>(-3.8)</td>
<td>(-1.6)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OLS *</td>
<td>0.05</td>
<td>-0.03</td>
<td>-0.10</td>
<td>0.05</td>
<td></td>
</tr>
<tr>
<td>(3.8)</td>
<td>(-0.2)</td>
<td>(-2.4)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OLS</td>
<td>0.05</td>
<td>-0.09</td>
<td>-0.08</td>
<td>0.31</td>
<td>0.39</td>
</tr>
<tr>
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<td></td>
<td></td>
</tr>
<tr>
<td>IV</td>
<td>0.06</td>
<td>-0.14</td>
<td>-0.07</td>
<td>0.26</td>
<td>0.38</td>
</tr>
<tr>
<td>(5.0)</td>
<td>(-1.4)</td>
<td>(-2.1)</td>
<td>(4.1)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Dependent variable: \((S_u - S_{u,t-1})/S_{u,t-1}\)

| IV | 0.21 | 0.00 |
| (15.4) | (1.4) |  |

Notes: t-statistics in parentheses. Sample for all regressions except regression *:
branches in industry, excluding coal, fuel and electric power, with rates of change
in sales between minus 60% and plus 50% from 1989-4 to 1990-1, and sales in
excess of 100 billions zl. There are 85 observations. Regression * further
excludes food processing, and has 70 observations. The indices \(t\) and \(t-1\) refer to
the quarters 1990-1 and 1989-4 respectively. \(S_u\) are sales for branch \(i\) for quarter
\(t\), deflated by the average price of output of branch \(i\) during the quarter. \(I_u\) and \(C_u\)
are inventories of finished goods and the stock of working credit* (bank credit not
associated with a particular investment project) for branch \(i\) at the end of quarter \(t,
\) deflated by the price of output of branch \(i\) at the end of quarter \(t\). The IV
regressions instrument the credit variable by the ratio of credit to sales at the end
of 1989-4.
(6) Cross sectional data on 3-digit branches can be used to explore further an hypothesis advanced by Calvo and Coricelli(1992a). Examining the Polish macroeconomic evidence, they suggest that part of the output decline was indeed due to supply constraints, themselves due to the sharp fall in working credit preventing firms from buying inputs needed in production. Thus, I first add the change in working credit to the inventory regressions, and estimate the relation between inventory changes, sales changes and working credit changes by either OLS or by using initial working credit at an instrument for changes in credit. Working credit has a strong effect. Given sales, firms which were more credit constrained in the first quarter of 1990, satisfied those sales more from inventories than from production. There is only a weak relation, however, between sales themselves and working credit. The evidence does not appear to support a strong effect of working credit on sales through the supply side.

These regressions are not the last word on this issue. Calvo and Coricelli have used data from Berg and Blanchard(1992) to estimate alternative specifications. They have found that, if the specification is one of the rate of change of sales on the rate of change of working credit, the relation between sales and working credit is stronger than the relation reported above. Appendix A elaborates and interprets the Calvo and Coricelli hypothesis and confronts the relevant evidence. It concludes that there is little supportive direct evidence and much contradicting the idea that a credit crunch limiting output through a contraction of supply initiated the output decline. More general forms of the credit-crunch hypothesis which emphasize imperfect credit markets as a transmission mechanism deserve more research. There are no clear policy implications of the Calvo and Coricelli hypothesis beyond the recognition that a better financial system would indeed be better.

(7) Turning to the causes of the decrease in demand, the evidence is clear that it was not a sudden shift towards imports or a loss of export markets, as was to be so dramatically the case in East Germany later in 1990. At the new exchange rate, both exports and imports were up, but with a net trade surplus(or at least a measured trade surplus, as many imports of consumption goods surely went unrecorded) as a result. In support of this point, Berg and Sachs (1992) show that there is no positive relation between import penetration and declines in output across 2-digit industries, either in 1990 or in 1991.
The proximate sources of the demand contraction were decreases in both consumption and investment demand. Despite a large decrease in real wages, and thus a larger decline in disposable income than in output, personal saving was up substantially for the first half of the year. Just as for wage restraint which is documented in section 6, this may have been because of uncertainty about the future. It may have also been from the desire to rebuild real balances. Over the year, consumption partially recovered in line with real wages, but and inventory decumulation and declining investment kept demand and output low.

(8) The conclusion that a drop in aggregate demand rather than dislocations was in large part responsible for the initial output decline implies that one cannot avoid the question asked by Bruno(1992): could this sharp contraction have been partly avoided? The answer must be, with the benefit of hindsight, a qualified "yes". Profit taxes, coming largely from paper profits due to the valuation by firms of inputs at historical cost and from the revaluation of foreign deposits, were larger than expected. As argued later, the effect of the large profit taxes was probably to lead to low nominal wage increases, thus to lower disposable income of workers and lower consumption demand. In retrospect, the budget surplus was probably both contractionary, and the source of pressures for increased spending later in the year, a dangerous course as high revenues, largely due to inflation, were temporary. But hindsight is key here. Guessing what would happen to aggregate demand, the trade balance and capital flows in January 1990 was at best a difficult exercise, and credibility required erring, if anything, on the side of excess\textsuperscript{15}.

3. The collapse of CMEA and the second output decline.

In January 1991, the Polish economy was shaken by another major shock, the breakdown of trade within the CMEA.\textsuperscript{16}

(1) Until the end of 1990, trade between most socialist countries had taken place under CMEA arrangements. Prices were set in a common unit of account, the transferable

\textsuperscript{15}Dornbusch(1991) models a related situation in which a government rationally chooses the degree of (costly) adjustment to balance the chance of failure of an uncertain reform with the cost of adjustment and the costs of failure. In equilibrium countries adjust enough to yield a reasonable chance of success. In the event of success the adjustment will generally look excessive ex post.

\textsuperscript{16}see Rodrik (1992) for a more detailed examination, looking at Poland, Hungary and Czechoslovakia. A detailed description of CMEA trade is given in World Bank(1989).
ruble, and the general principle was one of balanced trade. While relative prices in rubles were supposed to reflect relative world prices, the relative price of finished goods in terms of materials was substantially higher than the relative world price. Thus, a country like Poland for which the share of industrial goods in exports to the Soviet Union was more than 80%, and the share of raw materials in imports from the Soviet Union was more than 55% had particularly favorable terms of trade under CMEA arrangements.

Was Poland buying cheap oil from the Soviet Union --compared to world prices--, and selling normally priced industrial goods, or was it instead buying oil at world prices and selling industrial goods above world prices? This is, from an economic point of view, irrelevant. With balanced trade between the two countries, all that mattered was the terms of trade. But the answer matters in understanding what happened to measured CMEA exports and imports when there was a shift to world-dollar prices. What is needed is the exchange rate between the transferable ruble and the dollar. There were two such rates. The first was the official CMEA rate, which was in 1990 about 1.5$ per ruble. At that rate, oil was priced in line with world prices, and finished goods were priced much above world prices. The second was the rate used by the National Bank of Poland (NBP), which was .22$ per ruble in 1990. At that rate, both oil and finished goods were underpriced, oil more so than finished goods. To consolidate ruble and dollar transactions, Polish statistics used the second rate. At that rate, the share of trade with the USSR in 1989 was 21% for exports and 18% for imports. At the official CMEA rate, the numbers were 46% and 37% respectively.

It was widely understood in 1990 that the end of the year would mark the end of CMEA trade arrangements, and would be associated both with a terms of trade shocks and a decrease of trade between CMEA countries. And indeed, throughout 1990 there was already a steady shift in ruble to dollar trade within CMEA, varying in degree across CMEA partners. While in the first quarter of 1990, 20% of exports and 23% of imports with the Soviet Union were settled in dollars, the numbers were 44% and 76% at the end of the year.

At the end of 1990, a careful survey was conducted, asking Polish and Soviet

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17This view differs with Rodrik’s position that the “right” rate is, in any useful sense, the official rate set by the CMEA countries (the so-called “IBEC” rate) of approximately 0.6 transferable rubles per dollar.
importers and exporters what quantities and at what prices they thought they would import and export after the shift (Rosati (1990)). The first conclusion was that, compared to pre-shift dollar prices using the NBP rate to convert rubles to dollars, import prices would increase by a factor of 4, export prices by a factor of 3, thus leading to an adverse terms of trade shift. The second conclusion was that the volume of Polish exports to the Soviet Union would decrease by 20%, the volume of Polish imports from the Soviet Union would also decrease by 20%.

(2) The shock to the economy turned out to be larger than this survey anticipated. 18

The increase in import prices from former CMEA countries for the first two quarters of 1991 compared to the first two quarters of 1990 was 161%, the increase in export prices only 23%. 19 These smaller than expected increases in export prices probably reflect the fact that part of the adjustment had already taken place in 1990, and that firms had been overly optimistic as to the quality of their goods. The decreases in import and export volumes were 39% and 40%, thus larger than expected. The decrease in the value of exports to the Soviet Union was particularly large; in contrast, the value of trade with Hungary and Czechoslovakia was only marginally down. It appears in retrospect that much of the decrease in volume was due not so much to a shift in CMEA country demand towards non-CMEA products, but rather to the collapse of the Soviet Union and to the payments mechanism. As a result, the overall trade balance, which had shown a surplus of about 1 billion $ in the first two quarters of 1990, was balanced in the first two quarters of 1991. 20

18 The degree to which enterprise managers underestimated the effects of the CMEA shock is surprising in retrospect. Government efforts to provide restructuring assistance in 1990 to firms dependent on CMEA trade met with virtually no interest. Survey data (Business Survey (1990)) confirms that at least through late 1990 few firms predicted major consequences from the end of CMEA.

19 Source: Plan Econ, August 1991. I am not sure about the treatment of East Germany in those numbers. It is likely that trade with East Germany is counted in 1990. It is not counted in 1991.

20 Berg and Sachs (1992) and Rodrik (1992) make a distinction between a terms of trade effect and a loss of market effect, in which demand for certain manufactured goods disappears and production ceases rather than being redirected, perhaps at lower prices. Much anecdotal and other evidence suggests that output which had been sold to the Soviet Union is not finding customers elsewhere. For example, there is no negative association between a decline of exports to the CMEA and an increase in exports to the West across the six major sectors of industry.

Poland received in its barter trade with the USSR a volume of raw materials worth approximately $3.2 billion at world prices (calculated by adding the dollar values at world prices of the most important raw material imports from the CMEA zone, and subtracting the dollar value of raw material exports to the CMEA zone). Thus if the old Soviet-directed industries must be scrapped, Poland must devote $3.2 billion
Coinciding with the shock was another large drop in output. Industrial output in
February was 20% below that of December 1990, and roughly remained there for the
rest of the year. The output drop was accompanied by another large increase in the price
level. Inflation for January was 12.7%. The increase in prices was due to both to a
large increase in the price of CMEA imports, and to further elimination of a number of
subsidies.

How much of the decline in output in early 1991 can be attributed to the CMEA
shock, and through which channels? Was it through the direct and indirect effects of the
decrease in the value of exports to the CMEA, which was between 2% and 3% of GDP,
or was it through disruptions due to the loss of crucial imports? Or were there other
factors at work? An important question in this context is whether and by how much the
CMEA shock was compounded by tight credit policies at the beginning of 1991. It was
widely felt at the end of 1990 that the incomes policy was in danger of failing,\textsuperscript{21} and
that monetary policy had been too lax in the second half of 1990. Nominal interest rates
were increased from November on, reaching annual rates of 72% from February to
April, and then decreasing again to reach 40% in October. Thus we take a first pass at
this question by examining the cross section evidence on changes in sales, CMEA exports
and CMEA imports.

We look at the behavior of sales across branches in industry, first at the 2-digit level
because some of the variables can only be constructed at that level, and then at the 3-digit
level. The results are reported in Table 3.3. The basic specification is:\textsuperscript{22}

\[ S_i \text{ stands for sales in branch } i \text{ during the first five months of 1991-1 and } X_i \text{ for } \]

\textsuperscript{21}This issue reemerges in the analysis of inflation below. Part of the problem came from the mechanics
of the incomes policy itself, which had allowed for an increase in wages which had to be undone at the

\textsuperscript{22}Domestic influences on sales are omitted, so to the extent that these are correlated with the CMEA
shock the equation is misspecified. An attempt was made to examine the importance of import liberalization,
energy dependence of the industry as a proxy for cost shocks, and certain other factors. These results are
discussed in Berg and Sachs (1992). For current purposes the important point is that the results presented
above regarding the CMEA shock are not noticeably effected by the inclusion of these other variables,
suggesting that the misspecification bias is in practice small.

105
ruble sales during 1991-1 (converted to zloty at the official rate), both deflated by the average price index for output of branch $i$ during the first two quarters of 1991-1. At the 2-digit level $X_{n}$ includes both direct and indirect ruble sales, with indirect sales being computed using the 1987 I/O matrix value of the same variables during the four quarters of 1990.\textsuperscript{23}

The first line reports the results of this regression over the 20 2-digit branches. The coefficient on ruble sales is significantly different from zero and one. The adjusted $R^2$ is however a low 0.21. The second regression adds the ratio of CMEA intermediate imports to sales in 1989 (the latest year for which the required data exist). The coefficient on this import variable is negative, and not significant. Other things equal, an increase in the share of imports of 1% leads to an additional decline in sales of 0.4%. The third regression uses the share of ruble exports to sales in 1990. The results are of a strong negative effect of the export share and a weak negative effect of the import share.

The last regression reports results from estimation at the 3-digit level. As ruble exports are not available at that level of disaggregation for 1991, I substitute the 3-digit share of ruble exports in sales in 1990. Also, only direct exports are measured. For reasons of data availability, the 2-digit level share of CMEA imports in sales for 1989 substitutes for the 3-digit data. The results are consistent with those obtained at the 2-digit level.

\textsuperscript{23}This section draws on Berg and Sachs (1992). This data does not cover dollar trade with CMEA countries, so the variable overstate the actual decline in trade between 1990 and 1991. Aggregate exports to the former CMEA countries fell some 40% in value while ruble exports fell about 80 in the first half of 1991. The regression coefficients should be interpreted accordingly.

The ruble values are converted to zloty at the official ruble/zloty rate established by the national bank of Poland then deflated by the PPI. Prices of exports in rubles changed little over the period.

The estimate of the sectoral breakdown of the demand shock to firms starts with the change in ruble values of exports to the CMEA zone for each period (1989 to 1990 and 1990 to 1991). The 1991 number is simply twice the value for the first six months. This is multiplied by the base-year average ruble/zloty exchange rate and divided by base year sales, yielding the measure of the final demand shock.

The total shock was calculated using an input-output table of the Polish economy from 1988 used by the Polish Ministry of Finance. This table contains 38 sectors, including the 21 we use in our regressions. Using standard techniques, the total shock is calculated as:

$$dY=(1-A)^{-1}dE$$

where $dE$ is the change in export demand described above and $A$ is the input-output matrix.
Table 3.3. Sales and the CMEA shock.

