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Intelligence

## Revisiting Soviet Economic Performance Under *Glasnost*: Implications for CIA Estimates

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**Intelligence**

# **Revisiting Soviet Economic Performance Under *Glasnost*: Implications for CIA Estimates**

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**Revisiting Soviet Economic  
Performance Under *Glasnost*:  
Implications for CIA Estimates**

**Scope Note**

This paper assesses the implications of recent *glasnost*-inspired critiques of the USSR's official economic statistics for CIA's estimates of Soviet economic performance. The CIA estimates, although predicated on the belief that Moscow's macroeconomic measures are unreliable, are based on a variety of official Soviet data. In particular, the paper focuses on what the recent criticisms have to tell us about the accuracy of CIA's estimates of the growth and structure of Soviet gross national product (GNP).

Although determining the size of the USSR's GNP relative to those of the United States and other countries is also important to an assessment of the USSR's economic performance, recent Soviet critics of the official statistics have had little to say on this matter. As a result, this subject is not discussed in this paper but is deferred to a subsequent study.

This paper draws heavily on the results of an unclassified conference on the impact of Gorbachev's policies on Soviet economic statistics, sponsored by the Office of Soviet Analysis in December 1987.



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## **Revisiting Soviet Economic Performance Under *Glasnost*: Implications for CIA Estimates**

### **Summary**

Mikhail Gorbachev's *glasnost* policy has encouraged Soviet critics of official economic statistics to embark on what amounts to a broad-based depreciation of the USSR's past economic performance. Their writings have generally confirmed what CIA and most Western Sovietologists have long believed about Moscow's macroeconomic data—that they are expressed in prices that fail to reflect the relative costs of producing goods and services and that they greatly inflate real growth. The alternative estimates of overall economic growth that these critics present seem unrealistically low, in our view, but some of the particulars of their criticisms highlight the need for improvements in important parts of CIA's alternative measures of Soviet economic performance.

### **Soviet Unofficial and CIA Views**

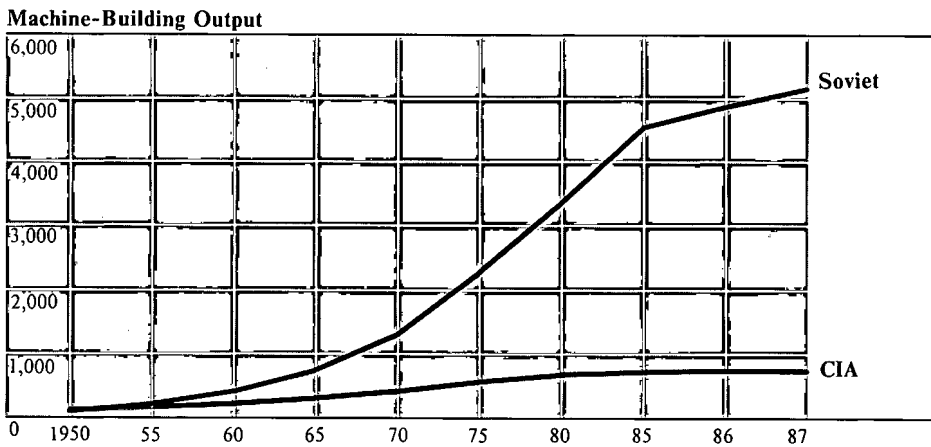
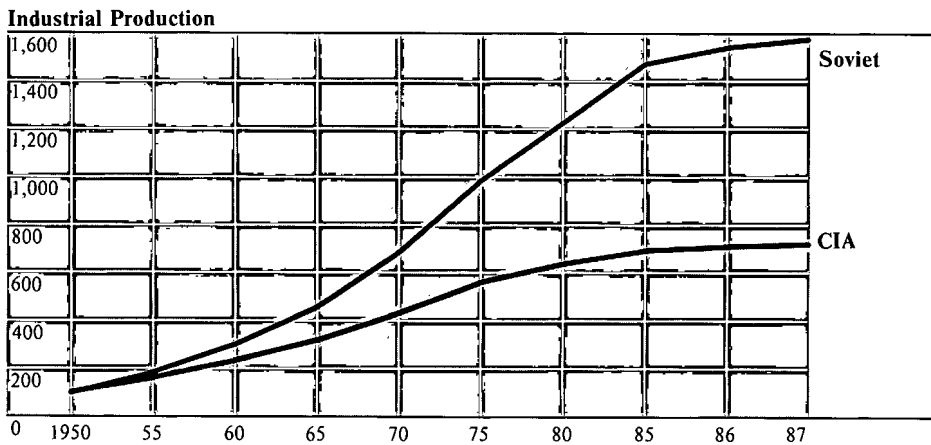
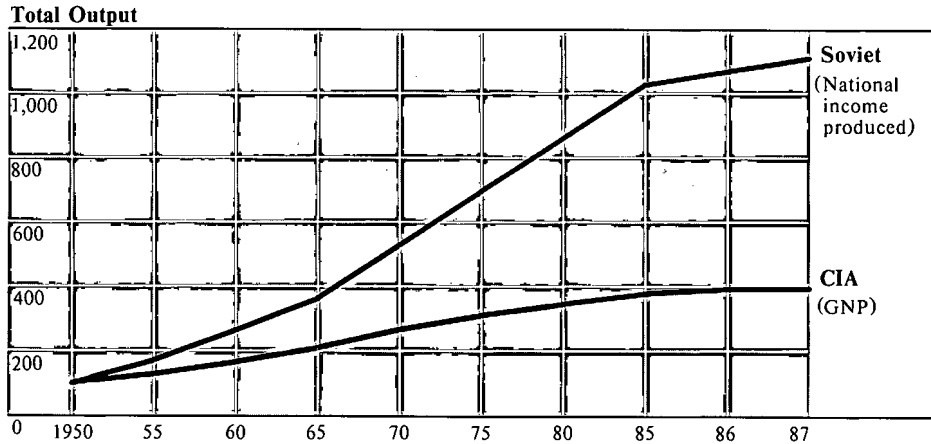
CIA and the Soviet critics of the USSR's published statistics agree in the sense that both reject Moscow's claims of economic growth as inflated and its data on the allocation of resources as misleading and flawed. CIA's estimates have consistently suggested that the structure of Soviet GNP has been substantially different from that shown by data in official prices and that the growth of GNP has been substantially lower than official data imply (see figure 1). CIA's estimates are much closer to those of the critics than to those of the state statistical authorities. Nonetheless, some of these critics have advanced alternative estimates that suggest Soviet growth has at times been appreciably lower than estimated by CIA.

### **Assessment of the Charges**

Soviet critics of the official statistics have identified two sources of upward bias in the disaggregated Soviet data on which CIA's indexes of GNP growth are based: overreporting of the physical quantities of goods produced and hidden inflation in the statistics reported in allegedly constant ruble terms. We rely overwhelmingly on statistics in physical units because we agree that Soviet value statistics reported in supposedly constant prices reflect a considerable degree of inflation. We believe the physical production statistics are reliable. Detailed Western studies of the quality of data on physical production suggest that the degree of overreporting is small and has not increased over time. Also, critics of the official statistics, while complaining of such overreporting, have themselves used physical measures in developing their alternative estimates.

**Figure 1**  
**A Comparison of Official Soviet Statistics on**  
**and CIA Estimates of the USSR's Economic Growth**

(1950=100)



Official Soviet figures are from *Narodnoye khozyaystvo SSSR*, various years.  
 CIA estimates are in 1982 factor-cost prices.

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Although we have more reason to be concerned about official Soviet value statistics, even in this case the biased data affect only portions of our estimates:

- In the estimates of growth on the *sector-of-origin side*, the share of ruble value data in our sample is fairly small (11 percent). In our judgment, any overestimation resulting from their use is likely to be offset by underestimation resulting from our greater reliance on physical measures that fail to reflect improvements in product quality.
- On the *end-use side*, because our indexes of the growth of investment and consumption rely more heavily on official ruble value series and current-price statistics deflated with official price indexes, the inflationary biases in the official data may have a larger impact.

In some rough sensitivity testing, when allowance is made for likely downward as well as upward biases in our indexes, our estimates of the average annual growth of GNP during the years 1951-87 remain virtually unchanged. Yet, because the growth of some key end uses could have been different from what we estimate, the same sensitivity testing suggests that by 1987 the share of investment in GNP could have been about one-sixth less than we estimate and the share of consumer goods in GNP could have been smaller by about one-tenth. Because defense expenditures are estimated independently of other end uses by a method requiring little reliance on officially published data, our estimates of their level and their share of GNP remain the same.

On balance, the *glasnost*-inspired criticisms of official Soviet statistics, while reassuring with regard to CIA's rejection of the official estimates, add weight to earlier indications that the CIA estimates of some components of GNP may require revision and refinement. We are at present focusing on the machine-building and metalworking sector of origin and the new fixed investment end-use category. Still, additional data, not yet available in official reporting despite Gorbachev's professions of openness, are likely to be required before the necessary changes can be made with confidence. The estimates provided to date by the critics are of little help in this regard. Some of the critics are establishment figures—for example, Gorbachev's adviser Abel Aganbegyan—who might have access to the great volume of data required to produce reliable alternatives to the official measures of economic performance. Yet all the critics have displayed the



same inattention to documentation and vagueness on methodology as the statistical agencies they fault. The published criticisms, moreover, have a pronounced political coloration. They serve to blacken the record of Gorbachev's predecessors as well as to set that record straight.

**Continuing Need for Alternative Estimates**

The need for independent estimates of Soviet economic performance like those of the CIA is likely to increase. While Soviet critics are debunking official claims of past growth, the state statistical agency is not backing away from these claims and is further distorting the recent record. In the absence of estimates derived without reliance on Soviet macroeconomic data, US policymakers would have to accept the flawed official measures—at the risk of seriously overstating the USSR's ability to raise living standards and provide for future growth and understating its commitment of resources to defense.

## Contents

	<i>Page</i>
Scope Note	iii
Summary	v
Recent Soviet Critiques of Official Statistics	1
Antecedents and Common Themes	1
CIA Estimates—An Alternative to Soviet Measures	4
Estimating GNP in 1982, the Base Year	4
Estimating the Growth of GNP	5
CIA Estimates Versus Official Measures	7
CIA Estimates and the “New” Statistics	10
Unclear Basis of Alternative Estimates	10
Inflation and CIA Estimates of Growth	11
Use of Quantity Data	12
Estimating the Allocation of GNP	14
Some Sensitivity Testing	16
Growth of Soviet GNP	16
Distribution of GNP by End Use	17
Conclusions and Prospects	18

## Revisiting Soviet Economic Performance Under *Glasnost*: Implications for CIA Estimates

### Recent Soviet Critiques of Official Statistics

The Gorbachev years have been a time of criticism and reassessment of the USSR's economic statistics and much of its "official" historical record. The General Secretary's *glasnost* has led to the airing of often sensational charges of inaccuracy and falsification on the part of the state statistical agencies and of sharp complaints about the inadequacy of official measures of economic performance. Gorbachev has encouraged such criticism by his frequent references to the late Brezhnev years as a "period of stagnation" while official statistics depict the period as a time of respectable growth.

