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Economic Intelligence Report

COMPARISON OF THE NATIONAL PRODUCTS OF THE EUROPEAN SATELLITES

CIA/RR ER 63-36

November 1963

CENTRAL INTELLIGENCE AGENCY

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FOREWORD

Comparative estimates of gross national product (GNP), industrial production, agricultural production, and personal consumption in the European Satellites are presented in this report. Comparisons are made with West Germany, the US, the USSR, and other countries and groupings. The estimates of GNP for the European Satellites in US dollars supersede and differ somewhat from those previously published by this Office, although the methodology behind them is similar in most respects. Comparisons of levels of industrial production, agricultural production, and personal consumption are presented for the first time, with the exception of a preliminary calculation of industrial levels undertaken for the Joint Economic Committee of Congress.* The report summarizes the concepts and methods underlying the estimates without providing detailed supporting data or sources, which will be made available on request.

Except for comparisons involving GNP and industrial production in the USSR, the estimates in this report are wholly from unclassified sources.

* Joint Economic Committee, Congress of the US, Comparisons of the United States and Soviet Economies, Supplemental Statement on Costs and Benefits to the Soviet Union of Its Bloc and Pact System: Comparisons with the Western Alliance System, US Government Printing Office, Washington, D.C., 1960.

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COMPARISON OF THE NATIONAL PRODUCTS OF THE EUROPEAN SATELLITES*

Summary and Conclusions

The European Satellites,** although small individually, together represent a significant addition to the economic strength of the USSR. In 1961 the gross national product (GNP) of the Satellites as a group was approximately $79 billion,*** 36 percent as large as the Soviet GNP. The aggregate GNP of the Satellites, however, amounted to only 22 percent of that of the NATO allies of the US and is matched by the GNP of West Germany† or the UK alone. The Satellite with the largest GNP in 1961 was Poland, followed closely by East Germany and Czechoslovakia and (at a much lower level) by Rumania, Hungary, and Bulgaria, as shown in Figure 1†† and in Table 1.†††

On the average the Satellites have achieved a level of economic development somewhat lower than that of the USSR. The per capita GNP of the Satellites combined in 1961 was about 80 percent of the Soviet level, little more than one-half of the West German level, and about one-third of the US level. In degree of economic development the Satellites fall into three groups of countries, as shown in Figure 2†† and in Table 2.‡ Czechoslovakia and East Germany are at the top with per capita GNP's of about 85 percent and 75 percent, respectively, of the West German level. Poland and Hungary are in an intermediate position, about 45 to 50 percent of the West German level, and Rumania and Bulgaria are at about one-third of this level.‡‡

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* The estimates and conclusions in this report represent the best judgment of this Office as of 15 October 1963.

** The terms European Satellites and Satellites as used in this report include Bulgaria, Czechoslovakia, East Germany, Hungary, Poland, and Rumania. Albania is excluded unless otherwise indicated.

*** All dollar values in this report are given in terms of 1955 US dollars.

† The term West Germany as used in this report excludes the Saar and West Berlin.

†† Following p. 2.

††† Table 1 follows on p. 2.

‡ Table 2 follows on p. 3.

‡‡ Albania, with essentially a Middle Eastern economy, probably has a per capita GNP of no more than one-half of the Bulgarian level.

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Table 1

European Satellites and Selected Other Countries:
Gross National Product
1961

Country or Area	Billion 1955 US $
US	453.4
Other NATO countries, excluding the US	357.3
West Germany a/	81.3
USSR	222.0
European Satellites b/	79.2
Poland	20.7
East Germany	19.3
Czechoslovakia	17.7
Rumania	9.9
Hungary	7.5
Bulgaria	4.1

a. Excluding the Saar and West Berlin.
b. Excluding Albania.

Similar relationships among the Satellites also are found for per capita personal consumption, but these countries lag somewhat farther behind West Germany than in the case of per capita GNP, reflecting the Communist emphasis on investment and the large role of government activities in planned economies. The relative disparity between GNP and personal consumption is especially great in Czechoslovakia, which has by far the largest investment per capita in the Satellites and also has substantial armed forces.

The European Satellites are less industrialized than West Germany and are more oriented toward agriculture. As shown in Table 3,* all the European Satellites except East Germany are smaller relative to West Germany in industrial production than in GNP, while all are considerably larger in agricultural production than in GNP. In the aggregate, Satellite industrial production is less than 90 percent of that of West Germany, but Satellite agricultural production is 2.3 times that of West Germany. East Germany is the largest industrial producer among the Satellites but is followed closely by Poland

* Table 3 follows on p. 4.