<table>
<thead>
<tr>
<th></th>
<th>constant</th>
<th>((X_{u i} - X_{u i, i}) / S_{u i, i})</th>
<th>(Q_{u i} / S_{u i, 2})</th>
<th>(R^2)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2-digit</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OLS</td>
<td>-0.10</td>
<td>0.46</td>
<td></td>
<td>0.22</td>
</tr>
<tr>
<td></td>
<td>(-5.0)</td>
<td>(2.5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OLS</td>
<td>-0.09</td>
<td>0.38</td>
<td>-0.46</td>
<td>0.20</td>
</tr>
<tr>
<td></td>
<td>(-3.4)</td>
<td>(1.9)</td>
<td>(-0.8)</td>
<td></td>
</tr>
<tr>
<td><strong>3-digit</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OLS</td>
<td>-0.07</td>
<td>-0.71</td>
<td>-0.24</td>
<td>0.38</td>
</tr>
<tr>
<td></td>
<td>(-2.9)</td>
<td>(-3.0)</td>
<td>(-0.5)</td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**

The sample for the first three regressions is 2-digit branches in industry, excluding coal, fuel and electric power. There are 20 observations. The sample for the last regression is 3-digit branches in industry, excluding energy, coal, fuel and power, with rates of change of sales between minus 60% and plus 50% from 1990 to the first half of 1991, and sales in excess of 100 billions zl. There are 101 observations.

\(t\) and \(t - 1\) refer to the average for 1990 and the average for the first 5 months of 1991 respectively. \(S_{u i}\) and \(X_{u i}\) are average total sales and average ruble sales - direct and indirect - respectively, for branch \(i\), deflated by the average price of output of branch \(i\) during \(t\). \(Q_{u i} / S_{u i, 2}\) is the ratio of ruble imports to sales in branch \(i\) for 1989.
level, and show a strong effect of the export share, with a coefficient of -0.4, and a marginally significant effect of the import share, with a coefficient of -1.0. In all regressions the constant term, which captures the decline of output not accounted for with CMEA variables, is negative. It is equal to 75 of the total decline at the 2-digit level and 50% at the 3-digit level.

The regressions in sum yield three main findings: There is a strong effect of direct and indirect changes in CMEA exports on branch sales. Interestingly, the coefficient is significantly different from both zero and one. The fact that it is less than one is probably due to the fact that some of the trade was continued in dollars.\footnote{It is possible that managers might have wanted lower profits in order to justify a lower firm purchase price, particularly if managers or workers expected to be the future owners. This was unlikely to be a major factor at least in 1990, however, in part because the vast majority of privatization transactions involved valuations based on book value of assets (see chapter 4).} For the 3-digit regressions, where no trade data were available for 1991, the CMEA variable measures the initial share of ruble exports in total sales. Given the overall value decline of about 40%, the coefficient of -0.4 is consistent with little reorientation of sales. There is a negative but weak effect of CMEA imports, suggesting effects through the supply side, through the loss of crucial imports. And in all cases, the constant term in the regression, which captures the decline in output not explained by the export and import variables is equal to 50 to 75 of the decline. There is no way to tell from these regressions whether the effect comes from multiplier effects from the loss of exports, or from the effects of tighter monetary policy for example.

4. The evolution of state firms

At the beginning of the reform program, there were in Poland about 8500 state firms. Of those, 2000 had more than 500 employees and accounted for 80 of industrial production, 1000 had more than 1000 employees and accounted for 66 of industrial production. One of the crucial issues in the reform process was whether and how they would adapt and restructure. Two years later, at the end of 1991, the evidence was not encouraging.

(1) The enormous problems that these largely dysfunctional state firms would face in restructuring were well documented before the fact by Kornai(1991), and, in the case of Poland, by Lipton and Sachs(1990). But these problems were compounded by two
additional factors: The first was the lack of progress in the privatization of large state firms. After a bitter debate in Parliament, a privatization law was passed in August 1990. The results, at least for large firms, have been very limited. Not before November 1990 were the first five firms sold through public offerings. At the end of 1991, five more firms had been sold in the same manner, and another 16 had been sold through public tenders or auctions.\textsuperscript{25}

The lack of privatization did not however imply that firms were under the effective control of the state. A latent structure of control, the "Workers' councils" had been put in place in the reform of 1981. As long however as managers had the backing of the center, those councils did not play a dominant role. But with the fall of the Communist government in the summer of 1989, the councils took on progressively more power, including the ability to hire and fire managers. This tendency was reinforced over the following two years. Elections for new councils in 1990 were often followed by referenda on the management. By the end of 1990, half of all managing directors had been confirmed by elections, 40\% of these new.\textsuperscript{26}

Thus the stalling of privatization did not preserve the strong role of the state in running firms. Instead it led to an increase in the power of insiders, especially workers, in firms, while at the same time making their stake in the ultimately privatized firm very uncertain.

(2) Under those conditions, how would we have expected managers to behave?

Had managers acted only on behalf of the absentee owner (the state, or the owner-to-be after privatization), they would have adjusted prices so as to maximize profits. They would have then decreased employment at least in line with sales. To the extent that the firms had market power, they would have passed on wage increases partly or fully through prices. And they would have started restructuring firms.

Had managers instead acted only on behalf of workers, they would have chosen prices so as to maximize revenues net of non labor costs. Absent any constraint on

\textsuperscript{25}In addition, some 82 firms with employment over 500 were leased to management and workers in a procedure designed for small and medium enterprises. See chapter 4 for details and analysis.

\textsuperscript{26}See Dabrowski et al (1991) for an excellent discussion of ownership and control of Polish state firms in the 1980's and in 1990.
wages, they would have then chosen the wage so as to redistribute revenues to the workers. How much they would have kept in profits would have depended on the horizon of workers, thus on the stake that workers expected to have in the newly privatized firms, as well as on such factors as their degree of liquidity constraints and their attachment to the firms.

Present constraints on wages, such as were actually imposed by the incomes policy (the so-called "popiwek"), they would have kept employment high, as high employment was the only way of increasing the wage bill, and thus the share of revenues going to workers. And increases in the wage norm would not have affected the revenue maximizing price, thus would not have been reflected in increases in prices.²⁷²⁸

The evidence seems to be saying that during 1990-1991 managers quickly shifted to act primarily in the interests of their workers. And more importantly, the evidence suggests that the horizon of the workers, and thus of the managers' decisions, became increasingly short. At the end of 1991, the results of such behavior was excess employment and the nearly full appropriation of quasi-rents in wages. The question of whether there has been much restructuring by firms will be discussed below. The answer seems to be that the defects of the ownership and control structure have tended to block significant action at the enterprise level, but that the workers and managers who largely control the firms have made some positive responses, consistent with the strong dollar export performance and recovery of output since the middle of 1991. I now review the evidence, starting with the reaction of firms to the initial stabilization program²⁹.

(3) Surprisingly, wages were initially set below what was allowed by the -not very generous- increase in the norm under the incomes policy. In retrospect, the main reason was probably uncertainty as to what stabilization might bring, including the possibility

²⁷In 1990 firms generally could not vary the limit on the total wage bill by changing employment. Thus a reduction in employment allowed an increase in the wage. In 1991 the norm on the wage bill moved proportionally with employment.

²⁸A formal model of a labor managed firm in a transition environment is given by Jackman and Scott (1992).

of bankruptcy and thus of loss of control of the firm by workers and managers. In addition the design of the incomes policy allowed for short falls from the norm to be made up later in the year and thus gave another reason to err on the side of prudence at the beginning. Another factor in causing wages to be below the norm, to which we return below, was that enterprise cash flow was low, despite the high book profits which resulted from faulty inflationary accounting. The income taxes payments on these book profits, in a context of low economic profits, drained enterprises of cash.

Markups, defined as revenues minus (accounting) costs over costs, had steadily increased throughout 1989. For the year as a whole, average markups stood at 32%, and at 40% for the last quarter\(^3\). They were sharply down, at 31%, in the first quarter of 1990. The size of the decline is consistent with the joint hypothesis that for lack of a more sophisticated strategy, firms initially set prices using their traditional markup over anticipated unit cost, and that they underpredicted the fall in output as the survey evidence referred to above suggests. And as the decline of output was not accompanied by a proportional decrease in employment, the result was a decline in labor productivity—of 23% in January—and thus lower profits and markups.

In looking at markups in both 1989 and early 1990, a caveat is however in order. During that period, very high rates of inflation together with accounting of inputs at historical cost were the source of large paper profits. True profits were smaller. A simple inflation adjusted markup series can be constructed by regressing markups monthly for the period 1989-1991 on the average inflation rate over the current and past two months, and taking the residual. This crude "inflation adjusted" series gives markups of 24% for the fourth quarter of 1989, and of 15% for the first quarter of 1990. Using the alternative approach of constructing cash flows instead of profits or markups, Schaffer (1992b) shows that, despite high reported profits, after-tax cash flows were actually negative in the first quarter of 1990. This is because not only inputs had to be

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\(^3\)Depending on availability, the numbers in this section numbers refer to one of two sets of firms. The first, to which this number refers, includes all non agricultural enterprises with 50 or more employees in industry and construction and 20 or more in other sectors. This is the sector covered as a rule in the monthly Statistical Bulletin, published by GUS. There is a break in the series in 1991, when sufficiently large private firms are added. This change is not significant for the markup as the share of the private sector in these larger firms is small (4% in the third quarter of 1991). The other set includes all state firms (or more precisely all firms subject to the dividend tax), thus excluding private sector firms and cooperatives. This is the set to which 3-digit branches refers.
purchased at their current price, but because taxes, levied on accounting profits, were unusually high.

(4) Soon after stabilization, it became clear to workers and managers that their worst fears had been excessive, and that while profits and sales had declined, firms were still making profits and the risk of bankruptcy was low. Thus, the rest of 1990-1991 was characterized by a steady transfer of rents from profits to wages, together with only a slow and insufficient decline in employment.

Employment in state firms in industry which stood at 4.1 million at the end of 1989, stood at 3.6 million at the end of 1990, and at about 3.2 million at the end of 1991. The available evidence suggests that the decline was accomplished mostly by attrition. The proportion of unemployed layed off "for economic reasons" stood at only 16% of total unemployment at the end of 1990 and at 23% at the end of 1991\(^3\). But this decline in employment was insufficient to restore labor productivity even to its pre-reform levels. At the end of 1990, labor productivity in industry stood at 90% of its December 1989 value; at the end of 1991, it was down to 77%.

With positive profits and, after a few months, improving cash flows as well, the initial wage restraint quickly disappeared. By June 1990, nominal wages were back to the norm. By the end of the year, they were 22% above the norm, the result of a flawed design of the policy, in which firms which had paid wages below the norm at the beginning of the year could use this accumulated credit to pay wages above the norm later in 1990. With the beginning of a new calendar year, firms had either to cut nominal wages to be below the new norm, or to pay considerable excess wage taxes. The outcome was a partial accommodation of the pressure by an upward revision of the norm, and low wage settlements, in no doubt made easier by the coincident CMEA-induced decrease in output. But throughout 1991, firms were increasingly willing to pay the excess wage tax in order to pay wages above the norm. At the end of the first half of 1991, 38% of state industrial enterprises were paying some excess wage tax. In the fourth quarter of 1991, more than 36% of total tax revenue (excluding the turnover

\(^3\)Polish law since 1990 assigns special rights to those fired in "group layoffs", in other words as a result of economic problems of the enterprise. Since these rights impose burdens on the enterprise and may generate an incentive to disguise these layoffs, this data must be treated with caution.
tax) were coming from the excess wage tax.

Profit rates steadily declined. Measured markups, which were equal to 31% in the first quarter of 1990, were down to 24% in the last quarter of 1990, and to 13% in the last quarter of 1991. In the last quarter of 1991, 29% of 2-digit branches were reporting gross profits (and 75% reported negative net profits), something no branch had done in 1990. Inflation-adjusted markups were also down from 22% in early 1991 to about 12% at the end of 1991. The evidence supports the hypothesis that, as would be expected if managers were acting on behalf of their workers, there was incomplete pass-through of wage increases. The evidence from the last three quarters of 1990, which is given in the section on inflation below, is particularly clear. During those three quarters, relative non-labor costs in state firms remained roughly constant, while wage costs per unit of output were up by 60%. The increase in the producer price index was only 30%, thus implying a pass-through coefficient of about one half.

There is however an alternative interpretation of the evidence, namely that, because of foreign competition, firms were only partly able to pass wage increases into prices, and that the low profit margins at the end of 1991 reflected instead an over-appreciation of the zloty. Between January and December 1990, the real appreciation of the zloty was indeed a large 28%, and despite the shift to a crawling peg in May, was another 15% in 1991. How much of the decrease in profit margins was due to the appropriation of rents in wages, and how much was the result of a loss of competitiveness is crucial to assessing both the past and the options for the future, such as the desirability of a sharp devaluation. To some extent, we can test two hypotheses by looking at the difference in the evolution of profit rates across sectors with differential exposure to foreign competition and dependence on exports to the West. The evidence on the distribution of profit rates across 3-digit branches does not show a clear pattern. More formal, but preliminary regressions of the change in profit rates as a function of import penetration and export dependence in 1990 do not show a significant effect of the import

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32A nice example of the role of foreign competition in limiting prices is given by the price of black and white TV's in 1990. The price which was 430,000 zlotys in December was 773,000 in January, 1.3 million in February. But from then on, it steadily went down, reaching 1.1 million in July, and 1.0 million in December. The question is how general this constraint was.
variable.\textsuperscript{33}

(5) At the end of 1991, there were ominous signs, that with not enough profits to cover tax liabilities, many firms were now testing the credibility both of the banking system and of the government. Banking reform is another area where little progress has been made. The traditional mono-bank of centrally planned economies had been broken up in a central bank, six specialized banks and nine commercial banks in February 1989\textsuperscript{44}. But over 1990-1991 banks had neither the incentives nor the knowledge to change their lending practices, so they continued to lend mostly to state firms, irrespective of their financial conditions. At the end of 1991, loans to state firms still accounted for 90\% of the portfolio of commercial banks; of those, it was estimated that about 30\% were non-performing. Thus, while the inflation of 1989 had largely wiped out the debt position of firms, after two years of new lending, banks were again hostages of their borrowers, and obviously reluctant to start bankruptcy proceedings. A similar game was played vis\-a-vis the government. An increasing number of firms are in arrears in their payments of taxes, testing the credibility of the government’s stated policy to trigger bankruptcy for non payment of taxes.

(6) The evolution of profit rates over 1990-1991 points to the limits of incomes policy, a point of significance beyond Poland. One of the goals of the incomes policy was to avoid such a redistribution of revenues from profits towards wages. Nevertheless, by the end of 1991, after tax profit rates were very nearly equal to zero. How did this happen? As section 6 documents, the incomes policy, with its limited indexation, seems to have allowed the straightforward transfer of revenues to workers through increases in wages given prices in 1990. But in addition to the fact that firms seemed by the end of 1991 to pay or at least accrue large popiwek tax liabilities, the policy left two channels

\textsuperscript{33}Specifically, the markup in the first 5 months of 1991 was regressed on the markup, and energy use, exports to the CMEA, imports from the west and exports to the West as a share of domestic industry sales, all in 1990, for the 101 3-digit branches described in Table 3.3. A similar regression was performed with the change in real sales as the dependent variable (and excluding the 1990 markup from the list of independent variables.) All the variables were significant at the 10\% level, with expected signs, with the exception of the indicators of trade with the West, which were never significant. There is, however, some slight evidence of a weak positive association between dependence on dollar exports in 1990 and growth in 1991.

\textsuperscript{44}The commercial banks were further transformed into joint stock companies in October 1991.
open. The first is that, in response to decreases in output, firms could increase the share of revenues going to workers by reducing employment less than output. The second is that, in response to increases in the price level not due to an increase in the producer price index—such as rents, electricity—, firms could increase wages according to the partial indexation of the norm without further increasing their prices. Both of these channels explain why profit margins steadily decreased over those two years. There is probably a general lesson here, that incomes policy can slow down but cannot stop the transfer of revenues to workers if they are so inclined.

