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WP/94/6

INTERNATIONAL MONETARY FUND

European II Department

Measuring the Transition:
A User's View on National Accounts in Russia ^{1/}

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January 1994

Abstract

As Russia's transition unfolds, the traditional national accounts concepts and reporting mechanisms become increasingly inadequate. As a result, the margin of error associated with basic price and quantity estimates widens substantially. A selection of key measurement and interpretation issues is discussed here, in operational rather than in methodological terms.

JEL Classification Numbers:

E65, P20, P22, P24, P27

^{1/} An earlier version of this paper was presented in Paris, on December 13, 1993 at the Fifth National Accounts Conference organized by the National Accounts Association, and will be published in the volume of conference proceedings.

^{2/} For helpful discussions, I wish to thank Mrs. Kislitsena of the State Statistical Committee of the Russian Federation and Mr. Gavrilentov of the Center of Economic Analysis in Moscow, as well as Mr. Schaffer of the Centre for Economic Performance at the London School of Economics and my Fund colleagues in the European II, Statistics and Policy Development and Review Departments. Of course, all opinions and any remaining errors are my sole responsibility.

1994-01-01
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I. Introduction

The transition from a centrally planned economy to a market oriented one is obviously a major challenge for policy makers and economic agents alike. It is also a challenge for national statistical agencies, which all of a sudden find themselves confronted with a host of new problems, both of a conceptual and of a practical nature. 1/ This paper discusses some of the issues faced by users of the national accounts information compiled by the Russian State Statistical Committee (Goskomstat). In contrast to some earlier work of a more general and programmatic nature, 2/ this paper deals with a restricted set of problems and numerically illustrates how significant these can turn out to be in practice. In the process, a few examples are provided that reveal the dangers associated with an uncritical use of the raw data. While the focus is on Russia, similar issues arise in the other states of the former Soviet Union and, to a lesser extent, in the economies in transition of Central and Eastern Europe.

In the last few years, much work has been carried out by Goskomstat, with the technical assistance of several multilateral institutions, to bring Russian macroeconomic statistics into line with international standards. 3/ However, this is a long-term endeavor: in the meantime, the hybrid methodology used and some of the idiosyncrasies of transitional economies raise a number of difficult questions for those who need to build macroeconomic estimates and projections. Section II briefly reviews several key characteristics of the traditional statistical apparatus, some of which are only receding very slowly. Section III examines a few index problems affecting the measurement of consumer and producer prices as well as of output and consumption volumes. Section IV discusses some of the analytical and policy implications of these index problems. Section V contains concluding observations.

II. Background

Despite the progress to date, some of the distinctive features of the old system of national accounting are still ubiquitous in current statistical publications. They largely stem from the political functions assigned to the statistical agency in the former regime, which can be described as monitoring and propaganda functions. 4/

Traditionally, a key role of the statistical organs was to monitor enterprises' compliance with the objectives set by the planning authorities. This has several drawbacks. First, the approach was therefore of an exhaustive nature rather than survey based. However, as the diversity and number of economic units increases in the course of the transition, frequent

1/ See for instance Zakharov (1993).

2/ Such as Marer and others (1992).

3/ See Zharova (1993).

4/ See for example Blades (1991).

censuses become impractical. 1/ Second, outcomes were measured in cumulative form ("for the first n months of the year") in order to show to what extent plan targets had been fulfilled. This masks revisions to earlier data and hence precludes the construction of time series by decumulation. Third, the incentives of the reporting units were distorted under such a system, as enterprises were induced to report upward biased output figures. Lastly, plan objectives were typically expressed in physical rather than in monetary terms. Hence, in an environment of administered prices (subject to infrequent, small adjustments) and passive finance, valuation issues, including the construction of price indices, required and received little attention.

Another important function of the statistical agency was to advertise the achievements of central planning. This explains the lack of transparency of the data released and their sometimes scrambled appearance: different definitions were used across time without proper documentation on how to convert one concept into another; abrupt revisions took place occasionally but were not commented upon and only partly publicized, not least because revisions were seen as a sign of weakness rather than as a welcome improvement; and in some cases data were simply not published at all or falsified (for instance, by imputing insufficient allowances for waste and losses). 2/

In recent years, much progress has been made. Previously unpublished historical data were made available, statistical reports became more easily accessible and more detailed, and regular press releases started to be issued. The ideological content shrunk while the presentation of the data improved markedly. Nevertheless, some of the old habits die slowly.

III. Index problems

1. Deflators

In a short period, Russia moved from a system of rigid price lists to decentralized price setting, and from repressed to open, and very high, inflation. Even with the best statistical apparatus, such a radical change would create extremely difficult measurement problems.

a. Consumption

Through 1991, the synthetic indicator used to gauge inflation at the consumer level was a Paasche retail price index (RPI). As its name indicates, this measure used as weights current-period volumes of retail

1/ Admittedly, conducting surveys and in particular controlling the quality of the survey base in an environment characterized by dramatic structural changes is also quite problematic.

2/ Other examples are provided by Guzhvin (1992).

sales of goods and services rather than base-period consumer expenditure shares. As such, it became increasingly inadequate to quantify price developments faced by consumers. In particular, in a context of changing expenditure patterns, it could not be linked intertemporally as a Laspeyres index can be. Other shortcomings included the fact that the RPI system did not ensure consistent matching of specifications from month to month, and therefore did not account properly for missing or new items; 1/ the use of (typically more lumpy) delivery rather than sales volumes for some items; and the distortions imparted by climatic and other random disturbances when current monthly retail sales are used as weights rather than average expenditure shares computed over a longer period. Furthermore, the use of data collected through the traditional retail trade organizations became increasingly inadequate as respondent cooperation deteriorated and other forms of distribution gained in prominence.