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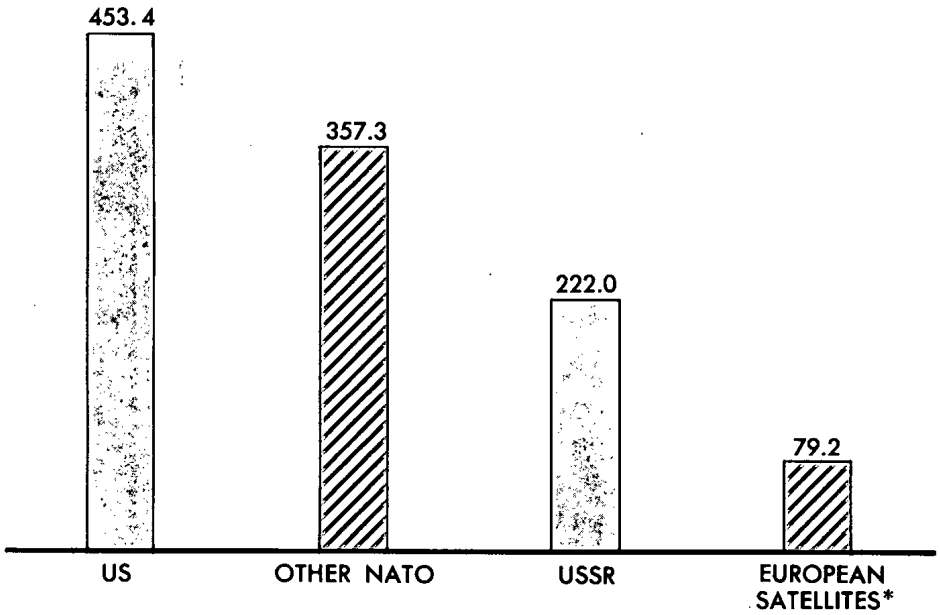
Figure 1 50X1

EUROPEAN SATELLITES AND OTHER SELECTED COUNTRIES
GROSS NATIONAL PRODUCT, 1961

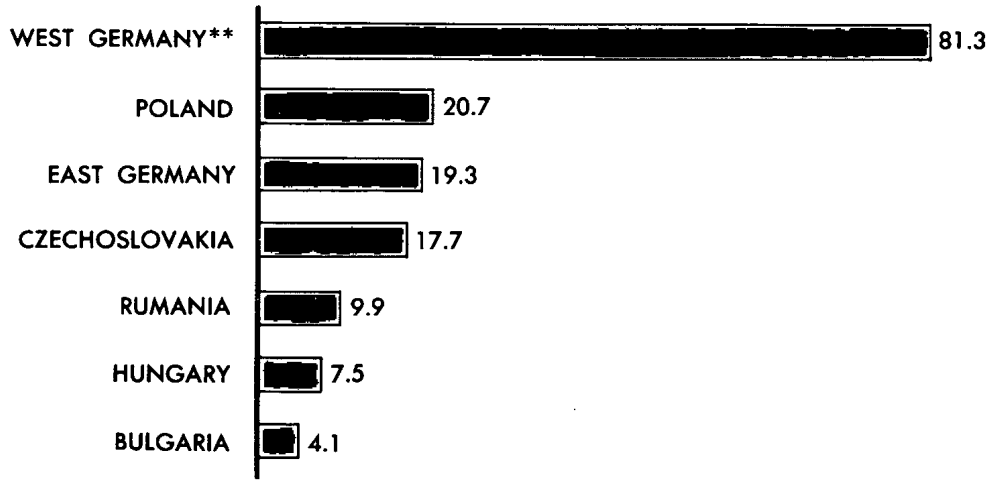
Billion 1955 US Dollars

Comparison of the European Satellites with the US, Other NATO Countries, and the USSR