Other Soviet officials and economists have made more explicit charges. For example:

- Gorbachev's economic adviser Abel Aganbegyan asserted in a recent book that Soviet economic growth since 1965 has been substantially lower than officially claimed and that, during the period 1981-85, economic growth was close to zero (see figure 2).
- In an article in the literary journal *Novyy mir*, economist Grigoriy Khanin and journalist Vasilii Selyunin charged that Soviet national income did not increase 90-fold during 1928-85, as official statistics show, but only sixfold or sevenfold.<sup>1</sup>
- Many economists and journalists have denounced the pricing system for failing to reflect the relative resource costs of producing goods and services and Soviet indexes of retail prices for understating the actual increase in the cost of living.
- Dramatic accounts have been published in the press about the falsification of cotton production figures in Soviet Central Asia during the Brezhnev years, and scores of officials have been prosecuted for involvement in this and similar frauds.

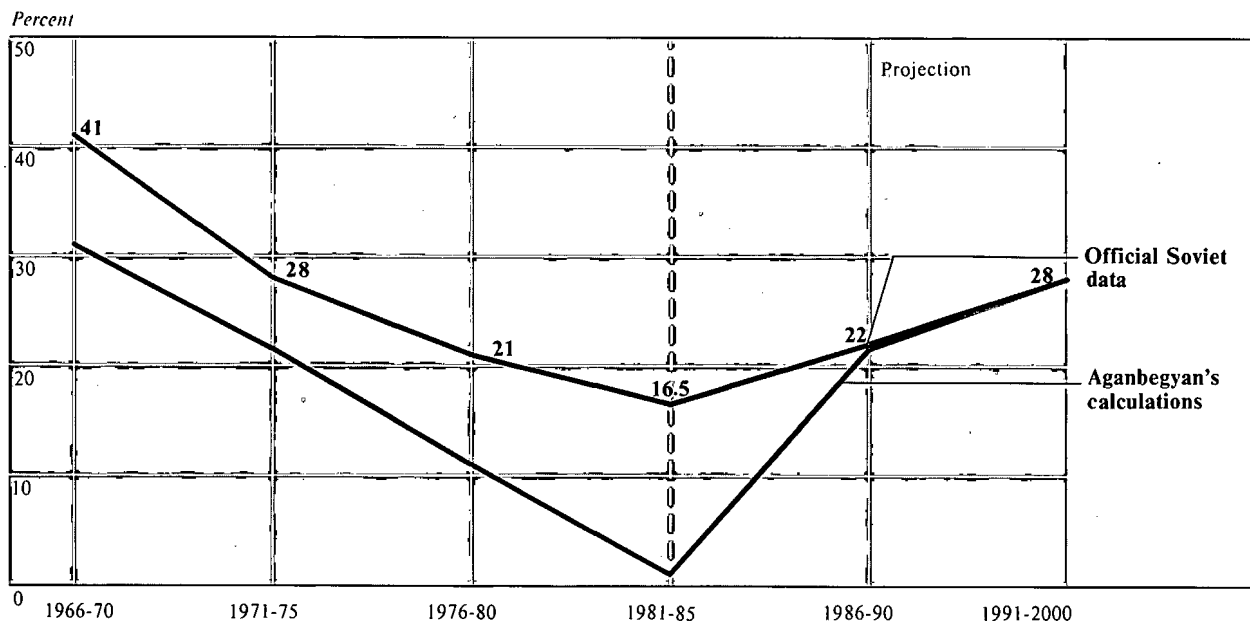
<sup>1</sup> This and other notes are appended.

For many Soviet readers these revelations have doubtless amounted to a hard-to-swallow rewriting of the USSR's economic history. For Western analysts, who long have discounted the reliability and utility of official Soviet claims of economic growth and have constructed independent estimates, the *glasnost*-inspired charges have been less surprising. Nonetheless, they do raise questions about the adequacy of the corrections for such inaccuracies and distortions in Western estimates. This paper assesses the implications of recent Soviet criticisms of Moscow's official macroeconomic measures for the most widely used Western substitute for them: CIA's independent estimates of the growth and structure of Soviet GNP.

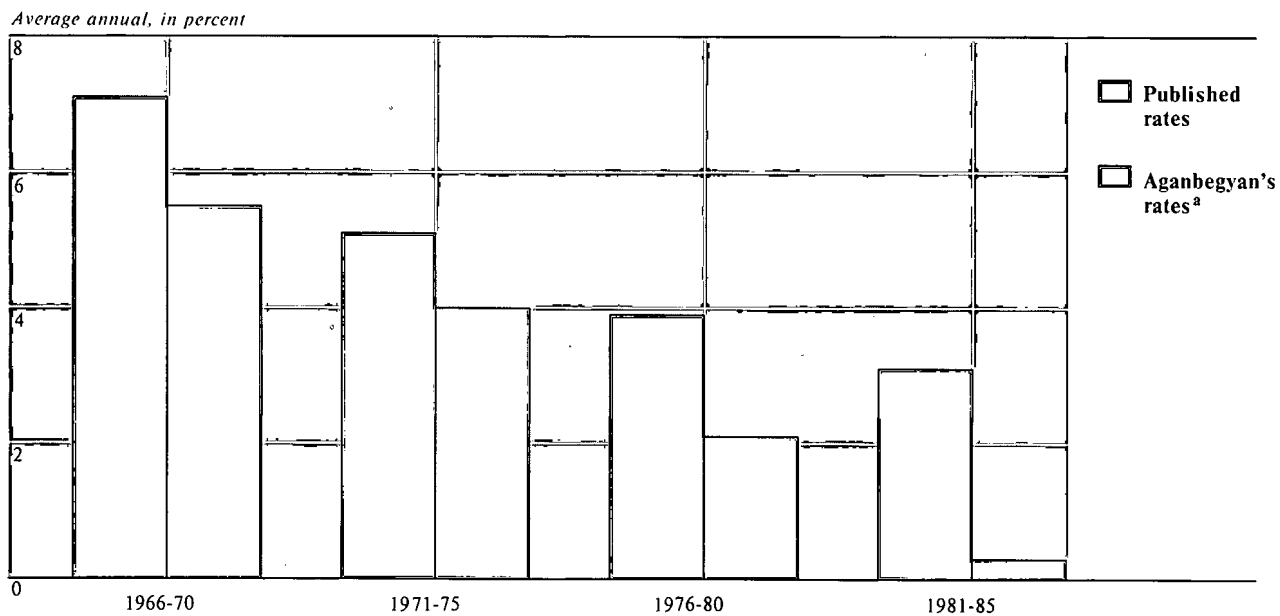
### Antecedents and Common Themes

CIA's decision to compile independent estimates of Soviet economic performance reflects the fact that Western observers have for decades rejected the statistics on economic growth reported by the USSR's statistical authorities.<sup>2</sup> Western experts concluded many years ago that there was an inherent bias in the way Soviet statistics were collected and reported and that there were serious gaps in the published statistics. Published Soviet complaints about official statistics came later. Present-day denunciations of the official statistics, with high-level support, were preceded by less dramatic charges. In the 1960s, for example, critiques of the officially reported growth rates for Soviet national income by Al'bert Vaynshteyn were published in the USSR and attracted considerable attention in the West.<sup>3</sup> Similarly, the validity of the published price indexes for the machine-building sector of industry was questioned by Soviet scholars in the 1960s and 1970s.<sup>4</sup> In some instances the economist critics offered alternative price indexes that showed rates of inflation substantially greater than officially acknowledged. Soviet statistics on the growth of machine-building output subsequently were criticized as inflated in articles by V. K. Fal'tsman, A. Kornev, K. K. Val'tukh, and B. L. Lavrovskiy.<sup>5</sup>

**Figure 2**  
**Growth of Soviet National Income Utilized,**  
**by Five-Year Periods, 1966-2000**



Source: Abel Aganbegyan, *The Economic Challenge of Perestroika* (Bloomington: Indiana University Press, 1988)



<sup>a</sup> Adjusted, according to Aganbegyan, using a "more realistic" index of price change.

These and other articles from Soviet scholarly journals and monographs, when combined with the recent discussions of official statistics in the popular press, represent a sizable body of criticism. Although the particulars of the criticism vary greatly, certain complaints have occurred frequently. For example, there has been widespread agreement that state-controlled official prices (which we call established prices) distort the true structure of production and present a seriously flawed picture of how resources are allocated to end uses. On the sector-of-origin side, the most common charge is that the prices of agricultural goods and consumer services are set too low, thus understating their share of annual production and causing the manufacturing and processing industries to appear larger than deserved. More generally, the real resource contributions of various sectors are misstated because, under Soviet pricing, profits do not adequately reflect capital charges and economic rent. On the end-use side, the discounted, often below-cost prices at which some goods are sold and the inclusion of large turnover (sales) taxes in the prices of others prevent a true picture of resource flows. In neither case is falsification of the statistics at fault; rather, the distortions are systemic.

With regard to the growth of Soviet output, both Soviet and Western critics of the official statistics have charged that the supposedly constant or, in Soviet parlance, "comparable" prices in which production is reported actually incorporate substantial "disguised" or "hidden" inflation and that, as a result, real growth is much less than claimed. Most often, this inflation is said to take the form of the overpricing of new products that differ little if at all from their predecessors but are assigned substantially higher prices. The abuse of new product pricing, which helps to meet plan targets, is said to be especially common in industries such as machine building, where claims of product innovation can be made much more easily than in agriculture or the extractive industries. Directly related to this charge is the complaint that the official indexes of prices fail to reflect the inflation that actually occurs.

The official index of retail prices has come in for particular criticism under *glasnost*. According to the index, consumer prices rose at an average rate of only

0.3 percent a year during 1961-87. Soviet economist Oleg Bogomolov, however, has claimed that over the same general period the cost of the shopping basket of goods bought by the average city dweller has increased at an average annual rate of 1.5 to 2.5 percent.<sup>6</sup> Other Soviet authors have cited even higher estimates of the growth in retail prices.