In early 1992, a new index was thus developed by Goskomstat combining information on retail sales volumes (at the product level) and data on consumer expenditure shares (in the process of aggregation). This so-called "hybrid" CPI was referred to implicitly as *the* consumer price index in Goskomstat publications through early 1993.

With technical assistance from the International Monetary Fund, a standard Laspeyres consumer price index was designed in the spring of 1992. The coverage of this index was restricted to 27 urban areas and 262 items. Accordingly, it was called the "urban CPI". 2/ Starting in early 1993, its geographical and product coverage was broadened to include all oblast centers and 407 items. This "expanded CPI" is now published as the CPI by Goskomstat and used for indexation purposes (notably, as a benchmark for the quarterly revisions of the minimum wage). 3/ In principle, the weights reflect household expenditure shares in the previous calendar year and are to be revised annually, even though more frequent adjustments are not ruled out. 4/

While measurement accuracy has improved with the successive generations of price indices, a problem arises for users when a choice has to be made on the appropriate string of indices to be used as a deflator over a period of several years. Indeed, alternative measures turn out to yield fairly different results, as illustrated in Table 1, which compares the evolution

1/ Before the transition, RPI inflation was downward biased insofar as it ignored the pseudo-innovations introduced by enterprises in order to circumvent price controls.

2/ For additional details, see Goldina and Pakhomov (1992) and Koen and Phillips (1992).

3/ More specifically, a derivative of the expanded CPI excluding items deemed "non-essential" (such as various types of alcoholic drinks, some varieties of fish, and jewelry) is used for indexation; its behavior differs only marginally from that of the full expanded CPI.

4/ See Goskomstat (1993).

of the urban CPI and the hybrid CPI in 1992: by the end of the year, the latter had risen by 26.1 times, as opposed to 24.2 times for the former. A very different result, and a much lower increase (18.6 times), would be obtained with the RPI. 1/ However, to some extent, the subsequent uncertainty is inherent to a period of rapid changes in relative prices and consumption patterns: even if the margin of error surrounding individual price and quantity observations were nil at all times, measured inflation would vary significantly depending on the set of weights selected.

Table 1. Urban and Hybrid Consumer Price Indices in 1992

	<u>Urban CPI</u>		<u>Hybrid CPI</u>	
	Index	Percent <u>1/</u> change over previous month	Index	Percent <u>1/</u> change over previous month
January	396	296.0	345	245.3
February	504	27.3	477	38.0
March	587	16.4	619	29.9
April	688	17.2	753	21.7
May	760	10.5	843	11.9
June	866	13.9	1,004	19.1
July	927	7.1	1,110	10.6
August	1,007	8.6	1,206	8.6
September	1,160	15.2	1,347	11.7
October	1,520	31.1	1,657	23.0
November	1,932	27.1	2,089	26.1
December	2,421	25.3	2,614	25.1

Source: Goskomstat of the Russian Federation.

1/ Base 100 = December 1991.

b. Production

The producer price index (PPI) published by Goskomstat covers a set of key industries and relies on fixed weights (updated annually). In contrast to what its designation (*optoviy*) may suggest, this index measures prices at the factory gate rather than in wholesale trade. Hence, it excludes imported goods. The compilation of this index has become more complex with

1/ See Koen and Phillips (1993), Table 2. Goskomstat ceased the publication of the RPI in the course of the second half of 1992, although the RPI continued to be computed for internal purposes.

the proliferation of barter deals, side payments, arrears, discounts for cash, and price discrimination.

A number of problems arise for the user of the PPI. First, cumulative price increases derived by chaining 12 successive monthly PPI inflation rates vastly exceed the corresponding 12-month reported increases (see Table 2). For instance, comparing December 1992 to December 1991, chaining the monthly inflation rates would generate a 61.9 times increase, whereas the direct 12-month measure indicates a rise of 33.8 times. This divergence is probably due to the fact that a so-called Sauerbeck rather than a Laspeyres formula is used for the monthly inflation rates. In a context of non-synchronized and large price increases, this is likely to induce an upward bias in the chained series. 1/

1/ Both formulas use base-period weights but the variations are computed comparing current prices with prices in the previous month (Sauerbeck) versus prices in the base period (Laspeyres). The following two-good (A and B) and three-period (0, 1 and 2) example illustrates why this may result in an upward bias. Suppose that both goods represent half of the index at time 0; that the price of A doubles in the first period, while that of B remains unchanged; and vice-versa in the second period. Then the Laspeyres index will indicate a 100 percent increase in the price level between time 0 and time 2, while the chained Sauerbeck indices will point to a 125 percent increase ($(0.5 \times (1+1) + 0.5 \times (2+1)) \times (0.5 \times (2+1) + 0.5 \times (2+2)) = 2.25$). For a more detailed discussion, see Lequiller (1993).

Table 2. Industrial Producer Price Index

		Month n compared to month n-1		Month n compared to month n-12	
		Percent change	Implied compounded index <u>1/</u>	Percent change	Implied percent change <u>2/</u>
		(a)	(b)	(c)	(d)
1990	December	...	22.5	...	...
1991	January	62.9	36.6	...	...
	February	18.9	43.5	...	...
	March	7.1	46.6	...	...
	April	8.2	50.4	...	...
	May	3.8	52.3	...	...
	June	2.8	53.8	...	...
	July	17.5	63.2	...	...
	August	15.2	72.8	...	...
	September	6.6	77.6	...	...
	October	5.8	82.1	...	...
	November	9.4	89.8	...	...
	December	11.3	100.0	236	345
1992	January	382	482	918	1,218
	February	75	842	1,123	1,836
	March	28	1,079	1,237	2,216
	April	17	1,263	1,369	2,404
	May	23	1,553	1,579	2,868
	June	36	2,112	1,857	3,826
	July	17	2,471	2,016	3,809
	August	13	2,797	1,997	3,741
	September	14	3,200	2,120	4,022
	October	27	4,064	2,620	4,849
	November	27	5,161	2,998	5,645
	December	20	6,194	3,275	6,094

Sources: Goskomstat of the Russian Federation; and author's calculations.

