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Republic of Poland: Selected Issues and Statistical Appendix

This Selected Issues and Statistical Appendix report on the Republic of Poland was prepared by a staff team of the International Monetary Fund as background documentation for the periodic consultation with this member country. As such, the views expressed in this document are those of the staff team and do not necessarily reflect the views of the Government of the Republic of Poland or the Executive Board of the IMF.

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INTERNATIONAL MONETARY FUND

REPUBLIC OF POLAND

Selected Issues and Statistical Appendix

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I. Fiscal Costs Associated with NATO and EU Accession[1]

A. Introduction

1.   Poland is currently preparing to join both the North Atlantic Treaty Organization (NATO) and the European Union (EU). In line with its new commitments, Poland is likely to incur significant budgetary costs, though these are difficult to quantify because the exact nature of Poland's obligations in joining NATO and the EU are still uncertain. Membership in both NATO and the EU will entail a relatively long accession period, probably stretching out to 2015 for NATO accession, and possibly equally long for fully phasing in all aspects of EU accession, such as consistency with the EU's common agricultural policy.

B. Fiscal Costs Associated with NATO Accession

2.   As part of its accession to NATO, Poland has prepared a plan to harmonize its armed forces with NATO's forces. Over the 1998–2015 period, the main goal is to modernize the armed forces, which would entail reducing the number of soldiers from 250,000 to 180,000, and upgrading military equipment and infrastructure. Under this plan, the number of officers would decline while the number of noncommissioned officers and professional staff would increase. There would also be a reduction in administrative divisions and some equipment purchases. Army infrastructure would decline, and naval and air infrastructure would increase.

3.   Altogether, the military budget is divided into two main components: core national defense and secondary services, such as health care and social security. The core services comprise 72 percent, secondary services, 20 percent, and other costs, 8 percent. The plan commits Poland to spending no more than 2.4 percent of GDP per year on the military over the accession period, which would require a slight increase in spending over current levels (Table 1). Spending is roughly 2.1 percent of GDP in 1998. The costs associated with NATO accession can be divided into two groups: indirect costs associated with upgrading equipment and infrastructure, and direct costs. Indirect costs would likely be borne in any event so it is difficult to allocate them specifically to joining NATO. Direct costs include those associated with improving interoperational relations and training with other NATO countries; creating and maintaining Polish representations in NATO; creating a joint Polish, German, and Danish corps; and payment of Poland's contribution to the NATO budget. Costs related to the possible purchase of multitask aircraft have not yet been included in the budget, though savings elsewhere might free up funds for this purpose. There are no firm estimates of the costs of these aircraft yet.

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[1] Prepared by Janet Stotsky.

C. Fiscal Requirements for EU Accession[2]

4.   Under the Europe Agreement that Poland signed in 1991, Poland committed itself to reform its laws, regulations, and institutions in preparation for accession to the European Union (EU).There are relatively few formal fiscal requirements for Poland's accession to the EU. The main requirements relate to bringing Poland's regulatory and administrative structures into compliance with EU standards and also raising excise taxes on fuel and cigarettes so that these taxes achieve minimum levels mandated by the EU. There are, however, other fiscal reforms that Poland is likely to undertake as part of its accession strategy that could have significant budgetary implications.

Meeting EU regulatory standards

5.   The main requirements are to bring Poland's regulatory and administrative structures into compliance with EU standards, especially in the areas of upgrading road systems and infrastructure for utilities, improving water treatment and quality, and reducing air pollution. The direct costs specifically related to EU directives on regulatory and administrative structures are estimated at US$6.6 billion over the 1998–2000 period, according to a recent World Bank Country Economic Memorandum (CEM). This is equivalent to about 1.5 percent of GDP on an annual basis.

Transport

6.   In the transportation area, harmonization with the EU will require Poland to strengthen main roads to handle heavy EU loads, to restructure the railways and cut subsidies to them, and to increase the taxes on motor fuels. In 1992, it was estimated that Poland might need to spend about US$1.4 billion to strengthen its main international roads. Some of the improvements in the transportation infrastructure could be financed by higher fuel taxes if the government chose to dedicate these funds to this purpose, as is common in many countries. Reducing subsidies to loss-making railways would also ease fiscal burdens.

Environment

7.   Poland already has a modern National Environmental Policy, which would, over time, harmonize its environmental policies with those of the EU. Nevertheless, meeting EU directives will be expensive, requiring substantial investments in both institutions and environmental infrastructure. The direct budgetary costs depend on whether the private sector picks up a share of the costs through higher user charges and the extent of EU subsidies for this purpose. Key areas for environmental legislation are:

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[2] This analysis draws heavily from the World Bank, Country Economic Memorandum on Poland, June 1997.

Air pollution

8.   The main reason for poor air quality is the discharge of smoke and particulate matter from coal combustion. The investments required to reduce particulate emissions to EU standards are estimated to cost US$6 billion to US$8 billion over 8 to 10 years and of sulfur dioxide pollutants, US$4.2 billion over 15 years. Most of these costs would be borne by industry and households, though direct budgetary costs could arise from subsidies or tax breaks to industry and households to put in place less polluting technologies, especially in switching from coal to cleaner fuels.

Water quality and wastewater management

9.   The largest investment is needed for improving water quality and wastewater management. The investments required to meet urban wastewater treatment provisions could total US$11 billion to US$14 billion over 15 years. Upgrading or installing treatment plants to meet basic secondary treatment standards could add US$11 to US$12 billion to this total over years.

Industrial pollution

10.   There has already been a substantial decline in industrial emissions of air and water pollutants in Poland in recent years and complying with EU emission standards may not be difficult for most industries. A few industries, however, such as steel and paper, may face a heavier burden.

Oil, gas, and telecommunications

11.   Poland is also likely to require investments in the oil, gas, and telecommunications sectors to ensure compliance with EU directives and regulations, but the budgetary implications depend significantly on the pace of privatization and other changes in the regulatory environment. In the energy area, the EU requires improvements in the regulatory framework, price transparency, restrictions on state aid, and harmonization of indirect taxes. In the telecommunications area, the EU also requires a liberalized regulatory framework.

Taxes

12.   The main outstanding area for tax harmonization is excise taxes on fuel and cigarettes as Polish rates for some goods are below minimum EU rates for members. The EU minimum rate for gasoline is currently about 70 percent higher than the Polish rate and for diesel, 170 percent higher. The EU requires the excise tax on cigarettes to comprise at least 57 percent of the retail price and in Poland, it is currently 40–50 percent. The elimination of the import surcharge in 1997 removed one other outstanding issue, though Poland remains committed to a process of tariff reduction as part of trade agreements signed with other

European countries. Apart from ensuring compliance with the EU Sixth Directive on indirect taxes, Poland does not need to make significant adjustments to its indirect or direct tax system for accession to the EU, though there remain areas of weakness in tax structure and administration that ought to be a priority for reform as part of Poland's general strengthening of fiscal management and policy.

Other areas of restructuring

State enterprises

13.   Enterprise restructuring is another important component of reforms. Although there are no formal requirements for reform of state enterprises for EU accession, it may be necessary for the government to assist in restructuring certain state enterprises to enable the proper development of these industries in the economy.

Agriculture

14.   In agriculture, Poland falls considerably short of EU quality and technical standards. The effect on the budget of EU accession is hard to quantify given that the system of agricultural subsidies in the EU is excessive and is likely to be reformed in the future. Agricultural subsidization in Poland was 15 percent of value-added in 1993, compared with around 50 percent in the EU, according to the OECD. This would suggest that Poland (or the EU) might have to incur costs to raise Poland's level of support to make them consistent with EU levels. However, the EU intends to reduce its subsidies for agriculture, which should make Poland's convergence with EU levels easier to achieve. It is also possible that Poland and other Eastern European countries will be exempted from EU standards in the agricultural area. The direct costs in the agricultural area are mainly the administrative costs of implementing all of the directives and a small extra cost to the farmer's pension fund, KRUS, if farmers take earlier retirement.

Structural funds

15.   Poland will likely be eligible for substantial EU structural funds, possibly on the same magnitude as those available to Greece and Portugal (about 2.5 percent of GDP), though this will depend in part on whether Poland develops the institutional capacity to absorb these funds. One potential use could be to meet the costly environmental compliance requirements of the EU. Another use could be to support institutional harmonization with the EU and the training of civil servants in public administration.

Fiscal implications

16.   The CEM summarizes the budgetary implications of the main reforms (Table 2). The main direct costs specifically related to EU directives are for improvements to the transpor-

tation infrastructure (US$1.3 billion), air pollution abatement (US$0.7 billion), water and wastewater treatment (US$2.5 billion), and infrastructure for the underground storage of gas (US$2.1 billion).These dollar-denominated amounts are converted into a share of projected GDP over this period, using the exchange rates and nominal GDP figures in the medium-term. The direct costs specifically related to EU directives total US$6.6 billion over this three-year period. This is equivalent to about 1.5 percent of GDP on an annual basis.

17.   There are also likely to be significant benefits to the overall health and well-being of the population through improvements in environmental quality, and to the economy through improvements in the transportation and commercial and industrial infrastructure, and through reform of loss-making state enterprises.

D. Conclusion

18.   Poland's accession to the EU could result in fiscal costs in certain areas, especially in upgrading the infrastructure in transportation and utilities, and improving the environment. The legislative reforms and the establishment of the regulatory and administrative structures are also likely to entail costs, though these costs are more difficult to quantify.

Table 1. Poland: Fiscal Costs of NATO Accession (in 1998) 1/

Total costs	All military operations	No more than 2.4 percent of GDP per year (US$3.3 billion)
Indirect costs	Upgrading equipment and infrastructure	Difficult to attribute the amount related to NATO
Direct costs	Improving interoperational relations and training	Zl 312 million (US$82.8 million)
	Creating Polish representations in NATO	Zl 15.8 million (US$4.2 million)
	Creating a common Polish, German, and Danish corps	Zl 28 million (US$7.4 million)
	Polish contribution to the NATO	2.5 percent of the NATO budget budget no earlier than 199 (roughly Zl 140 million or US$34.3 million in 1999)

Source: Polish Ministry of Defense.

1/ Zloty amounts and shares of GDP are converted into U.S. dollars at estimated GDP and exchange rates in 1998 and 1999.

Table 2. Poland: Budgetary Impact of Selected Reforms for EU Accession: Cumulative 1998–2000 (In billions of U.S. dollars at 1996 prices)			
Reforms	**Costs**	**Gains**	**Comments**
1. Infrastructure (excluding environment)			
- Road rehabilitation	1.1		Polish government (GDPP*) estimate to adapt the bearing capacity of existing international roads, not counting alignment and lane capacity improvements
- Railways restructuring	0.2		World Bank estimate, payment of early retirement and severance packages of 1 year and half wages to 30,000 workers.
- Gas sector	2.1		World Bank estimate, investment mostly in underground storage
2. Environment			
Air pollution:			
- Fees for car emission impact		1.2	World Bank estimate, fuel taxes alignment to EU levels (increasing tax revenues on fuel up to 1 percent of GDP by 2003)
- Desulfurization in power sector	0.7		World Bank estimate of a total costs of US$3.5 to 4.2 billion in order to reach the 2005 target in the public sector.
Water and wastewater:			
- Sewer system	1.1		World Bank estimate of rehabilitation and expansion and operation costs
- Wastewater treatment	1.1		World Bank estimate
- Drinking water	0.3		World Bank estimate of upgrading and distribution
Total	6.6		
Yearly average in percent of GDP**	1.5		

Notes: (*) GDPP: General Directorate for Roads.
      (**) Assumes GDP growth rate of 4.5 percent per year.

Source: World Bank CEM.

II. DIRECTIONS FOR FISCAL MANAGEMENT AND RESTRUCTURING IN POLAND[3]

A. Introduction

19.   During the pretransition period, Poland had a system of government characterized by a strong state government with extensive powers, and local governments with little independent expenditure or revenue powers. Since 1990, Poland has been engaged in extensive fiscal restructuring. Two themes underlie recent reforms in fiscal management and intergovernmental relations. First, at the state budget level, the institutions for financial management, inherited from the pretransition system, are poorly suited to the requirements of a market economy, particularly the cumbersome and decentralized system of management of the state budget. One consequence of these institutional arrangements has been a persistent problem of expenditure arrears, most notably, in the health care area. A critical issue that Poland must address in the next few years is how to improve the management of the state budget both to achieve a reduction in the state budget deficit and to ensure a high level of public service provision. Second, with respect to intergovernmental relations, movement from a system of total reliance on the state government toward a system of decentralized local governments has been guided by the notion that this would improve the provision of public services. There is still considerable uncertainty as to how many levels of government would be most effective in Poland and the ultimate evolution of the intergovernmental system.

B. Current System

20.   Poland's state government consists of a central administration, mainly organized into powerful ministries, and geographic units, divided into 49 voivods and 267 rayons. The basic unit of local government is the gmina, of which there are 2,489. Warsaw consists of 11 gminas while all other cities and towns consist of only 1 gmina.

21.   The state government's main responsibilities are for national defense, income transfers, the social insurance system, health care, higher education, state roads, and the police and judicial system. The state relies heavily on personal income and payroll taxes, corporate profits tax, a value–added tax, excises, trade duties, and nontax revenues. The gminas' main responsibilities are for primary education, local roads, communal services, and basic utilities, such as water and sewerage. Gminas rely primarily on the local property tax and an array of smaller tax and nontax sources.

22.   The government is currently considering several major reforms in the intergovernmental system. As part of the proposed health care reform, state primary and secondary (nonspecialized) health agencies, now managed by voivods, would become autonomous though they would still be funded primarily by state tax revenues. Voivods would be consolidated into perhaps 12 regions, which would supervise the autonomous health

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[3] Prepared by Janet Stotsky.

agencies. The government is also considering the creation of a middle tier of government, termed powiats, which would be independent from both the state government and gminas, and these would replace rayons. There would be about 320 powiats. The expenditure responsibilities are envisioned to be roughly comparable to counties in the United States and would include authority over secondary schools, some health services, and some roads. There is not yet any identified means of financing powiats, since the other levels of government are reluctant to cede revenue sources to powiats.

23.   In order to achieve sustainable, noninflationary growth, it is important that the overall general government deficit be reduced over the medium term. It is thus essential that policies at the local government level contribute to reducing the state budget deficit, and that the reforms within the state budget and among the different levels of government not threaten the ultimate objective of a balanced budget.

C. Health Care Reform[4]

24.   As part of the process of economic transition, Poland's system of health care provision has been under stress. Poland has not experienced the serious drop in spending on health care and in life expectancy that some other transition economies have experienced.[5] Nevertheless, the health care system is poorly structured and does not provide the quality of care that is typically found in a developed economy.

25.   As an important step toward modernizing its health care system, in 1997, Poland enacted the General Health Insurance Law, which would create a health financing system based on public and private insurance, to go into effect in 1999. Because of inconsistencies and unresolved issues in the law, the Ministry of Health has now drafted an Amending Act. The precise plan for implementation is still in flux. Under the proposed new system of health care, governmental health units would be turned into autonomous health units and directors of these units would sign contracts with the state. The aim is to establish a system by which all units would have access to public finances and competition between them would lead to an improvement in quality.

26.   A main component of the reform is the creation of a public insurance scheme. Under the proposed system, Poles would be able to choose from regional (public), trade, and private insurance funds, and which doctors and hospitals to use. The authorities describe the plan as one in which "money would follow the patient." The division of the insurance market into

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[4] This discussion substantially benefited from the analysis of a World Bank Health team that visited Poland in January 1998.

[5] Ellen Goldstein, Alexander S. Preker, Olusoji Adeyi, and Gnanaraj Chellaraj, "Trends In Health Status, Services, and Finance: The Transition in Central and Eastern Europe," World Bank Technical Paper, No. 341, 1996.

distinct public and private insurance options exists in a number of countries. One advantage of choice is that it could create an atmosphere in which health care providers would be more likely to compete to provide a high level of care. The disadvantages are that it could be more administratively complex, particularly if it combines both public and private elements, and it could require a higher level of regulatory oversight. The proposed amendments deal only with oversight of the regional insurance funds.

27. The proposed insurance funds would be supported by a tax on personal income. The proposed amendments provide for a health insurance premium defined as a given percentage of income, which could change over time. The tax would apply to income at a flat rate.[6] The tax would be offset against personal income tax liabilities, so that there would be no net increase in tax.[7] For taxpayers who are not subject to the personal income tax, the government would make a payment on their behalf.

28. The proposed financing mechanism raises several important issues. First, while dedicated payroll taxes for health insurance are common in Europe, it is questionable whether it would be wise to introduce a dedicated income tax for health insurance in Poland in light of the already very high payroll tax burden to support social insurance programs. Dedicated taxes that are linked to income (such as the proposed tax) build automatic inflation into health care appropriations in the budget. The proposed amendments allow the Board of the Union of Health Funds to increase the percentage contribution rate, even without the concurrence of the Ministry of Finance. To a possibly large extent, this removes the determination of the level of health care spending in the budget from the general considerations that apply to other competing uses of public funds. In an environment where the state budget is faced with a difficult challenge to rein in public spending, this built-in increase in health care appropriations in the budget would only make this task more difficult. And since, according to the proposed amendments, any increase in the taxes dedicated to health insurance premiums must be matched by an equal reduction of personal income taxes, this would make difficult the achievement of other budget goals (though, presumably, there is nothing to stop the Parliament for legislating an increase in other taxes or the personal income tax for "other" reasons). The proposed amendments do not indicate what would be the relationship between the proposed financing and the expenditure needs.

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[6] The amendments are unclear as to whether the income would be gross or net as defined in the personal income tax law or just wages, as is typically found in other European countries.

[7] The amendments are also unclear as to how this offset would work, whether through a credit or some other means. The amendments do not specify what would happen if the health insurance premium were greater than the personal income tax liability, if, for instance, the premium were levied on gross wages and net taxable income were considerably smaller than gross wages.

29.   Second, the proposed financing provides little in the way of incentives for health care providers to contain the growth in health care expenditures. Providers would be paid on a fee for service basis, which gives them incentives to offer more services to patients than might strictly be necessary. Hospitals would be reimbursed under a "global" budget, which could lead to a decline in the quality of care, if hospital management is poor. Drawing upon international experience, there are several ways in which the health care system could provide strong incentives for cost containment. For hospital reimbursements, the development of a system of diagnosis related groups (DRGs) has been successful in the United States in slowing hospital cost inflation. Under this system, hospitals are not reimbursed at cost for the treatment of patients. Instead, diseases and treatments are divided into related groups and hospitals are reimbursed for patient care depending on the diagnosis and treatment. Also, it may be desirable for Poland as part of the reform to develop a notion of core health care services that would be provided on demand to the population and another set of services that would be provided with limits, and to determine the appropriate level of technology that would be consistent with expected demand. Finally, one important method of controlling health care cost growth is to impose some marginal cost on the patient of additional treatment through copayments and deductibles. The proposed financing mechanism imposes no direct marginal cost at all on the patient since any increase in the premium is offset by a decrease in the personal income tax liability (though the proposed amendments do allow for the possibility of requiring a copayment). There may, however, be indirect costs if other taxes rise or if expenditures on other public services are cut.

30.   Third, the proposed reforms only partly address the potential problem with adverse selection that is common in insurance markets. Trade and private insurers are likely to try to attract only the healthier and higher income elements of the population. As a result, regional insurance funds are likely to end up with a disproportionate share of the least healthy people, which is likely to increase their costs relative to the other funds. Although the financing of the system builds in an equalization mechanism for transferring money to funds that are facing deficits, it is unclear that the transfers would be sufficient to ensure that people covered by the regional funds receive the same quality of care that those covered by the other funds receive. This adverse selection may make it difficult to establish a set of norms for average costs of treatment, which are important in setting goals to contain the growth of costs (such as, for instance, under a system of DRGs).

31.   Fourth, the proposed amendments obligate the state budget to extinguish the debts of public health care establishments prior to concluding agreements with the health funds. As previous efforts with eliminating health care arrears attest, paying off debts alone does little to impose discipline on health care establishments or prevent a recurrence of this persistent problem.

32.   The proposed system of health care provision offers some improvements over the current system, but it does not satisfactorily address the fiscal burden of health care. Shortcomings in the design and financing of the proposed system should be addressed before the system is implemented.

D. Restructuring the Intergovernmental System

33.   The intergovernmental system in Poland is evolving in other dimensions as well. One important change is the devolution of responsibility from higher to lower levels of government for some public services.

Expenditure assignments

34.   From an efficiency perspective, there are certain advantages of more decentralized forms of intergovernmental fiscal relations. A federal system is likely to be more sensitive to local differences in preferences. It is thus appropriate to devolve responsibility for some expenditure decisions to lower levels of government to reflect local preferences. International experience would suggest that for countries such as Poland, there is some scope for decentralization. One disadvantage of a more decentralized intergovernmental system is that it typically leads to greater inequalities between wealthier and poorer localities, though most intergovernmental systems try to address these inequalities through shared revenues and intergovernmental grants.

35.   The main advantage of creating a middle level of government is that it could more efficiently provide public services that have spillovers extending beyond individual localities. The government should reallocate certain local functions with spillovers to this middle level and then provide financing by a combination of shared state or local taxes, user charges, and grants from the state government. Apart from the introduction of a new middle level of government, there is a need to consolidate the smallest of the gminas into larger local entities to achieve economies of scale in public service provision.

Revenue assignments

36.   Assigning expenditures to lower levels of government raises the issue of how to finance those expenditures. There are persuasive arguments linking the provision of local public services with local financing.[8] Local governments in Poland rely on several sources of revenue including: own–source taxes; a share of the personal income tax collected by the central government; a share of the corporate income tax collected by the central government; grants and transfers from the central government; and local fees and user charges. By international standards, the own–source revenue of local governments in Poland is quite low. Strengthening the Polish local revenue system would contribute to government accountability by more closely linking the decision to spend with the decision to raise revenues to pay for that spending.