Inflation in the official investment statistics has not been discussed as much in the popular press as inflation in the consumer sector, but some Soviet economists say this is a serious problem. In a recent survey, Vladimir Kontorovich and Boris Rumer summarized the views of those scholars and journalists who allege this to be the case as suggesting "a consensus range of 2 to 3 percent inflation in investment in 1971-75 and 2 to 4 percent in 1976-80. The inflation rate increased from the 1960s to the 1970s—but this trend of inflation apparently was not continued in the early 1980s."<sup>7</sup>

In contrast to the widespread complaints about the reliability of measures of Soviet output expressed in comparable ruble terms, official indicators expressed in terms of physical quantities—such as tons and kilowatt-hours—have come in for much less criticism. Nonetheless, the reported falsification of statistics on cotton production in Central Asia and other published accounts of overreporting have led some critics to question the reliability of physical indicators of growth as well as of value measures. This subject is discussed in the section "Use of Quantity Data."

Another charge made by critics of the official statistics is that, whether expressed in terms of physical quantities or ruble values, statistics on the production of goods and services are inadequate indicators of the satisfaction of demand, because the quality of the goods produced is so poor and the assortment so ill suited to consumer needs. It has, for example, become fashionable for both Soviet leaders and economic specialists to point out that, while the Soviet Union is among the world's leading producers of shoes, consumers are loath to buy domestically manufactured

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### **Soviet Versus Western Measures of Economic Growth**

*The Soviets usually measure their economic performance using a Marxian concept that we call net material product (NMP). This measure differs from Western GNP in that it excludes depreciation and services that do not contribute directly to material output (for example, passenger transportation, education, health, and government administration). Published NMP growth rates—reported by the Soviets as both national income produced and national income used—are further biased because inadequate adjustment is made for inflation. The NMP and GNP measures also differ considerably in some years because the weight used for agriculture in Soviet accounting differs from that used in Western estimates. For years such as 1986, when agriculture's performance was unusually good, the two measures are closer together. Both GNP and NMP measures, however, show that economic growth has slowed in the USSR since the mid-1970s.*

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footwear, and Soviet shoes have no export market.<sup>8</sup> Similar charges have been leveled about data on the production of investment goods, and the general conclusion is that statistical indicators of growth often reflect, in practice, a growing waste of resources. This topic is discussed in the section "CIA Estimates and the 'New' Statistics."

### **CIA Estimates—An Alternative to Soviet Measures**

In an effort to correct the distortions in official Soviet macroeconomic data and to measure Soviet economic growth in terms familiar to a Western audience, CIA has constructed independent estimates of the USSR's GNP since the 1950s (see inset).<sup>9</sup> Specifically, the CIA attempts to replicate as closely as possible the concepts used by the United States and other Western countries.<sup>10</sup> Estimates of the size and growth of Soviet GNP are based on a wide array of data and information culled from official Soviet statistical handbooks, the press, and specialized economic publications. The CIA procedure is to develop a detailed set of GNP

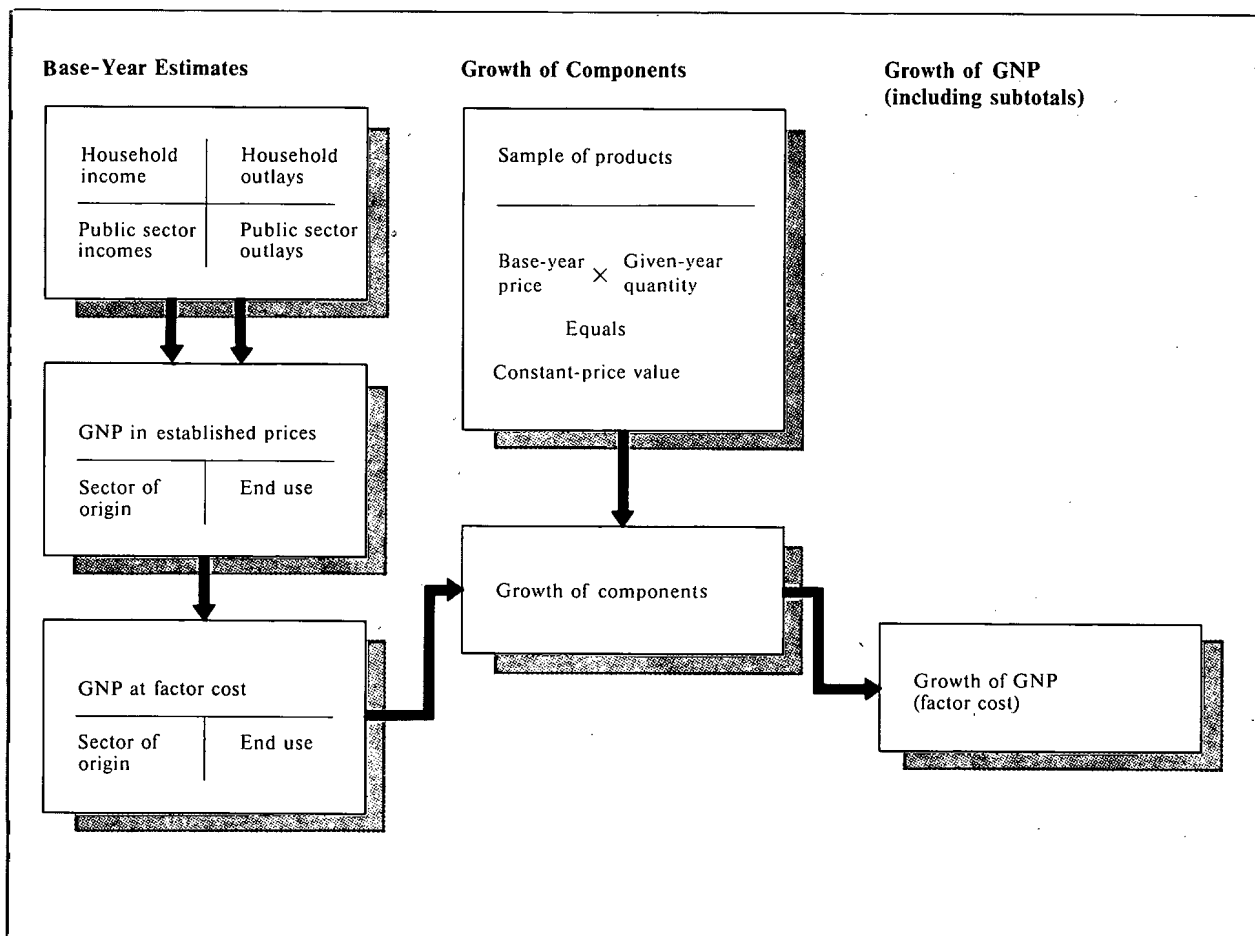
accounts for a base year (currently 1982) and then to move the components over time with indexes that reflect changes in real output.

### **Estimating GNP in 1982, the Base Year**

To estimate GNP in 1982 in established prices, we first construct four basic national income accounts—two showing the incomes of the public and household sectors and two showing the expenditures of those sectors on final goods and services in that year (see figure 3). GNP equals the sum of total incomes (or expenditures) of the public and household sectors. Total GNP is then disaggregated to obtain value added in 30 sectors of origin (such as branches of industry, agriculture, and transportation) and values for 26 end uses (such as various categories of consumption, investment, and government services).

The values obtained at this point in the estimating process, if correctly calculated, reflect the actual prices received by producers and paid by consumers in 1982. Because of the peculiarities of Soviet price setting, however, these values do not measure the relative real resource costs of producing the various goods and services. Serious distortions result from heavy turnover taxes on many consumer goods and large price subsidies for other goods and some services; other major distortions arise because the profits reflected in current product prices stem from profit margins that are arbitrarily set and do not measure actual returns on capital. To correct for these major distortions, we modify the sectoral values estimated in actual prices by subtracting turnover taxes, adding subsidies, and replacing profits with values that reflect a uniform rate of return on capital (currently taken to be 12 percent). These adjusted ("factor-cost") valuations of outputs of producing sectors and of end uses of GNP provide the base-year weights that are used in estimating changes in GNP and its major components over time.<sup>11</sup>

**Figure 3**  
**The CIA's Estimation of Soviet GNP**



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Meanwhile, the role of the "second economy" continues to bedevil both Western and Soviet measures of national output (see inset, page 6). CIA includes second-economy activity in the base-1982 value of GNP but cannot track the changes in second-economy production over time.

#### **Estimating the Growth of GNP**

To measure the growth of GNP, we move the factor-cost values for each producing sector over time with quantity indexes designed to reflect real changes in

output. The growth of GNP as a whole is obtained from the sums of the values for all sectors in each year.

**Sector-of-Origin Indexes.** The indexes of growth in the individual producing sectors necessarily are based for the most part on data for samples of products or activities. For some sectors, such as agriculture and transportation, the sample coverage is complete or nearly so. For other sectors, such as the chemical and

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### ***The Second Economy and GNP***

*According to a mass of evidence, a thriving "second economy" exists in the Soviet Union alongside the formal economy. Gregory Grossman defines the second economy as comprising "all production and exchange activity that fulfills at least one of the two following tests: (a) being directly for private gain or (b) being in some significant respect in knowing contravention of existing law." <sup>a</sup> There are fairly reliable data for the former, but not for the latter. In estimating the size and growth of Soviet GNP, the CIA attempts to include the full range of economic activities that are measured in GNP statistics in the West. This standard calls for the inclusion of all legal private production and also of some activities that are legal in the West but illegal or semilegal in the USSR.*

*Our estimates of Soviet GNP in 1982 include second-economy activities that account for 11 percent of consumption and 6 percent of GNP. We count all of the legal private production that official Soviet data permit us to identify—production on private farming plots and private investment. We also include estimates of a variety of privately produced services, without regard to their legality. These estimates, which probably are too low, are based on fragmentary and often conflicting information drawn from the Soviet press and from Western surveys of the family budgets of Soviet emigrants. Lack of reliable data precludes estimation of illegal production of consumer goods. For the most part, we have assumed that the second-economy activities counted in GNP grow in real terms as do the sectors in which they are included. There are no credible data with which to assess changes in the volume of illegal activities.*

<sup>a</sup> "The 'Second Economy' in the USSR," *Problems of Communism* (September-October 1977): pp. 25-40.

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nonferrous-metals branches of industry, the coverage is much smaller. Although we believe our samples to be reasonably representative overall, we take every opportunity to improve them when new data are made available.