(7) The emerging picture of the state firms has been gloomy. There are, nonetheless, a few encouraging signs. There is much qualitative evidence that many firms have been trying to develop contacts with foreign firms and reach new markets. Other qualitative evidence suggests, however, that these efforts have not often been dramatic in scope, as the confused control mechanisms of state enterprises meant that significant action required the active cooperation of several actors: unions, the workers’ council, management, and the government. Much of the statistical evidence is positive. Exports to the West have remained strong. Exports to the EC, in particular, which had grown in 1990 at 65 in dollars over 1989, were up by 21% in 1991. As Figure 1.5 shows, aggregate industrial production seems to have increased since June of 1992. One question is whether state firms in at least some sectors are doing better, and restructuring. There are again a few signs that this is the case. Food processing is the only 2-digit industry which grew during 1991. From June 1991 to June 1992, however, all 2-digit industry increased real sales, by amounts that varied from 2% in the fuel and power sector to 17% in the food industry.

35As explained below, according to the incomes policy enterprises faced a punitive tax for ‘excessive’ wage increases.
36As indicated earlier, this applies to post-1990, when the wage norm applied to wages rather than the wage bill.
37Jorgensen et al. (1991), Bruno (1992), Dąbrowski et al. (1991)
38See for example McDonald and Sachs (1992).
39One statistical problem here is the inclusion of Eastern Germany in the EEC from October 1990 on. Excluding East Germany from the EEC, I estimate the increase to the rest of EC to have been only about 13%.
40This data includes the rapidly growing industrial private sector for 1991 and 1992, but as discussed above the private share in industry remains relatively small.
5. The growth of the private sector.

(1) We now turn to the brighter side of the story. 1990 and 1991 saw a spectacular increase in the size of the private sector. Despite obvious shortcomings in the data, the basic trends are clear.\(^4\)

In December 1988, recorded private employment outside agriculture accounted for 1.2 million. At the start of stabilization, it had already increased to 1.8 million jobs. By the end of 1990, it stood at 2.3 million, and by the end of 1991, at 3.0 million, a cumulative increase of 67%. Thus, in two years, its share of total employment doubled, from 13% to 26%. Including agriculture which was already mostly private, the share of private sector employment stood at the end of 1991 at 45% of total employment.\(^4\)

Thus, as a matter of arithmetic, as of the end of 1991, 43% of the decrease in state firm employment had been absorbed by an increase in private sector non agricultural employment.\(^4\)

(2) Not surprisingly, the growth of the private sector was stronger in those sectors which had traditionally been repressed in the Soviet-type economies.\(^4\) In trade the private sector accounted for 75% of sales at the end of 1991, compared to 10% at the end of 1989, the result of both privatization of shops and of high rates of firm creation: total employment growth was 16% in 1991. The private sector has also become dominant in construction. At the end of 1991, private sector sales accounted for 50% of total sales, up from 22% in 1989. By contrast, in industry, the private sector accounted for 18% of sales in industry, up from 7% in 1989.

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\(^4\)The numbers below come from forms filled by the private sector firms and from newly instituted surveys by the Polish Central Statistical Office. Those forms are similar to those filled by state firms. Obvious caveats as to coverage and accuracy apply. The broad trends below are consistent with the evidence from a number of surveys of private sector firms. Johnson (1992) reports preliminary results.

\(^4\)See Table 1.5 in Chapter 1 for more information on changes in the sectoral distribution of employment. As described in Chapter 1, there has been an important change in the definition of the private sector in Poland. The so-called "cooperative" sector was considered "socialized" until 1991. In Table 1.5 the private sector is divided into the cooperative sector and "other". The numbers in the paragraph above consider only the non-cooperative private sector. Note that the share of private sector including cooperatives in total employment went from 47% at the end of 1989 to 56% in December 1991. The cooperatives were essentially centrally controlled before 1990 but are now apparently autonomous.

\(^4\)Increases in unemployment equal 73% of the drop in state sector employment. The two fractions do not add to 1 because of entry from the labor force and potential double counting of individuals who have jobs and are unemployed.

\(^4\)Bolton and Roland (1992) point out that the share of services in total 1989 employment was 36% in Poland and 53% in a sample of 8 poorer OECD countries.
Also not surprisingly, given the concentration of private sector activity in trade and services and the excessively concentrated industrial structure characteristic of centrally-planned economies, most of the jobs have been created in very small businesses. Bolton and Roland (1992) point out that firms with less than 100 employees represented 1.4% of total 1989 industrial employment in Poland versus 14% in West Germany and 32% in Italy. Official statistics distinguish between three types of private businesses, joint ventures --firms with some foreign capital--, domestic firms and individual businesses. The difference between the last two is technically one of legal status (the existence of trade books), but is mostly one of size. The rate of growth of all three over 1990-1991 was roughly the same. But because individual businesses represented more than 80 of employment at the start, more than 80 of the growth of employment over 1990-1991 was in individual businesses. Average employment in those businesses, at the end of 1990, was 1.7 workers.

(3) That the Polish economy needed more trade, services and construction is not at issue. But, given the difficulties that state firms have to restructure, the question arises of whether this can be accomplished instead by growth of the private sector. This raises the issue of how and what private medium size firms, especially those in industry, have been doing.

The converse side of the statistics we just saw for individual businesses is that the number of private sector jobs created in larger domestic firms, with or without foreign capital, while increasing at high rates, only accounted for 500,000 workers in mid 1991, up from 250,000 pre-stabilization. Similarly, output of private sector industry grew by 48% in 1991, but from a small base. This evidence is consistent with the very small recorded flows of foreign direct investment. Again, while FDI increased from 11 million dollars in 1990 to 100 millions for the first three quarters of 1991, this still accounts for less than 0.2% of GNP.

The picture we can assemble of the performance of these larger private firms is fragmentary but the pieces seem to fit. First, the larger private sector firms which existed pre-stabilization (about 1500 industrial companies, with an employment of about 29,000

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people in 1989), clearly did better than the state firms during stabilization; their real sales in particular were down only by 2% for the year. Second, while the profit rates of firms with some foreign capital were affected by the output decline of 1990, their investment was stronger than that of state firms. Third, in 1990, for firms with some foreign capital, the ratios of exports and imports to sales were 39% and 11% respectively compared to 8% and 15% for the average state firm. In general, exports by the private sector have been growing more rapidly than total production, represented 4.9% of total exports in the end of 1990 and 20% in 1991. Major categories include processed food (mainly milk), furniture and industrial metal goods. Finally, real sales in private industry grew by 48% in 1991 after growing by 9% in 1990. Thus, the evidence is that, while they account for a small proportion of employment, larger private firms are doing well.

The issues for the future, if the state sector does not adjust, are whether such firms can be created in time to take up the slack or whether, in the meantime, the declining state firms will be able to extract ruinous amounts of subsidies from the banking system and the government in lieu of adjustment, thereby endangering the entire reform.\footnote{Bolton and Roland (1992) try to estimate the amount of labor reallocation which can take place without privatization. They assume that the growth in small firms and in services required to match poor OECD countries comes not through privatization but through new private firms and similarly that the required reduction in employment in large firms and in industry takes place through job loss. This leaves only 28% of the total 1989 labor force and 44% of industrial labor potentially involved in privatization.}

5. Inflation, wage and price setting.

Inflation stabilization was associated with a sharp increase in the price level. The increase in the CPI from the beginning to the end of January was 106%. After that, inflation declined sharply to a an average rate of about 3-5% per month. This raises two sets of issues. What caused the initial jump in prices? Was it due to an increase in costs, to supply bottlenecks, to the exercise of monopoly power, to an over-devaluation of the zloty? And how could inflation remain high for so long in the presence of a strong incomes policy with low indexation of wages? In this section, we develop a simple accounting framework, which allows for identification of proximate causes.\footnote{This approach is developed in more institutional and quantitative detail in Blanchard and Layard (1992).} Having done so, we describe the inflation process over 1990-1991. In the process, a number of themes touched on already in previous sections reassert themselves.
(1) Let $w, p_c, p_l$ denote the logarithms of the nominal wage, the consumer price and the producer price at $t$, and let $\Delta$ denote a first difference. Thus, as a matter of accounting, we can write:

$$\begin{align*}
\Delta w &= a \Delta p_c + \Delta w \\
\Delta p_c &= \Delta p_l + \Delta p_c \\
\Delta p_l &= \Delta w + \Delta p_c
\end{align*} \quad (3.3)$$

The first equation decomposes the change in the wage into the component due to inflation through indexation, and a residual. The second equation decomposes the change in the consumer price index into the change due to the producer price index and a residual. The third decomposes the change in the producer price index into the change in wages and a residual. Combining the three equations gives inflation as a function of the three $\epsilon$'s and the degree of indexation:

$$\Delta p_c = (\epsilon_w + \epsilon_a + \epsilon_{pc})(1 - a) \quad (3.4)$$

We now construct and further decompose the various $\epsilon$'s.

(2) The movement of wages.

The incomes policy which was put in place in December 1989 has largely been kept to this day. It initially covered all firms, but private firms were excluded from 1991 on. Each firm was subject to a wage norm, which was initially roughly equal to the pre-stabilization wage. The norm for each firm increased through time for three reasons. First, it was partially indexed to inflation, the effect captured in the wage equation above. The coefficient of indexation was equal to 0.3 in January 1990, 0.2 from February through April, and stayed at 0.6 thereafter, with a brief stay in June 1990 at 1.0. Second, because the wage norm applied in 1990 to the wage bill rather than the wage, it allowed for a further increase in the wage itself in proportion to the decline in employment. Since 1991, the wage norm applies to the wage so that this effect is no longer present. And, third, the wage norm increased as a result of other, ad hoc, adjustments; as we shall see, these were important at the end of 1990.

The wage norm was not an absolute constraint on firms. Rather, excesses of wages above the norm were taxed at very high rates, from 100% up to 500%. The tax applied to the excess of the total wage bill since the beginning of each year over the total wage
Table 3.4. Decomposition of wage inflation.

<table>
<thead>
<tr>
<th>Quarter</th>
<th>$\Delta w$</th>
<th>$a\Delta p_e$</th>
<th>$\epsilon_w$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td>Employment effect</td>
<td>Other norm</td>
</tr>
<tr>
<td>90-1</td>
<td>14</td>
<td>20</td>
<td>-5</td>
</tr>
<tr>
<td>90-2</td>
<td>14</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>90-3</td>
<td>25</td>
<td>7</td>
<td>18</td>
</tr>
<tr>
<td>90-4</td>
<td>29</td>
<td>10</td>
<td>19</td>
</tr>
<tr>
<td>91-1</td>
<td>2</td>
<td>14</td>
<td>-12</td>
</tr>
<tr>
<td>91-2</td>
<td>6</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>91-3</td>
<td>9</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>91-4</td>
<td>22</td>
<td>7</td>
<td>15</td>
</tr>
</tbody>
</table>

Notes:

All data for industry only. $\Delta w = \ln(W_t)-\ln(W_{t-4})$, where $w$ is the nominal wage at the end of quarter $t$, $a\Delta p_e = a(\ln(p_e)-\ln(p_{e-4}))$, where at is the average degree of indexation during the quarter, and $p_e$ is the CPI at the end of the quarter. The "employment" term is $-\ln(N_t)-\ln(N_{t-4})$ for 1990, 0 for 1991, and captures the fact that the wage bill rather than the wage was subject to the wage norm in 1990. "Other norm" denotes adjustments of the logarithm of the norm, and "Other non-norm" is equal to the difference between the logarithm of the wage and the logarithm of the norm.

norm since the beginning of the year. Thus firms which paid a wage lower than the wage norm early in the year can pay a wage above the norm at the end of the year without incurring excess taxes; this aspect also turned also to be important at the end of 1990.

Based on this brief description, in Table 3.4 quarterly changes in the logarithm of the nominal wage from the last quarter of 1989 on are decomposed into four components. The first is that due to inflation and indexation. The other three correspond to $\epsilon_w$. The first reflects the "employment effect", the fact that in 1990 the wage norm could go up in proportion to the employment decline. The second reflects other adjustments of the norm. The third reflects deviations of the wage from the wage norm\(^\text{48}\).

\(^{48}\)I thank Jan Rajski for information about the norm.
Table 3.4 shows that the beginning of stabilization was associated with considerable wage restraint. Despite a large increase in prices and low indexation of the norm, wages were still 11% below what was allowed by the norm in March 1991.

As the last column of the table shows, this initial restraint was followed for the rest of 1990 by an increase in wages first to and then above the wage norm. This was due to two factors. The first was the progressive realization by workers that profits were still high and that wages could be increased to the norm without triggering immediate bankruptcy. Indeed, the realization was that wages could indeed be increased beyond the norm without dire effects: by the end of the year, roughly two thirds of firms in industry were willing to pay the excess wage tax in order to transfer some of the profits to their workers. The second was the result of the design of the incomes policy. As most firms had paid wages below the norm in the first three months, they could afford to pay wages above the norm for the rest of the year without paying the excess tax. As a result, by July, wages were above norm wages. And by December the excess of the wage over the wage norm, the cumulative value of the numbers in the last column, was 22%.

At the beginning of the new year 1991, firms were thus faced with the choice of either reducing wages by more than 20% to get them under the norm, or having to pay considerable excess wage taxes. The political outcome was of partial accommodation of wage realities by adjustments of the norm. As Table 3.4 shows, the increase in the norm unrelated to inflation was 8.0%. The CMEA shock and the drastic decline in profit margins did the rest, and wage growth was slow enough so as to get wages back within the norm within a month. But, after February, the increase in wages was again in excess of the norm, with, as a result, steadily increasing excess wage tax payments, which was documented earlier.

(3) The movement of prices.

Table 3.4 decomposes in turn the movement in the CPI. The first two columns give the change in (the logarithm of) the CPI, and the change in the CPI in excess of the change in the producer price index, εpc. The next set of columns decompose the change in the producer price. The decomposition is motivated as follows. Consider the following identity:

where WN is the wage bill, C is non wage costs, Y is gross output, and μ is the markup.
\[ P_{fr} = (1 + \mu)(WN + C) \]  

(3.5)

Let \( \alpha \) be the share of wages in total costs. Then taking logarithms, differentiating with respect to time and rearranging, we can write:

\[ \Delta p_t = \Delta w + \epsilon_p \]  

(3.6)

where

\[ \epsilon_p = (\Delta n - \Delta y) + ((1 - \alpha)/\alpha)(\Delta c - \Delta p) + (1/\alpha)\Delta \ln(1 + \mu) \]  

(3.7)

\( \epsilon_p \) is the sum of three terms. The first is the negative of the rate of change in labor productivity. The second is proportional to the rate of change in the relative price of non labor inputs; \( c \) is defined as the logarithm of \( C/Y \). The third is proportional to the rate of change of one plus the markup. An increase in any of these three terms increases the producer price given the wage. The last five columns of Table 3.4 give the decomposition of changes in the producer price index. Table 3.5 suggests the following:

The initial increase in prices was due neither to an increase in consumer prices over producer prices, nor to an increase in markups. These facts largely put to rest three common pre-stabilization fears: that either because of too large a devaluation, or because some firms were now in a position to exert monopoly power, or because of sharp supply bottlenecks, prices may increase far in excess of costs.