1/ Base 100 = December 1991.

2/ Calculated from column (b).

Another intriguing observation is that the changes in the PPI published by Goskomstat exceed the increases in the implicit deflator for industrial output: for example, for 1992, the PPI was reported to have risen on average by 20.5 times, while the implicit deflator for industrial output rose by 16.8 times. One reason could be that military industries included in the industrial output figures are excluded from the PPI sample; to the extent that the state, as a monopsonist, kept price increases below average in this sector, this difference in coverage could contribute to the registered discrepancy between deflators.

c. Other deflators

A deflator for capital investment has also started to be compiled and published by Goskomstat. Apparently, this index is constructed as a combination of selected components of the PPI. The rates of change published so far for various periods are difficult to reconcile amongst each other and suggest that the investment deflator is still of an experimental nature. To the best of our knowledge, other key deflators, in particular those pertaining to external trade transactions, are not yet being computed at all.

2. Volumes

Given that volume indices are the duals of price indices, the mismeasurement of quantities distorts price indices and vice-versa. Among the problems faced in the collection of data on quantities is of course the breakdown of the traditional reporting mechanisms. With the breakdown of central planning, enterprises may feel less compelled to abide by the reporting instructions received from the statistical authorities. ^{1/} Also, and less innocuously, enterprises may deliberately misreport or underreport in order to escape taxation or simply because the legality of their activity is doubtful. This affects the macroeconomic data all the more as the traditional census approach to data collection continues to prevail.

A particularly striking example of the problems caused by the relentless pursuit of exhaustiveness involves the time series of industrial output. Large enterprises (which around mid-1993 represented about 90 percent of total output) report at a monthly frequency, while smaller entities and joint ventures report only once a quarter. But no adjustment is made to the monthly series to account for the latter. Hence, the published cumulative industrial output data display end-of-quarter humps that to some extent reflect inconsistent aggregation rather than true seasonality.

Genuine seasonal fluctuations in output can nevertheless be identified for a number of sectors. In industry, seasonal variations associated with the number of working days or with the end-of-quarter and end-of-year "output storms" (resulting from the efforts to fulfill planned targets) permeate the output series (see Chart 1). In agriculture and, to a lesser extent, in construction, climatic conditions cause a concentration of activity in the third quarter of the calendar year. The same is true for deliveries to the Far North. Sectoral seasonal fluctuations partly offset each other: for instance, July and August are relatively low for industry (owing to vacations) but very active for agriculture. Tentative estimates

^{1/} As suggested, *a contrario*, by the adoption in May 1992 of the Law "On Responsibility for Violating Procedures for Presenting State Statistical Reports" (published on July 4, 1992 in *Rossiyskaya Gazeta*).

suggest, however, that significant quarterly seasonal variations remain at the aggregate level. The derivation of precise seasonal coefficients for overall output is hampered by the persistence of high inflation and large short-run relative price swings. It is also affected by likely changes in agents' underlying seasonal behavior. For example, one would expect the "output storms" to lose some of their prominence in the course of the transition.

Another problem in measuring output volumes pertains to services. Many of them (in particular, education, health care and administration) were considered unproductive and were excluded from aggregate output under the material product system of accounts. 1/ Services therefore received insufficient attention from statisticians. While the service sector used to be notoriously underdeveloped in the centrally planned economy, it is catching up in the course of the transition. The impact on overall indicators of activity of errors in the measurement of services is thus of growing concern. 2/

IV. Some analytical and policy implications

1. Measuring the size of the economy

a. Levels

Incorrect measurement of the size of the economy in a given period may lead to mistaken policy conclusions. This applies insofar as GDP (or GNP) is a key scale variable in any analysis of economy-wide developments, including for cross-country comparison purposes.

A striking example would be the implication of the official revision of 1992 nominal GDP by Goskomstat. An early estimate of Rub 15 trillion had been published in January 1993, based on the partial data available at the time. A few months later, this figure was revised upwards by one third, to Rub 20 trillion. 3/ On this basis, and *ceteris paribus*, the deficit of the state budget (excluding extra-budgetary funds and unbudgeted import subsidies) would have to be revised from $11^{1/2}$ percent to $8^{1/2}$ percent of