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[8] A distinction also needs to be maintained between the assignment of the revenues of a particular tax to a level of government and the assignment of the responsibility to collect that tax. It may be more efficient and effective for a higher level of government's tax administration to collect the tax.

37. The local property tax is in many countries the mainstay of local finance. The property tax is an effective tax for local governments to use because it is levied on a relatively immobile tax base. The more mobile the tax base, the greater the risk that interjurisdictional differences in tax burdens would cause taxpayers to move to reduce their tax burdens, though to the extent that taxpayers perceive a link between their local taxes and the supply of local public goods, they may be less likely to try to avoid the tax. The main local tax in Poland is property taxes on real property. There is no up–to–date register of ownership and market valuations for property in Poland. Hence the existing property tax relies on specific charges levied on area. Modern property taxes are based on registers, which are regularly revised, and the tax is levied on an ad valorem basis on property value, typically at an effective rate of 1–2 percent. Poland plans to implement a property tax based on market valuation for property in the near future, though there remains political opposition to strengthening this tax.

38. Shared revenues from the personal income tax and corporate income tax are a major source of revenues for local governments. All gminas receive a predetermined share of personal income tax and corporate income tax revenues. In 1998, the gminas are receiving 17 percent of personal income tax revenue collected in the locality, an increase over 16 percent in 1997. In the past, the gminas' share of personal income tax revenues was proportional to population and this method has been only slowly phased out for gminas with low incomes, which have been hit hard by the switch to a transfer based on income earned in the community. In 1998, the gminas are also receiving a 5 percent share of the corporate income tax based on employment of each corporation in a locality.

39. The shared personal income tax collected by the central government is another way of strengthening local revenues in the short term. Transferring a fixed share of a centrally administered tax such as the personal income tax to the localities is practiced in other countries. The shared tax could, however, be made more flexible. Each local government could be allowed to set its own tax rate (on the tax base set by the central government) and therefore be accountable to its citizens for this tax burden. Allowing local governments to "piggy back" on existing taxes is another alternative. Depending on the degree of autonomy granted as regards setting the additional rates for these taxes, there is the possibility both of straining administrative capabilities and compromising the competitiveness of some regions.

Intergovernmental grants

40. Grants from the central government are also an important component of local public finance in Poland. Transfers from the state budget consist of four types: (a) a general subvention, equal to 0.9 percent of planned revenues. Part of this subvention is an equalization subsidy, which helps equalize the potential of poorer gminas to pay for public services. It is given to gminas where the per capita income is less than 85 percent of the total and the equalization covers 90 percent of the difference between 85 percent and 100 percent; (b) an educational subsidy, categorized under the general subvention, equal to 7.5 percent of planned revenues. This subvention compensates for the transfer of responsibility for primary education

to gminas; (c) targeted subsidies which can only be spent on targeted projects. Voivods establish the projects and amounts. The list of possible projects is extensive, including investments, social assistance, and other governmental purposes; and (d) a road subsidy, which replaced the local road tax in 1997.

41.   Many federal systems use equalization grants to "level the playing field" for the range of jurisdictions.[9] However, equalization grants are technically difficult to implement because they entail determining whether the objective is to equalize the taxable capacity or actual public service provision of differing localities and then to devise an appropriate measure of taxable capacity, which is not easily manipulated by the local administration—for example, if the indicator of taxable capacity is based on a limited set of taxes, there is an incentive for lower level jurisdictions to raise revenue by using taxes not included in the indicator base. Finally, equalization grants in many countries often prove to be politically contentious.

Local government borrowing

42.   Gminas are, in principle, free to borrow without central government interference or control. In practice, however, most local governments have been reluctant to incur debt, even for capital purposes, reflecting a combination of prudent behavior and the absence of an established mechanism and market for issuing this debt. The localities face a limit that the sum of interest, principal and payments for debt guarantees cannot exceed 15 percent of total revenues, including intergovernmental grants. Although no locality has yet reached this limit, the use of municipal debt has begun to grow rapidly, with the outstanding amount of municipal debt nearly doubling from Zl 447 million to Zl 897 million, from 1995 to 1996 (still, however, only ¼ percent of GDP).[10] This debt is likely to continue to grow in the next few years as localities face pressures for substantial investments in infrastructure and other capital projects. Since reliance on market forces alone at this stage of transition may not ensure that sufficient discipline is maintained on subnational borrowing, it is important to impose formal constraints as well. Subnational external borrowing should be strictly limited to avoid an accumulation of external debt by local governments, which may require a state bailout in the event of a severe economic downturn or fall in the exchange rate.

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[9]The case for equalization grants presumes that the instruments available to the central government through tax and transfer programs, are insufficient to achieve overall distributional objectives.

[10]Tony Levitas, "The Development of the Polish Municipal Capital Market: 1994-96," Research Triangle Institute, 1997.

III. New Developments in Money Demand in Poland[11]

A. Introduction

43.   Several recent developments have complicated the analysis and forecasting of money demand in Poland. Foremost has been the rapid growth of broad money, which has exceeded the projections of most standard money demand models during the past couple of years, and especially during 1997. Real money growth was negative in 1993, in the range of 7–10 percent per year during 1994–96, but was about 14 percent in 1997. The fact that this acceleration in money growth has been accompanied by continuing disinflation suggests that there probably has been some general upward shift in money demand. Is there statistical evidence of such a shift in the money demand process in recent years? If so, what factors seem to explain this shift?

44.   New institutional developments in Poland also complicate the analysis of money demand. During the past couple of years, for example, there has been extremely rapid development of the government securities market, especially the treasury bill (T–bill) market. Turnover in this market has been doubling every 15–18 months, with average monthly turnover increasing from less than 20 billion zloty per month in June 1996 to over 50 billion zloty in recent months—almost US$1 billion per day. As this market has grown deeper, the government has actively encouraged treasurers of large enterprises to substitute T–bills for bank deposits (because their return is higher), a move that in theory should work to reduce money demand. Is there statistical support for this hypothesis? Might this be a factor causing actual money demand to be lower than the authorities realize and hence, a potential source of inflation?

45.   This note explores these issues. The first section provides an overview of trends in money demand in Poland in recent years. The second section examines the statistical problems of existing money demand equations and describes a quarterly money demand equation that does a decent job of tracking money demand over recent years. The third section attempts to quantify the possible effects of the fast growth in the government T–bill market on money demand by enterprises. The paper argues that there is statistical corroboration for the hypothesized substitution effect, but finds that it is relatively small, especially in the face of strong overall household demand for money.

B. Main Trends in Money Demand

46.   Although Figure 1 shows that broad money has displayed a general upward progression over the past 6 years, it is when the series is expressed in real terms, as in Figure 2, that a sharp acceleration starting in 1995 becomes most evident. Actually, two periods of rapid acceleration of broad money demand appear on careful inspection—one

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[11]Prepared by Robert F. Wescott.

Figure 1. Poland: Broad Money (M2)
(In billions of zloty)

Figure 2. Poland: Real Broad Money (M2)
(January 1992= 100)
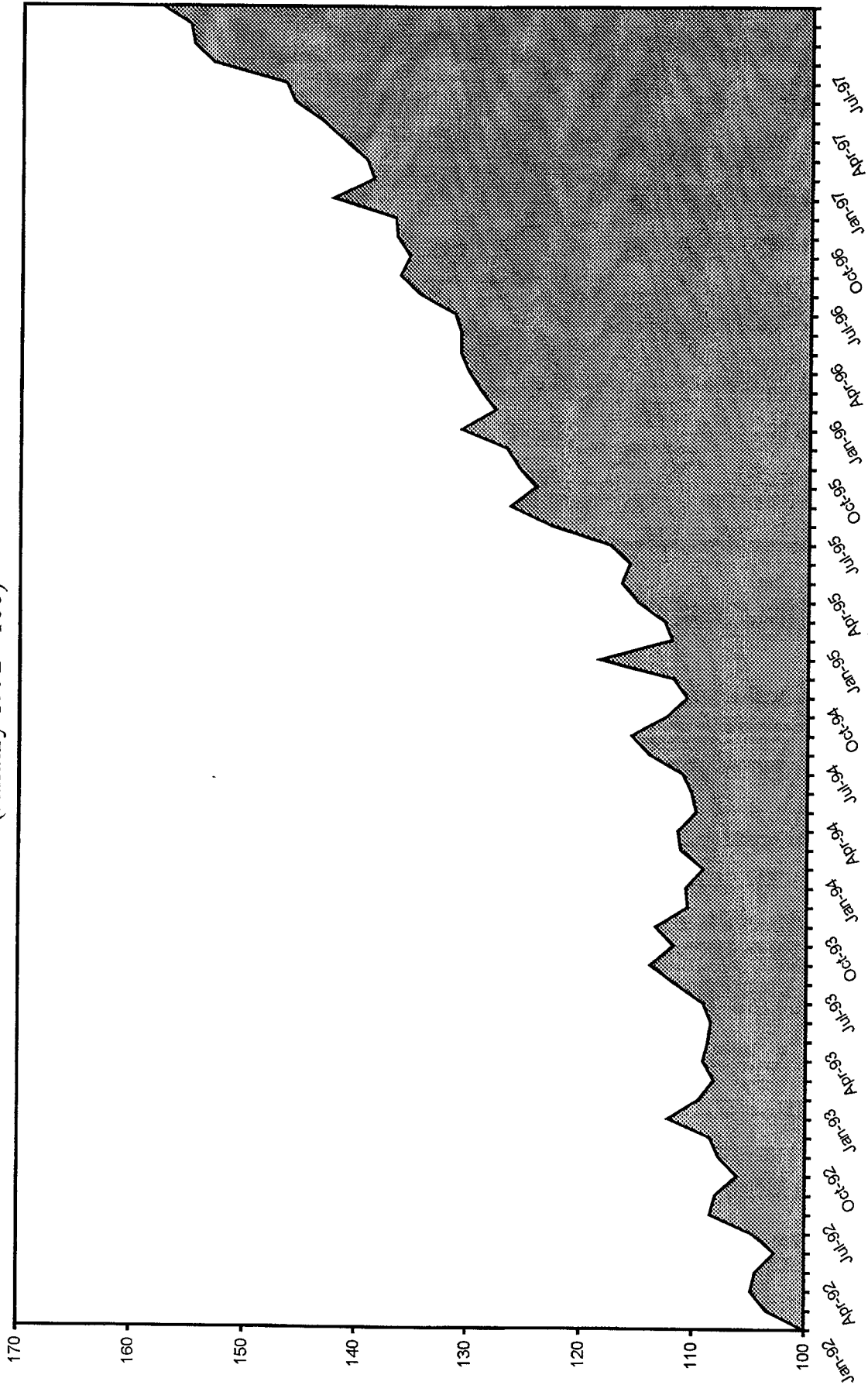
period from early 1995 until late 1996, and a second phase of even more rapid growth starting in late 1996 and continuing throughout 1997.

47.   Figure 3 shows which components of broad money have been chiefly responsible for these developments. Foreign currency deposits have been trending downward as a share of GDP over the period since 1995, meaning that demand for zloty money has been driving money growth. Specifically, as Figure 4 makes clear, it has been household deposits that have been fueling the growth of broad money. These deposits increased from roughly 8 percent of GDP in the early 1990s to over 15 percent in 1997. Zloty currency demand and enterprise deposits have been roughly flat as a share of GDP over the entire 1992–97 period.

48.   This brief review of the main trends in money demand suggests that it would not be surprising to find evidence of a structural break in the money demand process around 1995, and that it may be difficult to explain recent money demand behavior based upon the historical experience of the first half of the 1990s. It also shows that virtually all of the growth in money has come from household zloty deposits. There has been a gradual remonetization of the Polish economy over this period, but as Figure 5 illustrates, the ratio of M2 to GDP in Poland remains much lower than in the Czech Republic, although it is about the same as the ratio in Hungary.

C. Evaluating Money Demand Equations

49.   Given the sharp increase in real money demand that began in 1995, it indeed is the case that simple quarterly equations estimated over periods such as 1992–97 do have a difficult time explaining recent money demand trends. In fact, most standard models of Polish aggregate money demand do display Chow–test evidence of a structural break at the end of 1994 or during 1995.[12] For example, a typical money demand equation that explains the log of real money demand as a function of the log of industrial production and the delta log of the consumer price index displays evidence of a structural break after the fourth quarter of

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[12]In discussions in December 1997, NBP officials confirmed that their main quarterly money demand equations that have been relied upon in the past for forecasts of money demand displayed evidence of structural breaks—with the break indicated between early 1995 and early 1996.

Figure 3. Poland: Broad Money and Components (M2)
(In percent of GDP)
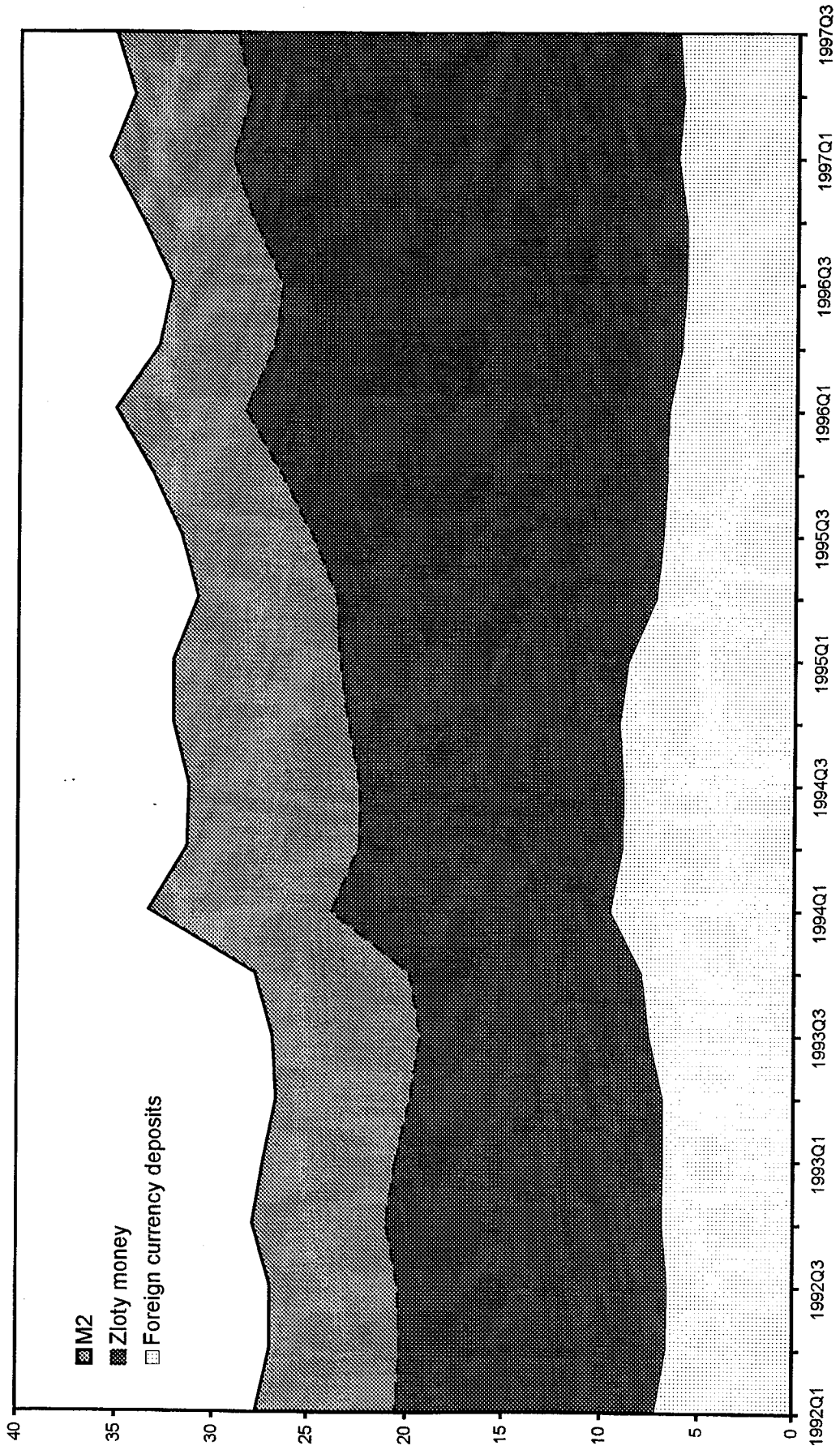
Figure 4. Poland: Components of Zloty Money
(In percent of GDP)

Household deposits
Zloty currency
Enterprise deposits
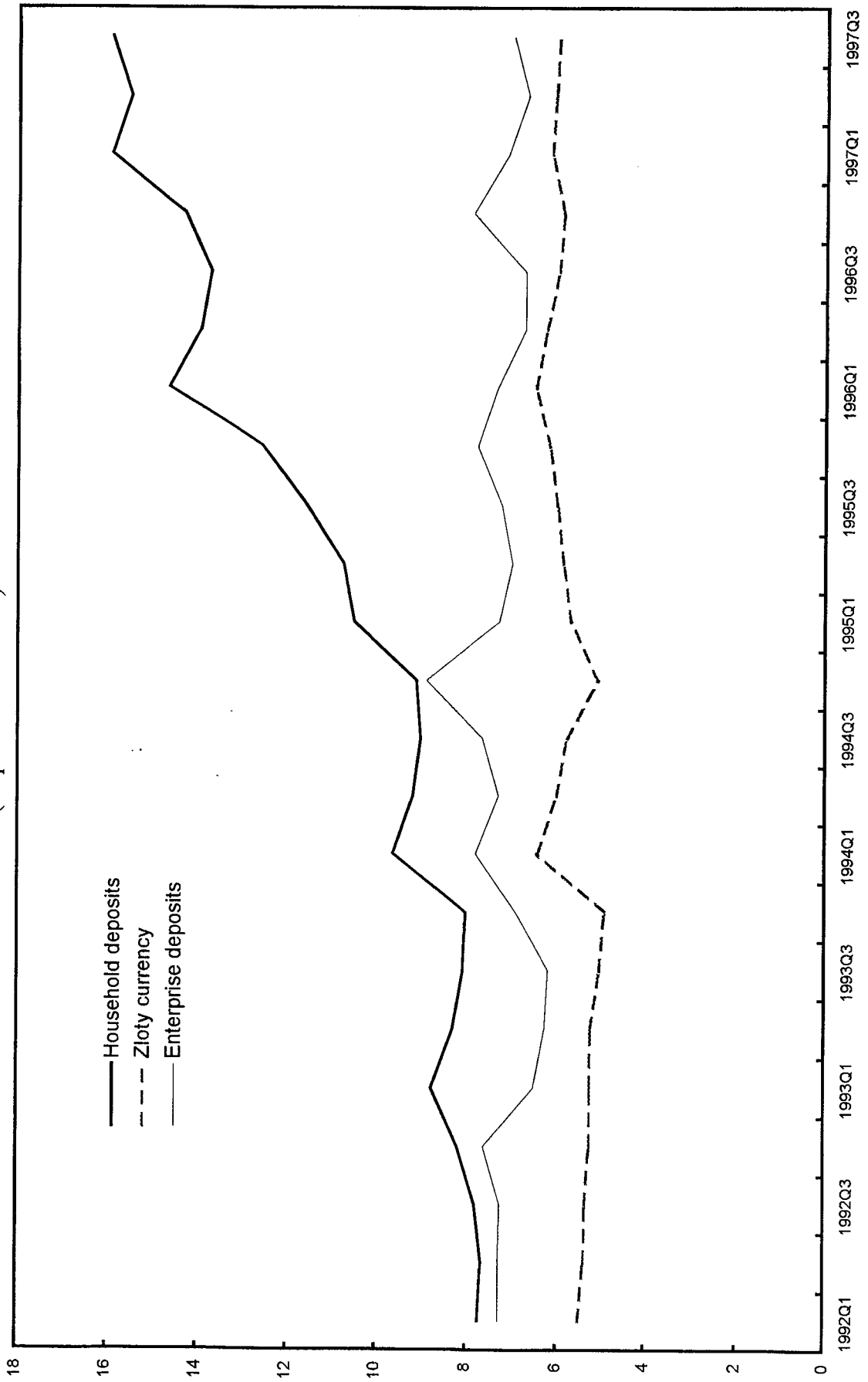
Figure 5. Poland, Hungary, and Czech Republic: Ratio of M2 to GDP
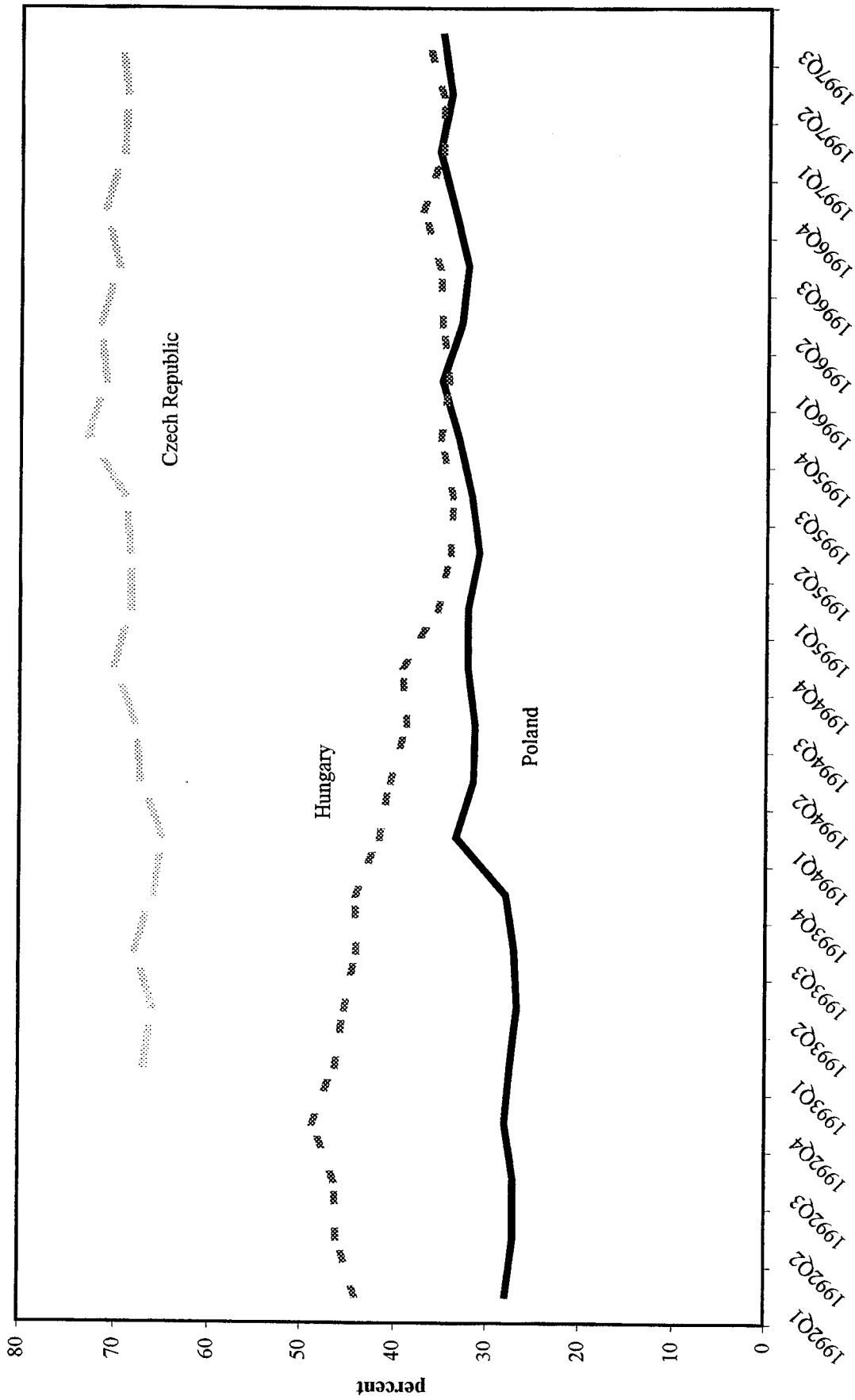
1994.[13, 14] Particularly worrisome is the fact that this and similar equations consistently underpredict money demand from late 1996 through the end of 1997.