In most instances, data for the products in the sample measure output in physical units (such as tons of wheat, liters of vodka, or ton-kilometers of freight carried), as shown:

	Percentage Share of Sample Data	
	Physical Units	Value Terms
<b>GNP by Sector of Origin</b>	<b>89</b>	<b>11</b>
Of which:		
Industry	82	18
Agriculture	100	0
Services	89	11

Whenever possible, we adjust these physical quantity series to account for changes in product mix and for quality. In the case of automobiles, for example, our data capture changes in the numbers of different models produced; and, in the case of coal, they reflect changes in the quantity of the various grades extracted. Growth in many of the services (such as education or health) is measured by work-hour employment—a practice that does not capture growth based on productivity gains but one that is commonly employed in Western national income accounting because of the difficulty of measuring productivity trends in these sectors.

But CIA has not been able to dispense completely with ruble measures of output. Published Soviet measures in comparable prices are used to estimate growth in output for products that make up about 20 percent of the value of the sample of industrial products. In the machinery branch, some 40 percent of the sample consists of such data series. Although there are reasons to doubt that these official measures have been properly deflated, we employ them to obtain more complete coverage and to include new and complex products for which physical quantities either are not available or would fail to capture changes in quality and mix. The likely net effects of this reliance on official numbers are assessed in the section "Some Sensitivity Testing."



**End-Use Indexes.** Indexes of growth are also calculated for each of the 26 major end uses of GNP. For consumption—the largest component of GNP—our sample of products and services covers more than nine-tenths of estimated total consumption, including state expenditures for education and health. The indexes used for investment in principle cover the entire sector, as do nearly all of the indexes that measure government administrative services.

The quantity indexes used to measure change over time in the 26 end-use sectors are based mainly on data in physical units, as shown:

	<i>Percentage Share of Sample Data</i>	
	Physical Units	Value Terms
Consumption	78	22
Investment	58	42

The indexes of consumption of food and soft goods rely almost entirely on published Soviet data on per capita consumption of major goods and on production data adjusted whenever possible to take account of net imports, inventory change, and changes in mix and quality. Because of a lack of reliable data for alternative approaches, our indexes for consumer durables and personal services are based on sales data deflated by official price indexes, which probably understate real price changes. The indexes for all other services rely mainly on work-hour employment or other physical indicators. Although we rely on physical quantity data to measure the growth of the construction component of investment, we employ official Soviet value statistics—said to be in constant (“comparable”) prices—to assess the growth of the machinery and equipment component of new fixed investment.

CIA estimates the magnitude and growth of Soviet military expenditures in rubles independently of GNP. We employ a direct-costing (building-block)

approach that requires the identification and enumeration of the physical elements constituting Moscow's defense effort over time and the application of cost factors to them. These ruble estimates—except for research, development, testing, and evaluation activities—are aggregated by military service and military mission. Estimates of total defense spending in rubles are compared over time with CIA measures of GNP—in factor-cost prices—to obtain measures of the burden of defense in the USSR. That burden is currently estimated to be about 16 percent of GNP.<sup>12</sup>

Because we consider the data available to estimate growth of GNP by producing sector to be more reliable than those used for the end uses, we set the values of total GNP by end use in each year equal to those obtained for GNP by producing sector. Subtracting the total value estimated for the 26 end uses in each year from the total GNP thus obtained leaves a residual value, which contains a portion of defense expenditures as well as net exports, inventory change (including the inventory writeoff due to waste in the distribution system), and any statistical discrepancy. Additional defense expenditures are believed to be scattered among other components, notably in investment and in research and development expenditures. Attempts to estimate net exports and inventory change in constant prices have been blocked by the lack of suitable price deflators.

#### **CIA Estimates Versus Official Measures**

By using these methods to estimate the structure and growth of Soviet GNP, CIA historically has obtained results that differ markedly from the USSR's official macroeconomic measures. As can be seen from a comparison of the structure of Soviet GNP in established prices and in adjusted factor-cost prices, for example, factor-cost measures also give a quite different picture of the contributions of the various producing sectors to overall economic output and of the

**Table 1**  
**Distribution of Soviet GNP in 1982,**  
**by Sector of Origin**

Percent

	Established Prices	Factor-Cost Prices
<b>GNP</b>	<b>100.0<sup>a</sup></b>	<b>100.0<sup>a</sup></b>
Industry	50.4	33.4
Construction	6.7	8.0
Agriculture	15.4	20.2
Transportation	8.4	9.9
Communications	0.9	0.9
Trade	4.7	6.7
Services	11.3	18.5
Military personnel	1.6	2.0
Other branches	0.7	0.6

<sup>a</sup> Because of rounding, subtotals may not add to 100.

**Table 2**  
**Distribution of Soviet GNP**  
**in 1982, by End Use**

Percent

	Established Prices	Factor-Cost Prices
<b>GNP</b>	<b>100.0</b>	<b>100.0</b>
Consumption	52.7	52.7
Consumer goods	41.4	34.7
Food	24.7	24.6
Soft goods	11.1	6.5
Durables	5.6	3.6
Consumer services	11.3	18.0
Investment	27.9	31.2
New fixed investment	21.7	24.3
Machinery and equipment	8.6	9.3
Construction and other	13.0	14.7
Net additions to livestock	0.2	0.3
Capital repair	6.2	6.9
Other government expenditures <sup>a</sup>	19.4	16.1

<sup>a</sup> Includes most of defense spending. Some defense outlays are also reflected in other end uses such as investment.

allocation of resources to major end uses in the base year than would data in official prices (see tables 1 and 2).

Similarly, CIA's reliance on production indexes based largely on disaggregated physical data yields estimates of the growth of GNP and its components substantially lower than those implied by the Soviet macroeconomic measures that are their closest counterparts (see table 3). For the last two five-year plans, in fact, CIA estimates show a rate of growth roughly half that of the official series on national income produced. For industry and machine building as well as for national income, the differences between the estimated and reported rates of growth have been substantial (see table 4). Nonetheless, both the estimated and reported series are alike in indicating that Soviet economic growth has been slowing gradually but persistently over the past two decades.

The differences between CIA estimates and official claims of growth on the end-use side are especially striking with regard to consumption and defense. In the case of consumption, CIA estimates show markedly smaller gains—an average annual growth of 2.9 percent per capita during 1951-87—than the corresponding Soviet measure “real per capita income of the population,” which grew at an average of 4.5 percent a year during the same period. In the case of defense, Soviet officials have acknowledged in recent years that the only data officially released—a single-line entry in the annual state budget—include only a portion of actual defense expenditures. To judge from our estimates, the portion of actual defense expenditures included in the announced defense budget is small. Furthermore, although the announced budget has been roughly constant since 1965, even when

**Table 3**  
**Comparison of CIA Estimates of and Official Statistics**  
**on Soviet Economic Growth**

*Average annual growth in percent*

	CIA Estimates		Official Statistics <sup>b</sup>	
	GNP	GMP <sup>a</sup>	National Income Produced	National Income Used
1951-60	5.1	6.7	10.3	NA
1961-65	4.8	4.9	6.5	5.7
1966-70	5.0	5.3	7.8	7.1
1971-75	3.1	3.3	5.7	5.2
1976-80	2.2	2.2	4.3	3.9
1981-85	1.8	1.7	3.6	3.1
1986-87	2.2	1.8	3.2	2.4
<b>1951-87</b>	<b>3.8</b>	<b>4.2</b>	<b>6.7</b>	<b>NA</b>
<b>1966-87</b>	<b>2.9</b>	<b>3.0</b>	<b>5.2</b>	<b>4.6</b>

<sup>a</sup> CIA estimates of GNP have been adjusted to make them roughly comparable in coverage to the official estimates by excluding services that do not contribute directly to material output. The resulting estimates of gross material product (GMP), however, still include depreciation, which is excluded from Soviet national income measures.

<sup>b</sup> National income produced is the sum of value added (except depreciation) in all branches of material production; national income used is smaller than national income produced by losses (from natural disasters and the like) and the value of net exports of material goods.

**Table 4**  
**Comparison of CIA Estimates of and Official Statistics**  
**on Soviet Economic Performance**

*Average annual growth in percent*

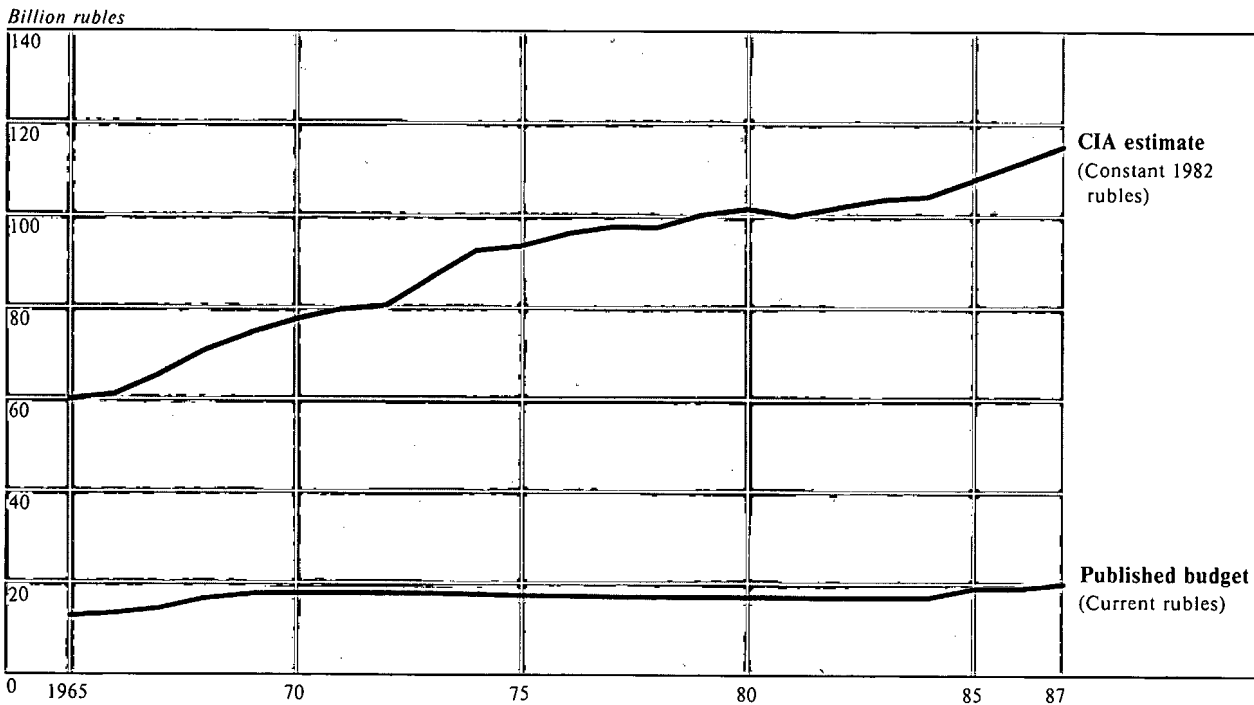
	Industry			Machine Building and Metalworking		
	Official Statistics <sup>a</sup>	CIA Estimates <sup>b</sup>	Difference	Official Statistics <sup>c</sup>	CIA Estimates <sup>b</sup>	Difference
1951-60	11.7	8.7	3.0	15.4	7.5	7.9
1961-65	8.6	6.5	2.1	12.4	7.0	5.4
1966-70	8.5	6.3	2.2	11.8	7.1	4.7
1971-75	7.4	5.4	2.0	11.6	6.6	5.0
1976-80	4.4	2.6	1.8	8.2	3.7	4.5
1981-85	3.7	1.8	1.9	6.2	1.3	4.9
1986-87	3.2	2.1	1.1	5.9	1.4	4.5

<sup>a</sup> Industrial output in comparable prices. From *Narodnoye khozyaystvo SSSR*, various issues.