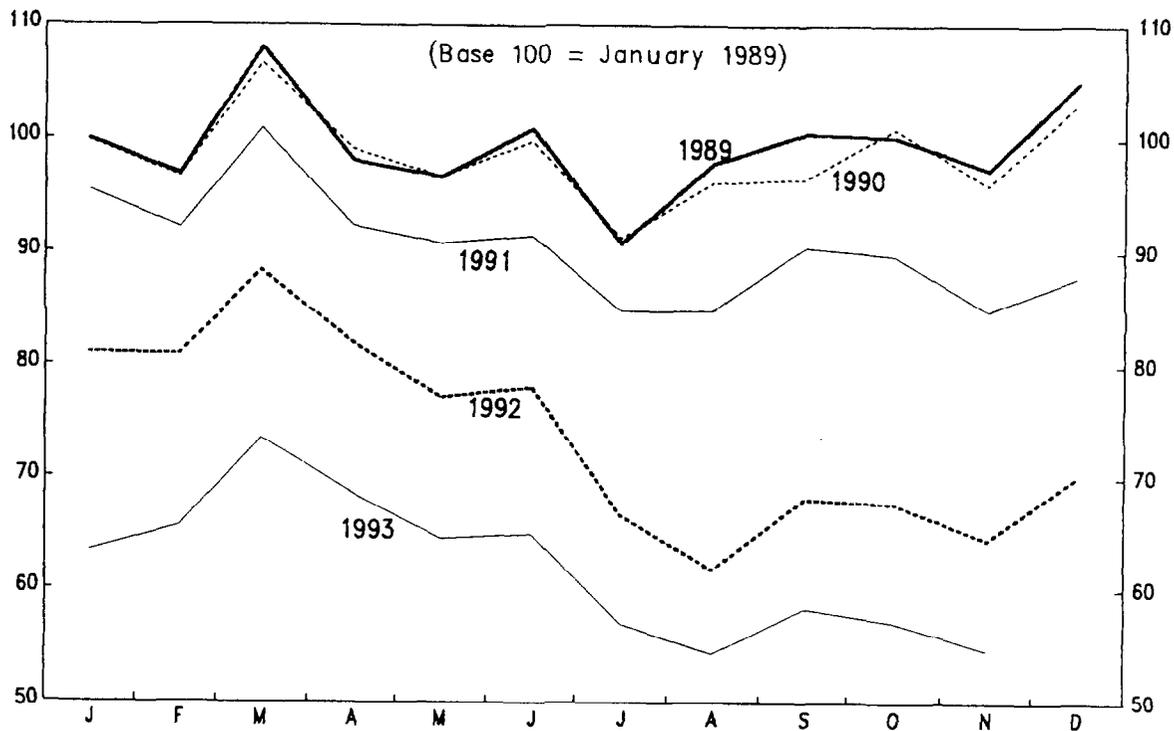
1/ More than half a century ago, Clark (1939, p.5) already deplored that "the Soviet authorities have adopted a somewhat limited and materialistic definition of national income".

2/ It should be acknowledged that volume (and price) indices for services are almost universally less reliable than the corresponding indices for goods. In that sense, the problem raised here should not be viewed exclusively as a legacy of the old regime.

3/ This remains a provisional estimate. The Center of Economic Analysis around mid-1993 had derived and was using an estimate of Rub 17.5 trillion.

CHART 1
Volume of Industrial Output
(1989-93)

(Non seasonally adjusted data)



Sources: Goskomstat of the Russian Federation; and author's calculations.

GDP. 1/ At a more disaggregated level, fiscal ratios--for example, value added tax receipts as a share of GDP--would have to be adjusted correspondingly, as would their interpretation in light of the experience in other countries. To the extent that estimates and projections of nominal GDP for subsequent periods are based on 1992 figures, such a revision would of course have a considerable impact on the evaluation of current and prospective developments.

b. Rates of change

Turning to rates of change in real terms, two related issues deserve mention. One pertains to comparisons with economic performance under the former, central planning system. The other involves measurement problems in the course of the transition, irrespective of the starting point.

One of the recurrent comparisons made by policymakers as well as by commentators involves contrasting current output levels with those reached in the late 1980s or current and past rates of change in output. The point is often missed in this context that growth rates and output levels were substantially overstated in the old regime, as documented by Khanin and others. 2/ It is also frequently overlooked that while incentives were geared under central planning towards overreporting, they are now clearly reversed. On this account, the oft-encountered curve describing the evolution of output over time (see Chart 2) may be overly concave.

Whatever the exact level from which the transition started, and independently from any underreporting bias, the official data on rates of change of real GDP may be misleading for another reason. Considering 1992 for example, the official rate of decline in real GDP amounted to 18.5 percent. This estimate was derived at 1991 prices. If 1992 prices had been used instead, the drop would have been significantly lower. At world prices, it would have been even less. 3/ This result mainly reflects the smaller rate of decline in output in the energy sector (where the extraction of oil declined by 13.3 percent, that of coal by 4.6 percent and that of natural gas by only 0.4 percent). In 1991, domestic relative prices for energy carriers were much lower than on world markets. In 1992, this was

1/ Financial data for 1992 are presented in International Monetary Fund (1993).

2/ See Ericson (1990), Kostinsky and Belkindas (1990) or, for an official recognition, Guzhvin (1992). Khanin's estimates have been criticized for their crudeness and for their lack of documentation (preventing replication); nevertheless, his work deserves mention for it spurred an important debate, and reportedly caused him to be exiled as far as Kyzyl (capital of the Tuva Autonomous Republic, bordering Mongolia).

3/ Mr. Gavrilentov at the Center of Economic Analysis carried out such an exercise, and estimated, using fairly aggregated data, that instead of a 20 percent decline at 1991 prices, real GDP fell by 15 to 16^{1/2} percent at 1992 prices and 13 to 14 percent at world prices.

still the case, albeit to a lesser extent. Thus, the weight in total output of a large sector declining less than average was substantially smaller at 1991 than at 1992 or world prices.

c. Dollar GDP

Another ramification of the price and volume index problems is the valuation of GDP in US dollars. 1/ Looking at 1992, one approach would be to simply use the exchange rate quoted in the interbank market in order to convert ruble GDP into dollars, bearing in mind that hence the outcome depends on the estimate for ruble GDP at domestic prices. 2/ On this measure, Russia's economy would be smaller than Denmark's. Given the large short run swings in the real exchange rate, comparisons at higher frequencies yield further intriguing results. For example, based still on the interbank rate, the size of Russia's economy in US dollars more than doubled from the first to the second quarter of 1992.

An alternative approach is to rely on purchasing power parity (PPP) estimates. For example, extrapolating to 1992 the figure published by the World Bank (1992) for 1990 GDP in US dollars, it appears that Russia's economy would be over four times bigger than suggested by the first method. 3/ This PPP-based measure implies that Russia's economy would be larger than that of the Netherlands, or that the income per capita in Russia would amount to one-ninth of the Dutch income per capita--still a seemingly low number.