*Excluding Albania

Comparison of the European Satellites with West Germany



**Excluding the Saar

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EUROPEAN SATELLITES AND OTHER SELECTED COUNTRIES

GROSS NATIONAL PRODUCT PER CAPITA AND PERSONAL CONSUMPTION PER CAPITA, 1961

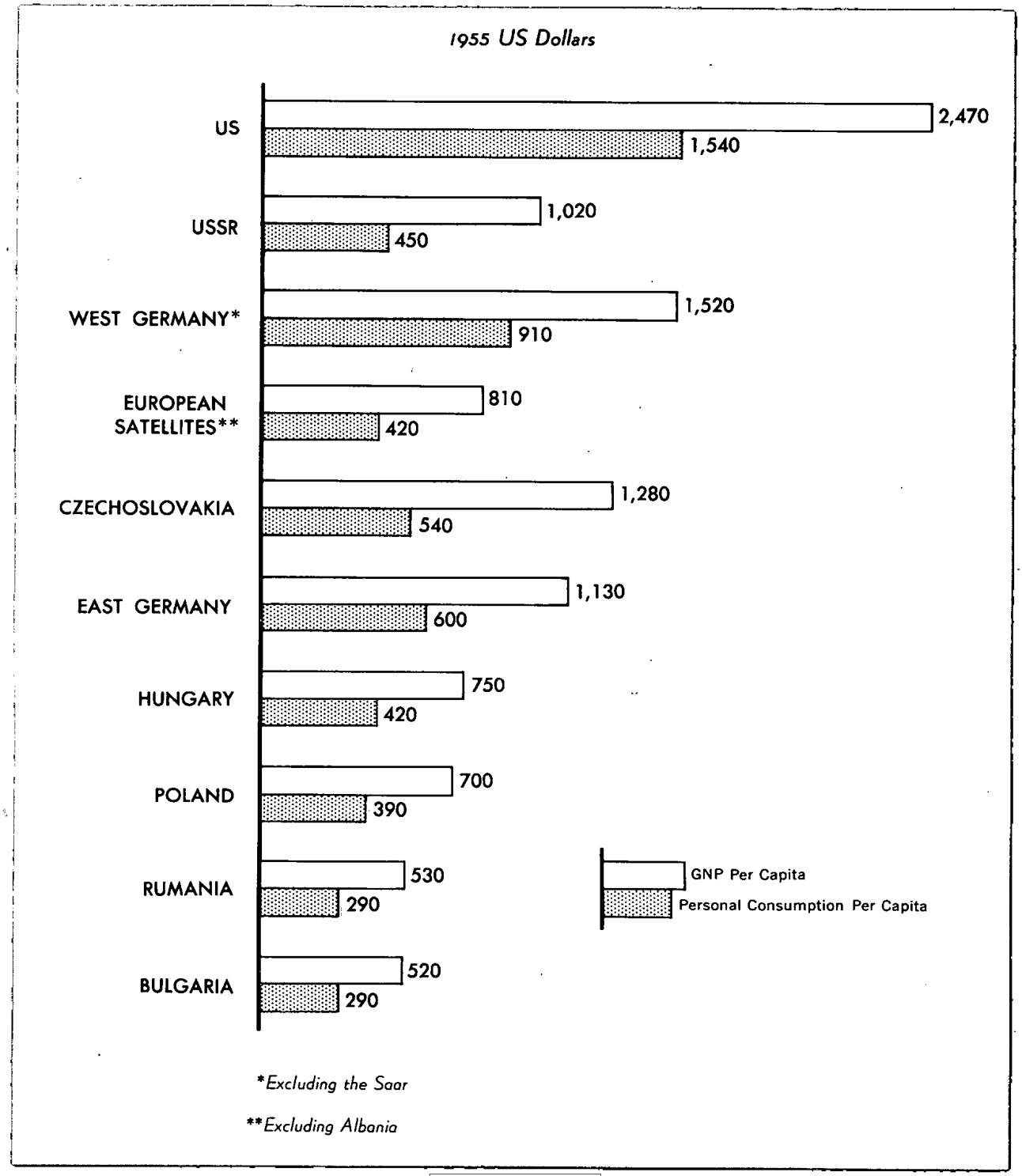

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Table 2

European Satellites and Selected Other Countries:
Gross National Product Per Capita
and Personal Consumption Per Capita a/
1961

1955 US $

Country or Area	Gross National Product Per Capita	Personal Consumption Per Capita
US	2,470	1,540
USSR	1,020	450
West Germany b/	1,520	910
European Satellites c/	810	420
Czechoslovakia	1,280	540
East Germany	1,130	600
Hungary	750	420
Poland	700	390
Rumania	530	290
Bulgaria	520	290

a. Based on midyear population. Personal consumption in West Germany and the European Satellites represents all expenditures for consumption from personal incomes. Personal consumption in the US and the USSR represents expenditures for consumption from personal incomes less those for educational and health purposes. Personal expenditures for education and health appear to have made up only about 1 percent of total personal expenditures in West Germany and less than 1 percent in the European Satellites (compared with about 8 percent in the US). Hence the comparison is not significantly affected by the difference in the treatment of education and health expenditures.
b. Excluding the Saar and West Berlin.
c. Excluding Albania.

and Czechoslovakia. Poland is by far the largest agricultural producer of the area, with Rumania taking second place.