<sup>b</sup> In 1982 factor-cost prices.

<sup>c</sup> Machine-building and metalworking output in comparable prices. From *Narodnoye khozyaystvo SSSR*, various issues.

**Figure 4**  
**Soviet Defense Expenditures: Published Budget**  
**Versus CIA Estimate**



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expressed in constant-price terms, our estimates indicate that actual defense expenditures have consistently increased (see figure 4).

#### **CIA Estimates and the "New" Statistics**

CIA and recent critics of the USSR's official economic data have similar views of Soviet economic statistics in the sense that both reject Moscow's claims of economic growth as inflated and its data on the allocation of resources as misleading and flawed. CIA's estimates are much closer to those of the critics than to those of the state statistical authorities. Nonetheless, some of these critics—in particular,

Selyunin and Khanin—have advanced alternative estimates that suggest that Soviet growth has at times been lower than CIA maintains (see table 5).

#### **Unclear Basis of Alternative Estimates**

As participants in a recent CIA-sponsored conference on Soviet statistics noted, however, Soviet critics of the state statistical authorities have generally displayed the same lack of methodological rigor and inattention to documentation as the regime agencies they fault.<sup>13</sup> As a result, it is often difficult to determine exactly how their estimates were constructed. Even the Selyunin-Khanin estimates have serious

**Table 5**  
**Alternative Measures**  
**of Soviet Economic Growth**

*Average annual growth  
in percent*

	Official Soviet Statistics <sup>a</sup>	Selyunin- Khanin Estimates <sup>b</sup>	CIA Estimates <sup>c</sup>
1951-60	10.3	7.2	5.1
1961-65	6.5	4.4	4.8
1966-70	7.8	4.1	5.0
1971-75	5.7	3.2	3.1
1976-80	4.3	1.0	2.2
1981-85	3.6	0.6	1.8

<sup>a</sup> National income produced in comparable prices. From *Narodnoye khozyaystvo SSSR v 1985*, pp. 34, 38.

<sup>b</sup> National income produced in comparable prices. From Richard E. Ericson, "The Soviet Statistical Debate: Khanin vs. TsSU," Harri- man Institute for Advanced Study of the Soviet Union Occasional Paper No. 1, unpublished (May 1988).

<sup>c</sup> GNP in 1982 factor-cost prices.

problems of this sort, and they are perhaps the best documented of the recent *glasnost*-inspired alternative estimates of Soviet economic growth by virtue of Khanin's publication of methodological articles in Soviet academic journals.<sup>14</sup> Professor Fyodor Kushnirsky, formerly of the Ukrainian Gosplan and now at Temple University, reports, for example, that when he followed the methods Khanin outlined and used the types of statistics to which Khanin referred, he obtained results that were strikingly different from those that Khanin described.<sup>15</sup> Kushnirsky's conclusion was not that Khanin was wrong, but that his estimates fail to meet the test of being "reproducible."

In the absence of clear evidence on the methods and sources underlying the alternative Soviet estimates of the USSR's economic growth, we can only speculate about the reasons for the differences between them and the CIA estimates. On the sector-of-origin side, two shortcomings of the disaggregated Soviet data on which CIA relies to construct indexes of growth could be responsible for the differences: hidden inflation in the series expressed in ruble prices and overstatement of the data on the physical quantities produced. As we have already indicated, however, the share of ruble-value data in our overall sample is small, and we

believe that any overestimation resulting from their use is likely to be at least partially offset by the underestimation resulting from our reliance on physical indexes that fail to reflect improvements in product quality and increased labor productivity (see section "Some Sensitivity Testing"). In the case of data on physical quantities, we believe the evidence that overreporting of these data has increased over time is inconclusive and note that even the critics of official Soviet statistics make heavy use of such series in constructing their alternative estimates.

#### **Inflation and CIA Estimates of Growth**

Inflation of Soviet ruble-value series has the most potential for affecting CIA measures for the industrial sector, particularly machinery production. As mentioned above, about 40 percent of the value of CIA's sample of machinery products consists of official measures in comparable prices. Although most Western and many Soviet experts have long maintained that official data on machinery's growth are inflated, the recent critics of the official statistics generally say that the rate of inflation has been greater and the real growth of machinery less than estimated by CIA (see table 6).

It should be borne in mind, however, that, although they account for 40 percent of our machinery sample, potentially inflated machinery production data account for only 13 percent of the sample from which the growth of industry is estimated and less than 5 percent of the sample used in estimating the growth of GNP. Any upward bias in our estimates due to hidden inflation, moreover, is offset to some degree by the use of quantity data in the remaining 60 percent (by value) of the machinery sample. These data often do not reflect improvements in the average quality of the product. In some machinery sectors, such as those for automobiles and weapons, the indexes probably contain little bias since they are based on highly disaggregated and nearly complete samples in which changes in assortment are reflected. In other machinery sectors, however, our indexes probably understate growth because for them we use more aggregated physical series that do not account for changes in product mix and quality improvements over time.<sup>16</sup> To the extent

**Table 6***Average annual growth in percent***Alternative Measures of Growth of Soviet Machinery Output, 1961-85**

	CIA <sup>a</sup>	Treml <sup>b</sup>	Selyunin and Khanin <sup>c</sup>	Val'tukh and Lavrovskiy <sup>d</sup>	Official Soviet <sup>e</sup>
1961-65	7.0	NA	8.7	10.7	12.4
1966-70	7.1	6.3	5.5	5.9	11.8
1971-75	6.6	4.5	5.1-6.2	4.7	11.6
1976-80	3.7	2.3	2.0-3.1	1.2	8.2
1981-85	1.3	NA	0.2-1.2	NA	6.2
<b>1961-85</b>	<b>5.1</b>	<b>NA</b>	<b>4.3-4.9</b>	<b>NA</b>	<b>9.4</b>
<b>1966-80</b>	<b>5.8</b>	<b>4.4</b>	<b>4.2-4.9</b>	<b>3.9</b>	<b>10.5</b>

<sup>a</sup> Growth of total machinery, calculated from indexes of gross output by subbranch, weighted by value added in 1982 prices.

<sup>b</sup> Growth of civilian machinery, calculated from indexes of gross output by subbranch, weighted by gross output in 1982 prices. See Vladimir G. Treml, "Weighted Aggregate Price Index for Soviet Machinery (1965-82)," manuscript (1986), p. 12.

<sup>c</sup> Growth calculated by dividing official index of total machinery output by Selyunin and Khanin's index of disguised inflation, presumably for total machinery. See Vasilij Selyunin and Grigoriy Khanin, "Lukavaya tsifra," *Novyy mir* (February 1987): pp. 187, 194.

<sup>d</sup> Presumably, growth of civilian machinery. See K. K. Val'tukh and B. L. Lavrovskiy, "Proizvodstvennyy apparat strany: ispol'zovaniye i rekonstruktsiya," *Ekonomika i organizatsiya promyshlennogo proizvodstva* (February 1986): p. 29.

<sup>e</sup> Calculated from indexes given in various issues of *Narodnoye khozyaystvo SSSR*.

this is true, any upward bias due to hidden inflation caused by using value series is at least partially offset. As for the rest of industry, there probably is little or no bias in the production data for the basic-materials branches and fuel branches—except possibly coal and gas where caloric content per unit has declined—because product characteristics tend to be stable. (For coal and gas we use reported production in standard fuel units rather than in tons.) Biases in either direction could be present in the remaining industrial-branch indexes, but they probably are small.

Downward bias in our indexes of the growth of Soviet services might also offset at least some of the upward bias resulting from the use of inflated ruble data in other indexes. In a recent Ph.D. dissertation, Mark Prell maintains that our reliance on physical quantity data to estimate the growth of housing construction and on labor inputs to estimate the growth of several other services results in underestimation because these data fail to reflect improvements in quality or labor productivity.<sup>17</sup> Similarly, Michael Boretsky, after applying our estimating procedures to US and

West German data and obtaining results that showed lower growth than officially reported for several services, maintained that we underestimate the growth of Soviet services as well.<sup>18</sup> We have acknowledged that our estimates of the growth of some Soviet services are understated<sup>19</sup> but do not believe the degree of bias is as great as Prell and Boretsky claim.