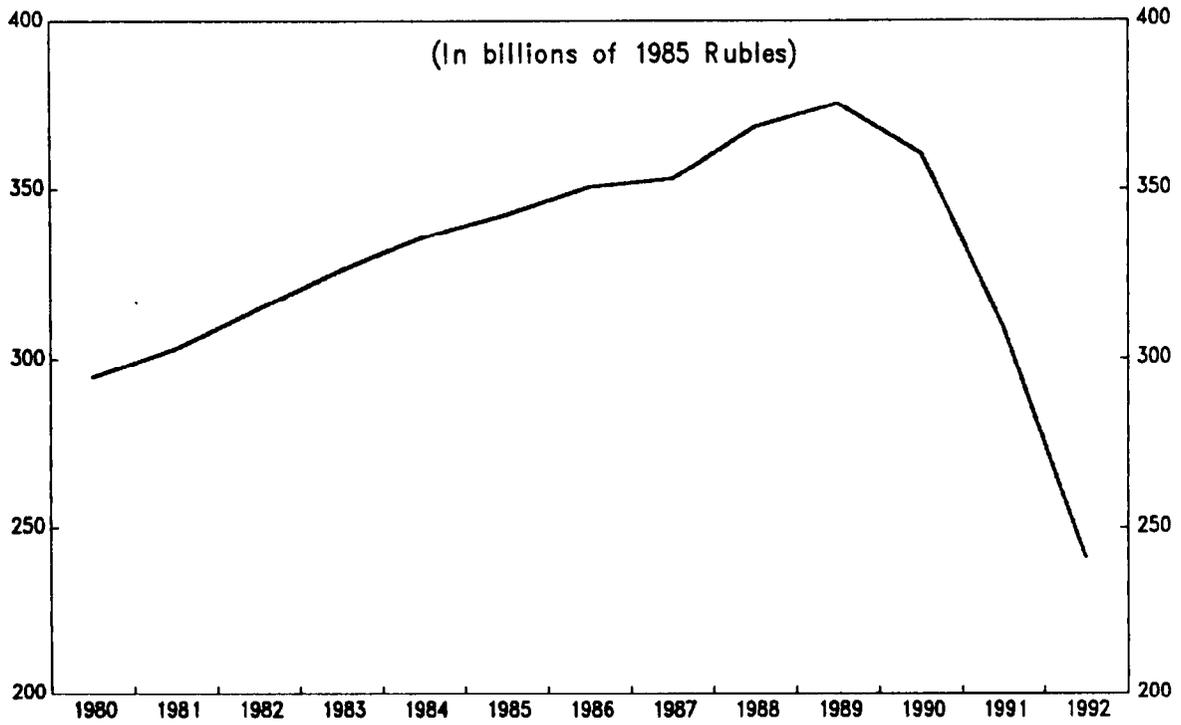
If indeed dollar GDP estimates are excessively low, the conclusions drawn from such indicators as openness or indebtedness ratios may be skewed. For example, looking still at 1992 and considering only trade with countries outside the former Soviet Union, the ratio of foreign trade turnover (exports plus imports) over GDP would exceed that recorded for a small open economy such as the Netherlands if GDP were valued using the interbank exchange rate and would still be larger than that observed in the United States if the above PPP-based measure were used. Given that a very large portion of external trade is still conducted with other states of the former Soviet Union and that recorded external trade has declined very

1/ Since most studies in this area are carried out with reference to the US dollar, this currency is used here as an international numéraire. In what follows, deviations from purchasing power parity across market economies are ignored.

2/ Here, an estimate of Rub 17.5 trillion for 1992 as a whole is used for illustrative purposes (and the corresponding monthly GDP estimates are converted into US dollars).

3/ The extrapolation to 1992 is done applying dollar inflation and the rates of change in real GDP at domestic prices as published by Goskomstat to the 1990 dollar base, and therefore presumably overstates the decline in world prices (recall the discussion above).

CHART 2
Net Material Product
(1980-92)



Source: Goskomstat of the Russian Federation yearbooks.

substantially since 1990, both measures would suggest a surprisingly high degree of openness.

2. Assessing inflation and the behavior of real variables

Depending on the price index used, the estimate of inflation may vary substantially. As a result, assessing the behavior of such key variables as real wages, real household consumption, enterprise profits and stockbuilding becomes difficult.

a. Inflation

For any given sequence of consumer price indices, it is difficult to form a precise view on the core rate of inflation, for at least two reasons. Firstly, price liberalization remains incomplete, implying that discrete administered price adjustments take place at varying intervals, which show up as blips above and beyond the underlying rate of inflation. For example, in April 1993, the price of "legal and banking services" (which carry a weight of 0.0002 in the overall CPI) jumped by 112 times, 1/ and this factor alone caused an increase exceeding two percentage points in the overall CPI. Secondly, it would seem that some prices are subject to a high degree of seasonality. In particular, the price of fruits and vegetables tends to decrease--*ceteris paribus*--in the summer months, which is reflected in absolute declines in the RPI for city markets (see Chart 3). Work is underway at Goskomstat in order to quantify seasonal fluctuations, but the derivation of a set of robust seasonal coefficients is hampered by the lack of reasonably long, homogeneous time series.

b. Wages

Real wages dropped abruptly as prices jumped in January 1992. 2/ They subsequently recovered in the course of the first half of 1992. But the magnitude of the initial plunge and the estimate of the recovery by mid-1992 vary considerably with the price measure used, as shown in Table 3. 3/

1/ This was the result of a change in the pricing of notary services: instead of, for example, a nominal fee of some Rub 10-15 for the certification of a signature, a charge equal to the monthly minimum wage was henceforth to be applied (in April 1993, the minimum wage stood at Rub 4,275).

2/ See Koen and Phillips (1993) for a detailed discussion.

3/ The benchmark used in this table is end-1991 in order to ensure that the variation across measures is solely due to the divergent behavior of the various price indices. It should be borne in mind that December 1991 would be a very misleading base for an economic analysis of real wage behavior, as it represents the culmination of a rapid and unsustainable surge in wages.