The increase was due instead to an increase in the relative price of non labor inputs and the large decrease in labor productivity. Blanchard and Layard (1992) further decompose the increase in costs, and find, in addition to the removal of subsidies, two surprising culprits. The first is imputed depreciation. The book value of capital was

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49 As was discussed in the section on state firms, reported \( C \) is measured at historical cost, so that it underestimates true cost when inflation is high. No attempt was made to adjust for inflation, so that the increase in costs is probably overestimated when inflation slows down. This is probably most important for the second quarter of 1990.

30 Bruno (1992) argues that the large devaluation of the zloty was a cause for the initial price jump. The evidence does not support his argument.
Table 3.5. Decomposition of price inflation.

<table>
<thead>
<tr>
<th>Quarter</th>
<th>$\Delta p_c$</th>
<th>$\varepsilon_w$</th>
<th>$\Delta w$</th>
<th>$\varepsilon_p$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td>$\Delta w$</td>
<td>$\varepsilon_w$</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Total</td>
<td>Relative Cost</td>
<td>Inverse Productivity</td>
</tr>
<tr>
<td>90-1</td>
<td>84</td>
<td>1</td>
<td>82</td>
<td>14</td>
</tr>
<tr>
<td>90-2</td>
<td>15</td>
<td>11</td>
<td>5</td>
<td>14</td>
</tr>
<tr>
<td>90-3</td>
<td>10</td>
<td>1</td>
<td>9</td>
<td>25</td>
</tr>
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<td>90-4</td>
<td>16</td>
<td>4</td>
<td>12</td>
<td>29</td>
</tr>
<tr>
<td>91-1</td>
<td>23</td>
<td>7</td>
<td>17</td>
<td>2</td>
</tr>
<tr>
<td>91-2</td>
<td>10</td>
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<td>9</td>
</tr>
<tr>
<td>91-4</td>
<td>12</td>
<td>7</td>
<td>5</td>
<td>23</td>
</tr>
</tbody>
</table>

Notes:
$\Delta p_c = \ln(P_c) - \ln(P_{c,t})$, where $P_c$ is the consumption price index at the end of the quarter. $\varepsilon_w = \ln(P_w) - \ln(P_{w,t}) - \ln(P_{w,t}) + \ln(P_{w,t})$, where $P_w$ is the industrial price index at the end of the quarter.
$\Delta w = \ln(W) - \ln(W_{t})$ where $W$ is the wage at the end of the quarter in industry. $\varepsilon_p$ is decomposed into three components, which are constructed from industry data. The first is $((1-\alpha)/\alpha)(\ln(C_t) - \ln(P_t) - \ln(P_{t}) + \ln(P_{t}))$, the weighted change in the real cost of non-labor inputs in industry. $C_t$ is the cost of non-labor inputs in industry during the quarter. $\alpha$ is the weighted average of the share of wage costs in total cost for the current and the past quarters. The second is $\ln(N_t) - \ln(Y_t) - \ln(N_{t}) + \ln(Y_{t})$, the change in the inverse of labor productivity, where $Y$ and $N$ are average gross output and employment in industry during the quarter. The third is equal to $(1/\alpha)(\ln(1+\mu_t) - \ln(1+\mu_{t}))$, where $\mu_t$ is the ratio of sales minus costs to costs in industry during the quarter.

multiplied by 11 in January 1990.\(^{31}\) And the other is bank costs, due to the high nominal rates at the beginning of stabilization. It is clear that neither of the economic

\(^{31}\)Of course, changing the imputed depreciation should lower actual costs as the tax deduction is higher. Only if Polish enterprises were following a pricing rule which implied some mark-up over accounting costs would this change in imputed depreciation increase prices. Anecdotal evidence suggests, however, that managers were indeed marking up over book costs.
costs associated with either capital depreciation or interest payments went up much in January 1990 (ex post real rates were large and negative in January). But one can easily believe that these were treated mostly as increases in costs by firms.

Thereafter, the evolution of prices was the result of two divergent evolutions. As electricity prices, rents, gas, retail price margins and so on were increased, the consumer price index steadily increased compared to the producer price index. But while \( \epsilon_{pc} \) increased, \( \epsilon_{pd} \) decreased. And the main source of the decrease has been the decrease in the markup. As the section on state firms discussed, there are two potential reasons for the decline in the markup. The first is that increasing foreign competition prevented firms from passing on costs into prices. The second is that managers have increasingly passed on revenues to workers. As is argued earlier, the evidence, as it was, suggested that the second was an important part of the story.

(4) We can now briefly put our results together. The initial increase in prices was due primarily to an increase in non wage costs. The persistence of inflation later in 1990 was due primarily to the catching up of wages, coming itself from the undoing of initial restraint and design flaws of the incomes policy. In 1991, new non wage relative cost increases, increases in the consumer over the producer price index, and increases in wages beyond the norm, all contributed the persistence of inflation. Thus, there is no single clue as to why inflation has persisted in Poland. There was no "stickiness" of inflation, just many shocks along the way. This conclusion is again likely to be of more general relevance than to Poland for these two years.

7. Issues for the near and medium term

Two years after stabilization, the two fundamental issues are the behavior of state firms and the nature and speed of private sector growth.

(1) The bottom seems to have been reached in the state sector, after the two shocks of January 1990 and January 1991, and since the middle of 1991 shaky growth has resumed. Lack of progress on privatization have left state firms adrift, however. The nominal owner, the state, exerts no control, while workers have gained power over management. The imposing magnitude of the restructuring task, together with uncertainty about their stake in the restructured firm, have led managers and workers to act with increasingly short horizons. The incomes policy has slowed but not prevented a steady transfer of
revenues to workers over the past two years; profit rates have steadily decreased to the level just sufficient to avoid triggering bankruptcy.

Absent changes in incentives, most state firms are likely to stagnate or decline slowly, behaving passively until threatened with extinction, acting to avoid closure and taking some small positive steps but not taking the more difficult measures needed to survive and grow. Thus, on the positive side, in response to increased foreign competition, wages are likely to adjust so as to maintain minimal profit margins. On the negative side, cheaper credit or subsidies are likely to translate more into higher wages than into higher investment or restructuring.

Creditors, including the banking system, the government, and other enterprises, have been unwilling to take responsibility for closing or restructuring an enterprise, instead making credit available when necessary to avoid collapse for a small number of politically important firms and not initiating bankruptcy for other delinquent firms. The problem is compounded by the fact that the banking system has also not been either privatized or restructured. There are ominous signs that many firms are attempting to take advantage of this unwillingness to bankrupt. The proportions of bad loans in banks' portfolios and of firms in tax arrears are steadily increasing.\(^2\)

(2) Private sector growth has been impressive. And it is leading to the development of a much needed trade and services sector. More generally, the overall pattern of adaptation in the economy is rapid and in the right direction. Heavy industries are in relative decline, trade with the West is expanding, and the small and medium sized firms that were missing in the Polish economy are being created. Absent privatization, however, large state firms will continue to dominate industry for the next few years and they are increasingly extracting resources from the government and the banking system. It is clear, then, that private sector growth cannot, in the short or medium term, substitute for the restructuring and privatization of state firms.

(3) Current macroeconomic problems are mainly the manifestation of these two underlying structural developments.

The most pressing current crisis is fiscal. Preliminary estimates put the budget

\(^{2}\)The reluctance of banks to actually grant new loans to delinquent firms, as opposed to restructuring existing debts, limits the ability of firms to exploit this situation.
deficit for 1991 at 4.5-6% of GDP.\textsuperscript{33} The proximate source of the deficit is the sharp decline in profit tax revenues, which is in turn due to the sharp decline in profits of state firms in 1991. Original estimates were that the tax would yield 11.7% of GDP; actual income taxes were only 5.1% for the year. It is, however, too easy to forecast other crises in the making. If non repayment of loans does not trigger bankruptcy, for example, an increasing number of firms will finance higher wages through borrowing. Or, as the non tradable sector grows and the tradable sector stagnates or shrinks, pressure from a growing trade deficit will require either steady real depreciation or a further contraction of output.

This assessment raises two types of policy issues. The first is that of the role of conventional macro tools—fiscal, monetary, exchange rate policies—in the current environment. The second is that of which measures should be put in place to enhance structural adjustment.

(4) The role of macro policy in increasing activity in the current environment is sharply limited. Some instruments are simply unavailable, most obviously fiscal policy. But, more generally, the response to traditional macro policy tools may, in the current environment, be too weak to justify their use. It is true that much of the decrease in output over the last two years has come from adverse shifts in demand, from stabilization first and from the collapse of CMEA later. But because of the evolution of the state firms over these two years and their likely response to different policies, it does not follow that there is much room now for demand to increase output.

Consider for example the likely effects of a devaluation, an a priori appealing policy prescription given the sharp deterioration of the trade position from a surplus of close to 4% in 1990, to trade balance in 1991, and the emergence of a deficit in 1992. In those state firms which have been able to maintain employment or at least limit the decline to the rate of attrition, despite the sales decline, the devaluation is more likely to translate into an increase in prices and wages rather than an increase in output. The conclusions on the inefficacy of the incomes policy to limit wage increases suggest that this may take

\textsuperscript{33}These numbers, as well as the numbers just below, are from Gomulka (1992) who gives a detailed description of the budget for 1991 and of budget proposals, as of February, for 1992. More recent informal forecasts put the 1992 budget deficit at some 8% of GDP.
some time, but will eventually take place. Only those state firms which being forced to cut employment sharply and which would be able to sell more on Western markets at lower prices are likely to fire fewer workers and expand output; they may not be many. And of the various constraints on the growth of the private sector in tradables, access to credit, skilled labor or foreign capital and expertise probably play a more important role than competitiveness.

A loosening of credit policy is likely to be similar but more harmful, especially without some sort of quantitative limits on credit to state enterprises. Given the behavior and incentives of the enterprises, it would be likely to raise wages and perhaps increase the insolvency of the state sector. And it could easily have a perverse effect on enterprise restructuring by drawing resources into those firms which adjust least. In contrast, reestablishing some of the CMEA trade, being aimed by its nature at many of the firms which are making the largest losses and contracting employment, would be more likely to slow down the employment decline in the state sector without drawing valuable resources away from the expanding private sector.

(5) Despite the severe external shock suffered in the beginning of the year real consumption has risen sharply. The trade balance has moved rapidly towards deficit, and the fiscal stance appears unsustainable. More needed, then, than expansive macro policies are measures to accelerate the restructuring process. These include, not surprisingly, privatization, reform of the banking system, and a credible commitment of the government to start bankruptcy proceedings when appropriate. Similar statements could have been made—and were made—two years ago. But the last two years have made much clearer how state firms behave in the absence of such conditions.

While the next chapter discusses privatization strategies, there are both additional constraints and lessons from the last two years. And both imply that workers must play a large role in the privatization process. First, in order to obtain the required employment and wage adjustments which are now needed to reestablish profit margins, any realistic privatization plan must give workers a large stake in the outcome. Second, whatever adjustment there has been has been undertaken by workers and managers, not by the state. Privatization plans which weaken their power without immediately
providing adequate substitutes risk decreasing horizons further and slowing adjustment.54

At this point, delinquent tax payments by state firms amount to 12% of total revenue. Moreover, the rate of delinquency and permitted deferment of taxes seems to be accelerating sharply. The government thus has to reestablish the credibility of its hard budget constraint by starting bankruptcy proceedings for those firms which are late in their tax payments. As long as the government may bail out enterprises, other creditors may be unlikely to initiate bankruptcy proceedings themselves. Even if creditors wish to bankrupt a company they will have deep difficulties in the existing legal, accounting and administrative framework, as the last two years have shown.55

Along with a hardening of the government budget constraint and an invigoration of bankruptcy procedures, a reform of the banking system is urgently needed. Thanks to high inflation of 1989, enterprise debt levels were low at the beginning of the stabilization program. But many firms have increasingly followed a policy of borrowing in lieu of adjustment. While commercial banks have been transformed into joint-stock companies in October 1991, privatization is still some time off. A cleanup of balance sheets is probably needed before privatization. Current proposals by the Ministry of Finance and the Central Bank to close some of the debtor firms, replace some of the firms' debts by government debt, and transform some into equity positions by banks go in the right direction56. If such cleaning up is implemented long before privatization of banks however, quantitative restrictions on loans to state firms may be required to prevent a new run-up of debt.

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54 Similarly, commercialization not quickly followed by at least partial privatization may be counterproductive as it risks removing whatever incentives are left for workers and management to start restructuring.

55 See for example Banaszuk (1992) for a description of bankruptcy proceedings against Ursus, a giant Polish tractor enterprise. Over the course of six months in 1991 three creditors filed bankruptcy petitions (one a second time after a partial repayment by Ursus), and two groups associated with Ursus management filed for protection from creditors. The legal status of the last two petitions is unclear, because among other reasons both groups have ceased to exist legally. The case is apparently stuck in appeal, in part because the court needs to get a statement from the Ministry of Industry about its intentions towards this sector of the economy.

(7) If some of these structural measures are taken, Poland will then enter the next phase of the transition. And one can already identify the next set of problems it is likely to confront. All state firms will have to shed a large amount of labor, and many will have to close. We saw that just getting labor productivity back to its pre-stabilization level implied a significant further decrease in employment. If progress is made with privatization, the central set of issues two years from now will be high unemployment, the search for a social insurance system, the effects of unemployment and state firm wages on private sector wages, and the nature of the constraints on private sector growth.
Appendix A: The ‘Credit Crunch’ hypothesis.

In a series of articles\textsuperscript{3}, Calvo and Coricelli have argued that a credit crunch was responsible for a large part of the output decline in Eastern Europe, and that credit probably was too tight at the beginning of many of these programs. The potential policy relevance of their arguments justifies analysis of their claims. In this appendix I will review the Calvo and Coricelli propositions, place them in a slightly larger context, and confront the relevant evidence.

The argument, as presented in Calvo and Coricelli (1992a and 1992b), starts with the observation that there was a sharp contraction in the amount of real credit in January 1990. Real credit was actually well below IMF ceilings for the first quarter, and credit was not rationed, because of the extremely high real interest rates prevailing in the first quarter. This fall coincides with the dramatic output decline, of course. This observation is combined with an analysis of the primitive nature of credit markets in Poland, both before and after the “big bang”.

- Banks do not and cannot screen borrowers for credit-worthiness. They were never supposed to carry out this role in the previous system, and even since January 1990 they have neither the incentives nor the information base required to distinguish among borrowers in the usual way.

- Polish state enterprises have essentially no source of external funds except for bank credit. There was and is essentially no commercial paper or equity market. The only exception to this is the inter-enterprise credit market, in which enterprises build up receivables and payables with each other, both voluntary and as arrears. The National Bank of Poland until 1990 implicitly guaranteed these loans. Starting in January of 1990, the perceived risk associated with extending inter-enterprise credit increased sharply.

- There is and was thus a sharp segmentation between savers and firms. For example, individuals and some enterprises, especially foreign trade enterprises, had relatively large stocks of foreign exchange, but there is and was no mechanism for channeling these funds to enterprises which want to borrow. International credit markets were essentially closed to Polish state enterprises.