50.   Such a consistent underprediction of money demand suggests that the simple model described above is misspecified, and that additional variables might be having an effect. Two changes in particular might have had a profound effect on Polish money demand behavior in recent periods: the rapid increase in real bank deposit rates from highly negative levels a few years ago to highly positive levels now, and the steady firming of the zloty. Higher real bank deposit rates make Polish households more likely to view bank deposits as a form of wealth and therefore more desirable, while the firming of the zloty in international currency markets causes zloty deposits to be seen as a more reliable store of value and therefore more worth holding. The swing in bank deposit rates has been particularly sharp: in mid 1995 such deposit rates were between minus 4 percent and minus 7½ percent in real terms, whereas by late 1997 they had increased to a positive 6½ percent.[15]

51.   An augmented aggregate money demand equation, presented in Appendix I, adds these variables to the basic money demand equation and finds that they do improve the explanatory power of the model, especially when the estimation period is from the first quarter of 1995 to the end of 1997. The following table provides a decomposition of real money growth in 1997, based upon the right–hand–side variables in this augmented model:

1997 4th Quarter on 4th Quarter Percent Change

Total Real M2 Growth	13.9
due to change in IP	6.5
due to change in CPI	4.1
due to change in real bank deposit rate	3.9
due to change in zloty vs. parity	-0.6

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[13]For further description of such models of money demand in Poland, see "Money Demand in Poland," Attachment II, IMF Staff Country Report No. 97/33, April 1997, pp. 174–88.

[14]The simple model described here was judged to be the most robust of numerous models that were tested. Among the explanatory variables tested were the log of industrial production, the log of real retail sales, the delta log of the CPI, interest rate spread variables, etc. For the model selected, the F statistic for a Chow test for a break after 1994–Q4 was 19.3 (critical value for 0.05 significance 3.05 and for 0.01 significance 4.89)—meaning that the evidence of a break was highly significant.

[15]Inflation in these real estimates was defined as the backward–looking 12–month change in the CPI.

52.   This analysis suggests that rising real interest rates contributed in an important way to the rapid increase in real money demand in 1997. Real interest rates are very high now, however. As real interest rates stabilize or decline during the course of 1998 and 1999, as is expected, it is likely that there will be a significant slowdown in the rate of growth of money demand. This suggests that the Polish monetary authorities need to be cautious in supplying liquidity to the banking system during the next couple of years to help make sure that a mismatch of money supply and money demand does not occur. Such a mismatch could lead to an inflationary bias in monetary policy.

D. Do Enterprises Treat Government Securities as a Substitute for Money?

53.   Although aggregate money demand has been increasing rapidly as described above, the fast growth of the Polish T–bill market raises the question of whether enterprises might be substituting these instruments for traditional demand deposits. Such a development would tend to work in the direction of diminishing money demand.[16] Do Polish enterprises treat government securities as a substitute for money? If so, how large of an effect does the growing T–bill market seem to have on enterprise money demand? This section attempts to answer these questions via an econometric approach. Because of severe data limitations, however, the results of this analysis should be considered more as a statistical illustration of a possible effect, rather than as firm proof of a relationship.

Methodology

54.   In order to test whether enterprises might be substituting T–bills for bank deposits, a three–step methodology was employed. The first step was to estimate a basic money demand equation for enterprise demand deposits, with the log of enterprise bank deposits minus the log of CPI inflation (i.e., the change in the real demand for this type of deposit) estimated as a function of the log of real retail sales.[17] The residuals for this equation were then examined with the supposition being that this standard model would tend to overpredict enterprise money demand for recent periods, especially the quarters of 1997. This is because if T–bills were increasingly substituting for enterprise demand deposits, there should be a growing gap in this simple equation's ability to predict these deposits, with systematic overpredictions in recent periods. The amount of overprediction would then be considered the unexplained portion of enterprise deposit demands that might be due to the increased use of T–bills.

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[16]That is, the partial effect would tend to be negative for money demand by enterprises, and hence for overall money demand.

[17]A number of different variables and specifications were tested, including industrial production in several formulations, the spread between the interest rate on T–bills and bank deposits, etc., but the simple money demand function described above provided the most robust equation.

55. The second step was to then augment the basic money demand equation with a variable or variables to quantify the growth and attractiveness of the T–bill market. Among the variables tested were the spread between the interest rate on T–bills and bank deposits, the outstanding volume of T–bills, and a variable that measured the turnover volume of T–bills in the secondary market. In theory, a larger spread between the interest rate on T–bills and bank deposit rates, a larger volume of T–bills, and a larger T–bill turnover volume (indicating a more liquid market) would be expected to make the holding of T–bills more attractive and the holding of bank deposits by enterprises less attractive. Based upon statistical results, the T–bill turnover volume was judged to be the best way to quantify the extent to which T–bills might substitute for bank deposits.[18] This variable would have to enter with the proper theoretical sign (negative, meaning that more T–bill turnover would mean less demand for bank deposits), and be statistically significant. The R–bar squared for this augmented equation would also have to be higher than it was for the basic equation to prove that its overall (corrected) explanatory power was higher.

56. The third step was to compare the residuals for this augmented equation with the residuals from the basic equation. Presumably, this more complete model of enterprise bank deposit demand would show smaller residuals on average, and in particular, smaller residuals in recent periods. The improvement in the forecast would then be considered a measure of the degree to which T–bills substitute for enterprise bank deposits.

57. The basic and augmented models are presented in Appendix II. Note that both models feature variables that had the proper theoretical signs and that were statistically significant. Several alternate specifications of the model were attempted that had theoretical support, but they did not produce significant results. As a general caveat, it should be remembered that estimating demand functions for components of money demand has been shown by Begg , et. al., to be unreliable for transition economies.[19]

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[18]The coefficient on the interest rate spread variable was not found to be statistically significant, so this variable was not used. The variable measuring T–bill turnover in the secondary market was judged to be a better variable the outstanding volume of T–bills, because it was judged to better capture the liquidity aspects of the market—something that should be important to corporate treasurers thinking about substituting T–bills for bank deposits.

[19]See David Begg, Linda Hesselman, and Ron Smith, "Money in Transition Economies: Do We Know Much Yet? Evidence from Central and Eastern Europe," IMF Manuscript, 1996.

Results

58.   Over the first three quarters of 1997, the average overprediction of the basic equation was 0.03 in log terms (0.90 billion zloty) and the average overprediction with the augmented equation was 0.00667 in log terms (0.27 billion zloty):

Average actual enterprise bank deposit demand, 97Q1–97Q3:	30.10 Bil. Zloty
Average predicted using basic equation, 97Q1–97Q3:	30.99 Bil. Zloty
Average predicted using augmented equation, 97Q1–97Q3:	30.37 Bil. Zloty

59.   That is, the augmented equation with the T–bill turnover variable did lead to a lower standard error for the regression equation as expected (by 0.62 billion zloty) and did make the forecast more accurate, as hypothesized above. Even the basic equation, however, predicted demand that was within 0.9 billion zloty of actual demand on average during 1997. This suggests that although this substitution effect (away from enterprise money demand and toward T–bills) has been statistically significant, the effect has been rather small. Overall, it seems to have been overwhelmed by the extremely rapid growth of money demand by households.

AUGMENTED MONEY DEMAND EQUATION WITH REAL BANK DEPOSIT RATE AND ZLOTY EXCHANGE RATE VARIABLES

Ordinary Least Squares

Quarterly data for 12 periods from 1995–Q1 to 1997–Q4

log(fmb)-log(pcpi)

$$= \ \ 0.79410 * \log(aip) - 0.39739 * d\log(pcpi)$$
$$\ \ (6.22546) \qquad\qquad (1.58184)$$

$$+ \ 0.00666 * realdeprate + 0.00199 * zlotyvsparity - 4.69597$$
$$\ \ (2.16724) \qquad\qquad (0.83811) \qquad\qquad (7.76678)$$

Sum Sq   0.0012   Std Err   0.0132   LHS Mean   -0.9799
R Sq   0.9896   R Bar Sq   0.9837   F 4, 7 167.141
D.W.(1) 3.0476   D.W.(4)   0.8869

Where:

fmb	=	broad money demand
pcpi	=	consumer price index
aip	=	index of industrial production
realdeprate	=	real bank deposit rate, percent
zlotyvsparity	=	value of zloty vs. parity, percentage difference

Note: The zloty variable is not found to be significant, but it is retained on grounds that it has the right sign, a reasonable (though admittedly small) coefficient, and because its inclusion helps to make other variables more significant. Although the Durbin–Watson statistic suggests the possible existence of negatively serially correlated error terms, the actual residuals do not appear to be serially correlated. A host of interest rate variables that are often included in money demand equations (yield on 90–day T–bills, other spread variables, etc.) did not enter the equation with the correct sign or were statistically insignificant.

EQUATIONS USED FOR TESTING THE EFFECT OF GOVERNMENT T–BILLS ON ENTERPRISE MONEY DEMAND

The basic equation for explaining enterprise demand deposits was:

Ordinary Least Squares
Quarterly data for 11 periods from 1995–Q1 to 1997–Q3

log(fmb_de)-log(pcpi)
  =   0.51411 * log(ars_r) - 4.94079
      (3.92840)   (8.04709)

Sum Sq   0.0189 Std Err   0.0458 LHS Mean -2.5294
R Sq   0.6316 R Bar Sq 0.5907 F 1, 9 15.4323
D.W.(1)   2.0870 D.W.(4) 0.2869

Where:

fmb_de	=	demand deposits by enterprises
pcpi	=	consumer price index
ars_s	=	real retail sales

The augmented equation was:

Ordinary Least Squares
QUARTERLY data for 11 periods from 1995–Q1 to 1997–Q3

log(fmb_de)-log(pcpi)

  =   0.89201 * log(ars_r) - 0.07029 * log(tbillturn) - 6.54829
      (3.97176)   (2.12412)   (6.67019)

Sum Sq 0.0128 Std Err   0.0400 LHS Mean -2.5294
R Sq   0.7507 R Bar Sq 0.6883 F 2, 812.0419
D.W.(1) 1.9385 D.W.(4) 0.3616

Where:

tbillturn = average monthly T–bill turnover volume (for quarter) in billion zloty

Note: the Durbin–Watson (4) statistic does suggest some evidence of seasonality in these data.

The residuals were:

	Basic Equation	Augmented Equation
1995		
Q1	0.00	0.00
Q2	-0.00	-0.00
Q3	0.01	-0.03
Q4	0.06	0.02
1996		
Q1	0.00	0.01
Q2	0.04	-0.03
Q3	-0.04	-0.03
Q4	0.09	0.08
1997		
Q1	-0.02	0.03
Q2	-0.05	-0.02
Q3	-0.02	-0.03

IV. Measuring Currency Volatility in Poland[20]

A. Introduction

60.   Against a backdrop of financial market turmoil in Asia, the National Bank of Poland (NBP) continues to be concerned about highly volatile short–term capital flowing into Poland taking advantage of high spreads on zloty denominated debt. By refraining from frequent interventions in the currency market, the NBP is hoping to decrease the risk–adjusted foreign currency returns on zloty denominated debt resulting from a more volatile zloty exchange rate. But just how volatile is the zloty in currency markets? How can this volatility be measured? And is there evidence that the volatility of the zloty may be increasing over time?

61.   Through the use of a variety of volatility measures, evidence is found in this paper that the recent turbulence in Asian currencies largely has been passed through to the zloty by the NBP, causing volatility to increase. Large spikes in zloty volatility are found around the times of turbulence in the Asia markets in the summer and fall of 1997. The unconditional standard deviation of daily percentage changes in the zloty/U.S. dollar rate is estimated at 0.246 per day in 1996 or 3.94 in annualized terms. The corresponding standard deviation for 1997 is 0.548 per day or 8.77 in annualized terms, which makes for a statistically significant increase at any reasonable level.

62.   In developed currency markets, simple autoregressive models have been found to satisfactorily describe the evolution of currency risk. But when applying those models to the Polish zloty surprisingly little evidence of volatility persistence, and thus predictability, is found. A shock to volatility in Poland is found to die out after just one day, whereas the volatility shock in a typical developed currency market losts one to two weeks.

63.   The lack of persistence in historical zloty volatility implies that autoregressive models say little about future volatility, and it motivates an examination of the predictive power of zloty currency derivatives. While the low derivatives trading volume hinders formal analysis, casual investigation shows that the forward–looking volatility measures implicit in observed currency option prices might help predict changes in zloty spot rate volatility. It is tentatively concluded that once derivatives markets develop further in Poland the monitoring of currency option prices should prove useful in Fund surveillance work.

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[20] Prepared by Peter Christoffersen.

B. Zloty Spot Rate Volatility

Measuring historical zloty volatility

64. This section analyzes the developments in zloty volatility during the turbulence in international capital markets over the past two–plus years. The historical movements of the zloty within its +/- 7 percent band are depicted in Figure 6.

65. Volatility is inherently unobserved and must therefore be modeled and estimated. Before doing so it is necessary to establish a few pieces of notation. Let Y_t be defined as (100 x) the logarithmic zloty per U.S.dollar exchange rate at time t, and let y_t be the same observation after subtracting the conditional expectation based on all previous observations of Y_t,

$$y_t \equiv Y_t - E(Y_t|Y_{t-1},Y_{t-2},...),$$

where $E(Y_t|Y_{t-1},Y_{t-2},...)$ is to be estimated. For speculative prices such as exchange rates the most widely used model by far is the simple random walk model,

$$E(Y_t|Y_{t-1},Y_{t-2},...) = Y_{t-1}.$$

In the case of Poland which has a crawling peg regime, a more appropriate model is,

$$E(Y_t|Y_{t-1},Y_{t-2},...) = \mu + Y_{t-1},$$

where μ is a drift term capturing the monthly crawl in the peg equal to one percent over 1996 and 1997. Standard inference not reported here reveals that the random walk plus drift model yields a good description of the zloty, thus the unpredictable change in the exchange rate will be defined as $y_t = Y_t - Y_{t-1} - \mu$.

66. The simplest measure of volatility is unconditional variance which is consistently estimated by

$$Var(y_t) = \frac{1}{T}\sum_{t=1}^{T} y_t^2$$

Estimating the unconditional variance for the zloty per U.S. dollar from May 1995 to January 1998 yields an estimate of .424 per day or 6.78 in annualized terms as depicted in the top–left panel of Figure 7.[21]

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[21] The daily standard deviation is annualized by multiplying by $\sqrt{256}$, the number of active trading days in a year.

Testing if volatility has increased

67.   Using unconditional variance estimates it is possible to test whether volatility has increased significantly in 1997. The unconditional standard deviation of daily percentage changes in the zloty/U.S. dollar rate is estimated at .246 per day in the year 1996 or 3.94 in annualized terms. The corresponding standard deviation for the year 1997 is .548 per day or 8.77 in annualized terms. Under full ideal conditions the standard variance ratio test can be written

$$\hat{h}_{97} \ / \ \hat{h}_{96} \ \sim \ F(n_{97}-1,n_{96}-1)$$

where $\hat{h}_{97}$ is the estimate of variance, and n_{97} is the number of observations in 1997. The ratio of variance in 1997 to 1996 is equal to 4.95 which is significantly different from 1 at any reasonable level. It appears fair to conclude that the policy objective of higher exchange rate volatility, which would cause risk–adjusted dollar returns on Polish debt to fall, was achieved by the National Bank of Poland in 1997.

Tracking volatility using autoregressive models

68.   Rather than relying on unconditional variances when tracking exchange rate risk over time, a more precise concept is *conditional* variance which gives a measure of today's volatility given the information in all past observations in the sample. Generically one can write

$$Var_{t-1}(y_t) \equiv E[y_t^2|y_{t-1},y_{t-2},...].$$

69.   One of the simplest functions available is the K–day moving average of squares with constant weights equal to 1/K, call it MAV(K),

$$E[y_t^2|y_{t-1},y_{t-2},...] = \frac{1}{K}\sum_{i=1}^{K} y_{t-i}^2,$$

70.   The MAV(21) for Poland is depicted in the top–right panel in Figure 7. The number of days, K, is set to 21 which is the average number of trading days in a month, and the estimate is annualized as before. Unfortunately, MAV models tend to exaggerate volatility by imposing persistence when no persistence is really present. The squared–box type shapes in Figure 7 arise because one extreme observation gets equal impact (equal to 1/21) 21 days onwards. Despite this drawback, the MAV models are frequently applied by currency traders in financial markets.

A slightly more sophisticated model, often favored by practitioners in the risk management industry, is the exponential smoothing (ES) model of the squares, which is an infinite moving average with exponentially declining weights,

$$E[y_t^2|y_{t-1},y_{t-2},...] \equiv \sigma_t^2 = (1-\lambda)\sum_{i=0}^{\infty} \lambda^i y_{t-1-i}^2 = \lambda\sigma_{t-1}^2 + (1-\lambda)y_{t-1}^2.$$

The ES model underlies the Value–at–Risk measures recommended in J.P. Morgan's (1996) RiskMetrics system for market risk management. We follow J.P. Morgan's recommendation and set the smoothing parameter, $\lambda=.94$. The resulting, quite persistent volatility path is depicted in the bottom–left panel of Figure 7.

71.   The benchmark time–series model in the academic literature for estimating and forecasting time varying volatility is Bollerslev's (1986) GARCH(1,1) model, which can be written recursively as

$$E[y_t^2|y_{t-1},y_{t-2},...] \equiv h_t = \omega + \alpha y_{t-1}^2 + \beta h_{t-1}.$$

The GARCH(1,1) volatility also has a moving average interpretation; the above recursion can be written as

$$h_t = \frac{\omega}{1-\beta} + \alpha\sum_{i=0}^{\infty} \beta^i y_{t-1-i}^2.$$

For the zloty, the GARCH estimates are $\alpha = .28$ and $\beta = .42$, and the resulting much less persistent path of volatility is given in the bottom–right panel of Figure 7.

72.   It is evident from the equations above that the volatility models are all particular moving averages of past squared exchange rate movements. When tracking estimates from the unconditional, the MAV(K), the GARCH(1,1) and the ES models in Figure 7 several events stand out. First, the sharp peak in volatility around July 9, 1997 coincided with the turbulence in the Thai baht. Second, the adjustment of the band in December 1995 evident in Figure 6 is visible in the volatility figure (Figure 7) but is completely dominated by the peak in July 1997. Third, the turbulence in South East Asia in the fall of 1997 is evident but that episode is also dominated by the jump in July.

73.   Despite certain similarities, notice also the sharply different patterns of volatility from the different models. Compared to developed currency markets, and compared to the MAV(K) and ES models, persistence in volatility in the GARCH model is estimated to be relatively weak. The standard measure of persistence is $\alpha+\beta$ which is commonly measured to be around 0.95 for hard currency cross rates. Persistence as measured by $\alpha+\beta$ gives a rough measure of the rate of decay of a shock to volatility.[22] For the zloty per dollar rate we estimate $\alpha+\beta$ to be around .70. In fact, the correlelogram of the squares— not reported here— implies that an ARCH(1) model will suffice. The ARCH(1) model is characterized by having $\beta=0$, and a shock to volatility disappearing after just one day.[23]

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[22] To be exact, the squared exchange rate movements, y_t^2, in a GARCH(1,1) model can be written as an ARMA(1,1) model where the autoregressive parameter equals $\alpha+\beta$. Similarly the ES model can be written as a random walk in y_t^2 with MA(1) innovations.