#### Use of Quantity Data

Another possible source of error in CIA estimates is that Soviet industrial and agricultural production data in physical units may be bogus. This issue has been raised recently by Prof. Richard Ericson of Columbia University, who—after reviewing the arguments made by critics of official Soviet statistics—asserts that physical data "have become increasingly subject to fabrication and falsification." According to an unidentified source cited by Ericson, Soviet authorities estimate that 1.5 to 3 percent of reported physical output is fictitious.<sup>20</sup>

**Quantity Data Probably Reliable.** We first consider the general reliability of quantity data. A considerable body of research conducted over a number of years by Western and Soviet experts suggests that disaggregated Soviet data in physical units provide a generally reliable measure of reality:

- A comprehensive study of Soviet physical output statistics in the industrial sector in the 1950s by Gregory Grossman found that such data “generally meet certain rough tests of internal and external consistency wherever such tests are possible and have been tried.” According to Grossman, distortion in the data is kept well in check by the interests of customers, the difficulties of concealing large inventory shortages, controls over the distribution of products and the allocation of inputs, the attention of authorities to this key segment of the economy, and possibly severe penalties.<sup>21</sup>
- A study of Soviet statistics by Stephen Shenfield of the Center for Russian and East European Studies, University of Birmingham, United Kingdom, based on interviews with former Soviet statistical personnel, concluded, “The scope for statistical overreporting (*pripiski*) varies appreciably from field to field . . . but appears usually to be relatively modest.”<sup>22</sup>
- Using information from the Soviet Interview Project, Prof. Susan J. Linz of Michigan State University recently analyzed report falsification by managers in the USSR. In the study, managers describe such practices as relatively inconsequential: “Factories always keep a 1-percent margin” because “nobody complains about small errors.” But, these managers said, “Falsifications on a grand scale are dangerous.” Specifically, according to the managers, “The director would be fired,” “expelled from the Party,” or “taken to prison as well.”<sup>23</sup>

**Changes in the Extent of Cheating Are Key.** It is necessary to bear in mind that, even if production levels are exaggerated (or underreported), estimates of growth based on these levels will remain accurate if the extent and direction of misreporting do not change over time.<sup>24</sup> The key question, therefore, is whether the degree of cheating has changed, particularly in

recent years. Anders Aslund argues in a recent paper that such fraud “is likely to increase from year to year” and to be more frequent “when a national campaign is waged, and personnel shaken out on an almost national scale, as is the present case.”<sup>25</sup> A more convincing argument can be made, however, that fraud and cheating have not increased in recent years. The increased emphasis given to the discipline and anticorruption campaign by Gorbachev, for instance, together with the creation of a new quality control system in civilian industry and the call for better and more rigorous statistical procedures, could be discouraging the kind of cheating that makes its way into Soviet economic reporting. And, while counterarguments may be made with regard to the Brezhnev years, when corruption was reportedly rampant, even such critics of official statistics as Selyunin and Khanin have relied on physical production data in constructing their estimates of growth for that period. Indeed, Selyunin and Khanin, while arguing that overreporting has affected some physical measures published by the Soviet authorities, explicitly note that useful estimates can be constructed on the basis of such data.<sup>26</sup>

**The Problem of Waste and Losses.** Even if official data on the physical quantities of goods produced are not falsified, however, our indexes of production can overstate the GNP available for final end use (other than inventory change) if substantial losses occur between production of the goods and their delivery to consumers. In agriculture, for example, we adjust the official Soviet data on production of grain and sunflower seeds to account for the waste that occurs at harvest time. But our sector-of-origin indexes do not further discount the official data to account for the reportedly large losses that occur in transporting and storing the harvest. Rather, these indexes are designed to measure the growth in production, not final disposition of what is produced.

From an accounting standpoint, such losses should be reflected on the end-use side in the GNP residual—the difference between total GNP and those portions allocated to investment, consumption, defense, and other end uses that we explicitly estimate. Indeed, the

residual should also account, in theory, for the build-up of inventories of goods unwanted by consumers—another problem about which critics of official Soviet statistics have had a great deal to say. In practice, however, the degree to which losses and inventory change are captured in the residual is limited by the accuracy of the estimates of growth in major end uses, which is discussed in the following section.

### **Estimating the Allocation of GNP**

In contrast to its estimates of the growth of the major producing sectors, CIA's estimates of the growth of investment and consumption rely more heavily on officially published growth measures in ruble terms and official indexes of prices. As a result, the inflationary biases of the Soviet data may affect these estimates to a greater extent. If so, the estimated growth of the end-use residual—which includes net exports, inventory change (including postproduction waste), and a portion of defense expenditures—is understated. The estimated growth of total defense outlays, however, would be unaffected by a change in the residual's growth because it is calculated separately. Moreover, as with the estimates of growth on the sector-of-origin side, there is reason to believe that at least some of the inflationary bias in the estimates of the growth of some end uses is offset by likely underestimation elsewhere.

**Possible Overstatement of Investment Growth.** CIA's estimates of the growth in new fixed investment are the sum of separately calculated indexes for construction and for machinery and equipment. The index of the construction component is based on physical inputs of materials. The index of investment in machinery and equipment, however, is based on officially published data that are said to be in constant prices but are widely believed to have been improperly deflated (see inset).

Because the components of the estimated index of growth in new fixed investment are based on different types of data, their likely biases differ. Our measure of the construction component of investment (which is about 60 percent of total new investment in 1982 and is based on material inputs measured in physical units) would understate growth if there were improvements in the quality of those materials or a decline in

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### ***Inflation in the Soviet Index of Investment***

*Long before the advent of glasnost, Soviet economists alleged, directly or by implication, that officially published investment data were biased upward.<sup>a</sup> A sizable body of recent Western literature also addresses this issue, focusing mainly on investment in machinery and equipment.<sup>b</sup> Western scholars generally agree that some inflation is present in the officially published investment data, but estimates of its size differ greatly. Abram Bergson's analysis puts the likely upward bias (if any) in investment data at perhaps "a fraction of a percentage point" annually during 1976-80. He concludes that the construction component of investment probably contains little or no inflation and states, "It would . . . be surprising if the resultant overstatement overall in annual producers' durables investment growth was more than 1 percentage point for 1971-75 and 3 percentage points for 1976-80."<sup>c</sup>*

*But other Western scholars estimate that the rates of inflation are significantly higher, and the issue remains unresolved. Peter Wiles, for example, estimates that during 1966-76 "Inputs into investment grew about 3 percent per annum less rapidly than whatever rate is indicated by the current money values . . . as officially deflated."<sup>d</sup>*

<sup>a</sup> See the references provided by Vladimir Kontorovich and Boris Rumer, *Inflation in the Soviet Investment Complex* (Princeton Junction, N.J.: Command Economies Research, Inc., May 1988).

<sup>b</sup> The Western articles include: Abram Bergson, "On Soviet Real Investment Growth," *Soviet Studies* (July 1987): pp. 406-424; Stanley H. Cohn, "Response to Alec Nove," *Soviet Studies* (April 1981): pp. 296-299; Philip Hanson, "The CIA, the TsSU and the Real Growth of Soviet Investment," *Soviet Studies* (October 1984): pp. 571-581; Hanson, "Soviet Real Investment Growth: A Reply to Bergson," *Soviet Studies* (July 1987): pp. 425-430; Alec Nove, "A Note on Growth, Investment and Price Indices," *Soviet Studies* (January 1981): pp. 142-145; Nove, "Reply to Stanley H. Cohn," *Soviet Studies* (April 1981): pp. 296-299; Nove, "Has Soviet Growth Ceased?" *Manchester Statistical Society Bulletin* (15 November 1983); Nove, "Soviet Real Investment Growth: Are Investment Volumes Overstated? A Reply to Bergson," *Soviet Studies* (July 1987): pp. 431-433; and Peter Wiles, "Soviet Consumption and Investment Prices and the Meaningfulness of Real Investment," *Soviet Studies* (April 1982): pp. 289-295.

<sup>c</sup> Bergson, "On Soviet Real Investment Growth," p. 420.

<sup>d</sup> Wiles, "Soviet Consumption and Investment Prices and the Meaningfulness of Real Investment," p. 292.

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the material-intensiveness of construction. Our index of construction increases somewhat more slowly than the comparable Soviet measure—5.6 percent per year versus 6.9 percent during 1951-87. If we are substantially overstating the growth of that component, the growth in the physical production of the relevant materials is equally overstated. But, as the works of Grossman, Shenfield, and Linz suggest, the trends in Soviet data expressed in physical units do not seem to be overstated.

CIA measures of the machinery and equipment component—nearly 40 percent of total new investment—would overstate real growth to the extent that the official values that underlie our estimates are not fully corrected for price changes. Inflation could come either from failure to fully deflate the values of domestic production of investment goods or from failure to allow for price increases of imported equipment, or both. Until now, the CIA has considered the official data on the machinery component of investment acceptable because their growth, excluding imports, matches fairly closely the growth of the index of production of producer durables (excluding exports), which is calculated independently by CIA.<sup>27</sup> The respective average annual growth rates are 7.7 percent and 7.9 percent for the period 1951-87. Thus, if there is substantial inflation in domestically produced machinery, both our producer durables production index and our investment index are also overstated. If this is so, however, we believe they probably are not overstated by much.

Inflation could also be present in the official machinery investment data if the Soviet state statistical authorities record imported machinery in current prices. Soviet imports of machinery have increased rapidly and have become a large share of total machinery investment—probably more than one-fourth in 1986 if imports are recorded at their ruble cost. During 1971-80, for example, the volume of machinery imports rose by 128 percent and their prices by 77 percent, according to calculations from data published by a Soviet economist.<sup>28</sup> We do not know what methodology the statistical authorities use. If, however, they did not correct for increases in prices of imported machinery during the 1970s, average

annual growth of investment in machinery could be overstated by 1 percentage point or more on this account alone.

On balance, then, we judge that our estimates of investment are probably biased upward by some amount. Inflation in imported machinery prices is probably a partial reason, and some overstatement may be caused by the use of data on the annual growth of the machinery and equipment portion of new fixed investment reported by Soviet statistical authorities.

#### *Possible Overstatement of Consumption Growth.*

CIA's index of the growth of consumption, as noted above, consistently shows markedly smaller real gains than does the corresponding Soviet measure.<sup>29</sup> For 1951-87, the average annual rates of growth given by the two measures (per capita) are 2.9 percent and 4.5 percent, respectively. Nonetheless, as was the case with investment, our estimates of consumption growth contain some error because of inflation that cannot be accounted for and a failure to allow for improvements in the quality of consumer services.

Although CIA's measure of consumption growth is not obtained by deflating current-price values by an estimated consumer price index, we calculate a so-called alternative retail price index. It is based on a comparison of the growth of the published current values of retail purchases with their growth as measured in constant 1982 prices by our index of consumption of goods.<sup>30</sup> This index shows an average annual rate of price inflation of 1.5 percent during 1961-87 (a total increase of 51 percent); the official Soviet retail price index shows 0.3 percent annual inflation (a total of 8 percent).

CIA's alternative consumer price index, however, does not indicate that the rate of inflation has been as high as some recent Soviet studies suggest. A study by the USSR Price Committee and Ministry of Trade, for example, found that the average level of retail prices rose by an average of 2.8 percent a year during 1971-83.<sup>31</sup> Moreover, Prof. Richard Ericson has maintained that "it seems generally believed (in the USSR) that

the price of a typical bundle of consumer goods has been rising 3 to 5 percent a year, at least over the past decade."<sup>32</sup>

Regardless of whether these claims are accurate, the CIA alternative index undoubtedly records lower rates of inflation than would be revealed by a Western-style consumer price index. The index cannot capture the price creep that results from the "washing out" of cheaper grades of goods, leaving the consumer with only expensive grades to buy. Moreover, the accuracy of the "alternative" index depends on the accuracy with which we have measured changes in real consumption of goods (food, soft goods, and durables).<sup>33</sup>

Our measures of food and beverage consumption, which are based almost entirely on quantity data adjusted for quality and mix when possible, are probably the most reliable. An alternative price index for food alone shows a greater price change than does the overall alternative index and far more than the official retail price index for food and beverages. It rises by 63 percent during 1961-87, while the official index increases by 22 percent.