\footnote{Most recently, in Calvo and Coricelli (1992b).}
The upshot is that one of the potential causes of the output decline in early 1990 is this credit decline. In this interpretation, the extremely high interest rates led to a drastic decline in credit supply in 1990. Firms had three ways of dealing with this supply reduction. The first was to sharply reduce investment, especially in inventories. The scope of this was limited, however, by the fact that most inventories were not readily tradable internationally. As will be discussed below, overall inventory stocks did indeed decline sharply in early 1990. The second option was to attempt to increase borrowing from other enterprises, such as those that had captured capital gains on their stocks of foreign exchange. But a change in the nature of the market, the removal of NBP guarantees on the credits, decreased the availability of this sort of credit. In the event, real inter-enterprise credit actually fell in the first quarter of 1990. A third source of liquidity for the enterprise was to borrow from their own workers, by reducing wages. Indeed, wage payments were well below those allowed by government wage controls in the first quarter of 1990. That workers controlled the enterprises and perceived some ownership stake in the firm makes this a plausible interpretation.

Firms could not borrow on domestic capital markets, as explained above. Calvo and Coricelli hold that the above three means of adaptation were insufficient. For at least many firms, then, "liquidity" was insufficient to allow the purchase of the inputs required to meet demand, and output fell as a result. This "strong form" of the hypothesis is modelled in their paper. It implies a supply-constrained output decline traceable to a lack of liquidity in enterprises and resulting inability to buy inputs. Calvo and Coricelli also discuss a "weak form" of the hypothesis that reduced credit effects output (though they themselves do not make this distinction), pointing out that the methods mentioned above by which enterprises attempt to adapt to the fall in credit reduce demand for other enterprises' output. Inventory sell-offs of not fully tradable goods, lower investment demand by firms, and lower wages of workers all reduce overall aggregate demand.

I will argue below that there is no evidence for the strong form hypothesis, that is that the December level of real credit was about right and that the reduction in credit reduced output through reducing firms' access to inputs. More plausible is the weak

\footnote{I thank Mark Schaffler for useful discussions of these issues and for suggesting that Calvo and Coricelli's hypothesis has two forms.}
form, which holds that contractionary monetary policy acts directly through the amount of nominal credit, so that less nominal credit implies lower nominal aggregate demand. This interpretation constitutes no argument for looser credit in January of 1990. The strong form would seem to imply that tight credit did not restrain the price level, since supply was constrained more than demand. The weak form, however, simply proposes the channels through which monetary policy lowered aggregate demand, as was the purpose of the policy. Whether aggregate demand was too restrictive is a question about the formation of expectations and the credibility of the program, here as with any stabilization program, and Calvo and Coricelli do not make clear how their somewhat different channel for the action of monetary policy modifies the traditional arguments.

The question of how credit effects real activity is of course an old one, about which there has been extensive recent work, in macroeconomics.\textsuperscript{59} The weak form hypothesis is closely related to the "credit view" of the monetary transmission mechanism. It holds (i) that bank credit is a special source of capital for firms because of the special role that banks play in evaluating potential borrowers and (ii) that monetary policy effects the amount of bank credit directly. These two propositions are clearly true in Poland. There is no commercial paper market. Monetary policy is conducted directly through controls on credit, not open market operations.

A second theme of the recent macroeconomics literature is the distinction between credit market imperfections as sources of disturbances and as propagation mechanisms.\textsuperscript{60} In Gertler and Gilchrist (1992), for example, credit market imperfections make for higher sensitivity to monetary disturbances roughly along the following lines: Firms pay a premium for external funds, and this premium is higher if the firm's wealth is smaller and hence the loan riskier, so the premium increases with the real interest rate. Furthermore, smaller firms have higher premia because increasing returns to scale in information and bankruptcy imply that larger firms have easier access to non-bank credit and pay smaller premia for outside funds. One of the consequences is that any shock which drives up the real interest rate will be amplified by the resulting reduction in

\textsuperscript{59}See Gertler and Gilchrist (1992) and Gertler (1988).

\textsuperscript{60}I am grateful to Mark Gertler for suggesting the possible relevance of this point to Eastern Europe. See Gertler (1988) for a survey of the literature on credit markets and macroeconomics.
wealth, and hence increase in premium for external funds, that the higher rate implies. Another implication is that small firms, which are more credit constrained, will bear the brunt of the contraction.

Application of this idea to Poland is not straightforward. There is almost no non-bank credit market, so all firms are essential "small" in the Gertler and Gilchrist sense of having no access to outside capital markets. It is clear that the riskiness and cost of the only available non-bank funds, inter-enterprise and bank credit, went up with negative demand shock of January 1990 as well as with the reduction in confidence in the implicit NBP guarantee against bankruptcies of enterprises and banks. But it is difficult to imagine that capital allocation became significantly more inefficient with the introduction of the idea that investments should be profitable and loans repaid.

More generally, though, the fact that bank credit allocation is not efficient and that a secondary market for credit is embryonic does seem to imply an "excess sensitivity" to shocks, in the Gertler and Gilchrist sense, in that firms are not able to optimally smooth shocks. Moreover, the inter-enterprise allocation of credit matters. Since the decisions are not optimal and the market cannot rearrange the credit to best advantage, there may be a direct effect of changes in the quantity of bank credit extended. The implication may be that the output cost of a reduction in nominal aggregate demand is higher than it would be if credit markets functioned well. Again, there are no obvious policy implications for the conduct of monetary policy during stabilization. More work may be needed here.

I turn now to the evidence alluded to above on the role of credit in early 1990. Calvo and Coricelli (1992b) present, inter alia, aggregate data on real credit and real sales in the first quarter of the stabilization episodes in each of five eastern european countries, including of course Poland. They point out a correlation between the declines in real credit and the declines in output. Second, they note that in general liquidity from inventory sales appears to be able to cover only about half of the decline in credit, in general. Third, they note the decline in enter-enterprise credit during the same period, at least in Poland.

Clearly, this sort of evidence is inconclusive. For example, it does not distinguish between demand and supply of credit. As real interest rates went from being extremely
negative to positive in early 1990, demand for credit (and inventories) could be expected to fall drastically, in an efficient response to the fact that credit now has an opportunity cost. Nor does it distinguish among any of the specific claims regarding the transmission mechanism for credit, such as the strong-form hypothesis above.

The next step in their analysis is to look at cross-industry regressions, following Berg and Blanchard (1992). Within the framework used to analyze inventory and sales behavior discussed above (see page 3.2), one can examine the effects of other variables on both sales and inventory behavior. We thus construct a variable equal to the change in real working credit from 1989-4 to 1990-1, divided by sales in 1989-4. From 1989-4 to 1990-1 80% of branches in our sample in industry had a decrease in real working credit so defined, and the average decrease as a proportion of initial sales was 3%.

The last three regressions in Table 3.2 on page 99 take up the potential role of credit factors, along lines suggested by Calvo and Coricelli (1991a). The last regression in Table 3.2 regresses the change in sales on the change in working credit. The change in working credit may be partly endogenous however; inventories may in part be used as collateral. Thus, the it instruments the change in credit by the initial credit to sales ratio in 1989-4. It shows a positive, marginally significant relation between credit and sales. The effect is quantitatively small. The estimated coefficient implies that the 10% decline in working credit as a proportion of sales —the average for the sample of branches is 3%— leads to a 2% of the decrease in sales.

The third and fourth regressions in the table focus on the effects of working credit on inventories given sales. They regress changes in inventories on changes in sales and changes in working credit, with and without instrumenting the change in credit by the initial credit to sales ratio in 1989-4. The evidence is that inventory changes are still negatively correlated with sales, but also positively correlated with the change in working credit. Thus, while there is little evidence that tight credit contributed much to the decrease in sales, there is stronger evidence that tight credit contributed to inventory decumulation, thus leading to a larger decline in production given the decline in aggregate demand is much stronger. The adjustment to lower inventory levels and positive real interest rates should be seen as a necessary and ultimately positive feature of the adjustment to a market economy, despite the initial effect on demand.
These regressions are not the last word on this issue, as mentioned in the text. Calvo and Coricelli (1992b) have used data from Berg and Blanchard (1992) to estimate alternative specifications. They have found that, if the specification is one of the rate of change of sales on the rate of change of working credit, the relation between sales and working credit is stronger than the relation reported above. Specifically, Calvo and Coricelli report that a simple (instrumented) regression of the percent change in real sales on the percent change in real credit, yields a coefficient of about 0.2.\textsuperscript{61} The difference in specification matters because although Calvo and Coricelli report that the coefficient estimates are the same, the average variation in the independent variable in Table 3.2 is much smaller, as is the explained fraction of the variance of the change in real sales (the $R^2$). Calvo and Coricelli therefore can claim that the credit contraction accounts for a fairly important part of the output contraction directly.\textsuperscript{62}

In thinking about which specification is correct it is useful to consider an industry which starts with a very small share of working capital in sales in 1989. It would seem that this industry has other ways of financing costs, so that a given percent change in bank credit is not as significant as it would be in an industry where bank credit amounts to a large fraction of costs. The Calvo and Coricelli specification, on the other hand, implies that the unmeasured funding sources are proportional to bank credit, so that a given percent change in bank credit has the same importance in the two industries.\textsuperscript{63}

This sort of evidence will not be conclusive. Like the aggregate evidence, it does not clearly distinguish among alternative hypotheses about the importance of credit. There are better ways of getting at least the question of the source of the initial shock in January of 1990. Most of this evidence is described on page 96 above.

(1) The survey evidence of managers is overwhelming that the impulse for the output

\textsuperscript{61}I cannot duplicate their results.

\textsuperscript{62}Calvo and Coricelli also argue that the expansion of credit in the rest of 1990 is consistent with the relatively slight recovery of output, particularly if the component of the credit expansion which consists of interest capitalization should not be counted because it does not represent an increased ability to purchase inputs.

\textsuperscript{63}Calvo and Coricelli also try another specification, regressing (the log of) sales in 1990 on (the log of) credit, obtaining a coefficient of 0.6. They then suppose that this is an estimate of the effect of changing credit on output. This is the equivalent of estimating a production function directly, where the only input is credit. Since the industries vary in size significantly, I suspect that the inclusion of any other scaling variable, such as employment, would sharply reduce the importance of credit.
decline in January of 1990 was a lack of demand, not a credit-constrained inability to purchase inputs.

(2) If the strong form of the Calvo and Coricelli hypothesis held, then we would expect that final goods inventories would have increased with the initial shock. Real final goods inventories in industry clearly fell, while the evidence on total final goods inventories is much less clear. I read the evidence as tending to show that total final goods inventories rose in January. Because of the sensitivity of estimates of total inventories to assumptions about deflation, it is useful to look at data on physical inventories in trade, since that is where the uncertainty lies. As was argued in the text, the available evidence, patchy as it is, suggests strongly that real inventories of consumer goods rose sharply in January, before falling quickly as retailers adjusted stocks in response to the new environment. Thus, the initial shock was not apparently from the supply side.

(3) A second way to avoid the problems of interpretation of aggregate inventory data is to formulate the Calvo and Coricelli strong form hypothesis in terms of cross-industry inventory regressions. The results, presented in Table 3.2 above, demonstrate that in the industries where real sales declined the most, final goods inventories accumulated the most (or fell the least). This is a relatively powerful test versus the strong form hypothesis, which would predict the opposite relation from that found in the data.

None of this discussion speaks to the weak form of the hypothesis, which holds that the main mechanism for the transmission of monetary policy is bank credit, nor to the types of ideas mentioned above to the effect that credit market failures somehow amplify the effect of other shocks. As was mentioned, these types of hypotheses deserve more careful specification and investigation.64

The justification for entering into a discussion of these issues in such detail is that the implicit policy implications of some interpretations of the Calvo and Coricelli hypothesis are strong. I hope I have shown (1) there is no evidence that tight credit

64 Schaffer (1992a) and the body of this chapter have pointed out that the channels of monetary policy include the effect of credit on effect wages, investment, inventory demand, and so on. Indeed, evidence presented in Table 3.2 above suggests that tight credit contributed to inventory decumulation, thus leading to a larger decline in production given the decline in aggregate demand is much stronger. The adjustment to lower inventory levels and positive real interest rates should be seen as a necessary and ultimately positive feature of the adjustment to a market economy, despite the initial effect on demand.
caused some sort of supply constrained output decline; (2) that the policy implications of other interpretations of the evidence are not clear, and in particular do not, as formulated, effect the standard debate about the required degree of tight monetary policy in stabilization. It is the case that a more efficient financial system would be better, but this has no simple implication for stabilization policy.
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Chapter 4: The Logistics of Privatization in Poland

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1. Introduction.

Privatization remains the most important outstanding item on the agenda of radical reform in Poland. The ‘big-bang’ reform program was designed to stabilize the hyperinflation, free prices and liberalize trade and restructure the foundations of the economy toward a market system. An integral part of this restructuring was to be the rapid privatization of state-owned enterprises that overwhelmingly dominated the non-agricultural economy.

In fact, little privatization of SOE’s has taken place.2 This is not due to a lack of ideas about how privatization should be accomplished; there has now developed a minor industry in which economists propose and discuss privatization programs.3 Nor is it due to a lack of trying: the Polish government has attempted to implement several methods of privatization. This paper will supplement the discussion about privatization strategies with a review of the actual attempts to implement them. By doing so, it should become clearer why so little privatization has actually occurred.

Two themes emerge. First, although much of the debate has focussed on optimal privatization schemes, in practice the issue has proved to be how to execute a minimally acceptable and feasible program. It is common to discuss privatization in terms of a set of goals, such as speed, effective ownership, equity, fiscal stability, avoidance of excess dependence on foreigners, and low cost. The problem, however, does not seem to be how to best reconcile competing goals, but rather how to accomplish anything at all. What is striking in Poland is that more than two years into the radical ‘big-bang’ program the vast majority of state enterprises have undergone no ownership transformation; instead, the highly unsatisfactory initial structure has been maintained: the workers

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2In this chapter I do not address the dramatic success that has been achieved in the growth of the private sector, particularly in construction, trade and other services and the transfer of shops to private hands. These have resulted in an increase of the share of the private sector in GDP to more than half by the middle of 1992. In industry, however, the share is still only about 19%. The vital topic of reform and privatization of the financial system is also not addressed here. See chapter 3 for fuller discussion of how privatization of state-owned enterprises fits into the general problem of economic transformation in Poland.

control but do not own the enterprises.

If the current situation in the state enterprise economy were satisfactory, this lack of action would be easier to understand. The current pattern of control of state enterprises, however, gives little cause for complacency. The evidence implies, as economic theory would suggest, that these enterprises are generally performing poorly. And despite the huge budget deficits, political pressure is growing to help these enterprises with subsidies, looser credit and trade protection.⁴

The second theme is that the initial conditions and constraints have shaped what has been attempted and what has taken place. The next section isolates three constraints: the usual set of institutional weaknesses common to most LDCs, special problems associated with the revolutionary ‘rules-of-the-game’, and the existing pattern of ownership rights. Section three examines privatization efforts to date. Section four concludes.

2. The Constraints on Privatization

Poland shares with LDCs a set of well-known characteristics that make privatization difficult. They include:

- a lack of well-developed capital markets, especially financial institutions
- a shortage of skilled and experienced personnel
- weak administrative capacity, including a shortage of infrastructure such as copy machines and telephones
- a difficult macroeconomic environment
- state enterprises in generally poor financial condition

In addition, Poland’s efforts to date have brought out a further set of problems whose influence is harder to appreciate but equally pervasive. This is the fact that the situation with regard to the rules-of-the-game, in the broadest sense, is revolutionary: Laws are either new or newly enforced after decades of dormancy. Customs and traditions of behavior, especially the bureaucratic, are widely recognized as inappropriate to the new environment, while new practices have not yet developed. Two points should be emphasized here. First, I am not referring to some ‘socialist psychology’ where

⁴As of early 1992. See chapter 3 for more discussion of these issues, and McDonald and Sachs (1992) for a discussion of restructuring problems in state enterprises.
individuals are no longer capable of responding to incentives. Second, the problem is not predominantly that the laws themselves do not exist but that they have never been enforced. Most of the commercial code and bankruptcy law, for example, dates from the 1930s (See Gray (1991)).