[23] See Christoffersen (1998) for a comparison of volatility models for risk management.

74. As can be seen by inspecting the formulae above, the ES model is a special case of GARCH(1,1) where $\beta=\lambda$ and $\alpha=1-\lambda$ which implies $\alpha+\beta=1$. Thus the persistence of the ES model is forced to be one which means that a shock permanently changes volatility. Thus the highly persistent volatility pattern in the bottom–left panel of Figure 7 turns out to be an artifact of that particular model rather than a feature of the data itself. The 21–day moving average model, MAV(21), in Figure 7 by nature imposes persistence lasting for 21 days and then immediately dying out, accounting for the squared-box patterns.

C. Analyzing OTC Currency Options on the Zloty

75. The lack of persistence in zloty exchange rate volatility in the autoregressive GARCH models implies that the past sequence of exchange rate movements does not contain much information about future volatility. The lack of persistence thus motivates a search for alternative information which might have more predictive power. This section asks whether currency option prices can signal future changes in currency volatility. The advantage of using option prices over historical spot rates to predict future volatility is the inherent forward looking property of option prices. In developed markets, options as opposed to interest rates and forward rates allow computation of the entire expected distribution and thus estimation of extreme event probabilities, such as large depreciations.[24] Early warning systems of currency crises using options prices have been successfully applied by Campa and Chang (1996) to the ERM crises of 1991–94. While no exchange traded options exist for the zloty at present, contracts get traded over the counter (OTC). The quality of the analysis will of course depend on the available price data: more liquid markets, and a wider range of strike prices yield better estimates. Recent work by Campa, Chang and Reider (1997) suggest that OTC option prices on fully convertible currencies are indeed applicable to this kind of analysis. As the Polish zloty is not yet fully convertible, Polish option markets are not yet developed enough that the entire underlying distribution can be extracted. However, monitoring options prices and more precisely their implied volatility can still help to provide insight into the market's expectation of future zloty exchange rate movements.

The trading of Polish currency options

76. This section outlines the main features of currency option trading on the zloty.[25] The main banks and brokers in Poland have quotes on zloty per U.S. dollar and zloty per DM options on their screen daily. However, activity is typically limited to around 1–2 trades per week per bank, and the bid–ask spread is quite wide, around 10 percent for 1–month and 30 percent for 1–year maturity for a strike price at the forward rate. There is no Polish interbank market for currency options yet, so most trades are between banks and their corporate clients. Polish market participants mention that offshore brokers in London are the most active trading

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[24] See Söderlind and Svensson (1997) for a survey of these methods.

[25] See Malecki (1997) for an overview of developments in Polish currency and options markets.

zloty options as banks in Poland are restricted to trading with local clients. Interestingly, a major London broker notes that London firms typically get their quotes from the main banks *in* Poland. Due to the lack of external convertibility of the zloty, all options as well as synthetic forwards are cash settled in U.S. dollars upon expiration. The market participants believe that once the zloty becomes fully convertible, activity in zloty options will increase considerably. While the markets at present are not active enough to justify estimating the entire implied density, it is reasonable to study the volatility implied in quoted options prices.

Basic currency option pricing theory

77.   The standard theory of currency option pricing assumes that the underlying exchange rate follows a geometric Brownian motion and relies on risk free interest rates for the domestic currency (dollar), r, and for the foreign currency (zloty), r_f. Analogous to the well known Black–Scholes formula, the price of a European call option, c, on the zloty per dollar exchange rate, S, is given by the Garman and Kohlhagen (1983) formula (GK),

$$c = S \exp(-r_f(T-t))N(d_1) - X \exp(-r(T-t))N(d_2),$$

where T–t is the number of days until the option expires, N(•) is the standard Normal c.d.f.,

$$d_1 = \frac{\ln(S/X) + (r - r_f + \sigma^2/2)(T-t)}{\sigma\sqrt{T-t}}, \text{ and } d_2 = d_1 - \sigma\sqrt{T-t},$$

where σ is the volatility of the exchange rate.

78.   Focusing on options with a strike price, X, equal to the forward rate, F=X, and applying the spot forward parity, $F = S \exp(r-r_f)(T-t),$ one can simplify the pricing relationship to

$$c = \exp(-r(T-t))F[2N(\sigma\sqrt{T-t}/2) - 1].$$

This simple expression is explicitly invertible, and can be solved for the volatility term as

$$\sigma = \frac{2}{\sqrt{T-t}} N^{-1}(\frac{c}{2F}\exp(r(T-t)+\frac{1}{2}))$$

79.   If the GK formula were really true, at all points in time and for all contracts, one would get exactly the same volatility, as a constant volatility, σ, is assumed. However, the GK formula does not hold exactly in practice, and we can define

$$\tilde{\sigma}(c,F,r,T-t) = \frac{2}{\sqrt{T-t}} N^{-1}(\frac{c}{2F}\exp(r(T-t)+\frac{1}{2}))$$

to be the *implied volatility* which might vary over time, and depend on the call price, c, the forward rate, F, the risk free rate, r, and the days to expiration, T–t, of the option. Only in the case where the GK formula was exactly true would the left hand side be constant across time and option contracts.

80.   In OTC markets traders do not quote prices, c, but in fact use the GK formula to simply quote the option price in terms of its implied volatility, $\tilde{\sigma}$. Notice that there is a one–to–one mapping between $\tilde{\sigma}$ and c, so there is no loss in generality from quoting $\tilde{\sigma}$ rather than c. The advantage of quoting $\tilde{\sigma}$ is that the quote does not have to be continuously updated as the underlying spot rate or forward rate changes. Of course, quoting $\tilde{\sigma}$ does not imply that the traders believe the GK formula to hold; it is simply a market convention.

Interpreting observed implied volatilities

81.   Data on implied volatilities from currency options have been obtained from the dealer room of a major investment bank in Warsaw. Figure 8 gives the implied volatility from quoted mid–rate prices on 1–month at–the–forward call options on the zloty per dollar exchange rate. Also depicted is the historical volatility as measured by the bank. As is standard but somewhat misleading (see Section II), volatility is reported as a standard deviation of a 21–day moving average, MAV(21), and scaled by $\sqrt{256}$ to give an annualized number. As discussed above, historical volatility is overstated in the figure due to the application of the MAV technique. This makes the changes in implied volatility seem trivial. Despite this distraction, the key thing to note is whether implied volatility changes *before* the estimate of historical volatility, suggesting that implied volatility *leads* the actual and will be useful for exchange rate surveillance. Unfortunately, the evidence in Figure 8 is not conclusive. In the earlier part of the sample (1996), implied volatility seems to be *lagging* historical volatility suggesting that traders quote option prices based on historical numbers for volatility. However, later in the sample (1997), volatility in some instances does seem to move prior to surges in actual volatility indicating the usefulness of option prices as a leading indicator once markets develop further.

D. Summary

82.   In developed currency markets, simple autoregressive models have been found to satisfactorily describe the evolution of currency risk; but when applying those models to the Polish zloty surprisingly little evidence of volatility persistence, and thus predictability, is found. The lack of predictive power of autoregressive models motivates the question whether currency options can signal future changes in currency volatility? While the low derivatives trading volume hinders formal analysis, casual investigation shows that the forward looking volatility measures implicit in observed currency option prices might help predict forthcoming changes in zloty spot rate volatility once markets develop further.

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Figure 6. Poland: Zloty Exchange Rate

Value of the Zloty within the Band
(Basket per Zloty)
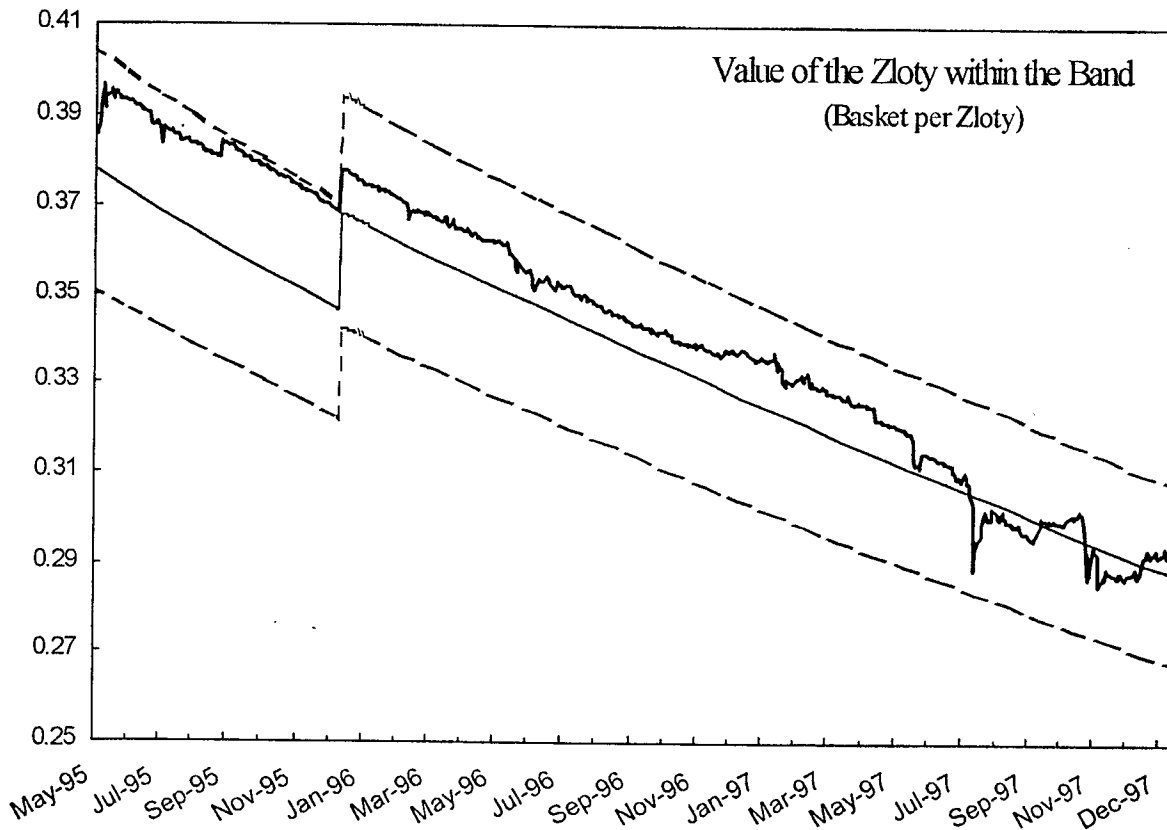
Figure 7. Poland: Historical Zloty Volatility: Four Methods 1/
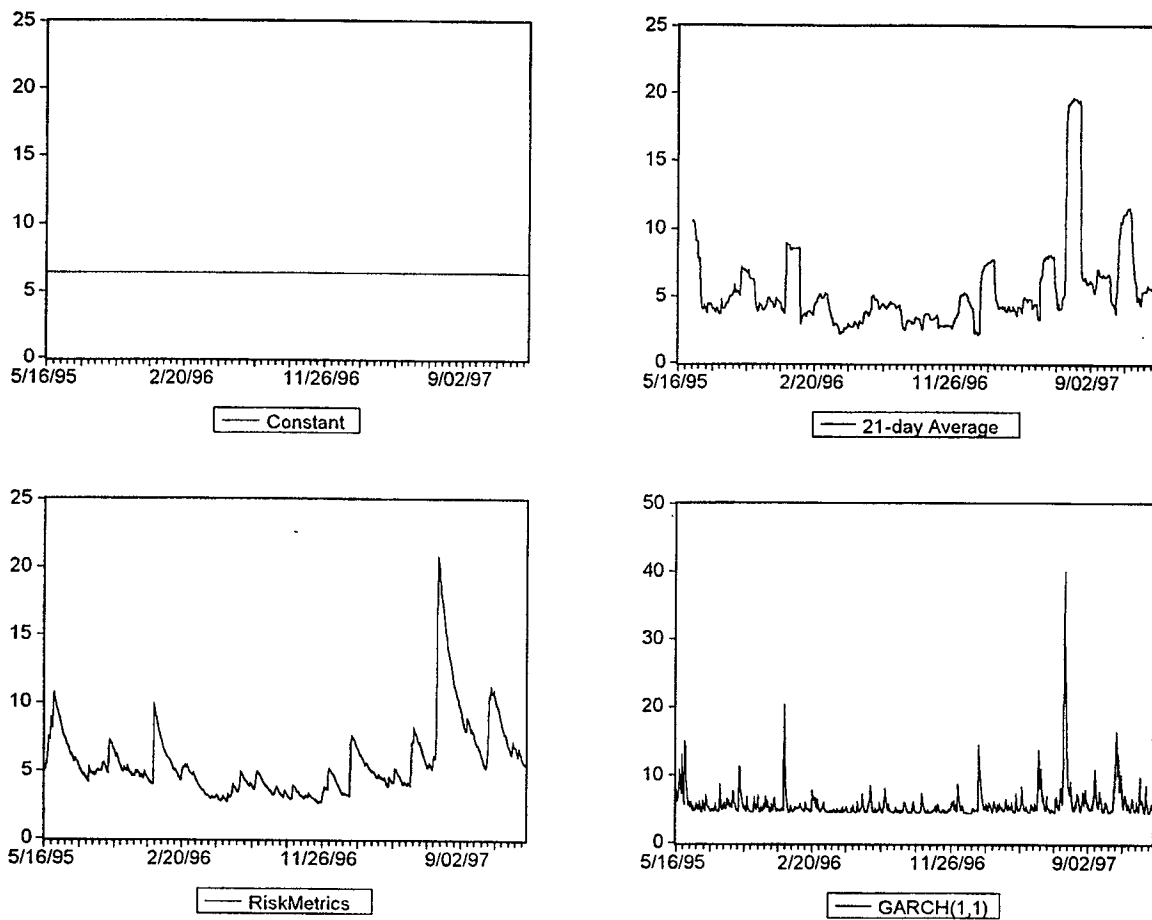
1/ Top left: Constant. Top right: Moving Average over 21 days, Bottom left: Exponentially smoothed (J.P. Morgan's RiskMetrics), Bottom right: GARCH(1,1). All four estimates are annualized by multiplying by $\sqrt{256}$.

Figure 8. Poland: Historical and Implied Volatility
One–Month at–the–Forward U.S. Dollars/Zloty Call Option 1/
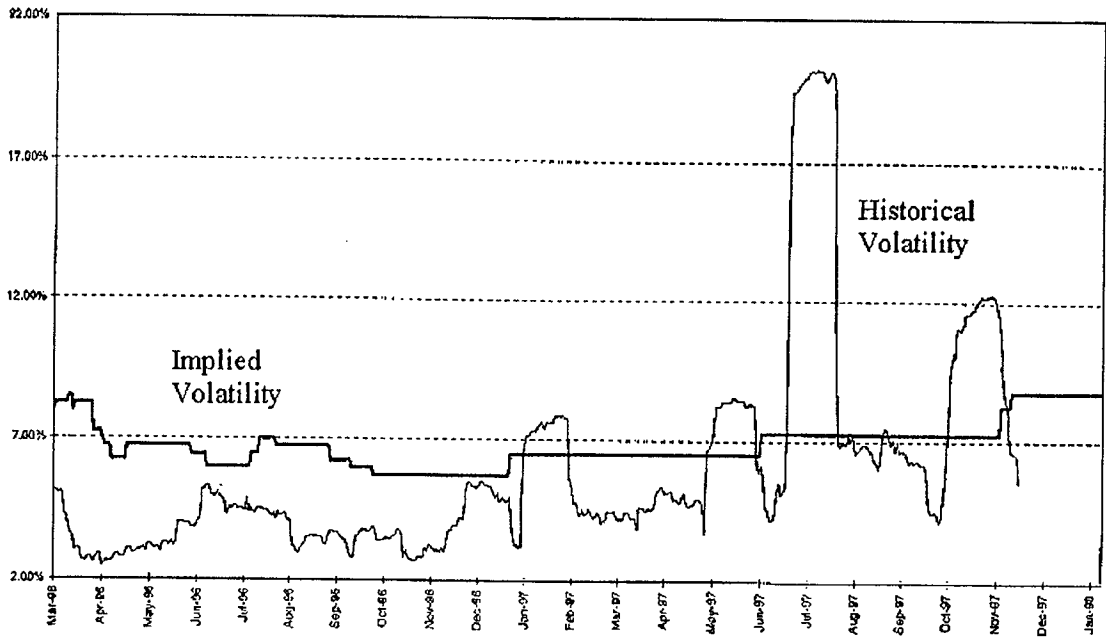
1/ The thick line gives mid–rate implied volatilities from a 1–month at–the–forward call option on dollar per zloty. The thin line is an estimate of historical volatility based on a simple average of a 21–day window of spot rate changes, annualized by multiplying by $\sqrt{256}$, and corresponds to the top–right panel of Figure 7.

Table 3. Poland: Composition of Aggregate Demand, 1993-1997

	1993	1994	1995	1996	Estimate 1997
	(In percent of GDP)				
Domestic demand 1/	99.0	99.0	98.7	103.3	105.2
Consumption	83.5	83.1	80.6	82.9	82.3
Private	63.0	64.3	62.1	64.3	64.5
Government	20.4	18.8	18.6	18.6	17.8
Gross capital formation	15.6	15.9	18.0	20.4	22.9
By type:					
Fixed investment	15.9	16.2	16.9	18.9	20.6
Net exports 1/	1.0	1.0	1.3	-3.3	-5.4
Exports	22.9	24.0	25.9	24.6	25.5
Imports	22.0	23.0	24.6	27.8	31.0
	(Percent change in real terms)				
Domestic demand	5.9	4.7	6.9	9.8	9.4
Consumption	4.9	3.9	3.4	7.5	6.0
Private	5.2	4.3	3.6	8.7	7.0
Government	3.8	2.8	2.9	3.3	2.4
Gross capital formation	12.8	9.0	26.0	20.6	22.0
By type:					
Fixed investment	2.9	9.2	16.9	22.7	18.5
Change in stocks 2/	1.3	0.0	1.4	0.0	1.0
External demand					
Net exports of goods and nonfactor services 2/	-1.6	0.4	0.0	-4.0	-2.8
Exports of goods and nonfactor services	3.2	13.1	23.6	12.0	14.0
Imports of goods and nonfactor services	13.2	11.3	24.3	29.9	22.4
Statistical discrepancy 2/	-0.4	0.1	0.2	0.3	0.3
Gross domestic product	3.8	5.2	7.0	6.1	6.9
	(In billions of zlotys)				
Gross domestic product	155.8	210.4	288.7	362.6	445.2

Sources: Central Statistical Office and staff estimates.

1/ Excluding statistical discrepancy.
2/ Contribution to GDP growth

Table 4. Poland: Sectoral Breakdown of Investment, 1992-96 1/

	1992	1993	1994	1995	1996	1992	1993	1994	1995	1996
	(In percent of total)					(Annual percentage change)				
Agriculture, hunting and forestry	3.2	3.2	3.0	3.3	3.6	-30.2	-7.6	5.4	14.4	29.5
Fishing	0.1	0.1	0.0	0.0	0.0	-58.3	74.2	-55.9	-69.2	107.2
Mining and quarrying	4.4	4.2	4.3	3.5	2.8	3.5	-12.2	15.8	2.7	-4.0
Manufacturing	22.7	20.1	24.8	24.9	26.2	-11.1	-0.3	32.7	16.2	27.5
Electricity, gas and water supply	12.4	14.4	14.3	14.3	13.4	16.1	6.6	3.7	16.3	12.0
Construction	4.7	4.1	4.6	4.6	5.9	14.1	-15.5	22.3	16.2	49.6
Trade and repair	5.8	6.8	6.3	8.1	7.5	41.0	21.0	0.9	46.2	9.1
Hotels and restaurants	0.8	1.0	1.1	1.1	0.7	-33.4	31.2	15.1	24.1	-34.2
Transport, storage and communication	8.7	10.2	9.7	10.8	12.0	11.6	18.5	-0.4	27.9	31.8
Financial intermediation	3.6	3.9	4.7	4.9	4.7	43.1	6.1	21.7	32.4	14.4
Real estate and business activities	24.1	18.9	14.9	12.9	11.0	-9.3	-18.2	-9.5	1.9	0.4
Public administration and defense compulsory social security	1.0	1.5	1.6	1.3	1.5	-3.3	33.0	9.8	10.7	32.4
Education	2.4	2.7	2.2	2.3	2.6	-3.0	17.7	-11.6	20.2	35.1
Health and social work	2.2	2.8	2.6	2.8	2.9	-4.6	31.4	-4.7	27.6	20.8
Other community, social and personal service activities	3.9	6.1	5.9	5.2	5.2	33.1	51.2	4.2	6.8	20.4
Total	100.0	100.0	100.0	100.0	100.0	0.4	2.3	8.1	17.1	18.2

Source: Data provided by the Polish authorities.

1/ According to the Polish version of the NACE-EKD classification system.