Table 3. Alternative Real Wage Measures
(In percent of December 1991 level)

	Consumption wage, using as a deflator:			Product wage, using as a deflator the chained PPI
	Urban CPI	Hybrid CPI	RPI	
January 1992	30	35	36	25
June 1992	49	42	58	20
December 1992	55	51	76	22

Sources: Goskomstat of the Russian Federation; and author's calculations.

The policy implications are not neutral with respect to the index chosen. For example, if a judgment is to be made regarding the sustainability of the real wage level reached by mid or end-1992, the assessment, and the ensuing policy recommendation, could vary with the deflator used. It should also be borne in mind that for those purposes, one would have to add to the wage *stricto sensu* related pecuniary and in-kind benefits provided by employers.

c. Household expenditures

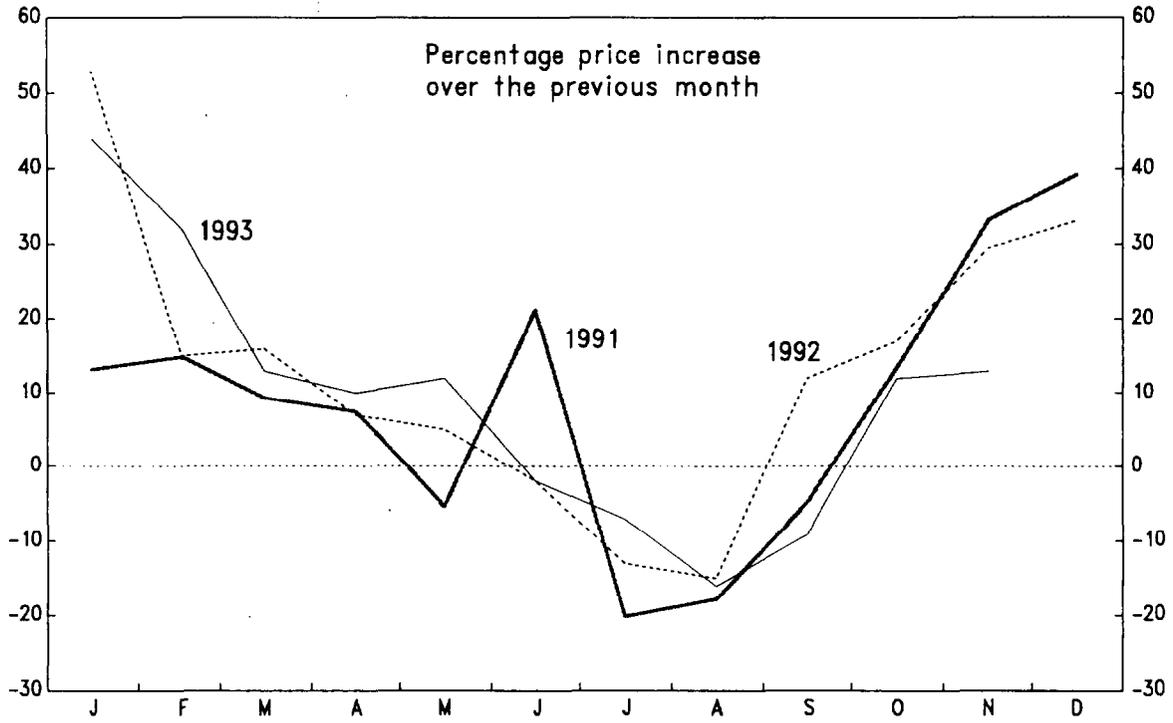
Similarly, the path of real household expenditures on goods and services in the first half of 1992 would differ depending on whether the urban CPI, the hybrid CPI or the RPI is used. Moreover, household expenditures data as they appear in the traditional Goskomstat table of "incomes and expenditures of the population" are also affected by a large increase in the apparent bias due to underrecording: while in December 1991 the level of household expenditures on goods and services as derived from the monthly household budget survey exceeded the sum of retail sales of goods and paid services appearing in the table of "incomes and expenditures of the population" by about 4 percent, this margin jumped to around 24 percent in January 1992 and 36 percent by June 1992. Again, the inferences about consumer welfare in the aftermath of price liberalization are very sensitive to the measure selected.