Our measure for soft goods may overstate growth, however, because it relies on Soviet value series for production of clothing and a few retail sales indexes, both of which may be inflated. On the other hand, the measure also relies heavily on physical series, which may not properly reflect changes in quality and mix, and thus may understate growth.

For consumer durables, we rely on a measure of purchases in current prices deflated by an estimated official Soviet price index for similar goods. We do this because the quantity data needed for another approach, like that used for food and soft goods, are not available. The estimated official price index undoubtedly understates price change; there is as yet no good way to determine how much.

Our measures of the growth of services are subject to both overstatement and understatement. Growth of personal services probably is overstated because the index relies on Soviet-published value-of-sales data in constant prices; there are good reasons to be skeptical

of the reliability of those data. On the other hand, our measures for housing, health, and education probably understate growth because of insufficient allowance for improvement in quality.<sup>34</sup> The indexes for education and health as end uses, however, do reflect some improvements in quality by incorporating a measure of purchases of materials by these institutions.

### Some Sensitivity Testing

In an effort to assess the likely impact of these different biases in the data used in our indexes of growth on both the sector-of-origin and end-use sides, we did some sensitivity testing.

### Growth of Soviet GNP

To measure the likely understatement or overstatement of CIA's measure of growth of Soviet GNP by sector of origin, the following assumptions were made:

- In the industrial sector, the ferrous metals index was assumed to understate growth by as much as 1 percentage point a year because of failure to capture changes in the assortment and quality of steel products such as cold-rolled sheet and seamless pipes and tubes.
- For the machinery branch, we constructed an index that splits the difference between our current index and an index of civilian machinery production compiled by Prof. Vladimir Trembl of Duke University.<sup>35</sup> (Trembl's index is based entirely on samples reported in physical units for various machinery sectors, and his sample is highly aggregated. As a result, it probably provides a "rockbottom" estimate of the actual growth of machinery output.) The net effect of this change was a reduction in overall machinery growth by almost 1 percentage point a year.
- For the chemicals branch, a national average understatement of 1 percentage point per year for the aniline dye, rubber products, and three synthetics sectors was assumed; a 1-percentage-point overstatement was assumed for mineral chemicals, the single value series.

**Table 7** *Average annual growth in percent*  
**Alternative Estimates of Growth of Soviet GNP, by Sector of Origin, 1951-87<sup>a</sup>**

	Current CIA Estimate	Adjusted Estimate
<b>GNP</b>	<b>3.8</b>	<b>3.9</b>
Industry	5.5	5.3
Agriculture	1.6	1.6
Services	3.2	4.1
Other <sup>b</sup>	5.2	5.2

<sup>a</sup> In 1982 factor-cost prices.

<sup>b</sup> Construction, transportation, communications, trade, military personnel, and other branches.

- In the services sector, in line with Mark Prell's thesis that our estimates of growth are understated because we do not take quality gains into account, several adjustments were made.<sup>36</sup> CIA's and Prell's growth rates were averaged to obtain a substitute index for housing. For the rest of the services, Prell's estimates of growth of services were used instead of the CIA estimates.

The net effect of all the adjustments was a negligible increase in the growth of GNP (see table 7). The growth rates of industry and services—the sectors affected by the adjustments—changed somewhat more.<sup>37</sup>

#### Distribution of GNP by End Use

As with the sector-of-origin measures, a number of assumptions were made to test the sensitivity of CIA's estimates of GNP by end use to changes in the end-use indexes:

- The consumer durables index was adjusted to incorporate a rate of inflation of 1 percent per year, a rate equal to the difference between the growth of our index, which is based on deflated retail sales, and the growth of Trembl's sample of consumer durables, which is based on physical production.
- For the machinery and equipment component of investment, we adopted the same discount as that used to adjust the index of machinery's growth on the sector-of-origin side.

**Table 8** *Average annual growth in percent*  
**Alternative Estimates of Growth of Soviet GNP, by End Use, 1951-87<sup>a</sup>**

	Current CIA Estimate	Adjusted Estimate
<b>GNP</b>	<b>3.8</b>	<b>3.9</b>
Consumption	3.8	4.3
Consumer goods	3.7	3.6
Consumer services	4.0	5.0
Investment	7.0	6.8
New fixed investment	6.5	6.3
Capital repair	10.6	9.5
Defense <sup>b</sup>	2.7	2.7
Other government expenditures <sup>c</sup>	1.0	2.6
Residual <sup>d</sup>	... <sup>e</sup>	... <sup>f</sup>

<sup>a</sup> In 1982 factor-cost prices.

<sup>b</sup> The CIA estimate of defense expenditures does not rely on Soviet statistics and was assumed not to be biased.

<sup>c</sup> Administration, other services, and civilian research and development.

<sup>d</sup> Includes net exports, inventory change (including waste), losses, and statistical discrepancy.

<sup>e</sup> Declines from 9.2 billion rubles in 1950 to -17.3 billion rubles in 1987.

<sup>f</sup> Declines from 9.2 billion rubles in 1950 to -13.3 billion rubles in 1987.

- The discount for capital repair was carried over from the capital repair sector of machinery output.
- Adjusted indexes for end-use services were obtained by applying the factors used for adjusting the sector-of-origin services indexes.

The results of this exercise are presented in table 8. Rates of growth for GNP, of course, are the same as those in table 7 because the sector-of-origin estimates provide the control totals for GNP. The main differences between CIA's current estimate and the adjusted estimate are a somewhat slower growth for consumer goods in the adjusted estimate because of slower growth of consumer durables; substantially faster growth of consumer and government services; and slower growth of new fixed investment and capital repair.

**Table 9**  
**Distribution of Soviet GNP by End Use**  
**in 1987 Based on Alternative Estimates**  
**of Hidden Inflation<sup>a</sup>**

Percentage  
 shares

	Current CIA Estimate	Adjusted Estimate
<b>GNP</b>	<b>100.0</b>	<b>100.0</b>
Consumption	53.7	56.8
Consumer goods	35.0	32.2
Consumer services	18.6	24.6
Investment	29.6	24.4
New fixed investment	23.8	20.6
Capital repair	5.8	3.9
Defense	16.0	15.2
Other government expenditures <sup>b</sup>	3.2	5.3
Residual <sup>c</sup>	-2.4	-1.8

<sup>a</sup> In 1982 factor-cost prices.

<sup>b</sup> Administration, other services, and civilian research and development.

<sup>c</sup> Includes net exports, inventory change, and statistical discrepancy.

The effect of these adjustments is, however, far from negligible. Indeed, if these differential rates of inflation had prevailed over the period 1951-87, the distribution of GNP in 1987 would have been appreciably different from that in our current estimate. The composition of consumption and the investment share of GNP are markedly different, for instance (see table 9).

### Conclusions and Prospects

On balance, the *glasnost*-inspired criticisms of official Soviet statistics are generally reassuring with regard to the accuracy of CIA's estimates of overall Soviet economic growth. However, they also lend support to earlier indications that the estimates of growth in new fixed investment and the output of producer and consumer durables may require adjustment. Efforts to accomplish this as well as to improve the estimates of growth in civilian and military machinery and services, the treatment of foreign trade, and the coverage of activities from the "second economy" are currently in progress.

### New Official Data on GNP

*In mid-1988, the Soviet Government published for the first time a measure of the size and growth of the economy using the Western concept of GNP. (The narrower concept of national income produced excludes depreciation and most services.) The new data include a figure for GNP in 1987 (825 billion rubles) and indexes of its real growth during 1981-87.<sup>a</sup> The rates of growth reported for Soviet GNP show considerably better performance than does the narrower measure of national income traditionally used—an average annual growth of 3.9 percent, as compared with 3.5 percent during 1981-87. Like the traditional measures, the new official GNP growth rates are markedly higher than those estimated by the CIA. We estimate that average annual growth of GNP during 1981-87 was 1.9 percent.*

*The new Soviet measures suffer from the same faults as the traditional ones used to assess economic performance. Evidently, the state statistical authorities have used the official indexes of net material product to measure growth of that component of GNP (roughly 75 percent of the total). The rest of GNP—mostly services and depreciation—increases at a rate of about 5 percent annually during 1981-87; a roughly comparable CIA measure of that component increases at less than half that rate.*

<sup>a</sup> SSSR v tsifrakh v 1987 godu (USSR in Figures in 1987), p. 14.

In many instances, however, additional data from either official sources or the writings of Soviet critics will be required before such improvements can be made with confidence. *Glasnost* may result in the publication of such data, although to date the *glasnost*-inspired critics have, unfortunately, been more intent on exposing the unreliability of official

data than on providing well-documented and authoritative alternatives. Still, now that it has begun, the campaign of criticism will be difficult to halt because it clearly serves the current leadership's purpose of blackening the record of its predecessors. Therefore, the unofficial reassessment of Soviet economic history is likely to continue.

The need for alternative estimates of Soviet economic performance like those produced by CIA will continue as well, because, while critics debunk past official claims of growth, the Soviet Government continues to use them and has even further distorted the recent record. Its recent publication for the first time of Western-style estimates of GNP to supplement the traditional Marxian measure net material product is a case in point (see inset). The new official measures, like the old, imply growth rates substantially higher than those indicated by the CIA estimates, and the cause of the differences is likely to lie, in our view, in the deficiencies of the Soviet value data.

In the absence of reliable alternatives to Moscow's macroeconomic measures, US policymakers would have to accept the inconsistent and largely undocumented Soviet figures or refrain completely from assessing actual Soviet performance. Because assessing that performance is crucial to assessing the USSR's ability to raise living standards, provide for future growth, and maintain its heavy commitment of resources to defense, either course would be unwise.