Table 5. Poland: Investment by Type and Decision-Making Entity, 1992-96

	1992	1993	1994	1995	1996
	(In billions of zlotys at current prices)				
By type:					
Building and structures	11.57	13.64	17.68	22.56	30.34
Machinery and equipment	6.38	9.32	13.94	21.94	31.57
Domestic	3.34	4.94	7.72	14.08	21.12
Imported	3.04	4.38	6.22	7.86	10.45
Other outlays	2.21	1.76	2.24	2.64	3.71
Total	20.16	24.72	33.86	47.14	65.62
By decision-making entity:					
Public sector	11.29	14.12	18.97	26.29	35.44
State property	9.04	10.85	14.51	20.11	25.84
Municipal property	1.95	3.02	4.12	5.32	7.84
Other	0.30	0.25	0.34	0.86	1.76
Private sector	8.86	10.59	14.89	20.85	30.18
Of which:					
Private domestic property	7.66	8.38	10.49	14.29	18.30
Of which:					
Cooperative	3.33	2.45	2.09	2.81	3.37
Total	20.15	24.71	33.86	47.14	65.62
	(As a share of total investment, in percent)				
Buildings and structures	57.4	55.2	52.2	47.9	46.2
Machinery and equipment	31.6	37.7	41.2	46.5	48.1
Private sector	44.0	42.9	44.0	44.2	46.0
Of which:					
Cooperative	16.5	9.9	6.2	6.0	5.1
Public sector	56.0	57.1	56.0	55.8	54.0

Source: Data provided by the Polish authorities.

Table 6. Poland: Value Added by Sector, 1992-96

	1992	1993	1994	1995	1996
	(In percent of total value added)				
Agriculture, forestry and fishing	6.9	7.2	7.4	7.4	6.9
Industry and Construction	43.6	42.7	39.8	39.9	37.8
Industry	35.5	35.7	33.2	33.8	31.5
Mining and Quarrying	3.5	4.0	4.9	4.5	4.1
Manufacturing	28.0	27.4	24.0	25.1	23.4
Electricity, Gas and Water Supply	3.9	4.3	4.2	4.2	4.1
Construction	8.1	7.1	6.7	6.0	6.2
Services	49.3	50.0	52.7	52.7	55.2
Trade and Repair	13.7	16.2	15.4	15.8	17.0
Hotels and Restaurants	0.4	0.6	0.7	0.6	0.7
Transport, Storage and Communications	6.4	6.6	7.4	6.5	6.4
Financial Intermediation	0.5	0.6	1.2	1.1	1.1
Real Estate and Insurance	6.7	6.3	7.4	7.6	8.2
Public Administration and Defense	6.3	5.6	5.2	5.9	6.1
Education	4.0	3.5	4.1	4.2	4.2
Health and Social Security	4.4	4.2	4.2	4.1	4.1
Miscellaneous Services	6.8	6.3	7.3	6.9	7.2
Total	100.0	100.0	100.0	100.0	100.0
	(Volume, percentage change)				
Agriculture, forestry and fishing	...	7.0	-15.1	11.9	2.5
Industry	...	8.6	10.3	9.9	7.1
Mining and Quarrying	...	-9.8	-1.9	7.7	4.7
Manufacturing	...	11.9	11.2	12.6	8.1
Electricity, Gas and Water Supply	...	1.5	16.2	-2.8	3.5
Construction	...	1.1	2.7	7.3	3.5
Trade and Repair	...	5.8	-1.5	4.4	8.0
Hotels and Restaurants	...	2.3	7.3	5.9	16.2
Transport, Storage and Communications	...	-5.3	0.5	3.1	5.7
Financial Intermediation	...	29.1	102.1	19.4	11.3
Real Estate and Insurance	...	1.5	6.9	5.6	2.4
Public Administration and Defense	...	5.2	7.8	4.1	4.4
Education	...	0.1	10.3	1.4	1.3
Health and Social Security	...	4.1	4.1	2.9	1.5
Miscellaneous Services	...	3.4	3.4	2.1	1.2

Sources: Central Statistical Office, OECD, and staff estimates.

Table 7. Poland: The Growth of Production, 1992-96

(Annual percent change in constant prices)

	1992	1993	1994	1995	1996
Industrial production	2.8	3.7	12.1	9.7	8.3
Mining and quarrying	-5.3	-4.1	4.6	-0.6	2.5
Manufacturing	5.1	10.4	13.7	11.6	9.8
Food products and beverages	1.7	8.6	12.8	9.3	9.6
Coke, refined petroleum, etc.	12.8	12.3	7.2	5.6	2.8
Chemicals and chemical products	-2.0	6.1	17.3	13.1	4.9
Basic metals	-2.3	1.8	16.7	15.2	0.0
Machinery and equipment	-7.7	9.4	15.5	20.9	9.8
Electricity, gas and water supply	-4.6	-11.2	4.7	0.9	0.3
Construction and assembly production	6.6	8.0	0.5	8.1	4.6
Agriculture	-12.7	6.8	-9.3	10.7	0.7

Sources: Central Statistical Office and staff estimates.

Table 8. Poland: Production and Yields of Selected Crops, 1992-96

	1992	1993	1994	1995	1996
	(In thousands of tons)				
Plant production					
Cereals	19,962	23,417	21,763	25,905	25,298
Of which:					
Wheat	7,368	8,243	7,658	8,668	8,576
Rye	3,981	4,992	5,300	6,287	5,653
Barley	2,819	3,255	2,686	3,279	3,437
Oats	1,229	1,493	1,243	1,495	1,581
Potatoes	23,388	36,270	23,058	24,891	27,247
Sugar beets	11,052	15,621	11,676	13,309	17,846
Oil plants	769	606	777	1,401	468
Fodder-root crops	6,324	8,419	7,062	6,393	5,007
Meadow hay	8,803	10,995	11,015	11,850	13,744
Straw 2/	18,177	20,803	19,878	24,041	22,559
Vegetables	4,774	6,138	5,369	5,928	5,423
Tree fruits 3/	1,889	2,223	1,721	1,654	2,315
	(Yield per hectare in quintals)				
Yields					
Cereals	24.0	27.5	25.7	30.2	29.0
Of which:					
Wheat	30.6	33.3	31.8	36.0	39.6
Rye	19.6	22.6	21.8	25.6	23.4
Barley	23.5	27.9	26.0	31.3	30.7
Oats	18.4	23.3	20.1	25.1	25.3
Potatoes	133.1	206.0	135.9	163.5	203.0
Sugar beets	294.1	391.6	291.6	346.2	394.0
Oil plants	17.6	16.7	19.5	22.1	15.5
Fodder-root crops	331.6	431.8	360.0	377.1	42.9
Meadow hay	37.7	47.5	42.5	52.2	51.9
Straw 2/	26.1	29.1	28.1	33.8	30.7

Source: Data provided by the Central Statistical Office.

1/ At current prices; in percent of total.
2/ From four cereals plus triticale.
3/ Total fruit production.

Table 9. Poland: The Growth and Structure of Agricultural Production, 1992-96 1/

	(1990 = 100) 2/				
	1992	1993	1994	1995	1996
	(Volume of production)				
Gross agricultural production	85.9	91.7	83.2	92.1	92.7
Final production 3/	87.9	94.9	84.7	98.5	97.6
Of which:					
Marketed output	89.6	89.4	80.7	88.2	93
Net final production 4/	91.9	101.1	...	...	...
	(In percent of total at current prices)				
Share of nonsocialized agriculture in : 5/					
Gross agricultural production	84.6	86.5	87.9	89.1	88.7
Final production	83.9	86.2	87.2	87.3	87.5
Of which:					
Marketed output	79.7	81.8	84.7	84.7	85.5
Net final production	86.9	88.9	90.4	90.5	...
Value added	91.3	92.2	93.2	94.1	...
Share of state procurement in:					
Gross agricultural production	32	28.6	29.4	27.9	29.5
Final production	48.6	43.9	43.4	43.5	47.1
Marketed output	54.7	52.9	52.7	55.6	56.4

Sources: Central Statistical Office, Rocznik statystyczny (various issues); and data provided by the Polish authorities.

1/ Excludes agricultural services.
2/ According to the Polish version of NACE-EKD.
3/ Gross agricultural production minus intermediate consumption.
4/ Final agricultural production minus value of products of agricultural origin bought by agricultural producers.
5/ Data for individual farms.

Table 10. Poland: Total Employment by Sector, 1993-96

(Annual averages)

	1993	1994	1995	1996	1994	1995	1996
	(In thousands of persons)				(Percent change)		
Total employment	14,330	14,475	14,735	15,021	1.0	1.8	1.9
Agriculture, hunting and forestry	3,688	3,887	3,836	4,010	5.4	-1.3	4.5
Industry	3,671	3,641	3,757	3,730	-0.8	3.2	-0.7
Mining and quarrying	421	393	375	357	-6.7	-4.6	-4.8
Manufacturing	2,979	2,971	3,104	3,095	-0.3	4.5	-0.3
Electricity, gas and water supply	271	276	278	278	1.8	0.7	0.0
Construction	853	820	841	843	-3.9	2.6	0.2
Trade and repair	1,872	1,863	1,858	1,901	-0.5	-0.3	2.3
Transport, storage, and communication	871	854	845	855	-2.0	-1.1	1.2
Education	813	842	852	857	3.6	1.2	0.6
Health and social welfare	975	977	1,011	1,018	0.2	3.5	0.7
Other	1,587	1,591	1,735	1,807	0.3	9.1	4.1
	(As share of total)						
Total employment	100.0	100.0	100.0	100.0			
Agriculture, hunting and forestry	25.7	26.9	26.0	26.7			
Industry	25.6	25.2	25.5	24.8			
Mining and quarrying	2.9	2.7	2.5	2.4			
Manufacturing	20.8	20.5	21.1	20.6			
Electricity, gas and water supply	1.9	1.9	1.9	1.9			
Construction	6.0	5.7	5.7	5.6			
Trade and repair	13.1	12.9	12.6	12.7			
Transport, storage, and communication	6.1	5.9	5.7	5.7			
Education	5.7	5.8	5.8	5.7			
Health and social welfare	6.8	6.7	6.9	6.8			
Other	11.1	11.0	11.8	12.0			

Sources: Central Statistical Office and staff estimates.

Table 11. Poland: Private Sector Employment by Sector, 1993-96

(Annual averages)

	1993	1994	1995	1996	1994	1995	1996
	(In thousands of persons)				(Percent change)		
Employment in private sector	8,147	8,595	9,121	9,626	5.5	6.1	5.5
Agriculture, hunting and forestry	3,426	3,698	3,695	3,905	7.9	-0.1	5.7
Industry	1,422	1,586	1,865	1,981	11.5	17.6	6.2
Mining and quarrying	7	10	12	11	42.9	20.0	-8.3
Manufacturing	1,410	1,569	1,843	1,959	11.3	17.5	6.3
Electricity, gas and water supply	5	7	10	11	40.0	42.9	10.0
Construction	607	629	685	719	3.6	8.9	5.0
Trade and repair	1,725	1,737	1,746	1,804	0.7	0.5	3.3
Transport, storage, and communication	204	211	223	246	3.4	5.7	10.3
Education	19	19	25	32	0.0	31.6	28.0
Health and social welfare	58	48	76	83	-17.2	58.3	9.2
Other	686	667	806	861	-2.8	20.8	6.8
	(Private sector share of total employment)						
Employment in private sector	56.9	59.4	61.9	64.1			
Agriculture, hunting and forestry	23.9	25.5	25.1	26.0			
Industry	9.9	11.0	12.7	13.2			
Mining and quarrying	0.0	0.1	0.1	0.1			
Manufacturing	9.8	10.8	12.5	13.0			
Electricity, gas and water supply	0.0	0.0	0.1	0.1			
Construction	4.2	4.3	4.6	4.8			
Trade and repair	12.0	12.0	11.8	12.0			
Transport, storage, and communication	1.4	1.5	1.5	1.6			
Education	0.1	0.1	0.2	0.2			
Health and social welfare	0.4	0.3	0.5	0.6			
Memorandum item:							
Total employment	14,330	14,475	14,735	15,021			

Sources: Central Statistical Office and staff estimates.

Table 12. Poland: Population, Labor Force, Employment and Unemployment, 1990-96

(In thousands of persons; end of year)

	1990	1991	1992	1993	1994	1995	1996
Population	38,183	38,309	38,418	38,505	38,581	38,609	38,639
Of which:							
Working age 1/	21,962	22,055	22,181	22,333	22,502	22,647	22,733
Nonworking age	16,221	16,254	16,237	16,172	16,079	15,962	15,906
Total employment 2/	16,145	15,443	15,011	14,761	14,924	14,968	15,487
Of which:							
In the public sector	8,243	7,052	6,606	6,060	5,878	5,623	5,413
Registered unemployment	1,126	2,156	2,509	2,889	2,838	2,629	2,360
(In percent of civilian labor force)	6.3	11.8	13.6	16.4	16.0	14.9	13.2
Reported vacancies	54	29	23	22	25	21	14

Source: Data provided by the Polish authorities.

1/ The working age for men/women is defined to be between the ages of 18 and 64/59.

2/ Employment statistics exclude workers doing military service, working in defense and public-safety related institutions, living abroad, or serving a jail sentence. These workers, however, are classified as part of the active labor force. Taking into account the different statistical treatment accorded to these workers, the calculated unemployment rate was close to zero through 1989.

Table 13. Poland: Wages and Salaries, 1993-97

	1993	1994	1995	1996	Jan-Sept 1997
	(Average monthly wage, in zlotys)				
Nominal gross wage	390	525	691	874	1,044
Of which:					
Enterprise sector	410	571	754	939	1,117
Budgetary sector	357	473	639	817	990
Industry	417	583	759	955	1,161
Mining and quarrying	683	1,045	1,337	1,677	1,788
Manufacturing	362	495	657	833	1,049
Electricity, gas and water supply	554	788	1,010	1,257	1,451
Construction	368	464	601	763	1,027
Wholesale and retail trade; goods repair	323	438	577	720	1,010
Hotels and restaurants	261	366	492	607	840
Transport, storage and communication	413	558	727	917	1,113
Financial intermediation	584	767	1,001	1,309	1,581
Real estate and business activities	427	566	736	952	1,158
Public administration and defense	492	638	859	1,131	1,338
Education	350	458	618	791	971
Health and social work	333	430	573	716	865
Nominal net wage	320	425	561	710	862
	(Percent change from year earlier)				
Nominal gross wage	34.8	34.5	31.6	26.5	19.5
Of which:					
Enterprise sector	37.1	39.3	32.1	24.5	19.0
Budgetary sector	31.8	32.4	35.1	27.9	21.2
Industry	37.8	39.8	30.1	25.9	21.6
Mining and quarrying	43.5	53.0	28.0	25.4	6.6
Manufacturing	35.4	36.7	32.7	26.9	25.9
Electricity, gas and water supply	46.8	42.3	28.2	24.5	15.4
Construction	23.9	26.3	29.4	27.0	34.6
Wholesale and retail trade; goods repair	25.4	35.4	31.8	24.8	40.3
Hotels and restaurants	23.7	39.9	34.5	23.5	38.4
Transport, storage and communication	36.2	35.0	30.2	26.2	21.4
Financial intermediation	34.7	31.2	30.5	30.8	20.8
Real estate and business activities	31.3	32.7	30.0	29.4	21.6
Public administration and defense	33.3	29.6	34.6	31.7	18.3
Education	35.5	30.7	35.0	28.0	22.8
Health and social work	30.6	29.2	33.3	24.9	20.8
Nominal net wage	31.3	32.9	31.8	26.7	21.4
Consumer price index	35.3	32.2	27.8	19.9	15.5

Sources: Central Statistical Office and staff estimates.

Table 14. Poland: Price Developments, 1990-97

(Percent change)

	1990	1991	1992	1993	1994	1995	1996	1997
GDP deflator	480.1	55.3	38.5	30.5	30.5	27.0	...	...
Of which:								
Consumption 1/	517.4	63.8	39.4	29.6	29.6	28.0	...	...
Investment 2/	569.0	40.3	19.6	24.6	23.1	22.9	...	...
Consumer price index (annual average)	585.8	70.3	43.0	35.3	32.2	27.8	19.9	14.9
Commodities	559.8	60.0	36.7	34.2	32.1	27.2	19.8	11.3
Foodstuffs	574.7	46.1	36.9	33.6	33.0	27.0	18.6	10.2
Alcoholic beverages	388.7	87.6	36.5	23.6	29.2	28.6	25.4	11.4
Other	591.2	75.8	36.5	36.8	31.4	27.3	20.7	12.6
Services	780.7	131.5	67.6	38.1	32.5	29.3	20.1	18.7
Consumer price index (end period)	249.3	60.4	44.3	37.6	29.5	21.6	18.5	13.2
Producer prices 3/								
Industry	...	40.9	34.5	31.9	25.3	25.4	12.4	12.2
Mining and quarrying	...	77.8	31.2	48.0	40.5	22.9	11.8	16.4
Manufacturing	...	39.6	26.8	29.3	24.2	25.9	10.7	8.7
Electricity, gas and water supply	...	40.5	86.7	40.1	23.6	27.1	15.1	11.3
Construction and assembly production	...	47.4	17.2	24.6	19.7	21.9	19.2	14.2
Administered prices (annual average)								
Retail prices 4/								
Alcoholic beverages	346.9	87.5	33.0	19.1	35.7	34.6	30.6	...
Fuel	1,044.5	132.3	37.6	46.8	37.4	18.3	25.2	...
Medicines	885.2	31.6	38.8	34.9	38.2	35.7	21.7	...
Electricity	1,383.7	151.7	70.6	37.3	37.4	28.0	16.1	...
Gas	1,176.9	369.5	145.8	29.2	30.3	24.6	18.7	...
Central heating and hot water	1,203.5	222.8	222.5	68.4	65.9	31.3	17.1	...

Source: Data provided by the Polish authorities, and staff calculations.

1/ Final consumption expenditure.
2/ Gross fixed capital formation.
3/ According to the Polish version of the NACE-EKD classification system. Until 1993 indices include VAT; 1994-95 excluding VAT, including excise tax; from 1996 onwards excluding VAT and excise tax.
4/ The range of prices administered by the state has fallen over time. In 1997: the price of spirit alcohol was controlled; furnace fuels (coal, wood) are no longer controlled; control of medicine prices applies to a limited range of domestically produced pharmaceutical goods; the price of natural gas delivered through municipal installations is controlled; the state sets maximum prices for central heating and hot water--the index measures actual prices in force, which are sometimes below the state-set maximum.

Table 15. Poland: Recent Price Developments, 1996-97

(Percent change from a year earlier)

	1996				1997			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Consumer price index	20.6	19.9	20.1	19.1	17.2	15.1	14.3	13.2
Commodities	20.4	19.6	20.5	18.8	16.0	13.5	12.6	11.4
Foodstuffs	17.4	17.1	20.3	19.4	16.1	12.7	11.9	10.5
Alcoholic beverages	31.1	27.0	25.9	18.8	15.0	16.0	12.3	11.7
Other	23.0	22.1	20.0	18.1	16.1	14.0	13.5	12.7
Services	21.1	20.5	19.1	19.7	20.6	19.6	19.0	18.3
Consumer price index (end period)	20.4	19.5	19.5	18.5	16.6	15.3	13.6	13.2
Producer prices								
Industry	14.8	13.8	10.9	10.5	12.2	12.2	12.5	11.9
Mining and quarrying	13.5	12.8	11.3	9.8	14.8	17.6	17.2	16
Manufacturing	12.5	10.6	9.9	10.1	9.6	8.3	8.6	8.3
Electricity, gas and water supply	18.8	18.5	11.7	11.9	12.5	11.1	11.3	10.5
Construction and assembly production	21.2	20.2	18.9	16.8	14.6	14.3	14.2	14.3

Source: Data provided by the Polish authorities.

Table 16. Poland: Monetary Survey, 1993-97
(In billions of zlotys)

	1993	1994	1995	1996	1997Q1	1997Q2	1997Q3	1997Q4
Net International Reserves	18.7	27.5	50.4	62.3	64.8	74.2	80.7	86.0
(in billions of U.S. dollars)	8.7	11.3	20.4	21.7	21.1	22.6	23.6	24.4
Net domestic assets	37.2	49.8	53.8	74.4	78.9	80.0	81.6	90.1
Credit to nongovernment	33.2	41.6	56.2	81.1	88.0	94.5	102.2	107.4
Credit to government, net	28.2	39.5	41.8	48.2	49.9	49.8	49.1	54.9
Other items, net	-24.2	-31.3	-44.2	-55.0	-58.9	-64.2	-69.7	-72.2
Money and quasi money 1/	55.9	77.3	104.3	136.7	141.6	152.0	162.3	176.1
Zloty money	39.8	55.2	83.0	113.3	116.6	125.5	133.5	145.2
Foreign currency deposits	16.1	22.1	21.3	23.4	25.0	26.5	28.7	30.9
Memorandum items (in percent)								
Nominal money growth (12-month) 2/	36.0	33.8	39.4	31.1	27.9	29.4	31.3	28.8
Real money growth (12-month)	-1.2	6.9	10.4	9.2	8.7	11.7	11.9	13.8
Real growth of credit to nongovernment	-3.7	-2.2	13.5	21.4	31.9	32.8	27.7	17.0
Share of foreign currency deposits								
in broad money	28.8	28.5	20.4	17.4	17.7	17.5	17.7	14.6

Sources: National Bank of Poland, and Fund estimates and projections.

1/ There was a break in this series at the end of 1996.
2/ For end 1996, the growth rate of broad money is adjusted to take account of changes to the reporting system.