The problem lies rather in the lack of institutional development and in the complexity of the decisions involved in privatization. The habits and traditions that lower transaction costs by substituting for rigid rules do not exist. As a result, where rules are broken, especially in privatization transactions, corruption is suspected. Thus each minor piece of a transaction, such as the publication of a request for tender offers, requires the signature of the head of a department, who may be criminally liable if there turn out to be mistakes in the advertisement. The result is that the Polish bureaucracy is in effect on a ‘work-to-rule’ strike.

The final and most important constraint on the privatization process is the initial structure of ownership rights. Understanding this requires a brief discussion of property rights in the state-owned enterprises. Polish state enterprises should not be confused with state-owned corporations in the West: they are not joint-stock corporations whose shares are controlled by agents of the state treasury. They are also not administrative units of the bureaucracy. They are unique legal entities, subject to their own specific structures of ownership and control, with as much political legitimacy as almost any institution in Poland.

Poland began decentralizing decision-making to the enterprise level in the 1950s, but the point of departure for the current situation is a series of laws passed in 1981 and still in effect. These defined a state enterprises as “an autonomous, self-managed and self-financing unit, possessing personality at law,” and gave to the self-management bodies, which are democratically elected workers’ councils, the power to appoint the managing director, allocate profits, and plan production. The government kept only the power to

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3Where bureaucratic institutions are not involved and where individual incentives are appropriate, such as in the small private sector, entrepreneurs are starting businesses in the hundreds of thousands.

6See North(1990) on how ideology, customs and tradition reduce transaction costs.

7A type of industrial action, common in public unions prohibited from more overt strikes, whereby all rules and regulations are followed blindly and no actual work gets done.

create and liquidate enterprises, placing it in the hands of the branch ministry or 'founding organ' responsible for the particular enterprise.

This legal self-management was strongly qualified in practice by the nature of the 'shortage economy'. The central administration and the management retained real independent power, partly through the fact that the shortage economy made personal contacts in the government and with other firms critical for the functioning of the firm in order to obtain inputs, subsidies, tax relief, and so on.\(^9\) The administration and the Party thus retained central roles in appointing and influencing management. In the late 1980s, as reform continued and central planning receded, the power of the workers' councils and managers \textit{via a vis} the state grew.

The critical point was reached in 1989 and 1990 with the collapse of the Communist regime. The financial relationship between the state and the enterprise was clarified. The only remaining Treasury claim on profits was in the form of a proportional income tax and a 'dividenda' payment based on the book value of capital in 1983. All remaining profits were left to the enterprise. The enterprise was still ultimately owned by the state, but most important aspects of ownership had by now been carefully and clearly allocated to the self-management bodies.

The final collapse of the old state structure at the end of 1989 and the beginning of 1990 led to a strong affirmation of the power of the workers' councils. New councils, elected in early 1990, proceeded to pass judgement on management in about half of the firms, replacing some 40\% of the managers reviewed.\(^{10}\)

The growth in the stake of workers in the firm was more than a legal phenomenon. The shock troops of the Solidarity revolution were the industrial workers, and the front line in the confrontation between the state and the people was the shop floor. As a result, the sense of attachment of workers to their enterprise should not be underestimated. For example, 45\% of workers surveyed in 1987 and 67\% in 1989, and 63\% and 77\% of managers, were in favor of selling shares to workers, despite the fact


\(^{10}\)Help-wanted advertisements can be observed in Polish newspapers in which workers' councils announce that they are looking for experienced, skilled managing directors.
that most workers did not support ‘support private initiative’ in large state enterprises.\textsuperscript{11} Privatization of large enterprises was also the most popular type of privatization among the entire population. For example, 80\% of respondents to another survey agreed that ‘shares of privatized state enterprises should always be sold first to their workers.’

The up-shot of this process is that workers are now the dominant force controlling the state-owned enterprise. Despite this power shift toward workers, however, management often maintains significant power because of information advantages or close contacts with suppliers, foreign partners, or even the government, and because workers’ councils may be passive or co-opted.\textsuperscript{12} This granting of some sort of a stake in the firm to insiders has the advantage of creating a certain incentive for those who have the information to make efficient decisions.

The situation is more complicated that the above description implies. In addition to workers and management, the state retains significant power in the enterprise. While it largely given up control of the enterprises, it has not relinquished the legal right to dispose of the assets of the enterprise. The need for Ministerial approval of important transactions such as privatization or formation of a joint venture confers influence. The government also retains some of its traditional power through control over the banking system and the budget. Finally, many enterprises are in arrears on taxes, giving the state the power to force the firm into liquidation, as described below.

This confused control structure results in feeble decision-making in the enterprise. The relative power of the various players (management, the workers’ council, the unions, the government, and possibly creditors such as state banks) varies widely from enterprise to enterprise. In general the end result, however, is that any one of the stakeholders can block change, while concerted action requires consensus. One implication is that in smaller enterprises, the insiders are more likely to cooperate and actively carry-out adjustments, whereas in large firms internal conflict and passivity are more common.\textsuperscript{13}

\textsuperscript{11}CBOS (1989).

\textsuperscript{12}There are often two, or even three, plant-level unions active in the enterprise, sometimes in conflict with the workers’ council. As a result, the Polish press speaks of the firm being lost in the ‘Bermuda Triangle’ of management, the workers’ council, and the unions.

\textsuperscript{13}See Dabrowski et al. (1991) and McDonald and Sachs (1992).
This peculiar ownership and control structure has unfortunate implications for privatization:

- The current situation is extremely dangerous and probably unstable: real wages are rising and profit rates have declined to the point where aggregate net profits were negative in the fourth quarter of 1991, with direct implications for the budget, both because of lower accrued taxes and because of enterprise arrears to the government. The budget deficit for 1991 was running at 4.5% of GDP, and arrears equalled 85% of this deficit. Taxes on wage increases in excess of government-established norms constituted the largest component of these unpaid liabilities. Prospects for the 1992 budget are worse.

- The withdrawal of the state has left current insiders with a powerful informational advantage over the government as well as a strong incentive to try to preserve their current rights during privatization. One potential positive implication is that those who control the firm have the information and some of the incentives to behave efficiently. The looming threat of disenfranchisement through privatization weakens these incentives and encourages irresponsible behavior.

- Insiders will resist disenfranchisement except where the firm is in financial distress. The government finds itself making promises of financial and other support in its effort to actively privatize firms.

The next section reviews the experience to date in the privatization of state-owned enterprises.

3. Privatization efforts to date

(1) Spontaneous privatization.

Given the above constraints, it is not surprising that the first occurrence of privatization was instigated and controlled by insiders. With the relaxation of government control over the enterprise in the late 1980s and as the end of the Communist era appeared, the management found opportunities to privatize profits through so-called 'nomenclatura privatizations.' In a typical transaction, the management and perhaps ministry officials would participate in a new private company that would enter into a joint
venture with the state enterprise. Transfer pricing and other terms of the joint venture would ensure that profits would be transferred to the private company.

Condemnation of these sorts of deals was widespread, and one of the first Solidarity-government reforms in late 1989 made liquidation of a state enterprise mandatory in the event that "over half of the enterprise's assets are composed of shares, other equity in joint-stock companies, or bonds, or have been transferred in usufruct to other parties on the basis of civil contracts." The increased power of the workers' councils and unions also resulted in a curbing of nomenclatura privatizations.

As the power in the firm has shifted from the nomenclatura to the stakeholders described above, a related form of spontaneous privatization has developed. In this case assets are transferred to private hands with the agreement of all the interested parties, which would normally include workers and managers. For example, one wholesale distribution enterprise, with several hundred employees, was largely dismantled and began to operate in private hands, probably without any transaction registered as 'privatization'. The gas-station was leased to employees, the trucks were sold, and a private company was using the parking lot and some of the office space. The arrangements may or may not have been legal, but probably no one with any power to seriously interfere was unhappy. In another case, a warehouse that was part of a state farm was being used by a local farmer to store animals prior to export, as part of a major private operation. The state employee in charge of the warehouse was also an employee of the private company.

By its nature, this sort of privatization is hard to observe, much less measure. It is probably economically efficient. If it is significant it represents an important qualifier both to the claim that little privatization has taken place and to the statistical evidence on the decline in employment and output in the state sector. Informal estimates from recent surveys suggest that perhaps one third of enterprises have engaged in some sort of partial asset transfer to the private sector, and that virtually all of the assets from the burgeoning

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private sector come from the state sector.\footnote{I am indebted to Tony Levitas for sharing preliminary results from current work in Poland. I rely heavily on his information both here and later when I discuss outcomes in liquidated enterprises. See chapter 2 for further discussion of measurement of the private sector and some estimates of biases in the measurement of output and consumption during transition.}

It is not clear that this sort of privatization can form an important part of the overall process. It appears to be difficult to arrange in the larger state enterprises. The privatization of an asset in such an enterprise requires an arrangement within the company for distribution of the gains. If the asset is well-defined (a pig-farm belonging to a shoe factory, for example) it may be a natural outcome for those working with the asset to appropriate it. For integral parts of the factory, however, the internal coalition may be difficult to form. In one case, a private company in Gdansk leased workshops and hired workers from one of the large state-owned ship-yards at much higher (presumably efficiency) wages. This arrangement was halted by the workers in the state enterprise, who apparently objected on grounds of equity.


The alternative to spontaneous privatization is active government intervention to privatize. The government gained the legal power to begin privatizing state enterprises with the passage of the Law on Privatization of State Enterprises on August 1, 1990, and this continues to define the context for privatization in Poland.\footnote{Center for Privatization(1990). See Madigan(1992) for a useful description of privatization mechanisms in Poland.}

This law was the culmination of a long and acrimonious debate. Initially, at the end of 1989, the government envisaged universal ‘commercialization’ of state enterprises (Polish terminology for the legal conversion of state-owned enterprises to joint-stock companies owned by the State Treasury and subject to the commercial code). The government hoped to rapidly privatize these commercialized firms, primarily through initial public offerings. There were several justifications for this approach: the desire to generate widespread share ownership for sociological and political reasons, a strong attachment to Anglo-Saxon-type capital markets, itself partly due to the influence of aid-financed investment bankers and financial market specialists, and, more generally, the feeling that the valuation and sale of assets was the only ‘civilized’ approach. The
government intentions to commercialize 'from above', without workers' council approval generated strong resistance and were abandoned. This was partly simple interest-group politics in the Sejm (the lower house of parliament), and partly a widespread fear of nationalization, based on concerns that the state would run the enterprises no better than it had in the past and that 'Solidarity' might take on characteristics of the former regime if given power over the enterprises.\textsuperscript{17}

The law envisages two possible paths for the privatization of an enterprise. The first, 'capital privatization', was intended in general for large enterprises. The second path, 'liquidation', was intended for smaller enterprises and will be discussed below. The first step in capital privatization is commercialization. This step normally requires the approval of the workers' council, the management, and an assembly of employees.\textsuperscript{18} With commercialization a board of directors is appointed by the representative of the Treasury (now the Minister of Privatization). The workers appoint 1/3 of the board. The State Enterprise Law no longer applies to commercialized enterprises. In particular, the workers' council loses its powers and the management is responsible to the board.\textsuperscript{19} After commercialization, the Ministry of Privatization (MOP) is responsible for privatization of the enterprise. The workers are given the right, however, to buy up to 20% of shares at half price, subject to a limit on the total discount equal to one years' wage.

The second major path of privatization envisaged in the law is 'liquidation'.\textsuperscript{20} Here, the basic idea is that the enterprise decides to privatize, the branch ministry responsible for the enterprise agrees, the MOP concurs, and the liquidation is implemented by the branch ministry. The state enterprise ends its legal existence and

\textsuperscript{17}The main alternatives to the government plan in the Sejm were variations on the idea of worker-self management. Gruzaecki(1990) argues that while there was some real attraction for the worker-management/ESOP type plan, a dissatisfaction with the government approach of selling enterprises generated much of the resistance. In the end and after some 24 versions, the final draft still assumed the case-by-case commercialization and sale of enterprises.

\textsuperscript{18}The law did provide that a majority of the council of ministers and the prime minister could compel an enterprise to commercialize without workers' council approval. This power has not been exercised to date. See Prywatyzacja #1 and #4 for explanations of this aspect of the law.

\textsuperscript{19}A later addition to the law allows the loosening of the wage controls in an effort to encourage commercialization.

\textsuperscript{20}Confusingly, the State Enterprise Law of 1981 also envisages 'liquidation' of state enterprises which are delinquent on certain tax payments. This distinct type of liquidation will be discussed separately below.
there are three possible outcomes for the assets:

1. The assets are sold piece-by-piece by the responsible ministry.

2. A new company is created between the Treasury and a private investor.

3. The management and employees create a private firm and lease the assets (and the liabilities) of the enterprise from the Treasury.\textsuperscript{21}

4. Implementation of the privatization law.

(1) Commercialization.

Commercialization is the necessary first step to capital privatization. Table 4.1 gives the number of firms commercialized by size facts and Table 4.2 a sectoral breakdown. Some 244 enterprises have been commercialized since the law was passed (as of the end of 1991). These represent about 10 percent of employment in the national economy. The government strategy has been to associate commercialization directly with privatization, so while the constraints discussed above have influenced this process as well, I will not focus on them, except to summarize some tentative conclusions.

First, it was not difficult to find board members. A training program developed within the MOP has succeeded in producing enough candidates. There is no direct evidence, however, that boards intervene actively. MOP officials complain that important decisions require their direct intervention. It appears that boards tend to become advocates for the enterprise instead of agents of the owner (the Treasury).\textsuperscript{22}

Second, the enterprise and the government tend to feel that the state is newly responsible for the enterprise. This is a logical result of the increased ownership rights of the government and an outgrowth of the implicit or explicit promises the government makes to enterprises in its efforts to get them to commercialize.

Third, some evidence points to an increased passivity in the enterprise. There is apparently a fear on the part of the management that since the government is now responsible for finding buyers, foreign partners, and so on, it is not a good idea to risk

\textsuperscript{21}The new private company must be created according to the commercial code, with a paid-in capital at least equal to 20\% of the book value of the state enterprise. The law also defines some of the terms of the lease. See Prywatyzacja #2 and #3 for legal commentaries on this aspect of the law, and especially Madigan (1992) for further explanation.

\textsuperscript{22}For this reason the placing on boards of representatives of creditors such as banks and other enterprises on the boards of commercialized companies is being considered.
Table 4.1
Number of State Enterprises Commercialized and in Liquidation as of December 31, 1991

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1) (2) (3) (4)</td>
<td>(1) (2) (3) (4)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>442 5 2 534</td>
<td>24 15 338 416</td>
<td>244</td>
<td>1194</td>
</tr>
<tr>
<td>&lt; 200</td>
<td>324 4 0 371</td>
<td>15 8 159 190</td>
<td>8</td>
<td>569</td>
</tr>
<tr>
<td>200 - 500</td>
<td>75 0 1 99</td>
<td>6 4 117 144</td>
<td>52</td>
<td>295</td>
</tr>
<tr>
<td>&gt; 500</td>
<td>43 1 1 64</td>
<td>3 3 62 82</td>
<td>184</td>
<td>330</td>
</tr>
</tbody>
</table>

Source: Ministry of Privatization, Warsaw

Means of liquidation:
(1) Via sale of property
(2) Via contribution into company
(3) Via leasing
(4) Total

strikes or other disruptions that might be caused by restructuring until this time. The fact that the MOP will actively structure any eventual privatization means that the management has much less chance of benefiting from, for example, a joint venture than if it could negotiate and conclude the deal itself.