The European Satellite regimes have set as one of their long-term goals the surpassing of the income and output levels in the advanced countries of Western Europe. To date, however, there has been little progress toward this objective. Since 1950, aggregate Satellite GNP has increased at about the same rate as the combined GNP of the Common Market countries and that of the European NATO countries, as

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Table 3

European Satellites and West Germany:
Comparisons of Gross National Product, Industrial Production, and Agricultural Production
1961

West Germany = 100

Country or Area	Gross National Product	Industrial Production	Agricultural Production a/
European Satellites b/	97	89	231
Poland	25	23	84
East Germany	24	24	29
Czechoslovakia	22	21	32
Rumania	12	11	45
Hungary	9	7	23
Bulgaria	5	3	18

a. Value added in agriculture.
b. Excluding Albania.

is shown in Table 4.* Over-all Satellite growth was slower than that of West Germany but faster than that of the US and the UK. In industrial production the European Satellites have gained, at least slightly, on Western groupings and have lost only a little ground to West Germany since 1950.

* Table 4 follows on p. 5.

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Table 4

European Satellites and Selected Other Countries:
Comparisons of Gross National Product and Industrial Production
1950, 1955, and 1961

Percent

European Satellites a/ as a Percent of:	Gross National Product			Industrial Production		
	1950	1955	1961	1950	1955	1961
US	14	15	17	10	12	18
UK	75	89	102	53	68	96
West Germany b/	118	102	97	95	81	89
Common Market countries c/	37	37	36	35	35	38
European NATO countries	23	24	24	20	22	26
Total NATO	8	9	10	6	8	10
USSR	40	39	36	N.A.	N.A.	N.A.
Soviet Bloc d/	28	28	26	29	28	28

a. Excluding Albania.
b. Excluding the Saar and West Berlin.
c. Including France, West Germany, Italy, Belgium, Luxembourg, and the Netherlands.
d. Including the USSR and the European Satellites and excluding Albania.

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I. Concepts

The comparisons in this report, like all international comparisons of economic aggregates, are imprecise and ambiguous. Standard practice in comparing any economic aggregate between a pair of countries is to value the quantities of goods and services produced (or used) in each of them in the prices of the other. The two resulting sets of comparisons can be expected to differ widely. The reason for the differences is that relative quantities of goods and services produced (or used), as well as the relative prices of these goods and services, vary considerably among countries. In general, the comparison is more favorable to a country when the aggregate being compared is valued in the prices of the other country. The reason is that countries tend to specialize in goods for which their resources are particularly suited and which therefore are relatively cheap. For example, if personal consumption in West Germany is being compared with that in Italy, the calculation in marks will tend to give results more favorable to Italy than the calculation in lira because products such as wine and olive oil, which are more important in Italian consumption than in West German consumption, have higher prices in marks than in lira relative to other goods that serve generally similar purposes (such as beer and butter). In other words, wine and olive oil are given heavier weight under the West German system of prices. The difference between the two valuations is, of course, greater the more different the economies -- that is, the greater the difference in degree of industrialization and in climatic and other natural conditions.

Because of the differences actually found in relative quantities and prices between countries, the two measures described above can be so far apart that almost any crude estimate of relative size would fall between them. To obtain a single measure, it is customary to calculate the geometric mean of the measures in the two currencies, but the choice of any such intermediate measure is essentially arbitrary. Nevertheless, intermediate (that is, compromise) solutions can be useful, and in practice it is also necessary to compromise at other stages in the calculations. In calculating price ratios, for example, products that are not strictly identical in the two countries unavoidably must be assumed to be equivalent in some instances. The practice has the effect of narrowing the range of valuations obtained by the two different pricing methods.

The complexity of the problem of international comparisons and the ambiguity of the results increase with the number of countries being compared. Proper methodology demands that the economic

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aggregates in each country be valued in the prices of all the other countries. This task is too laborious, however, when a large number of countries are involved. For example, if 10 countries were being compared, there would have to be 9 conversions per country, or 90 conversions in all.