d. Profits

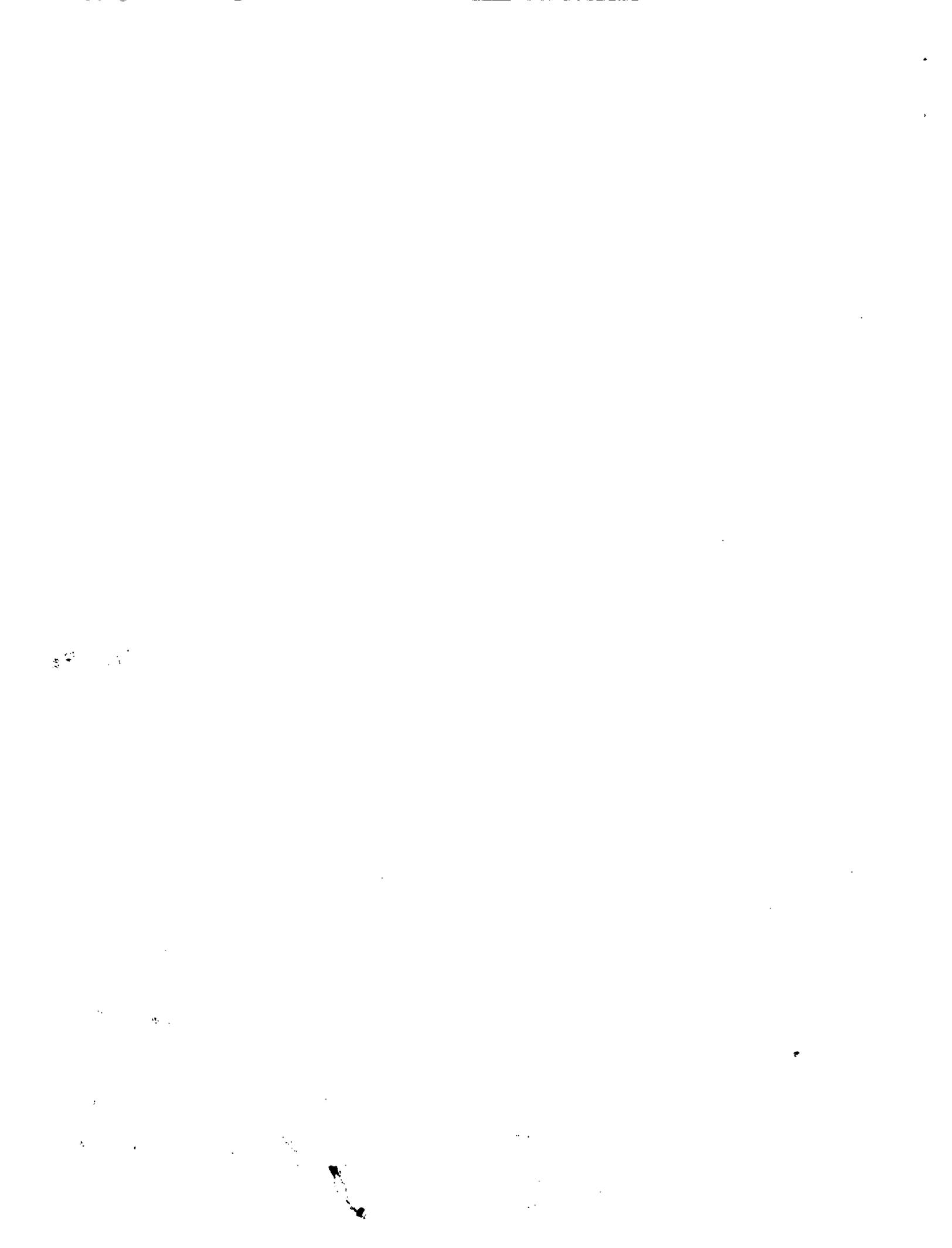
Estimating the size and assessing the behavior of enterprise profits is hampered by the same index problems. ^{1/} Table 4 illustrates the

^{1/} It should be borne in mind that in a context of extensive cross-subsidization and soft budget constraints, the concept of "profits" differs somewhat from that in market economies.

CHART 3
Inflation in City Markets
(1991-93)



Source: Goskomstat of the Russian Federation.



tremendous divergence between profit measures depending on whether a set of monthly GDP estimates (left column) or the chained PPI (right column) is used. By mid-1992, profits would have been three times larger on the basis of the first measure than on the basis of the second one. Obviously, only a fraction of the difference can be imputed to the decline in real GDP.

Another noteworthy regularity in this table is the very pronounced apparent seasonality of profits, which systematically peak in the last month of each quarter. Partly, this can be explained by the seasonality in output discussed above. But the within-quarter variations of output can by no means be large enough to cause such spectacular short-run swings in profits. Rather, the main reason for this pattern reportedly is that enterprises try to minimize their tax burden. For the monthly reports they have to submit in the first and second month of each quarter, they have a strong incentive to understate profits. Then, in the more detailed end-of-quarter reports, they typically adjust the preliminary profits estimates presented earlier upwards. As a result, part of the tax payments are deferred, which in a highly inflationary environment significantly reduces the real tax burden.

Table 4. Profits in 1992 1/
(Base 100 = 1991)

	Profits/GDP <u>2/</u>	Profits deflated by the PPI <u>3/</u>
January	63	42
February	91	44
March	128	59
April	75	35
May	67	27
June	114	38
July	55	20
August	97	30
September	122	40
October	84	23
November	90	25
December	181	53

Sources: Goskomstat of the Russian Federation; and author's calculations.

1/ Excluding profits in agriculture.

2/ Using the Goskomstat Rub 1,300.1 billion GDP estimate for 1991 and a provisional estimate of Rub 17.5 trillion for 1992.

3/ Using a compounded PPI both for the 1991 base and for 1992.

Besides the issue of the appropriate deflator, the measure of nominal profits itself is likely to suffer from an upward bias. Official figures point to a spectacular increase in profitability in 1991 and a further sharp rise in 1992. To a large extent, this likely reflects a failure to adjust

in a timely fashion for inflation in enterprise accounting, in particular as regards depreciation and stockbuilding. 1/

Particularly for 1992, the recorded surge in profits is probably also the result of the large scale accumulation of arrears. The latter implied that accrued profits far exceeded realized profits and, more generally, that estimates of GDP from the production and income side tended to dwarf estimates from the expenditure side. As expected payment delays lengthened considerably, the prices charged by producers were inflated to incorporate an implicit interest component, and these higher prices would translate immediately into higher production and income figures but would show up only with a lag in the expenditure accounts. 2/

e. Stockbuilding

Among the end-uses of GDP, stockbuilding is particularly difficult to estimate in an environment of high and volatile inflation. Indeed, the valuation of inventories then becomes very complicated, both for enterprises and for national accountants. Again, depending on the deflators used to make the required valuation adjustment, the estimate of the contribution of stockbuilding to GDP varies tremendously.