Table 17. Poland: Balance Sheet of the National Bank of Poland, 1993-97

(In billions of zlotys; stocks at end of period)

	1993	1994	1995	1996	1997
Net foreign assets	7.7	11.3	36.6	51.9	72.7
(In millions of U.S. dollars)	3,609	4,653	14,840	18,033	20,670
Net domestic assets	8.3	8.3	-8.2	-17.7	...
Claims on banks	6.4	7.5	8.2	...	7.7
Refinancing credit	4.7	5.4	6.4	6.8	7.7
Other	1.6	2.1	1.8	...	...
Nonreserve liabilities to banks	-1.4	-3.5	-9.5	-15.2	-15.7
Reverse repos	-0.7	-1.0	-3.5	-2.7	-1.3
NBP securities	-0.7	-2.5	-5.9	-12.5	-14.4
Net credit to general government	13.5	16.8	8.1	6.6	12.5
Other items, net	-10.1	-12.5	-15.1	...	...
Reserve money	16.0	19.6	28.4	34.2	42.3
Currency	12.2	14.8	22.4	27.4	31.1
Bank deposits	3.8	4.8	6.0	6.8	11.2
Memorandum items:					
Money multiplier 1/	3.50	3.94	3.68	3.93	4.16
Currency-deposit ratio 2/	21.7	18.9	23.1	21.2	18.3
Obligatory reserve ratios 2/					
Zloty demand deposits	23.0	20.0	20.0	17.0	20.0
Zloty time deposits	10.0	10.0	9.0	9.0	11.0
Foreign currency deposits	0.0	1.0	1.0	2.0	5.0

Sources   Data provided by the Polish authorities; IMF, International Financial Statistics; and staff estimates.

1/ Broad money divided by reserve money.
2/ In percent.

Table 18. Poland: Interest Rates, 1993-97 1/

(In percent)

| | NBP Rates | | Market Rates | | | | | | Interest Differentials 7/ | |
	Refinance 2/	Intervention 3/	Six-Month Deposits 4/	Prime Lending 5/	Treasury Bills 13-Week	26-Week	52-Week	WIBOR 6/ 3-Month	Six-Month Deposits	26-Week T-Bills
1993										
March	35.0	...	30.5	35.0	28.6	27.4	36.5	35.3	2.8	1.3
June	35.0	...	30.5	35.0	33.0	34.6	38.1	33.5	2.8	7.6
September	35.0	...	30.5	35.0	33.4	34.7	38.2	34.0	6.0	10.4
December	35.0	...	29.5	35.0	33.7	35.1	38.3	34.4	4.7	10.6
1994										
March	35.0	27.0	29.5	35.0	29.8	33.0	38.0	33.4	5.3	8.1
June	33.0	26.5	29.0	32.0	28.9	29.5	31.1	32.2	4.8	4.1
September	33.0	26.5	29.5	31.0	26.8	27.6	29.3	30.6	6.4	3.1
December	33.0	26.0	28.5	31.0	27.0	27.4	26.3	28.4	6.2	3.0
1995										
March	35.0	28.0	29.0	28.0	28.1	27.5	27.4	30.3	9.2	5.9
June	31.0	26.6	24.5	26.0	25.0	25.9	25.9	27.6	6.5	4.9
September	29.0	26.1	22.3	24.0	24.7	25.6	25.3	26.2	2.9	4.7
December	29.0	25.5	21.3	24.0	24.2	24.7	25.0	25.6	1.8	4.1
1996										
March	26.0	22.8	19.3	22.8	21.4	21.2	21.1	22.7	2.4	3.4
June	26.0	21.6	19.3	21.8	21.0	21.1	21.1	21.6	2.7	3.1
September	25.0	19.1	18.1	20.0	18.6	19.1	19.4	19.8	1.4	1.3
December	25.0	21.6	18.3	20.5	18.8	19.3	19.6	22.1	1.6	1.6
1997										
January	25.0	21.6	18.0	20.5	19.4	19.6	19.9	22.4	1.3	1.8
February	25.0	21.6	18.0	20.5	19.8	20.0	20.1	22.5	1.4	2.2
March	25.0	21.8	18.3	22.0	21.0	21.0	21.2	22.6	1.3	2.9
April	25.0	22.1	18.4	22.0	21.7	21.7	21.8	22.8	1.3	3.6
May	25.0	22.1	18.0	22.0	20.9	21.4	21.4	22.8	1.1	3.3
June	25.0	22.1	18.0	22.0	21.1	21.5	21.6	22.7	1.1	3.5
July	25.0	22.6	18.8	22.0	21.5	21.9	22.0	24.0	1.9	3.9
August	27.0	23.5	19.4	22.0	22.6	22.7	22.8	25.6	2.4	4.6
September	27.0	23.5	19.3	22.5	22.9	23.2	23.3	25.4	2.4	5.2
October	27.0	23.5	19.3	22.5	22.9	23.2	23.2	25.2	2.4	5.2
November	27.0	23.5	19.8	22.5	23.1	23.5	23.5	25.3	2.8	5.4
December	27.0	23.5	...	...	23.5	23.7	23.9	25.7	...	...

Source: Data provided by the Polish authorities; and staff calculations.

1/ The NBP refinance rate and the deposit and lending rates are end-period values, while all the other rates are monthly averages.
2/ From January 1996, the refinancing rate for central investment loans guaranteed by the State Treasury is equal to the Lombard rate (shown in the table); for other refinancing loans the rate is 1 point higher.
3/ One-day reverse repo rate in 1994-95, 14-day reverse repo rate in 1996.
4/ Midpoint of the range of rates offered by principal commercial banks.
5/ Prime lending rate on low risk loans.
6/ Warsaw interbank offered rate.
7/ Interest rate on zloty instrument minus interest rate on equivalent U.S. dollar instrument minus annualized rate of crawl.

Table 19. Poland: Reserve Requirements Ratios, 1995-97
(In percent)

	On zloty demand deposits	On zloty time deposits	On foreign currency demand deposits
1995			
March	20.0	9.0	1.0
June	20.0	9.0	1.0
September	20.0	9.0	1.0
December	20.0	9.0	1.0
1996			
January	20.0	9.0	1.0
February	20.0	9.0	2.0
March	20.0	9.0	2.0
April	20.0	9.0	2.0
May	20.0	9.0	2.0
June	17.0	9.0	2.0
July	17.0	9.0	2.0
August	17.0	9.0	2.0
September	17.0	9.0	2.0
October	17.0	9.0	2.0
November	17.0	9.0	2.0
December	17.0	9.0	2.0
1997			
January	17.0	9.0	2.0
February	20.0	9.0	4.0
March	20.0	9.0	4.0
April	20.0	9.0	4.0
May	20.0	11.0	5.0
June	20.0	11.0	5.0
July	20.0	11.0	5.0
August	20.0	11.0	5.0
September	20.0	11.0	5.0
October	20.0	11.0	5.0
November	20.0	11.0	5.0
December	20.0	11.0	5.0

Table 20. Poland: Consolidated General Government Operations, 1991-96 1/

	1992	1993	1994	1995	1996
			(In billions of zlotys)		
Revenue of general government	50.3	74.2	98.4	132.0	163.4
Tax revenue	41.9	60.9	83.3	111.6	139.0
Direct taxes	24.3	35.2	47.0	63.9	79.0
Personal income tax	8.1	14.0	20.5	27.7	33.3
Profit tax	5.1	6.6	7.2	9.3	11.3
Social security contributions	11.1	14.6	19.3	26.9	34.4
Indirect taxes	10.3	17.8	24.2	32.9	43.7
Turnover, VAT	...	...	15.2	20.7	28.2
Excises	...	...	9.0	12.2	15.5
International trade taxes	2.7	4.4	7.5	9.1	9.4
Other	4.7	3.5	4.6	5.7	6.9
Non-tax revenue	8.0	12.1	14.5	19.6	22.5
Dividend	0.8	0.7	0.5	0.7	0.3
Central bank transfer	1.1	1.4	2.4	3.0	0.4
Other	6.0	10.0	11.6	15.9	21.8
Capital revenue	0.5	1.2	0.6	0.9	1.9
Expenditure of general government 2/	56.9	78.7	103.6	138.7	172.5
Current expenditure	53.5	72.9	97.2	131.0	160.9
Wages and salaries	...	...	17.2	23.4	29.5
Subsidies	3.7	3.5	6.9	8.5	9.1
Transfers to households and nonprofits	22.9	32.1	46.6	61.3	76.5
Interest payments	3.7	5.3	8.7	13.8	14.3
Other current expenditure	22.2	32.0	18.0	24.0	31.5
Investment expenditure	3.9	5.1	6.3	8.3	12.3
Net lending	0.5	0.7	-0.1	-0.6	-0.7
Overall balance	-6.6	-4.5	-5.2	-6.7	-9.1
State budget	-7.9	-5.3	-6.0	-8.6	-9.9
Rest of general government	1.3	0.8	0.8	1.9	0.8
Financing	6.6	4.5	5.2	6.7	-9.1
Domestic	7.6	4.7	6.2	4.7	9.0
Bank	7.0	3.5	4.2	-0.9	2.7
Non-bank	0.6	1.1	2.0	5.6	6.3
Foreign (net)	-0.3	-0.6	-1.2	0.9	-0.7
Change in arrears	-0.6	0.4	0.2	1.2	0.8
			(In percent of GDP)		
Revenue of general government	43.8	47.6	46.4	45.6	45.0
Tax revenue	36.5	39.1	39.3	38.5	38.3
Non-tax revenue	6.9	7.8	6.8	6.8	6.2
Capital revenue	0.4	0.8	0.3	0.3	0.5
Expenditure of general government 2/	49.5	50.5	48.9	47.9	47.5
Current expenditure	46.6	46.8	45.8	45.3	44.3
Investment expenditure	3.4	3.3	3.0	2.9	3.4
Net lending	0.4	0.4	0.0	-0.2	-0.2
Overall balance	-5.7	-2.9	-2.5	-2.3	-2.5
State budget	-6.9	-3.4	-2.8	-3.0	-2.7
Rest of general government	1.1	0.5	0.4	0.7	0.2
Financing	5.7	2.9	2.5	2.3	-2.5

Sources: Data provided by the Polish authorities and staff estimates.

1/ Data are on a cash basis except for state budget expenditure, which is on a domestic commitments basis.
As of 1994, the data are compiled according to GFS. Hence, 1994-96 data may not be strictly comparable
with previous years. The state budget comprises central government and regional authorities.
2/ Expenditure includes net lending

Table 21. Poland: Components of General Government Budget, 1992-96 1/

	1992	1993	1994	1995	1996
		(In billions of zlotys)			
A. State budget					
Revenue	30.9	45.9	61.7	81.4	96.3
Expenditure	38.8	51.2	67.7	90.0	106.2
Balance	-7.9	-5.3	-6.0	-8.6	-9.9
B. Local authorities					
Revenue	6.4	...	14.7	19.9	30.8
Of which: intra-government transfers	2.0	...	0.1	0.1	0.1
Expenditure	6.5	...	14.8	19.7	31.3
Of which: intra-government transfers	1.7	...	2.3	2.8	3.2
Balance	-0.1	...	-0.1	0.2	-0.5
C. Extrabudgetary funds					
Revenue	24.5	33.2	43.9	55.2	68.0
Of which: intra-government transfers	9.0	12.0	20.4	22.6	25.0
Expenditure	23.8	32.8	42.9	53.4	65.5
Of which: intra-government transfers	...	...	0.0	0.1	0.1
Balance	0.6	0.4	1.0	1.8	2.5
D. Extrabudgetary units of the state budget					
Revenue	2.2	2.6	5.1	6.9	8.0
Of which: intra-government transfers	0.4	0.4	2.4	3.1	3.3
Expenditure	1.8	2.6	5.1	7.0	9.2
Of which: intra-government transfers	0.3	0.1	1.0	1.3	1.5
Balance	0.4	0.0	0.0	-0.1	-1.2
E. Extrabudgetary units of the local authorities					
Revenue	3.3	...	5.5	7.4	9.2
Of which: intra-government transfers	1.3	...	2.3	2.9	3.2
Expenditure	3.2	...	5.6	7.3	9.1
Of which: intra-government transfers	0.5	...	0.1	0.1	0.2
Balance	0.0	...	-0.1	0.1	0.1
F. Consolidated general government					
Revenue	50.3	74.2	98.4	132.0	163.4
Expenditure	56.9	78.7	103.6	138.7	172.5
Balance	-6.6	-4.5	-5.2	-6.7	-9.1
Change in arrears	-0.6	0.4	0.2	1.2	0.7
Balance (cash basis)	-7.3	-4.1	-5.0	-5.5	-8.4
		(In percent of GDP)			
State budget					
Revenue	26.8	29.5	29.1	28.1	26.5
Expenditure	33.8	32.9	31.9	31.1	29.3
Balance	-6.9	-3.4	-2.8	-3.0	-2.7
Consolidated general government					
Revenue	43.8	47.6	46.4	45.6	45.0
Expenditure	49.5	50.5	48.9	47.9	47.5
Balance	-5.7	-2.9	-2.5	-2.3	-2.5
Change in arrears	-0.6	0.3	0.1	0.4	0.2
Balance (cash basis)	-6.4	-2.6	-2.4	-1.9	-2.3
Memorandum items: (cash basis, national definition)					
State budget balance (billion zlotys)	-7.3	-4.4	-5.8	-7.4	-9.1
State budget balance (percent of GDP)	-6.4	-2.8	-2.7	-2.6	-2.5

Sources: Data provided by the Polish authorities and staff estimates.

1/ Data are on a cash basis except for state budget expenditure, which is on a domestic commitments basis. As of
    1994, the data are compiled according to GFS. Hence, 1994-96 data may not be strictly comparable with previous years.
    The state budget comprises central government and regional authorities.

Table 22. Poland: State Budget Revenue, 1992-97 1/

	1992	1993	1994	1995	1996	Prelim. 1997
	(In billions of zlotys)					
Total revenue	30.9	45.9	63.1	83.7	99.7	119.7
Current revenue	30.4	45.1	61.5	81.1	95.9	113.1
Tax revenue	27.3	41.4	56.5	74.8	90.4	105.6
Direct taxes	14.0	19.2	24.7	32.5	36.9	43.1
Personal income tax	7.2	11.9	17.4	23.5	26.2	29.8
Enterprise income tax	5.1	6.3	6.8	8.8	10.7	13.3
Excess wage tax	1.7	1.0	0.5	0.2	0.0	0.0
Domestic indirect taxes	10.3	17.7	24.1	32.9	43.6	55.2
Of which: Value-added tax 2/	...	...	15.1	20.7	28.0	36.2
Excise revenues	...	...	9.0	12.1	15.5	19.0
Trade taxes	2.7	4.4	7.5	9.1	9.4	7.1
Import surcharge (incl. various levies)	0.0	0.0	2.6	3.3	2.9	0.0
Customs duties	2.7	4.4	4.9	5.8	6.5	7.1
Others (incl. taxes abolished)	0.3	0.1	0.2	0.3	0.5	0.2
Non-tax revenue	3.1	3.8	5.0	6.3	5.6	14.1
Transfers from NBP	0.8	1.4	2.4	3.0	0.4	...
Dividend requirement	0.9	0.7	0.6	0.8	1.2	...
Receipts from abroad	0.0	0.0	0.0	0.0	0.0	...
Interest	0.3	0.4	0.5	0.7	1.1	...
Receipts of budget units, other revenue	1.2	1.3	1.6	1.7	2.8	...
Capital revenue (privatization)	0.5	0.8	1.6	2.6	3.8	6.6
	(In percent of GDP)					
Total revenue	26.9	29.5	29.8	28.9	27.5	27.1
Tax revenue	23.8	26.6	26.6	25.8	24.9	23.9
Direct taxes	12.2	12.3	11.6	11.2	10.2	9.7
Personal income tax	6.3	7.7	8.2	8.1	7.2	6.7
Enterprise income tax	4.4	4.0	3.2	3.1	2.9	3.0
Excess wage tax	1.5	0.6	0.2	0.1	0.0	0.0
Domestic indirect taxes	9.0	11.4	11.4	11.4	12.0	12.5
Of which: Value-added tax 2/	0.0	0.0	7.1	7.2	7.7	8.2
Excise revenues	0.0	0.0	4.2	4.2	4.3	4.3
Trade taxes	2.3	2.8	3.5	3.1	2.6	1.6
Others (incl. taxes abolished)	0.3	0.1	0.1	0.1	0.1	0.0
Non-tax revenue	2.7	2.4	2.4	2.2	1.5	3.2
Of which: Transfers from NBP	0.7	0.9	1.1	1.0	0.1	
Dividend requirement	0.7	0.4	0.3	0.3	0.3	
Capital revenue (privatization)	0.4	0.5	0.8	0.9	1.0	1.5

Sources: Data provided by the authorities, and staff estimates.

1/ Revenues are on a national presentation rather than GFS basis.
2/ Includes turnover tax through 1995.

Table 23. Poland: State Budget Expenditure, 1992-97 1/

	1992	1993	1994	1995	1996	Prelim. 1997
			(In billions of zlotys)			
Total expenditure and net lending (cash basis)	38.2	50.3	68.9	91.2	108.8	125.8
Current expenditure	35.8	47.1	65.2	86.4	102.5	119.9
Wages	6.9	9.1	10.9	14.8	15.9	20.2
Social security contributions for civil servants	2.3	3.0	3.7	5.1	5.1	5.7
Other purchases of goods and services	5.7	6.8	8.9	11.0	15.3	25.9
Interest	3.2	5.4	8.8	14.0	14.6	16.3
Domestic	2.1	4.2	7.0	10.7	11.2	12.6
Foreign	1.1	1.2	1.8	3.3	3.4	3.7
Subsidies	6.4	6.4	8.8	10.6	12.9	10.5
Transfers (excluding to local governments) 2/	9.5	14.0	19.2	24.5	27.7	31.8
Transfers to local governments	1.8	2.4	4.9	6.5	11.1	9.5
Capital expenditure and net lending	2.5	3.2	3.7	4.8	6.4	5.9
Capital expenditure and capital grants	2.0	2.5	3.1	4.1	6.1	5.9
Net lending (invoked guarantees)	0.5	0.7	0.6	0.7	0.3	0.0
Changes in arrears and residual	0.6	0.9	0.2	1.2	0.8	0.6
Total expenditure and net lending on domestic commitment basis	38.8	51.2	69.1	92.4	109.6	127.8
			(In percent of GDP)			
Total expenditure and net lending (cash basis)	33.2	32.3	32.5	31.5	30.0	28.4
Current expenditure	31.1	30.2	30.8	29.9	28.3	27.1
Wages	6.0	5.8	5.1	5.1	4.4	4.6
Social security contributions	2.0	1.9	1.7	1.8	1.4	1.3
Purchase of goods and services	5.0	4.4	4.2	3.8	4.2	5.9
Interest	2.8	3.5	4.2	4.8	4.0	3.7
Domestic	1.8	2.7	3.3	3.7	3.1	2.8
Foreign	1.0	0.8	0.9	1.1	0.9	0.8
Subsidies	5.6	4.1	4.2	3.7	3.6	2.4
Transfers (excluding to local governments) 2/	8.3	9.0	9.1	8.5	7.6	7.2
Transfers to local governments	1.5	1.5	2.3	2.2	3.1	2.1
Capital expenditure and net lending	2.1	2.0	1.8	1.7	1.8	1.3
Capital expenditure and capital grants	1.7	1.6	1.5	1.4	1.7	1.3
Net lending (invoked guarantees)	0.4	0.4	0.3	0.2	0.1	0.0
Changes in arrears and residual	0.5	0.6	0.1	0.4	0.2	0.1
Total expenditure and net lending on domestic commitment basis	33.8	32.9	32.6	31.9	30.2	28.9

Sources: Data provided by the Polish authorities; and staff estimates.

1/ Expenditures are on a national presentation rather than GFS basis.
2/ Includes pensions for uniformed personnel, and transfers to other state pension funds, the labor fund, and households.

Table 24. Poland: Operations of Extra-Budgetary Funds, 1992-96 1/

	1992	1993	1994	1995	1996
	(In billions of zlotys)				
Extra-Budgetary Funds -- Total					
Contributions and own revenues	15.6	21.4	29.2	41.0	51.4
Expenditures	24.0	33.0	44.6	56.3	69.5
Balance before budget transfer	-8.4	-11.6	-15.4	-15.3	-18.1
Budget transfer	9.0	12.0	16.1	16.6	18.7
Overall balance	0.6	0.4	0.7	1.3	0.6
Of which:					
I. Main Social Insurance Funds -- Total					
Contributions and own revenues	14.3	19.7	27.3	38.0	48.6
Expenditures	22.8	30.9	42.9	53.4	65.9
Of which: pensions	16.8	22.8	32.3	41.7	51.7
Balance before budget transfer	-8.5	-11.3	-15.6	-15.4	-17.3
Budget transfer	8.8	11.7	15.8	16.1	18.2
Overall balance	0.4	0.4	0.2	0.7	0.9
II. Other Funds -- Total					
Own revenues	1.3	1.8	1.9	3.0	2.8
Expenditures	1.2	2.1	1.7	2.9	3.6
Balance before budget transfer	0.1	-0.3	0.2	0.1	-0.8
Budget transfer	0.2	0.3	0.3	0.5	0.5
Overall balance	0.3	0.0	0.5	0.5	-0.3
	(In percent of GDP)				
Extra-Budgetary Funds -- Total					
Contributions and own revenues	13.6	13.7	13.8	14.2	14.2
Expenditures	20.8	21.2	21.0	19.4	19.2
Balance before budget transfer	-7.3	-7.4	-7.3	-5.3	-5.0
Budget transfer	7.8	7.7	7.6	5.7	5.2
Overall balance	0.6	0.2	0.3	0.4	0.2
Of which:					
I. Main Social Insurance Funds -- Total					
Contributions and own revenues	12.5	12.6	12.9	13.1	13.4
Expenditures	19.8	19.8	20.2	18.5	18.2
Of which: pensions	14.6	14.6	15.2	14.4	14.3
Balance before budget transfer	-7.4	-7.2	-7.4	-5.3	-4.8
Budget transfer	7.7	7.5	7.5	5.6	5.0
Overall balance	0.3	0.3	0.1	0.2	0.2
II. Other Funds -- Total					
Own revenues	1.1	1.2	0.9	1.0	0.8
Expenditures	1.0	1.3	0.8	1.0	1.0
Balance before budget transfer	0.1	-0.2	0.1	0.0	-0.2
Budget transfer	0.2	0.2	0.1	0.2	0.1
Overall balance	0.2	0.0	0.2	0.2	-0.1

Sources: Data provided by the authorities, and staff estimates.