(2) The first 5 IPOs.

In the year after the passage of the privatization law, the government focussed its energies on the preparation of companies for initial public offering (IPO). The idea was to make the first privatizations so successful that the process would ‘snowball’, so that up to one or two hundred enterprises could be processed and sold every year. However, the experience with the first five IPOs convinced almost everyone that additional methods of privatization was necessary.

The selection of companies was a long and politically difficult venture, in which a list of 20 companies in January 1990 was winnowed down a final 5. These companies, with 23 thousand total employees, were chosen as the best candidates by Western and Polish consultants, on criteria of quality of management, financial soundness, ability to export, and so on. They were offered to the public in November of 1990.
Table 4.2  
Number of State Enterprises Commercialized or in Liquidation by Industrial Sector  
as of December 31, 1991

<table>
<thead>
<tr>
<th>Sector</th>
<th>Total Number of Remaining State Enterprises</th>
<th>Number of Enterprises Transformed</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Liquidated</td>
<td>No</td>
<td>%</td>
<td>No</td>
<td>%</td>
<td>No</td>
<td>%</td>
<td>No</td>
<td>%</td>
</tr>
<tr>
<td>Industry</td>
<td>3009</td>
<td>255</td>
<td>8.5</td>
<td>201</td>
<td>6.7</td>
<td>456</td>
<td>15.2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Construction</td>
<td>1367</td>
<td>271</td>
<td>19.8</td>
<td>30</td>
<td>2.2</td>
<td>301</td>
<td>22.0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agriculture</td>
<td>1833</td>
<td>174</td>
<td>9.5</td>
<td>1</td>
<td>0.1</td>
<td>175</td>
<td>9.5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Forestry</td>
<td>51</td>
<td>1</td>
<td>2.0</td>
<td>2</td>
<td>3.9</td>
<td>3</td>
<td>5.9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transport</td>
<td>529</td>
<td>62</td>
<td>11.7</td>
<td>7</td>
<td>1.3</td>
<td>69</td>
<td>13.0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Communication</td>
<td>5</td>
<td>1</td>
<td>20.0</td>
<td>0</td>
<td>0.0</td>
<td>1</td>
<td>20.0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trade</td>
<td>608</td>
<td>126</td>
<td>20.7</td>
<td>1</td>
<td>0.2</td>
<td>127</td>
<td>20.9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>826</td>
<td>60</td>
<td>7.3</td>
<td>2</td>
<td>0.2</td>
<td>62</td>
<td>7.5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL ECONOMY</td>
<td>8228</td>
<td>950</td>
<td>11.5</td>
<td>244</td>
<td>3.0</td>
<td>1194</td>
<td>14.5</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Ministry of Privatization, Warsaw

Note: The percentages indicate the ratio of number of transformed enterprises to the number of remaining state enterprises.

enterprises were successfully sold, although the subscription period had to be lengthened and a state-owned bank allowed to purchase shares in order to avoid under-subscription in some issues. 130,000 shareholders bought shares worth 31 million dollars. The offering of five large companies simultaneously has to be considered a success considering the environment, but these transactions were expensive and more importantly required tremendous allocation of government human resources.

The achievement of actually privatizing 5 companies in the Polish situation and, in the process, creating some of the institutions of a capital market was remarkable. But the success has been mixed. Since the initial offering, at least two of the five have gotten into in serious difficulty, as real appreciation of the zloty and the elimination of CMEA trade have hit them hard. Share prices have fallen below the offering price in four of the
five companies. The boards do seem to function reasonably well. But these boards have a high concentration of scarce talent, such as the president of a new development bank and department directors from the MOP. The companies still appeal to the MOP for help when in trouble, as well, cashing in on implicit or explicit promises of support.

In a larger sense, the failure of the IPO approach was clear and acute. While certain technical details could be better worked out in the future, nothing suggested that there would be a ‘snowball’ acceleration of IPOs; the next round would clearly as hard as the first. While some capacity had been built, the transaction cost was unsustainable and public enthusiasm had fallen in response to the poor stock market performance. And after all, only five had been done. Nonetheless, the government continued to carry out public offerings, and since 1990 there have been another five full or partial public offers, in which some 33 million dollars worth of shares have been sold. (See Appendix Table A4.1 for a list of all firms privatized through capital privatization). In addition, there have been another 16 enterprises privatized through auctions and tender offers. As the table shows, the total value of shares sold in these 16 enterprises was about 142 million dollars, with the companies valued at 228 million dollars. The largest of these were sold at least in part to foreign investors.

The IPO approach has thus proven to be extremely slow. Advocates of alternative approaches had already provided the reasons why the program could not be the primary vehicle for privatization. Until the end of 1990, however, there were always those who argued that the process was about to accelerate drastically. It is thus instructive to briefly look at the reasons for the slow pace of public offers.

The novelty and risk of the procedure compelled the government to promise good returns to investors, and health and success to the companies involved. This made doing due diligence (verifying the health of the company, checking the balance sheet, etc.) even more arduous than the difficult environment would imply. The fact that afterwards there would be diffuse ownership, together with the political exposure of the project, made it necessary to carry out any restructuring prior to privatization. The ‘snowball’ concept exacerbated these problems by raising the stakes enormously.

In addition to the need to value the firm, all sorts of details slowed the process down. For example, the legal determination of all the land ownership claims and tax
liabilities of the enterprises was a necessary prerequisite for privatization and required close cooperation from a large number of government bureaucrats unaccustomed to making legal statements. In addition, in some cases complex ‘unofficial’ claims against the enterprise needed to be unravelled prior to privatization. For example, an enterprise might have been providing central heating to the local town free for many years. The future of this relationship would have to be negotiated prior to privatization.

Sales to foreign investors illustrate many of the same problems as IPOs. In particular, they highlight the different agendas and relative bargaining power of insiders and the MOP. Managers are often the best equipped to locate and negotiate with foreigners. They know their own business and often the industry, and may have long-term relationships with the foreign partners. They are generally interested in preserving and strengthening their company, perhaps under workers’ council pressure. They may also be looking for some sort of ‘golden parachute’ from the investor. The typical large direct foreign investment in the late 1980s, the joint venture, was thus often a sort of nomenclatura privatization.

The MOP recognized the inherent conflict of interest involved when managers negotiate deals for state enterprises, and called for major foreign investments to take place through capital privatization, with the Ministry of Privatization taking an active role in the negotiations and making the final agreement. This did not prove effective. Managers have the incentive to negotiate quick and cheap deals, but ministry bureaucrats do not. Given the sums of money involved, the difficulties in valuation, and the fact that the need to sell to highly risk-averse foreign investors lowers the price, very few bureaucrats are willing to take the responsibility for deciding to accept an offer. Moreover, they face steep obstacles in overcoming the insider power of managers to actually conduct legitimate tender procedures.  

As a result of these problems, many more deals have been announced than negotiated, and the big transactions have by and large not yet happened.

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23For example, at one point the Ministry wanted to conduct a competitive tender for an important enterprise with two interested foreign buyers, one Japanese and one British. After a long and disastrous meeting between Ministry representatives and the management on the one hand and the Japanese potential investors on the other, the Japanese went home for good. Only then did the Ministry officials notice that the management team was wearing the company ties of the British firm.
(3) The Sectoral Approach

As a result of the difficulties with IPOs and resultant demand for alternatives, and because of the difficulties the MOP had in coping with potential foreign investors, the ‘sectoral privatization’ approach gained favor in 1991. This was intended to speed up the process and deal efficiently with the many problems with the IPOs and individual trade sales. The idea of sectoral privatization was simply to process capital privatizations, especially trade sales to foreign investors, one industry at a time instead of one firm at a time. Thus one financial advisor could be used for a sector instead of a firm (See Hermann (1990)). There were five factors encouraging this approach:

1. A simple economy of consulting and ministerial resources was possible. Handling a sector would be only slightly more difficult than handling one firm. The economies of scale come in several forms:

   • marketing of companies to potential investors is more efficient. Industrial trade shows can be visited, advertisements in trade journals can be combined, and so on.

   • industry studies, both domestic and foreign, are a necessary part of a serious single company analysis.

   • someone must oversee each consultant contract within the MOP. It helps to have one contract for several companies. As discussed above, the difficulty in finding a person able and willing to accept responsibility for a deal cannot be overestimated. The sector approach was to provide structure and help for MOP officials.

2. The bargaining position vis-à-vis the foreign investor was seen to be stronger. The investor could no longer go from company to company seeking the best deal.

3. The bargaining position vis-a-vis the company would be stronger. The MOP is equipped with perhaps more information than the managers themselves, and can explain why the firm needs to be a part of the privatization. The ability to sit down with representatives of the entire industry and threaten them that if they do not get on board, they will lose out to their colleagues and competitors has turned out to be effective in getting firms to volunteer.

4. Sectoral studies could in principle help inform industrial policy.

5. Certain policies that effect all the firms in an industry could in principle be
carefully formulated and applied, such as treatment of environmental liability.

Sectoral studies are underway in some twenty sectors. One, in the detergents sector, has been more-or-less completed. This project was initiated because of foreign expressions of interest in particular companies. The result has been, after some 9 months, that most of the firms involved in the study have been dealt with in some fashion. The best three were sold for what Ministry officials perceived to be much better prices than would otherwise have been obtained. Other sectoral projects have resulted in studies with little other action so far, although perhaps 40 transactions are in some stage of preparation. Five transactions have been carried out as of the end of 1991, all trade sales to foreign investors. In general, however, the goals of the sectoral approach have yet to be realized. Heavy reliance on foreigners and consultants may have caused a public backlash against selling companies 'too cheaply' to foreigners. More generally, it remains a question whether much can be done except to sell good companies to foreigners, something which Western investment banks do know how to do. On balance, while the sectoral approach seems to be a sensible way to conduct some foreign trade sales and can provide some useful information to the Ministry, it is not in itself going to accelerate greatly the overall privatization process.

(4) Privatization through liquidation.

Liquidation is the second main path of privatization envisaged in the August 1, 1990 Privatization Law. It was designed to facilitate a decentralized and 'bottom-up' process, whereby interested enterprises could take the initiative to privatize themselves, subject to certain constraints, but with the possibility of lease-financing from the Treasury.

This type of privatization has been by far the most common, despite receiving much less attention in the public (and especially foreign-language) debate, and although the MOP resources devoted to this path have been relatively minimal.\(^24\) Although the law allows for three mechanisms for liquidation, in practice 81% of transactions have followed the leasing method: the creation of a new private company whose shareholders are the workers and managers and which leases the assets of the state enterprise. This

\(^{24}\)This is in part because small firms, typically the ones that undergo this sort privatization, represent a relatively small part of Polish industry. For example, the largest 413 enterprises employed in 1989 account for 45% of all workers in industry.
follows from the ‘bottom-up’ nature of the process: insiders only try this, in general, if they want to own their firm. (Table 4.1 and 4.2 above present the size and sectoral breakdown for liquidated enterprises).

In a typical transaction, the management and workers of a small and promising firm decide to privatize. They hire a consultant, approved by the MOP, who does a valuation of the company. The legal status of the assets and liabilities of the state enterprise is determined (land ownership etc). When the responsible branch ministry and finally the MOP agree, the liquidation begins. The workers and managers form a new company and put in the start-up capital as required by the law. Often a ‘rich uncle’, perhaps a foreign investor, helps provide the money. If no one objects, such as rival claimants for the assets or the local government, the MOP is likely to approve the liquidation. These transactions require months of strenuous effort, although, unlike capital privatizations, most of the work is done by the enterprise or the consultants it hires.

An important uncertainty exists as to how many of these deals have actually been completed. Some 416 liquidations have achieved final ministerial approval. However, only 154 have reached the final step, in which the state enterprise is crossed off the books. It appears that a variety of problems can arise to complicate the final closure of the deal. First, property claims turn out to be multiple and conflicting, or at least difficult to disentangle. Second, the new private company, which may already be operating and benefiting from the state-enterprise assets by the time the ministerial agreement is given, may try to renegotiate the terms of its lease.

There are some potential problems with these liquidation privatizations. The companies may be over-leveraged if the initial valuations were too high. The companies may be betting that the government will not want to reclaim the assets or that they will be able to appropriate the assets before this happens. The anecdotal evidence of excessively burdensome leases may, of course, reflect managerial attempts to force renegotiation of terms. The Ministry has been worried, however, that the enterprises

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29An example of the kind of tangled property claims that can cause problems may illustrate the point. A private sector supplier of plumbing (the ‘toilet king’) during the late 1980s gained control over the parking lot to a major hotel outside a major town. He apparently made a deal according to which he supplied fixtures to the hotel in return for some sort of concession to the (only available) parking lot. He is currently charging a few dollars to each hotel guest to park there. This hotel could not be liquidated without first clarifying the legal status of this contract.
would be so burdened by debt payments that they would not be able to invest.

Important early evidence suggests that firms which undergo this type of privatization engage in active and positive restructuring. They change pay scales, reduce the workforce, find partners, and so on. This seems to happen throughout the process, not only at the end, implying a confidence that the assets will eventually be privatized.

There are few signs of social or political resistance to these transactions, perhaps as result of its ‘bottom-up’ nature, although some people in the MOP are bothered by the idea that insiders are appropriating state assets too cheaply. In conclusion, this is a privatization method which seems to accommodate itself to existing stakeholders. With the caveats mentioned above, it seems to be proceeding fairly rapidly, without enormous Ministerial effort.\(^{26}\)

(5) Bankruptcy.

The second most common path to the transformation of a state enterprise, after liquidation and worker/management buy-out, is liquidation according to the state enterprise law of 1981, a form of bankruptcy. This method is intended for firms that are in arrears to the government, which thereby gains the legal right to appoint a liquidator to sell off the assets and pay-off creditors. A liquidator has begun work on some 534 mostly small firms, with an average employment of about 250, since the passage of the privatization law in 1990. Only a few of these liquidations have been completed.\(^{27}\)

There is also a German-style bankruptcy law that gives creditors or the firm the option to begin bankruptcy proceedings in court. Given the general macroeconomic climate and financial outcomes in state enterprises, one would expect a large number of these bankruptcies. It is outside the scope of this paper to discuss why, in practice, virtually none have occurred, but the logistical and institutional difficulties involved in

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\(^{26}\) One attractive alternative to the worker/management leasing approach for small companies would be simply to hold an auction. A desire to avoid excessive leverage, to find active outside owners, and to get better prices, led the Ministry to try this approach in 1991. Very few auction transactions have been carried out. Often, only one bidder has emerged, and this sole bidder may turn out to be a manager from the firm, or a partner in the consulting company that handled the valuation. Examples like this help explain why some in the Ministry consider that the most appropriate firms for auctions are the ones which come to the Ministry begging for help, desiring only to avoid bankruptcy: these are the firms that the insiders do not much want, and that therefore will not take care of themselves.