Interestingly, in the case of Russia, and not unlike what was observed in Eastern Europe, official data suggest the persistence of a very high level of stockbuilding after price liberalization. The official Goskomstat figures point to a massive increase in stockbuilding from around 2 percent of GDP in 1989 and 1990 to 14 percent in 1991. 3/ This surge may reflect too modest a valuation adjustment, but it could also be viewed as the logical consequence of increasing hoarding prior to the pre-announced January 1992 price liberalization. Final stockbuilding numbers have not yet been released for 1992. However, preliminary Goskomstat estimates suggest that stockbuilding may have amounted to around 10 percent of GDP in 1992. Admittedly, such a large estimate probably results from an insufficient adjustment for inflation, as was the case in a number of countries in Eastern Europe. 4/ However, there exist at least two economic rationales for the persistence of substantial stockbuilding or, at least, of a very high level of stocks. Firstly, in the presence of a heavy inflation tax on money holdings, and in the absence of hard budget constraints, firms had an incentive to continue the large scale accumulation of real assets, in particular of key intermediate inputs. Secondly, the absence of hard budget

1/ Apparently, stocks were revalued only once (at the beginning of 1992) and fixed capital assets twice (in mid-1992 and late 1993).

2/ See Gigantes (1993). This reasoning holds insofar as expenditure accounts are compiled on a cash basis while production and income accounts are compiled on an accrual basis.

3/ The estimate for 1989-90 is much lower than previously published figures for the former U.S.S.R. (see IMF and others (1991), vol.1, p.94).

4/ See for example Schaffer (1993) on Poland.

constraints also allowed some enterprises to further pile up inventories of unsold finished products.

V. Concluding remarks

This paper has emphasized the numerous problems encountered early in the transition by national accountants in Russia and by those who use their output. However, progress on the methodological front is genuine, if slow. For example, thought is being given to switching to a sample-based approach. 1/ But implementation is still embryonic. Therefore, the uncertainty surrounding macroeconomic estimates and projections is likely to have worsened during this period. Over time, the quality of the information collected and the methods used for its processing will certainly improve, as will the precision of the national accounts. The sooner financial stabilization is achieved, the sooner this improvement will come about, as a noteworthy side-benefit.

Beyond the difficulty to correctly estimate conventional national accounts indicators, which is the focus of this paper, it should be stressed that equally or even more important questions remain regarding more comprehensive economic welfare measures. These include the gains associated with the end of shortages and queues, which are hard to quantify. They also involve the improvement in welfare resulting from the cessation of the overproduction of a number of items and the wasteful use of inputs, which statistics on growth rates in real output conceal. Finally, the usual flow measures disregard the negative impact on welfare of the large environmental and other liabilities built up in the old regime, 2/ the costs of which will have to be borne in future.

1/ See for example Deyev and Krutova (1993) and Zakharov (1993).

2/ It is both tragic and ironic that such is the inheritance from central planning, which was supposed to extend agents' horizons to future generations.

References

Blades Derek: "Conference Report", in *Statistics for a Market Economy*, OECD, Paris, 1991, pp. 15-29.

Clark, Colin: *A Critique of Russian Statistics*, MacMillan and Co., London, 1939.

Deyev G.I. and T.A. Krutova: "Versions of the Basic Mass Method Used in Organizing Spot Statistical Surveys", Goskomstat of the Russian Federation, *Bulletin of the Scientific and Methodological Council*, no. 1, 1993, pp. 24-39 (In Russian).

Ericson, Richard E.: "The Soviet Statistical Debate: Khanin vs. TsSU", in *The Impoverished Superpower. Perestroika and the Soviet Military Burden*, edited by Henry S. Rowen and Charles Wolf Jr., San Francisco, Institute for Contemporary Studies Press, 1990, pp. 63-92.

Gigantes, Terry: "The Valuation of Output in Countries of the Former Soviet Union", mimeo, November 1993.

Goldina, L. and Yu. Pakhomov: "On the Consumer Price Index", Goskomstat of the Russian Federation, *Statistical Bulletin*, no. 10, 1992, pp. 47-48 (In Russian).

Goskomstat: "Regulations on the Procedure for Monitoring Changes in Prices and Fees for Goods and Services and Determining the Consumer Price Index", Goskomstat of the Russian Federation, *Bulletin of the Scientific and Methodological Council*, no. 1, 1993, pp. 58-76 (In Russian).

Guzhvin P.: "Trust in Statistics", Goskomstat of the Russian Federation, *Statistical Bulletin*, no. 9, 1992, pp. 3-21 (In Russian).

International Monetary Fund and others: *A Study of the Soviet Economy*, Washington, February 1991.

International Monetary Fund: *Russian Federation: Economic Review*, no.8, June 1993.

Koen Vincent and Steven Phillips: "Price Liberalization in Russia: The Early Record", International Monetary Fund, Working Paper no. 92, November 1992.

-----: "Price Liberalization in Russia: Behavior of Prices, Household Incomes and Consumption in the First Year", International Monetary Fund, *Occasional Paper*, no. 104, June 1993.

Kostinsky, Barry and Misha Belkindas: "Official Soviet Gross National Product Accounting", in *Measuring Soviet GNP: Problems and Solutions. A Conference Report*, Central Intelligence Agency, September 1990, pp. 183-195.

Lequiller, François: "A Case of Dramatic Drift in Inflation Measurement in FSU Countries", mimeo, International Monetary Fund, November 1993.

Marer Paul, Janos Arvay, John O'Connor, Martin Schrenk and Daniel Swanson: *Historically Planned Economies: A Guide to the Data*, World Bank, Washington DC, 1992.

Schaffer, Mark: "The Enterprise Sector and Emergence of the Polish Fiscal Crisis, 1990-91", World Bank Policy Research Working Paper no. 1195, September 1993.

World Bank: "Measuring the Incomes of Economies of the Former Soviet Union", International Economics Department, WPS no. 1057, Washington DC, December 1992.

Zakharov P.: "Adaptation of Russian Statistics to Market Economy Conditions", Paper presented at the Conference of European Statisticians, Bucharest, October 1993.

Zharova A.I.: "The Reform of State Statistics in the Context of Fundamental Economic Reform", Goskomstat of the Russian Federation, *Bulletin of the Scientific and Methodological Council*, no. 1, 1993, pp. 10-13 (In Russian).