## Notes

1. Vasilii Selyunin and Grigoriy Khanin, "Lukavaya tsifra" ("Cunning Figures"), *Novyy mir* (February 1987): pp. 181-201.
2. Prof. Abram Bergson was a pioneer in the construction of GNP accounts for the Soviet Union. His work was further developed by scholars at the Rand Corporation. The result of their efforts was a set of accounts for 1928, 1937, 1940, 1944, and 1948-66 in current and constant rubles, published in the 1950s and 1960s. A number of other scholars have also published estimates of Soviet GNP. For a survey of this voluminous literature, see Joint Economic Committee of Congress, *USSR: Measures of Economic Growth and Development, 1950-80* (Washington, DC: US Government Printing Office, 1982), pp. 11-12.
3. Al'bert L. Vaynshteyn, *Narodnyy dokhod Rossii i SSSR (The National Income of Russia and the USSR)* (Moscow: Nauka, 1969). See also Frederick G. Denton, "A Recent Soviet Study of Economic Growth, 1951-63," *Soviet Studies* (April 1968): pp. 501-509.
4. Ya. Kvasha and V. P. Krasovskiy, "Kapital'noye stroitel'stvo i problema vozmeshcheniya" ("Capital Construction and the Problem of Replacement"), *Voprosy ekonomiki*, No. 11 (1964): p. 12; Kvasha and Krasovskiy, "Kapital'noye stroitel'stvo i nakopleniye" ("Capital Construction and Accumulation"), *Voprosy ekonomiki*, No. 7 (1965): pp. 4-5; Kvasha and Krasovskiy, "Perspektivnoye planirovaniye i khozyaystvennyye izmereniya" ("Perspective Planning and Economic Measurements"), *Voprosy ekonomiki*, No. 4 (1968): p. 71; Krasovskiy, *Planirovaniye i analiz narodnokhozyaystvennoy struktury kapital'nykh vlozheniy (Planning and Analysis of the Economic Structure of Capital Investments)* (Moscow: Ekonomika, 1970), p. 242; and N. M. Mitrofanova, "Tendentsii dvizheniya kontraktnykh tsen v torgovle stran SEV" ("Trends in Contract Prices in CEMA Trade"), *Voprosy ekonomiki* (August 1978): pp. 101-106 (her calculations pertain to prices of exported machinery).
5. K. K. Val'tukh, "Investitsionnyy kompleks i intensifikatsiya proizvodstva" ("The Investment Complex and Intensification of Production"), *Ekonomika i organizatsiya promyshlennogo proizvodstva*, No. 3 (1982): pp. 4-31; V. K. Fal'tsman, "Narodnokhozyaystvennyy zakaz na novuyu tekhniku," ("The Economy's Order for New Equipment"), *Ekonomika i organizatsiya promyshlennogo proizvodstva*, No. 7 (1983): pp. 3-19; Fal'tsman and A. Kornev, "Reservy snizheniya kapitalo-yemkosti moshchnostey promyshlennosti" ("Potential for Reducing the Capital Intensity of Industrial Capacity"), *Voprosy ekonomiki*, No. 6 (1984): pp. 36-45; Val'tukh and B. L. Lavrovskiy, "Proizvodstvennyy apparat strany: ispol'zovaniye i rekonstruktsiya" ("Production Facilities of the Country: Their Use and Reconstruction"), *Ekonomika i organizatsiya promyshlennogo proizvodstva* (February 1986): pp. 17-32.
6. *Literaturnaya gazeta* (16 September 1987): p. 12.
7. Vladimir Kontorovich and Boris Rumer, *Inflation in the Soviet Investment Complex* (Princeton Junction, NJ: Command Economies Research, Inc., May 1988), p. i.
8. Economist Nikolay Shmelev has been especially vocal on this subject. For example, see his interview with a Hungarian correspondent as translated in Foreign Broadcast Information Service, *Daily Report* (SOV 88-112, 10 June 1988), p. 89; or his subsequent interview with a Bulgarian correspondent as translated in *Daily Report* (SOV 88-120, 22 June 1988), pp. 67-68.
9. CIA's methodology is explained and documented in Joint Economic Committee of Congress, *USSR: Measures of Economic Growth and Development, 1950-80*.

10. Western specialists have written many books and journal articles on the selection and refinement of estimating methods. An annotated bibliography of much of the literature is provided in the notes at the end of each chapter in Dan Usher, *The Measurement of Economic Growth* (New York: Columbia University Press, 1980).
11. In making this adjustment, we rely on the pioneering work done by Abram Bergson. See, for example, Bergson, *The Real National Income of Soviet Russia Since 1928* (Cambridge, Massachusetts: Harvard University Press, 1961).
12. For a discussion of CIA's methodology, see Joint Economic Committee of Congress, *Allocation of Resources in the Soviet Union and China—1983* (Washington, DC: US Government Printing Office, 1983), pp. 347-351.
13. Central Intelligence Agency, *The Impact of Gorbachev's Policies on Soviet Economic Statistics* (Directorate of Intelligence Conference Report SOV 88-10049, July 1988), pp. 2-3.
14. In addition to "Lukavaya tsifra" (see note 1), Khanin previously published several articles critical of official Soviet data. See, for example, "Alternativnyye otsenki rezul'tatov khozyaystvennoy deyatelnosti proizvodstvennykh yacheyek promyshlennosti" ("Alternative Estimates of the Results of the Economic Activity of Industrial Production Units"), *Izvestiya akademiy nauk, seriya ekonomicheskaya* (June 1981): pp. 62-71; and "Puti sovershenstvovaniya informatsionnogo obespecheniya svodnykh planovykh narodnokhozyaystvennykh raschetakh" ("Ways of Improving the Information Supply of Consolidated National Economic Plan Accounts"), *Izvestiya akademiy nauk, seriya ekonomicheskaya* (March 1984): pp. 58-67.
15. Fyodor Kushnirsky, "New Challenges to Soviet Official Statistics: A Methodological Survey," in Central Intelligence Agency, *The Impact of Gorbachev's Policies on Soviet Economic Statistics*, pp. 12-13, 15-16.
16. Construction and road machinery is a case in point. A study undertaken by the CIA using the so-called hedonic method analyzed the behavior of prices in this sector during 1960-73 to determine the extent to which increases were justified by improvements in product quality. Using this technique, the relative influence of the different physical characteristics in the determination of machinery prices can be judged by their respective regression coefficients. The results indicated that, although the increment in prices of new products often exceeded changes in quality, in most cases the technical characteristics proved to be statistically significant. In other words, for all of the types of construction machinery tested—scrapers, bulldozers, rollers, graders, and excavators—the research suggests that average quality improved over the period analyzed. More recently, Kushnirsky's research on the Soviet electrotechnical and automobile industries also concluded that the quality of products in these branches of machine building trended upward. Central Intelligence Agency, *An Analysis of the Behavior of Soviet Machinery Prices, 1960-73* (ER79-1063b, December 1979), and Kushnirsky, "New Challenges to Soviet Official Statistics," pp. 19-20.
17. Mark A. Prell, *The Role of the Service Sector in Soviet GNP and Productivity Estimates*, Ph.D. dissertation, Massachusetts Institute of Technology (1987). Prell's estimates of average annual growth are higher than ours for 1951-84 (by the percentage points shown) for housing (2.8), education (1.1), health (1.5), government (0.7), and municipal services (2.0). His estimate for the growth of science over the same period is 0.7 percentage point less than ours.
18. Michael Boretsky, "The Tenability of CIA Estimates of Soviet Economic Growth," *Journal of Comparative Economics* (December 1987): pp. 526-27, 532.
19. Joint Economic Committee of Congress, *USSR: Measures of Economic Growth and Development, 1950-80*, pp. 112-113, 344-345, 349.
20. Richard E. Ericson, "The Soviet Statistical Debate: Khanin vs. TsSU," paper presented at the Hoover Institution-Rand Corporation Conference on

the Defense Sector and the Soviet Economy, Stanford University (23-24 March 1988, revised May 1988), p. 10.

10. In another paper presented at the conference—"How Small Is the Soviet National Income?" (p. 12)—Anders Aslund writes that "according to some calculations of economists, fraud accounts for 5 to 25 percent of the production a year" in the "raw material producing sectors." He cites as the source Aleksey Sergeyev, "Prestige of the Honest Ruble," *Sovetskaya Rossiya* (18 March 1987): p. 1. But the instances of figure padding Sergeyev discusses do not include the overreporting of physical production. Instead, he discusses stealing of state resources, failure to report hours worked accurately, and—in general—"remuneration for work that has not been performed" and materials that have not been used in production.

21. Gregory Grossman, *Soviet Statistics on Physical Output of Industrial Commodities* (Princeton: Princeton University Press, 1960), pp. 123-134.

22. Stephen Shenfield, "State Statistical Work in the USSR: Findings from Interviews with Former Soviet Statistical Personnel," (Washington, DC: The National Council for Soviet and East European Research, April 1986), pp. 107-122.

23. Susan J. Linz, "Managerial Autonomy in Soviet Firms," *Soviet Studies* (April 1988): p. 187.

24. Alec Nove discusses the "law of equal cheating" in "The Pace of Soviet Economic Development," *Lloyd's Bank Review* (April 1956): p. 3.

25. Aslund, "How Small Is the Soviet National Income?" pp. 12-13.

26. Selyunin and Khanin, "Lukavaya tsifra," p. 200.

27. Joint Economic Committee of Congress, *USSR: Measures of Economic Growth and Development, 1950-80*, pp. 203-207.

28. V. Seltsovskiy, "Some Economic Statistical Methods of the USSR Foreign Trade Development Analysis in the Ninth and Tenth Five-Year Plan Periods," *Foreign Trade*, No. 5 (1982): pp. 37-42.

29. When assessing changes in living standards, CIA uses its indexes of components of consumption calculated in established (official) prices because they reflect the prices actually paid by consumers and institutions.

30. The derivation and an assessment of this index are given in Gertrude E. Schroeder and Barbara S. Severin, "Soviet Consumption and Income Policies in Perspective," in Joint Economic Committee of Congress, *Soviet Economy in a New Perspective* (Washington, DC: US Government Printing Office, 1976), p. 631.

31. V. Rutgayzer, Yu. Shevyakhov, and L. Zubova, "Sovershenstvovaniye sistemi planovikh pokazatelei dokhodov nasileniya" ("Perfecting the System of Planned Indicators of Income of the Population"), *Voprosy ekonomiki*, No. 1 (1988): p. 33.

32. Ericson, "The Soviet Statistical Debate: Khanin vs. TsSU," p. 4.

33. For a discussion of CIA's index, see Gertrude E. Schroeder and M. Elizabeth Denton, "An Index of Consumption in the USSR," in Joint Economic Committee of Congress, *USSR: Measures of Economic Growth and Development, 1950-80*, pp. 317-401.

34. Prell, as noted above, made a case for a substantial understatement of our indexes of these services. Even in the much maligned health sector, the educational qualifications of doctors and other employees have increased, and the quantity and quality of equipment available to each employee have risen substantially.

35. Vladimir G. Treml, "Weighted Aggregate Price Index for Soviet Machinery," unpublished paper (January 1986).

36. Prell, *The Role of the Service Sector in Soviet GNP and Productivity Estimates*.

37. For a full discussion of this exercise see James Noren, "The New Look at Soviet Statistics: Implications for CIA Measures of the USSR's Economic Growth," in Central Intelligence Agency, *The Impact of Gorbachev's Policies on Soviet Economic Statistics*, pp. 73-79.