\(^{27}\) Tables 4.1 and 4.2 above present the size and sectoral breakdown for enterprises liquidated through the Law on State Enterprises.
applying long-dormant laws are overwhelming.\textsuperscript{28}

(5) Mass privatization.

The inclusion of a discussion of mass privatization in a paper concerned with the experience of privatization is somewhat premature, as no companies have actually been privatized through this method. The constraints discussed in this paper have, however, shaped the ongoing preparation of the program.\textsuperscript{29} Therefore the following briefly outlines the program as it appears to be developing, reviews some of the choices that have been made and addresses unresolved questions, and then asks why it has taken so long to implement.\textsuperscript{30}

- The program aims to involve some 400 to 600 companies, at least initially. A plausible estimate would be that these companies will average about 1000 employees per company, so even this first tranche could amount to upwards of ten percent of employment in industry. These companies will be commercialized over the next few months (some 150 have already been completed). 37 Polish consulting companies coordinated by a major international accounting firm are preparing informational packets on each enterprise to be involved in the program.

- Ten to twenty financial intermediaries (‘funds’) are to be created. The funds will be joint-stock companies under the Polish commercial code, similar in some respects to American closed-end mutual funds. Their shares will be distributed to the Polish population, the ultimate owners. Their initial board will be appointed by the MOP. The first share-holder’s meeting will be held and the board subject to re-election perhaps after the 1992 books are audited, in 1993.

- The funds will choose and sign contracts with fund management companies, with the assistance of the MOP. The fund managers will have responsibility for all day-to-day management of the fund and its portfolio. The management contracts will contain strong

\textsuperscript{28}See Banaszuk (1992) for a discussion of some of the practicalities of bankruptcy in Poland.

\textsuperscript{29}Discussion of the design of large-scale free give-away privatization programs has a fairly long history, however. Among the many papers on free giveaways in Poland are Szomburg and Lewandowski (1990), Lipton and Sachs (1991) and Frydman and Rapaczynski (1992). Implementation had been prepared in earnest since S.G. Warburg was appointed advisor on mass privatization to the MOP.

\textsuperscript{30}At the time of writing the timing for the program is still uncertain, as the enabling legislation is before the parliament.
incentive clauses to minimize dependence on initial valuations.

- Each fund will be the lead shareholder in some ten to twenty companies, holding a 33% stake, and will hold much smaller pieces, say 2 to 3%, of many more enterprises. The method of distributing the companies to the funds has not been made clear. It may involve some sort of auction (for ‘bidding points’, not real money), or a random allocation.

- Workers in the enterprises involved will receive free-of-charge 10% of the shares in their firm (up to a limit of one years’ wage worth of equity at book value).

- The funds will be able to buy and sell shares in their portfolios soon after they begin operation, subject to approval of the Anti-Monopoly Commission. They will be responsible for appointment and oversight of board members for the companies in their portfolio. They will be given special responsibility for the companies in which they are the lead shareholder.

- The mechanisms for the transfer of the shares of the funds to the population are still under active discussion and investigation. One plausible option involves the creation of a single ‘program share’ which would represent one share in each fund in the program. These shares would be distributed to the population (or sold for a small fee) and would be tradeable over-the-counter. When a large number (for example 20) of the shares are taken to a licensed broker, they would be registered and ‘broken-out’ into the individual fund shares, which would be traded on the stock exchange. Dividends would not be distributed and proxy voting disallowed until the shares had been broken out. This potential solution has the advantage that it significantly reduces transaction costs associated with trading, payment of dividends, shareholder relations, and so on in the initial period.31 Shares in the funds may be distributed somehow as an alternative to wage or pension payments for public sector employees.

This brief description suggests that a large number of issues remain undecided. Among the more important questions are: how to guarantee sufficient autonomy of management companies; how to manage trading of the large number of shares and, possibly, dividend payments; how to handle the incentive contract if the fund decides to

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31Of course, if it were politically acceptable to randomly allocate each citizen to one specific fund, this would further simplify the process.
terminate the current fund management contract prematurely.

Many important questions appear to have been settled, however. I will concentrate on one: the ‘top-down’ versus ‘bottom-up’ creation of the funds. A central question faced early in the design of the program involved whether the funds should be created by the government or whether they should be allowed to develop spontaneously. Approaches similar to the current Czechoslovak approach were actively discussed in Poland. In this type of plan, vouchers are distributed to the population, who then are encouraged to choose an intermediary institution in which to invest the voucher. The intermediary, competing with other intermediaries for the voucher, can choose the enterprise of its choice for the initial investment.

The decision to reject this idea in Poland was to minimize complexity. It was decided that the construction of a system that could reliably and in a reasonably fraud-free way distribute and redeem vouchers would be costly and risky, and perhaps impossible. The benefits of a more spontaneous creation of intermediaries by individuals were not considered to be worth the risk of large-scale confusion, chaos and fraud. The Ministry decided that relying on tested and reputed fund management companies in the early stages would be more reliable than trusting the uninformed choice of voucherholders. In this model, shareholders would exercise choice later, as their share in the funds became tradable.

A potentially unfortunate upshot of this choice, however, and perhaps the major reason for the cautious approach so far taken towards mass privatization plans, is the risk of excess ‘centralization’ perceived by some, such as, for example, Frydman and Rapaczynski (1991). The government essentially creates the funds at first, and by default must appoint the first board of directors, who are subject only to the indirect discipline of diffuse share-ownership and legal obligations. It was judged that this would be an effective way of leveraging scarce government energies and that it would be possible to create a small number of quality boards.

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The current somewhat decentralized control structure has some advantages which could be threatened by a strengthening of direct government responsibility for the firm. There is the risk that the firms become even more passive than they currently are as workers and managers wait for the government to "save" them. Finally, the budget might come under even greater pressure if the government were less able to claim it had no responsibility for wage-setting in a given state enterprise.
Related to the 'top-down' nature of fund-creation is the need to decide on the structure of the intermediaries. If voucher-holders simply decided with whom to invest, the government could avoid deciding whether the funds should more closely resemble holding companies, mutual funds, venture capital funds, or whatever. In the event, the proportions of shares going to the funds as outlined above was judged to provide a sufficiently active owner while avoiding some of the risks of excessive concentration of power.

Most of the other outstanding implementation issues can be worked out through pragmatic and careful analysis of options and discussion with potential fund managers. Three, however, are arguably more serious: Until now, the Ministry has not used its powers to force the commercialization of state enterprises. Instead, it has relied on enterprises to volunteer for commercialization and specifically for mass privatization. Given the above discussion about incentives for insiders to attempt to preserve current rents where they exist, a concern about negative self-selection is logical.

It is not entirely clear that all of the difficulties associated with capital privatizations have been resolved for mass privatization. One of the goals of mass privatization is to avoid having to construct each privatization separately, but some firm-specific issues may have to be addressed. For example, it may be necessary to unravel unclear property claims and decide on the disposition of social assets currently controlled by the enterprise. Another example is provided by the problem of environmental liability. Blanket indemnification for past damage usually requires an environmental audit at the time of transfer of assets, a time-consuming process. On the other hand, the absence of indemnification may expose the funds to excessive future risk.

The final question concerns the political acceptance of foreign involvement, and of the program in general. Recent events, and some survey results, suggest that understanding and acceptance have grown and that the new Sejm is seriously addressing itself to remaining questions. Furthermore, the difficult situation for state enterprises has muted objections to temporary 'centralization' of control, and perhaps has focussed debate on how to improve the situation for the state enterprises. On the other hand, the recent elections have witnessed some resurgence of nationalism and doubts about foreign involvement in the economy. At the time of writing, mass privatization seems to have
renewed political momentum and a good chance of going forward.

Why then, is mass privatization taking so long to set in motion? On the one hand, the program has numerous potential advantages in light of the constraints mentioned above. It avoids some of the problems of valuation, finds owners for a huge number of firms, includes free distribution to insiders, but also prevents them from taking all the assets. It should mobilize resources in a decentralized way to restructure large numbers of enterprises, leveraging ministry energy through the funds. On the other hand, it is both a novel and complex operation, involving to date some four foreign advisory firms, tens of Polish consulting companies, and much technical and political effort. Legal, economic and political issues have to be carefully coordinated. Many decision-makers felt a strong disinclination to increase government involvement in the enterprises, after years of struggling for decentralization. Difficult choices have presented themselves at each step in the design of the program. The alternative of taking a little more time to reflect and gather information has always been attractive. The lack of examples has been decisive in encouraging this extra care\(^3\). The program also has an important all-or-nothing feature: the critical mass of companies included needs to be large enough that the value of the fund shares is not ridiculous. Finally, such a complex plan requires the several ministries, political leaders, and the population to mobilize behind a basically confusing agenda.

5. Conclusion

Two years after the 'big bang', 11 percent of Polish state enterprises have been commercialized or privatized. This paper has reviewed attempts at implementing privatization in Poland. In doing so, it has highlighted how difficult the process is and explained some of the reasons for this difficulty. The overthrow of the Communist regime, marketization of the economy, and legal and political revolution have changed all the 'rules-of-the-game', and in this environment the complexity of the privatization task overwhelms administrative capacity. Moreover, privatization requires a widespread rearranging of ambiguous property rights. It is not clear who owns the firm, who is responsible for liabilities, and in particular what power remains with the state. The result

\(^3\)Stabilization programs are also complex and risky to implement. However, the existence of various worked-out examples simplifies the design of a new program.
has been a confused political debate, a paralyzed bureaucracy, and enterprises whose workers and managers control the enterprise without any certain long-term stake in the firm.

We can characterize privatization strategies into three broad categories. The first, followed by Poland in 1990, stresses the careful creation of capital markets and case-by-case ‘top-down’ privatization of state enterprises. This has essentially failed. The second emphasizes the organic growth of the private sector, perhaps augmented with spontaneous privatization. (See Kornai (1991)). It may indeed be that the Polish economy will evolve over decades into a market economy without privatization of the large state enterprises. Indeed, the private sector is growing at a phenomenal rate, and liquidations of small enterprises seem to be proceeding fairly rapidly. The deep risks of this strategy are now evident, however. The deteriorating financial situation of state enterprises is leading to large and growing budget deficits. A macroeconomic relapse would endanger the growing private sector just as it threatens to move into manufacturing.

The third broad strategy is exemplified by the mass privatization program and emphasizes large-scale and widespread free distribution of equity through intermediary institutions. Much preparatory work has now been done and implementation should soon begin. It is possible that this novel approach, designed with Eastern European constraints in mind, may succeed where traditional methods have failed.

In retrospect, excess caution has been exercised in choosing the best possible scheme for mass privatization. It is difficult to imagine a plan whose implementation would have left the situation in the state enterprises worse than it is now. It may have been possible early on to act decisively and avoid much of the fragility of the current economic and political situation. A window of opportunity may have closed: the political honeymoon of the post-Communist era is over, and the financial predicament of the state sector continues to worsen.
<table>
<thead>
<tr>
<th>Name of Enterprise</th>
<th>Value (billion zł)</th>
<th>Method of Sale</th>
<th>Value of Shares Sold (billion zł)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. EXBUD S.A.</td>
<td>112.00</td>
<td>IPO</td>
<td>50.40</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Public Tender</td>
</tr>
<tr>
<td>2. SLASKA F-KA</td>
<td>70.00</td>
<td>IPO</td>
<td>58.10</td>
</tr>
<tr>
<td>KABLIS S.A.</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>3. PROCHNIK S.A.</td>
<td>75.00</td>
<td>IPO</td>
<td>60.00</td>
</tr>
<tr>
<td>4. TONSIL S.A.</td>
<td>120.00</td>
<td>IPO</td>
<td>60.00</td>
</tr>
<tr>
<td>5. KROSNO S.A.</td>
<td>132.00</td>
<td>IPO</td>
<td>66.00</td>
</tr>
<tr>
<td>6. FAMPA S.A.</td>
<td>87.50</td>
<td>Public Tender</td>
<td>77.00</td>
</tr>
<tr>
<td>7. ZMINOWROC</td>
<td>30.00</td>
<td>Leveraged Buy-Out</td>
<td>30.00</td>
</tr>
<tr>
<td>8. BUDOKOR SP. ZOO</td>
<td>52.80</td>
<td>Leveraged Buy-Out</td>
<td>42.20</td>
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<tr>
<td>9. NORBLIN S.A.</td>
<td>40.00</td>
<td>Public Tender</td>
<td>32.00</td>
</tr>
<tr>
<td>10. POLAM PILA S.A.</td>
<td>223.03</td>
<td>Public Tender</td>
<td>178.42</td>
</tr>
<tr>
<td>11. POLLENA</td>
<td>330.00</td>
<td>Public Tender</td>
<td>220.00</td>
</tr>
<tr>
<td>12. WOLCZANKA S.A.</td>
<td>75.00</td>
<td>Contract IPO</td>
<td>48.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Public Tender</td>
<td></td>
</tr>
<tr>
<td>13. SWARZEDZ S.A.</td>
<td>100.00</td>
<td>IPO</td>
<td>70.00</td>
</tr>
<tr>
<td>14. HUTA SZKLA</td>
<td>54.00</td>
<td>IPO</td>
<td>3.90</td>
</tr>
<tr>
<td>15. ZYWIEC S.A.</td>
<td>200.00</td>
<td>IPO</td>
<td>154.00</td>
</tr>
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<td>16. EKOMEL SP. ZOO</td>
<td>5.73</td>
<td>IPO</td>
<td>4.60</td>
</tr>
<tr>
<td>17. E. WEDEL S.A.</td>
<td>687.50</td>
<td>Public Tender</td>
<td>275.00</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IPO</td>
<td>83.20</td>
</tr>
</tbody>
</table>
### Appendix Table 4.1
Individual Enterprises Privatized Through Capital Privatization
as of December 31, 1991

<table>
<thead>
<tr>
<th>Name of Enterprise</th>
<th>Value (billion zl)</th>
<th>Method of Sale</th>
<th>Value of Shares Sold (billion zl)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MOSTOSTAL S.A.</td>
<td>99.75</td>
<td>Auction</td>
<td>69.82</td>
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<tr>
<td>FAMET S.A.</td>
<td>35.00</td>
<td>Auction</td>
<td>25.00</td>
</tr>
<tr>
<td>POL-BAF S.A.</td>
<td>40.60</td>
<td>Public Tender</td>
<td>38.50</td>
</tr>
<tr>
<td>TECHMA SP ZOO</td>
<td>7.00</td>
<td>Public Tender</td>
<td>3.60</td>
</tr>
<tr>
<td>KRAKBUD SP ZOO</td>
<td>10.60</td>
<td>Public Tender</td>
<td>8.50</td>
</tr>
<tr>
<td>KAPRINZ SP ZOO</td>
<td>4.5</td>
<td>Public Tender</td>
<td>2.40</td>
</tr>
<tr>
<td>POLLENA</td>
<td>165.82</td>
<td>Public Tender</td>
<td>119.97</td>
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<tr>
<td>POLLENA S.A.</td>
<td>71.60</td>
<td>Public Tender</td>
<td>57.28</td>
</tr>
<tr>
<td>ALIMA S.A.</td>
<td>209.18</td>
<td>Public Tender</td>
<td>125.51</td>
</tr>
</tbody>
</table>

Source: Ministry of Privatization, Warsaw

Key:

IPO = Initial Public Offering

Public Tender = Public tender of enterprise or portion thereof. This normally refers to a ‘trade sale’ to foreign investors.
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