1/ Data are on a cash basis. There were 18 funds in 1992, 17 in 1993, 18 in 1994, 17 in 1995, and 17 in 1996. Details of the three biggest funds (the main social funds) are shown in Table 6. The other funds cover veterans and other health concerns, geological and environmental issues, agriculture, and culture.

Table 25. Poland: Operations of Main Extra-Budgetary Funds, 1992-96 1/

	1992	1993	1994	1995	1996
	(In billions of zlotys)				
FUS -- Social Insurance Fund					
Contributions and own revenues	13.6	18.3	25.4	35.5	45.3
Expenditures	18.2	24.6	33.5	40.7	50.5
Of which: pensions	14.7	19.8	27.7	35.6	44.1
Balance before budget transfer	-4.6	-6.3	-8.2	-5.2	-5.2
Budget transfer	5.0	6.6	8.3	6.0	6.0
Overall balance	0.4	0.3	0.1	0.8	0.8
KRUS -- Farmers' Social Insurance Fund					
Contributions and own revenues	0.1	0.2	0.3	0.3	0.5
Expenditures	2.3	3.3	5.0	6.5	8.0
Of which: pensions	2.1	3.0	4.6	6.2	7.6
Balance before budget transfer	-2.2	-3.1	-4.7	-6.2	-7.5
Budget transfer	2.2	3.1	4.7	6.1	7.6
Overall balance	0.0	0.0	0.0	-0.1	0.1
FP -- Labor Fund					
Contributions and own revenues	0.7	1.1	1.7	2.2	2.9
Expenditures	2.3	3.0	4.4	6.3	7.5
Of which: unemployment benefits	2.0	2.7	2.6	3.6	4.4
Balance before budget transfer	-1.6	-1.9	-2.7	-4.1	-4.6
Budget transfer	1.6	2.0	2.8	4.0	4.6
Overall balance	0.0	0.1	0.1	-0.1	0.0
	(In percent of GDP)				
FUS -- Social Insurance Fund					
Contributions and own revenues	11.8	11.8	12.0	12.3	12.5
Expenditures	15.8	15.8	15.8	14.1	13.9
Of which: pensions	12.8	12.7	13.1	12.3	12.2
Balance before budget transfer	-4.0	-4.0	-3.9	-1.8	-1.4
Budget transfer	4.3	4.2	3.9	2.1	1.7
Overall balance	0.3	0.2	0.1	0.3	0.2
KRUS -- Farmers' Social Insurance Fund					
Contributions and own revenues	0.1	0.1	0.1	0.1	0.1
Expenditures	2.0	2.1	2.4	2.2	2.2
Of which: pensions	1.8	1.9	2.2	2.1	2.1
Balance before budget transfer	-1.9	-2.0	-2.2	-2.1	-2.1
Budget transfer	1.9	2.0	2.2	2.1	2.1
Overall balance	0.0	0.0	0.0	0.0	0.0
FP -- Labor Fund					
Contributions and own revenues	0.6	0.7	0.8	0.8	0.8
Expenditures	2.0	2.0	2.1	2.2	2.1
Of which: unemployment benefits	1.7	1.7	1.2	1.2	1.2
Balance before budget transfer	-1.4	-1.2	-1.3	-1.4	-1.3
Budget transfer	1.4	1.3	1.3	1.4	1.3
Overall balance	0.0	0.0	0.0	0.0	0.0
	(In percent of total revenues of respective funds)				
Memorandum items:					
State budget transfers to:					
Social Insurance Fund (FUS)	26.8	26.5	24.6	14.5	11.7
Farmers' Social Insurance Fund (KRUS)	97.0	93.7	94.8	94.8	93.8
Labor Fund (FP)	70.5	64.3	62.7	64.4	61.3

Sources: Data provided by the Polish authorities; and IMF staff estimates.

1/ On a cash basis.

Table 26. Poland: State Debt Stock, 1992-97 1/

	1992	1993	1994	1995	1996	1997
(In billions of zlotys)						
Total public debt	99.6	138.3	152.3	167.2	185.6	221.9
Domestic debt	25.9	40.0	55.9	66.1	79.6	99.1
Central bank	12.3	15.7	20.1	11.1	12.3	16.2
Commercial banks	12.3	20.3	28.0	40.0	45.3	48.2
Domestic nonbanks	1.3	4.0	7.5	11.9	19.3	27.1
Foreigners	0.0	0.0	0.3	3.1	2.7	7.6
Foreign Debt	73.7	98.3	96.4	101.1	106.0	122.8
(In percent of GDP)						
Total public debt	86.7	88.8	71.8	57.8	51.2	50.1
Domestic debt	22.5	25.7	26.4	22.8	21.9	22.4
Central bank	10.7	10.1	9.5	3.8	3.4	3.7
Commercial banks	10.7	13.0	13.2	13.8	12.5	10.9
Domestic nonbanks	1.1	2.6	3.5	4.1	5.3	6.1
Foreigners	0.0	0.0	0.1	1.1	0.7	1.7
Foreign Debt	64.1	63.1	45.5	34.9	29.2	27.8
Memorandum items:						
end-year exchange rate used for calculation zloty/$US	1.6	2.1	2.4	2.5	2.9	3.6

Source: Data provided by the authorities, and staff estimates.

1/ End year stocks at face value.

Table 27. Poland: Exchange Rate Developments

Period	Exchange Rate Policy	Action	Comments
Before 1990	Multiple exchange rates, adjustable peg to a basket of currencies	Frequent and substantial devaluations	
Jan. 1, 1990	Fixed exchange rate system	Unification of official and black market rates Devaluation (46.2 percent)	Exchange rate: Zl 9,500 per U.S. dollar
May. 17, 1991	Fixed exchange rate system	Devaluation (16.8 percent against the dollar). Shift from a dollar peg to a basket peg	Exchange rate: Zl 11,100 per U.S. dollar. Basket includes: U.S. dollar (45 percent), deutsche mark (35 percent), pound sterling (10 percent), French franc (5 percent), Swiss franc (5 percent)
Oct. 15, 1991	Preannounced crawling peg	Rate of crawl announced: 1.8 percent per month (Zl 9 per day)	
Feb. 25, 1992	Preannounced crawling peg	Devaluation (12.0 percent against the basket). Rate of crawl: 1.8 percent per month (Zl 11 per day)	Exchange rate: Zl 13,360 per U.S. dollar
Jul. 10, 1992	Preannounced crawling peg	Rate of crawl: 1.8 percent per month (Zl 12 per day)	Basket unchanged Technical adjustment made
Aug. 27, 1993	Preannounced crawling peg	Devaluation (8.1 percent against the basket) Rate of crawl reduced: 1.6 percent per month (Zl 15 per day)	Basket unchanged
Sep. 13, 1994	Preannounced crawling peg	Rate of crawl reduced: 1.5 percent per month	Basket unchanged
Nov. 30, 1994	Preannounced crawling peg	Rate of crawl reduced: 1.4 percent per month	Basket unchanged
Jan. 1, 1995	Redenomination	One new zloty equal to 10,000 old zlotys	
Feb. 15, 1995	Preannounced crawling peg	Rate of crawl reduced: 1.2 percent per month	Basket unchanged
Mar. 6, 1995	Preannounced crawling peg	Increase in the spread for NBP/banks transactions to +/- 2 percent around the NBP mean rate	Basket unchanged
May. 16, 1995	Preannounced crawling peg, with the fixing rate fluctuating within +/- 7 percent around central parity	Initial appreciation of fixing rate to 5 percent below central parity (3 percent below NBP buying rate). Rate of crawl: 1.2 percent per month	Basket unchanged
Sep. 8, 1995	Preannounced crawling peg, with the fixing rate fluctuating within +/- 7 percent around central parity	Further appreciation to 6 percent below central parity. Rate of crawl: 1.2 percent per month	Basket unchanged
Dec. 22, 1995	Preannounced crawling peg, with the fixing rate fluctuating within +/- 7 percent around central parity	Official appreciation of the central parity by 6 percent, initial appreciation of the fixing rate to 2.5 percent below the new central parity. Rate of crawl: 1.2 percent per month	Basket unchanged
Jan. 8, 1996	Preannounced crawling peg, with the fixing rate fluctuating within +/- 7 percent around central parity	Rate of crawl reduced: 1 percent per month	Basket unchanged
Feb. 25, 1998	Preannounced crawling peg, with the fixing rate fluctuating within +/- 10 percent around central parity	Rate of crawl reduced: 0.8 percent per month	Basket unchanged

Table 28. Poland: Effective Exchange Rates, 1992-97

(Quarterly average indices, January 1992 = 100)

		Real Effective Exchange Rate		Nominal Effective Exchange Rate
		Wage Based 1/	Price Based 2/	
1992:	I	94.3	96.5	94.9
	II	83.1	92.9	83.8
	III	81.6	94.9	78.5
	IV	82.6	100.3	76.7
1993:	I	85.1	103.9	74.5
	II	81.0	104.6	70.3
	III	83.5	103.8	65.6
	IV	79.1	102.3	60.1
1994:	I	74.7	103.0	57.1
	II	75.4	103.7	53.9
	III	72.6	105.7	50.9
	IV	74.5	107.9	48.5
1995:	I	74.3	109.4	46.6
	II	77.6	112.5	45.5
	III	79.2	116.1	45.4
	IV	79.3	118.2	44.5
1996:	I	82.0	122.6	44.2
	II	79.3	124.4	42.9
	III	83.3	124.4	41.3
	IV	81.5	125.2	40.4
1997:	I	79.5	128.9	40.3
	II	79.9	128.1	39.0
	III	77.1	125.7	37.2
	IV	...	125.8	36.5

Sources: IMF Information Notice System; and staff estimates.

1/ Based on data on unit labor costs in Poland and partner countries.
2/ Nominal effective exchange rate index deflated by seasonally adjusted index of relative consumer prices; a decrease indicates depreciation.

Table 29. Poland: Evolution of Customs Tariff Structure, 1989-97 1/

(Percentage rates)

Harmonized Commodity Description and Coding System (HCDDCS)	January 1989	August 1990 to August 1991	August 1991	December 1993 2/	June 1995 3/	December 1996 /4	January 1997 /4
All commodities	18.3	5.5	18.4	19.0	9.4	8.0	6.3
Agriculture products	17.2	4.0	26.2	26.2	19.5	18.3	17.3
Industrial products	18.7	...	16.3	17.0	8.0	6.8	5.1
Mineral products	7.8	3.4	8.9	8.9	2.3	3.1	2.1
Chemical products	13.5	3.9	14.1	13.7	6.8	6.6	3.4
Plastics	19.9	5.5	15.0	14.9	9.5	9.1	3.9
Fur and leather products	17.2	5.1	25.7	23.5	10.3	6.6	7.9
Wood and paper products	18.7	7.4	13.4	13.4	5.3	4.6	3.6
Textiles, footwear, clothing	22.2	9.7	20.6	21.4	12.4	8.2	6.9
Industrial mineral and metal products	15.4	4.2	14.7	17.6	10.1	8.9	6.7
Machinery, transport equipment, precision instruments	21.9	3.9	16.1	16.6	16.3	12.7	9.1
Jewelry, arms, art objects, miscellaneous manufactured products	19.9	11.6	19.1	17.0	13.2	9.8	6.9

Sources. Ministry of Foreign Economic Relations; Organization for Economic Cooperation and Development; and data provided by the Polish authorities

1/ Based on average frequency, including suspended tariffs and tariffs on duty-free tariff quotas. The Polish authorities were not able to provide updated information by the time of publication.
2/ Estimates based on CN classification.
3/ Estimates based on CN clarification, including suspended tariffs and Free Trade Agreements.
4/ Including free trade agreements.

Table 30. Poland: Recent Tariff Developments 1/

(Percentage rates)

	December 1996			January 1997		
	Average	Effective Average	Trade-Weighted Effective Average 2/ 3/	Average	Effective Average	Trade-Weighted Effective Average 2/ 3/
All commodities	13.02	8.01	7.47	11.61	10.70	5.77
Agricultural products	22.78	18.27	15.78	23.14	18.41	14.07
Animal products	28.38	24.46	24.46	28.05	28.04	24.07
Vegetable products	17.91	11.75	6.80	15.74	10.53	4.46
Fats and oils	22.18	17.15	17.15	15.84	16.84	16.51
Prepared foodstuffs	26.06	23.25	22.13	25.36	22.99	20.64
Industrial products	11.89	6.83	6.51	10.40	9.82	4.82
Mineral products	4.27	3.08	3.03	3.31	3.30	2.06
Chemical products	10.27	5.23	4.86	8.61	8.32	3.24
Plastics	11.08	6.60	6.00	9.12	8.87	3.83
Leather products	14.26	10.24	9.06	10.77	10.77	7.05
Wood products	10.20	6.57	6.57	8.34	8.34	4.39
Wood pulp products	8.95	4.48	2.59	7.31	6.44	2.06
Textile products	14.71	9.55	9.42	13.18	12.88	6.47
Footwear	16.44	13.80	13.80	14.60	14.60	11.37
Stone products	11.24	6.28	6.04	9.26	8.92	3.42
Precious materials	16.70	9.99	9.99	15.33	15.33	7.02
Base metal products	14.93	8.24	8.01	13.58	13.33	6.48
Mechanical and electrical machinery	11.58	4.81	4.63	9.56	8.47	2.98
Transport equipment	20.43	15.40	15.15	20.25	19.52	14.00
Optical products	11.75	6.98	6.61	9.71	8.21	4.41
Arms	31.00	26.73	26.73	29.00	29.00	24.10
Miscellaneous manufactured products	13.48	9.11	9.11	11.03	11.03	5.96
Art	--	--	--	--	--	--

Source: Data provided by the Polish authorities.

1/ Based on CN nomenclature excluding tariff free quotas. The Polish authorities were not able to provide updated information by the time of publication.

2/ Including Free Trade Agreements.

3/ Weights based on trade structure for January-July 1996.

Table 31. Poland: Balance of Payments, 1993-97 1/

(In millions of US dollars)

	1993	1994	1995	1996	1997 Q1	1997 Q2	1997 Q3
Trade balance	-2,293	-836	-1,827	-8,154	-3,067	-2,657	-2,523
Exports	13,585	16,950	22,878	24,420	5,766	6,692	7,018
Imports	15,878	17,786	24,705	32,574	8,833	9,349	9,541
Nonfactor services (net)	369	57	150	-209	90	60	-1
Receipts	1,846	2,100	3,190	3,383	923	897	838
Payments	1,477	2,043	3,040	3,592	833	837	839
Transfers (net)	929	1,182	6	224	160	186	357
Private (net)	821	1,025	-285	151	130	182	331
Official, net (incl. converted debt)	108	157	291	73	30	4	26
Investment income (net)	-1,292	-1,485	-628	-366	69	-316	-267
Current account (unadjusted)	-2,287	-1,082	-2,299	-8,505	-2,748	-2,727	-2,434
Reclassified current inflows (net) 2/	2,203	3,211	6,260	7,153	1,216	1,562	1,528
Current account (adjusted)	-84	2,129	3,961	-1,352	-1,532	-1,165	-906
Capital and financial account	-760	-530	4,871	3,139	1,019	2,774	2,005
Capital account	0	0	0	86	3	17	18
Financial account (incl. e&o and valn.)	-760	-530	4,871	3,053	1,016	2,757	1,987
Medium and long-term capital (net)	-471	31	132	-207	52	165	-58
Disbursements	922	894	702	819	165	321	192
Amortization due (net)	1,393	863	570	1,026	113	156	250
o/w:paid	923	373	503	964	111	142	235
Credit extended (net)	12	-11	29	-37	-18	-105	25
Direct investment	580	542	1,134	2,741	456	779	777
Portfolio investment	0	0	1,171	241	408	1,071	639
Cost of debt reduction	0	-1,948	0	0	0	0	0
Short-term capital (adjusted)	-1,108	623	1,701	681	229	529	974
Valuation adjustment and errors and omissions	227	233	704	-366	-111	318	-370
Overall balance	-844	1,599	8,832	1,787	-513	1,609	1,099
Net international reserves (-, increase)	-553	-2,534	-8,849	-1,792	513	-1,609	-1,100
Official reserves, net	6	-1,154	-10,336	-3,070	60	-1,710	-365
Gross official reserves	144	-1,748	-8,936	-3,070	60	-1,710	-365
Liabilities (+, increase)	-138	594	-1,400	0	0	0	0
Of which: Fund credit, net	-138	594	-1,400	0	0	0	0
Other int. reserves, net	-559	-1,380	1,487	1,278	453	101	-735
Gross other reserves	-401	-1,530	1,006	757	425	31	-599
Other liabilities	-158	150	481	521	28	70	-136
Debt relief	0	7,900	17	0	0	0	1
Principal (and arrears)	0	7,204	17	0	0	0	1
Interest	0	695	0	0	0	0	0
Change in arrears	1,397	-6,965	0	0	0	0	0

Sources: Data provided by the Polish authorities.

1/ Convertible currency trade on a payments basis from commercial banks.
2/ Foreign currency purchases in the kantor market that reflect current account transactions, as described in SM/95/310 and SM/95/316.

Table 32. Poland: Current Account of Balance of Payments in Convertible and Nonconvertible Currencies, 1992-97 1/

(In millions of U.S. dollars)

	1992	1993	1994	1995	1996	Jan.-Nov. 1997
Exports f.o.b.						
In convertible currencies	13,997	13,585	16,950	22,878	24,420	24,625
In nonconvertible currencies	47	13	74	17	0	0
Imports f.o.b.						
In convertible currencies	13,485	15,878	17,786	24,705	32,574	34,681
In nonconvertible currencies	90	202	133	68	11	11
Trade balance						
In convertible currencies	512	-2,293	-836	-1,827	-8,154	-10,056
In nonconvertible currencies	-43	-189	-59	-51	-11	-11
Services and unrequited transfers, net						
In convertible currencies	-782	6	-247	-472	-351	513
Of which: Interest payments, net	-1,740	-1,392	-1,633	-747	-422	-420
In nonconvertible currencies	64	38	31	11	0	0
Of which: Interest payments, net	61	30	29	15	0	0
Current account 1/						
In convertible currencies	-270	-2,287	-1,083	-2,299	-8,505	-9,543
In nonconvertible currencies	21	-151	-28	-40	-11	-11

Sources: Data provided by the Polish authorities; and staff calculations.

1/ Represents the summation of transactions, expressed in U.S. dollars, unadjusted for unrecorded trade. Transactions in transferable rubles were converted into U.S. dollars at the cross commercial rate.

Table 33. Poland: External Trade, 1994-97 1/

(Percentage change from a year earlier)

	1994	1995	1996	1997 Q1	Q2	Q3
Exports						
Value (U.S. dollar)	21.9	32.8	6.7	3.2	9.6	4.2
Volume	18.3	16.7	9.7	9.6	16.0	13.9
Price (U.S. dollar) 2/	3.3	13.8	-2.7	-6.4	-6.4	-9.7
Imports						
Value (U.S. dollar)	14.5	34.7	27.8	19.1	16.4	8.8
Volume	13.4	20.5	28.0	23.2	21.7	17.2
Price (U.S. dollar) 2/	1.9	11.8	-0.2	-4.1	-5.3	-8.4
Terms-of-trade	1.4	1.8	-2.7	-2.0	-1.1	-1.3

Source: Data provided by the Polish authorities; and staff estimates.

1/ Customs basis: merchandise exports, excluding unrecorded trade.
2/ Price indices are obtained from foreign currency price surveys.

Table 34. Poland: Direction of Trade by Commodity Group, 1996

(Share, in percent; SITC classification)

	Percent of Total Trade	Central and Eastern European Countries		Developed Countries		Developing Countries
		Total	Of Which: CEFTA	Total	Of Which: EU	
Exports (f.o.b.)						
Food, live animals	10.07	4.28	0.30	5.19	4.77	0.60
Beverages, tobacco	0.53	0.30	0.01	0.15	0.12	0.08
Inedible crude materials	3.38	0.43	0.32	2.62	2.50	0.33
Mineral fuels	6.86	2.10	1.14	4.37	4.11	0.39
Oils, animal fats	0.16	0.08	0.01	0.06	0.06	0.02
Chemicals	7.72	3.01	0.83	3.93	3.47	0.78
Manufactures classified by material	25.84	3.91	1.73	18.81	17.67	3.12
Machinery, transport equipment	23.40	3.00	1.10	18.28	16.31	2.12
Miscellaneous manufactured articles	22.01	3.37	0.61	18.32	17.22	0.32
Other	0.03	0.01	0.00	0.02	0.02	0.00
Total	100.00	20.49	6.05	71.75	66.25	7.76
Imports (c.i.f.)						
Food, live animals	8.48	0.90	0.45	4.95	3.80	2.63
Beverages, tobacco	0.67	0.06	0.03	0.40	0.29	0.21
Inedible crude materials	4.67	1.67	0.22	2.24	1.67	0.76
Mineral fuels	9.15	6.12	0.30	2.71	2.36	0.32
Oils, animal fats	0.58	0.13	0.09	0.35	0.34	0.10
Chemicals	13.76	2.11	1 50	11 22	9.70	0.43
Manufactures classified by material	20.08	2 36	1.72	16 70	15.74	1.02
Machinery, transport equipment	33.02	1.61	1 13	27 72	23.94	3.69
Miscellaneous manufactured articles	9.26	0.60	0 38	6 98	5.99	1.68
Other	0.33	0.00	0 00	0 32	0.09	0.01
Total	100.00	15.56	5.82	73.59	63.92	10.85

Source: Data provided by the Polish authorities.

Table 35. Poland: Commodity Composition of Trade, 1991-96

(At current prices, in millions of U.S. dollars; SITC classification)

	Value						Percent of Total	
	1991 1/	1992	1993	1994	1995	1996	1992	1996
Exports (f.o.b.)								
Food, live animals	1,099	1,686	1,410	1,735	2,100	2,460	12.8	10.1
Beverages, tobacco	46	75	137	240	164	131	0.6	0.5
Inedible crude materials	748	1,128	787	810	1,029	825	8.6	3.4
Mineral fuels	1,437	1,413	1,374	1,566	1,870	1,675	10.7	6.9
Oils, animal fats	18	20	18	20	35	38	0.1	0.2
Chemicals	1,239	1,134	964	1,163	1,774	1,887	8.6	7.7
Manufactures classified by material	2,961	3,585	3,746	4,742	6,314	6,316	27.2	25.8
Machinery, transport equipment	2,590	2,523	2,966	3,411	4,829	5,719	19.1	23.4
Miscellaneous manufactured articles	787	1,547	2,739	3,542	4,772	5,379	11.7	22.0
Other	719	76	4	11	9	9	0.6	0.0
Total	11,643	13,186	14,143	17,240	22,895	24,440	100.0	100.0
Imports (c.i.f.)								
Food, live animals	515	1,531	1,838	1,876	2,339	3,143	9.6	8.5
Beverages, tobacco	140	162	146	185	217	249	1.0	0.7
Inedible crude materials	625	861	866	1,111	1,562	1,737	5.4	4.7
Mineral fuels	2,529	2,674	2,346	2,253	2,651	3,389	16.8	9.1
Oils, animal fats	44	106	117	159	189	216	0.7	0.6
Chemicals	826	2,145	2,507	3,168	4,340	5,120	13.5	13.8
Manufactures classified by material	654	1,882	3,482	4,354	6,266	7,455	11.8	20.1
Machinery, transport equipment	2,299	4,742	5,568	6,226	8,688	12,272	29.8	33.0
Miscellaneous manufactured articles	367	1,642	1,911	2,133	2,701	3,435	10.3	9.2
Other	7	167	52	103	97	121	1.1	0.3
Total	8,006	15,913	18,834	21,569	29,050	37,137	100.0	100.0

Source: Data provided by the Polish authorities.

1/ Only public sector.

Table 36. Poland: Foreign Investment in Poland by Sector
Cumulative through December 1997

(In millions of U.S. dollars)

	Disbursements 1/	Percent	Commitments	Percent
Manufacturing	11,042	62.4	5,783	53.7
Food processing	3,277	18.5	1,109	10.3
Transportation equipment	2,511	14.2	1,970	18.3
Paper and printing services	1,158	6.5	293	2.7
Chemicals	1,087	6.1	518	4.8
Other non-metallic raw materials	971	5.5	865	8.0
Electrical and optical equipment	664	3.8	261	2.4
Metallic materials	375	2.1	184	1.7
Other	998	5.6	583	5.4
Mining	3,130	17.7	0	0.0
Financial intermediation	1,409	8.0	422	3.9
Trade	744	4.2	2,034	18.9
Services and municipal activities	555	3.1	232	2.2
Construction	355	2.0	512	4.7
Hotels and restaurants	306	1.7	431	4.0
Public utilities	97	0.5	1,040	9.7
Real estate	38	0.2	25	0.2
Transportation and Communication	16	0.1	299	2.8
Agriculture	15	0.1	0	0.0
Total	17,705	100.0	10,777	100.0
FDI below $1 million - estimated	2,882			
Total FDI	20,588			

Source: Polish State Foreign Investment Agency.

1/ Including equity and loans.
1/ Including equity and loans.

Table 37. Poland: External Reserves and Other Foreign Assets, 1991-97

(In millions of U.S. dollars)

At End of Period	1991	1992	1993	1994	1995	1996	Sept. 1997
Official external reserves	3,813.9	4,181.3	4,174.3	6,028.5	14,963.0	18,032.8	20,052.6
Gold 1/	189.0	189.0	189.0	189.0	189.0	189.0	300.2
Foreign exchange	3,624.9	3,992.3	3,985.3	5,727.7	14,657.2	17,728.7	19,641.9
Other foreign assets in convertible currencies 2/	4,278.9	5,775.5	6,184.5	7,820.1	7,081.7	5,801.7	5,845.0

Source: Data provided by the Polish authorities.

1/ Gold was valued at US$400 per ounce until December 1996; in 1997 gold was valued at the market price.
2/ Includes pre-paid letters of credit.

Table 38. Poland: Scheduled Debt Service by Creditor, 1991-96 1/

	1991	1992	1993	1994	1995	1996
Paris Club/Other Guaranteed/Jumbo						
Interest	1,940	3,020	2,625	1,320	852	786
Principal	1,480	76	79	82	148	219
Former CMEA banks and Russian Federation						
Interest	204	133	166	1	0	0
Principal	114	34	291	54	0	0
London Club (including revolving facility)						
Interest	1,000	1,140	906	796	356	364
Principal	3,521	1,363	157	1,522	0	0
Other commercial creditors						
Interest	0	0	88	281	175	185
Principal	0	0	854	274	403	582
World Bank						
Interest	0	27	64	61	106	116
Principal	0	0	0	0	5	168
International Monetary Fund						
Charges	63	74	49	38	48	0
Repurchases	0	0	138	316	1400	0
Other multilateral institutions						
Interest	0	0	3	0	5	11
Principal	0	0	12	5	14	57
Interest on short-term debt	0	0	23	3	33	48
Total (including IMF)	8,322	5,867	5,455	4,753	3,545	2,536
Interest	3,207	4,394	3,924	2,500	1,575	1,510
Principal	5,115	1,473	1,531	2,253	1,970	1,026

Source: Data provided by the Polish authorities.

1/ Table shows payments due.

Table 39. Poland: Servicing of Medium- and Long-Term
Debt in Convertible Currencies, 1991-96

	1991	1992	1993	1994	1995	1996
	(In millions of U.S. dollars)					
Debt service payments due in respect						
to current period's obligations	8,322	5,867	5,432	4,750	3,512	2,488
Of which:						
Principal	5,115	1,473	1,531	2,253	1,970	1,026
Interest	3,207	4,394	3,901	2,497	1,542	1,462
Debt service paid in respect						
to current period's obligations	755	888	1,908	3,120	3,430	2,418
Of which:						
Principal	44	65	1,061	2,013	1,899	964
Interest	711	823	847	1,107	1,531	1,454
	(In percent of exports of goods and nonfactor services in convertible currencies)					
Debt service due in respect						
to current period's obligations	58	38	35	25	13	9
Debt service paid in respect of						
current period's obligations	5	6	12	16	13	9
Of which:						
Principal	0	0	7	11	7	3
Interest	5	5	5	6	6	5
Debt service rescheduled	15	0	0	0	0	0
Incurrence of new arrears	32	16	9	4	0	0

Source: IMF staff compilation from data provided by the Polish authorities.

Table 40. Poland: Summary of Nontariff Trade Restrictions, 1997

I. Imports	II. Exports

I. Imports

1. Licensing. Not required except for:

- Alcoholic beverages other than beer
- Military equipment
- Radioactive material
- Petroleum oils and oils obtained from bituminous minerals
- Tobacco products
- Natural gas and other gaseous hydrocarbons
- Goods for industrial assembly of motor vehicles

3. Preferential tariff quotas:

- Vehicle parts for assembly of new cars
- Wheat
- Barley
- Oats
- Vehicles:
  Without catalytic converter - 25,000
  With catalytic converter - 13,750
- Trucks: 150
- Electronic parts
- Mackerel
- Paper
- Several chemical products
- Computers
- Several foils and wires
- Some agricultural goods from CEFTA
- Some chemicals for plant protection
- Equipment for environmental protection
- Some railway equipment
- Some medical equipment
- Pharmaceuticals
- Some articles for use in civil aircraft
- Military equipment
- Fire fighting vehicles
- Paper containers for juice and milk
- Some articles for construction of gas pipeline
- Articles for electro-mechanical industry
- Some goods for telecommunications
- Some types of oil for ships
- Baltic herring and fish-EFTA countries (3,900 tons)

4. Import prohibitions:

- Two-stroke engines and two-stroke motor vehicles
- Cars older than 10 years
- Tractors
- Motor vehicles for transportation of ten or more persons
- Special purpose motor vehicles
- Chassis fitted with engines and bodies more than 3 years old
- Trade with Iraq

II. Exports

1. Licensing. Not required except for:

- Radioactive materials
- Military equipment
- Coal
- Petroleum oils and oils obtained from bituminous minerals
- Natural gas and other gaseous hydrocarbons
- Goods subject to quotas

2. Quotas. Not required except for:

- Polish exports subject to international agreement; e.g., textiles to the EU, Canada, Norway
- Ferrous waste and scrap, remelting scrap ingots of iron and steel (500,000 tons)
- Waste and scrap of copper, nickel, aluminum, lead, zinc and tin (1,500 tons, established December 1996, previously prohibited)
- Raw hides and skins of bovine or equine animals, pickled or otherwise preserved
- Raw skins of sheep or lambs
- Leather of bovine, equine or other animals without hair on

3. Export prohibitions:

- Geese's eggs in shell: fresh, preserved or cooked
- Trade with Iraq (except food)
- Trade with Libya with respect to chemical catalyzers, pipes and tubes, steel chains, hydraulic and gas pumps, chemical installations and laboratory equipment, and automation equipment

Source: Data provided by the Polish authorities.

Table 41. Poland: Protectionist Measures Introduced by the European Union, March 1992– January 1998

Product	Type of Measure	Status	Description	Introduction Date
Silicon	Dumping	Provisional duties	EU imposed provisional duties of 32 percent on imports of silicon after Commission determined that dumping at margins up to 61.5 percent had	7/6/92
Frozen strawberries and black currants	Subsidies	Final ruling	EU Commission decided to impose countervailing duties in amount of the difference between Polish prices and EU minimum import prices on imports of frozen strawberries and black currants.	10/1/92
Seamless steel tubes	Dumping	Preliminary ruling	EU imposed provisional antidumping duties on imports of seamless steel tubes (10.8 percent). They were imposed for four months pending an inquiry.	11/15/92
Steel tubes	Dumping	Preliminary ruling	EU made preliminary affirmative determination in dumping case involving steel tubes.	11/15/92
Hematite pig iron	Dumping	Investigation	EU initiated a dumping investigation of imports of hematite pig iron.	12/9/92
Ferro-silicon	Dumping	Final ruling	EU council imposed definitive antidumping duties of 32 percent on imports of ferro-silicon.	12/15/92
Steel tubes	Dumping	Extension	EU extended for two months preliminary antidumping duties on imports of steel tubing.	3/8/92
Frozen blackcurrants, strawberries	Minimum prices	Amendment	EU amended a regulation imposing minimum prices on imports of frozen blackcurrants and strawberries.	4/1/92
Live animals and fresh meat	Import prohibition	Introduction	EU imposed import prohibition on animals and fresh meat because of cases of foot-and mouth disease in Italy.	5/10/93
Urea	Dumping	Investigation	EU Commission initiated a dumping investigation of imports of urea.	5/13/93
Urea ammonium nitrate	Dumping	Investigation	EU initiated a dumping investigation of imports of urea ammonium nitrate.	5/13/93
Steel tubes	Dumping	Final ruling	EU imposed definitive antidumping duties on imports of steel tubes (10.8 percent), duties effective 5/15/93.	5/15/93
Seamless pipes and tubes of iron and steel	Dumping	Final ruling	EU Commission imposed definitive antidumping duties (and there was a price undertaking) on imports of seamless pipes and tubes of iron and steel (11.7 percent).	5/15/93
Cherries	Minimum price	Introduction	EU Council agreed to introduce minimum import prices on cherries.	7/19/93
Silicon carbide	Dumping	Final ruling	EU imposed a duty of 8.3 percent.	4/13/94
Pig iron (hematite)	Dumping	Final ruling	EU imposed on rate of duty to equalize the price to ECU 149 per ton.	7/16/94
Urea ammonium nitrate solution	Dumping	Final ruling	EU imposed provisional duties to equalize the price to ECU89 per ton (alternatively a specific duty of ECU 19 to 22 ECU per ton could be imposed).	7/1/94
Zinc	Dumping	Investigation	EU Commission initiated a dumping investigation of imports of zinc.	6/9/95
Wooden pallets	Dumping	Investigation	EU Commission initiated a dumping investigation on imports of wooden pallets.	7/13/95
Zinc	Dumping	Final ruling	EU Commission imposed provisional (for six months) antidumping duties on imports of unwrought, unalloyed zinc (14.4 percent).	3/25/97
Ferro-silicon	Dumping	Periodical review	EU Commission initiated periodical anti-dumping reviews on imports of ferro-silicon.	7/4/97
Zinc	Dumping	Final ruling	EU Commission imposed antidumping duties on imports of unwrought, unalloyed zinc (10.6 percent) for those Polish producers which follow minimum price agreements.	9/22/97
Seamless pipes and tubes of iron or non-alloy steel	Dumping	Final ruling	After periodical review, EU Commission imposed antidumping duties on imports of seamless pipes and tubes of iron or non-alloy steel (30.1 percent) for five years, except for imports under agreed volume and price quotas.	11/17/97
Wooden pallets	Dumping	Final ruling	Minimum prices and antidumping duties (6.3 percent) on imports of flat wooden pallets; price agreement with Polish producers of so called 'wooden europallets'.	11/24/97
Hard-board	Dumping	Investigation	EU Commission initiated a dumping investigation on imports of hard-board.	
Milk and milk products	Import prohibition	Introduction	EU imposed import prohibition on milk and milk products because of not meeting sanitary requirements by Polish dairy companies.	12/1/97
String for sheaf-binders	Dumping	Investigation	EU Commission initiated a dumping investigation on imports of string for sheaf-binders.	1/2/98

Source: Data provided by the Polish authorities.

Table 42. Poland: Structural Change, 1990-97

	1990	1991	1992	1993	1994	1995	1996	Estimate 1997
Share of the private sector								
GDP /1	30.9	41.7	47.2	51.9	52.2	57.9	60.1	...
Employment 2/	45.1	50.2	53.7	56.8	59.4	61.9	64.1	67.0
Industrial output 3/	18.3	24.8	28.2	34.6	39.4	45.2	52.4	57.8 4/
Profitability of enterprises 5/								
Total	22.0	4.6	2.2	2.8	4.1	4.2	3.4	4.0 4/
Public	...	...	3.0	3.7	5.2	4.8	3.1	4.1 4/
Private	...	...	0.0	1.1	2.1	3.3	3.7	4.0 4/
Direction of trade 6/								
Former CMEA	23.2	16.8	15.4	13.3	14.5	17.3	20.5	23.1 7/
EU	44.3	55.6	58.0	63.2	62.7	70.0	66.2	65.6 7/
Other	32.5	27.6	26.6	23.5	22.8	12.7	13.3	11.3 7/
Share of exports in GDP 8/	8.1	11.8	12.6	12.9	15.2	17.5	17.8	20.2
Average tariff rate 9/	5.5	18.4	18.4	19.0	19.0	9.0	8.0	6.3 10/
Share of administered prices in CPI basket 11/	11.0	11.0	11.0	10.6	12.0	12.0	11.6	10.6
Share of private banks								
Assets	...	...	...	13.0	18.6	26.9	28.9	38.9 4/
Capital	...	...	...	26.4	27.7	32.2	39.4	56.5 4/
Pensions expenditure as a share of GDP 12/	8.1	12.2	14.7	14.9	15.7	15.5	15.2	15.9
Number of private businesses (in thousands)	1171	1473	1698	1865	1970	2137	2356	2505 4/

Sources Central Statistical Office, Ministry of Finance, CUP, and National Bank of Poland's own estimates.

1/ Since 1992, share of private sector in gross value added.
2/ Annual average employment; including agriculture.
3/ Industrial output sold; since 1993 excluding VAT.
4/ January--September, 1997.
5/ Profitability defined as gross profit to total income (in 1992, gross profit to total cost).
6/ Share of exports to country groups in total exports; custom statistics (shipment basis).
7/ January--October, 1997.
8/ Estimates based on balance of payments statistics; 1990-1995 shares recalculated at 1996 real effective exchange rate.
9/ Including free trade agreements.
10/ Estimated for January 1997.
11/ Prices directly controlled by the government; end-year weights.
12/ Including uniformed personnel and farmers' pensions. In 1997, includes payments to compensate for Constitutional Tribunal rulings (0.5 percent of GDP).

Table 43. Poland: Privatization 1990-97

(Number of Firms)

	1990	1991	1992	1993	1994	1995	1996	Jan-Sep 1997
Total number of remaining state-owned enterprises (SOEs) 1/	8,453	8,228	7,248	5,924	4,955	4,357	3,847	3,478
Privatizations completed	6	228	612	992	1,382	1,610	1,991	2,241
Flow	6	222	384	380	390	228	381	250
Privatizations started	130	1,249	2,056	2,526	3,010	3,465	3,799	4,140
Flow	130	1,119	807	470	484	455	334	341
"Leasing" (Art. 37 of the Privatization Law)								
Completed	0	182	475	707	945	1,054	1,243	1,377
Started	31	449	719	917	1,042	1,144	1,318	1,434
Bankruptcy (Art. 19 of the SOE Law)								
Completed	0	19	86	186	303	396	564	655
Started	18	540	857	1,082	1,245	1,358	1,405	1,484
Capital privatization								
Completed	6	27	51	99	134	160	184	209
Commercialized	38	260	480	527	723	958	1,076	1,222
Of which: NIF programme	0	0	0	0	0	321	512	512
Budget revenues from privatization (annual flows, in millions of zlotys)								
Total	...	171	484	780	1,595	2,642	3,750	4,676
In percent of GDP	...	0.21	0.42	0.50	0.76	0.91	1.03	...
Of which:								
Leasing and asset sales	...	46	172	287	323	406	973	245
Capital	...	125	309	439	847	1,714	1,945	2,531
Banks	...	0	4	54	425	521	831	1,899

Sources Central Statistical Office (GUS), Ministry of Treasury (formerly Ministry of Privatization), and Ministry of Finance.

1/ Central Statistical Office (GUS).

Table 44. Poland: Indicators of Banks' Health and Performance, 1993-97 1/

	1993	1994	1995	1996	Sept. 1997
Total number of banks	87	82	81	81	84
Solvency					
Not at required level of 8 percent	18	18	13	8	8
Of which: Negative solvency ratio	13	15	11	7	6
Profitability					
Number of loss-making banks	24	20	11	11	9
Gross profit/income					
Nine banks	19.7	20.7	22.3	...	...
Formerly specialized banks	-1.5	0.0	14.5	...	...
Private banks	6.7	9.6	21.0	20.5	18.3
Of which:					
with majority Polish capital	0.5	5.8	21.0	21.3	20.0
with majority foreign capital	32.3	...	20.9	19.7	16.0
Non-performing loans (in percent of total portfolio)					
Substandard	7.1	5.7	5.4	4.1	4.0
Doubtful	6.0	5.3	3.5	1.7	1.2
Lost	17.9	17.7	12.0	7.4	5.7
Total	31.0	28.7	20.9	13.2	10.9

Loan loss provisioning (in percent of total loan portfolio according to categories)	Required	Actual				
Substandard	20.0	16.3	25.8	26.1	27.4	51.6
Doubtful	50.0	25.0	55.4	59.3	54.3	52.2
Lost	100.0	87.1	100.1	100.2	99.7	100.0
Total (in percent of requirement)		82.6	103.1	104.1	103.3	108.0
Memorandum items:						
Actual provisions in billions of zlotys		4.6	6.9	7.4	6.7	6.1

Source: Polish authorities.

1/ Excluding cooperative banks and banks in liquidation or bankruptcy.

Table 45. Poland: Key Banking Prudential Regulations
(as of January 1, 1998)

Capital
-    Minimum capital: ECU 5 million (about Zl 19 million, US$5.5 million)
-    Minimum capital adequacy ratio: in general 8 percent; but 15 percent for newly started banks
during the first year, and 12 percent during the second year

Deposit insurance
-    Explicit insurance was available through state-owned commercial banks but not private banks until
February 1995, when the Bank Guarantee Fund came into force. Full coverage is up to ECU 1,000 (90
percent coverage up to ECU 5,000) per account in private banks, and unlimited in state-owned banks
(PKO BP, PKO SA, and BGZ up to end-1999).

Loan loss provisioning
-    Assets past due between 30 and 90 days ("substandard") require a 20 percent provision.
-    Those past due between 91 and 180 days ("doubtful") require a 50 percent provision.
-    Those past due more than 180 days ("lost") require a 100 percent provision.

Lending limits
-    Large exposures are defined as those debtors whose loans exceed 10 percent of capital in the
aggregate. Aggregate large exposures are limited to 800 percent of capital.
-    Aggregate direct lending to bank directors, managers, and members of their statutory bodies is
limited to 10 percent of capital (25 percent in cooperative banks).
-    Aggregate lending (including purchase of bonds and issue of guarantees) to insiders, i.e., entities
linked by capital or organization with the bank and having joint economic risk with the bank, is limited
to 25 percent of capital.

Capital concentration
-    The amount of shares and stakes acquired by a bank in a non-bank entity is limited to 15 percent
of capital.