The imprecision and ambiguity of all international comparisons of economic aggregates should be kept in mind whenever such comparisons are used. Thus only the broadest and most qualified conclusions -- for example, on relative economic strength or consumer welfare -- can be drawn from such comparisons. Because of the large number of countries being compared and the incompleteness of the data, this caution applies with full force to the present estimates. A particular effort was made, however, to bring all available information to bear in the comparisons so as to increase the chances of obtaining reasonable results. Where possible, more than one method was used for obtaining comparisons of the main aggregates. The results are believed to be reliable for making the kinds of generalizations presented in the previous section -- for example, no amount of refinement would be likely to change the ranking of the three groups of Satellites in per capita production and consumption. The particular estimates are subject to a wide margin of error, however, and a great deal of care must be exercised in determining their appropriateness for any particular purpose.

II. General Methodology

The comparisons used in this report involved several steps: (1) a comparison of the European Satellites with West Germany in 1955; (2) a comparison of West Germany with other countries and areas in 1955, and, by linking, of these countries and areas with the European Satellites; and (3) an updating of the comparisons by means of indexes of volume for the relevant aggregates. (The calculation of the indexes for the European Satellites will be described in a report now in preparation. The indexes for Western countries are from official sources.)

1. The comparison of the Satellites with West Germany in 1955 was made for GNP, personal consumption, industrial production, and agricultural production. For some of the Satellites, comparisons were also made of investment and government purchases of goods and services, but the individual estimates of these categories were not considered to be reliable enough for any use other than the calculation of GNP. West Germany was selected as the base for comparison because of its considerable similarities with the northern Satellites in regard to economic structure. To compare the Satellites with West Germany in 1955, Satellite aggregates were first calculated in marks,*

* The term mark as used in this report refers to West German marks (Deutsche Mark).

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and then the original mark calculations were adjusted to account for differences in relative prices between the Satellites and West Germany.

The calculations in marks are the heart of the present comparisons. They entailed two principal methods: (1) the conversion of Satellite values into marks by means of price ratios and (2) the calculation of quantity indexes relating Satellite aggregates to those in West Germany.

Method (1) -- the value conversion method -- was used for comparisons of GNP and its main end-use components (personal consumption, government expenditures, and gross investment) in Poland, Czechoslovakia, and Hungary with West Germany. Method (2) -- the quantity index method -- was used for comparisons of personal consumption, industrial production, and agricultural production in each of the Satellites (except Albania) with West Germany. The quantity index method was used both as a check on the value conversion method and as a supplement to it -- that is, to extend the comparisons to a larger number of countries and to provide comparisons that could not be obtained through the other method. Estimates based on these two methods were supplemented by independent estimates from other sources.* The results of all these calculations for 1955 and the independent estimates are shown in Table 5.**

In general, preference was given to the value conversion method over the quantity index method. There are two reasons for this preference. First, variations in relative prices among products within given categories in international comparisons probably tend to be smaller than variations in relative quantities, so that price indexes of passable quality can be calculated from a much narrower sample of items than would be needed for an adequate quantity index. Second, because a narrower sample can be used in a price index, the items selected can be defined much more precisely in regard to quality and other special characteristics than would be possible in a quantity index. For example, an appropriate price index for the category "wool fabrics" was obtained from one or two narrowly defined items which were taken to be representative of the entire category, but the quantity index had to be calculated from a series on total wool fabrics. The latter comparison would be expected to overstate the relative size of production in the country with the simplest or lowest quality mix of wool fabrics. This expectation was consistent with the findings in the case of***

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** Table 5 follows on p. 10.
*** Text continued on p. 12.

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Table 5

European Satellites and West Germany:
Comparisons of National Products, Selected End uses, and Sectors of Origin
1955

West Germany = 100

	Czecho-slovakia	East Germany	Hungary	Poland	Rumania	Bulgaria	European Satellites a/*
Calculated indexes							
Personal consumption							
Quantity index b/	23.3	29.4	12.9	36.7	18.9	7.3	128.5
Value conversion c/	19.8		11.5	29.4			
Gross investment (value conversion) c/	23.1		9.3	23.9			
Government purchases (value conversion) c/	40.9		16.4	41.0			
GNP (value conversion) c/	23.6		11.6	29.4			
Industrial production d/	19.1	25.7	7.7	23.3	8.8	2.9	87.5
Agricultural production e/	37.2	38.4	29.2	77.2	52.5	21.2	255.7
Industrial and agricultural production f/	22.2	27.8	11.3	32.4	16.2	6.0	115.9
Additional estimates							
Personal consumption		26.1 g/		23.5 to 32.5 h/			
Gross investment		19.2 g/					

* Footnotes for Table 5 follow on p. 11.

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Table 5
(Continued)

West Germany = 100

	Czecho-slovakia	East Germany	Hungary	Poland	Rumania	Bulgaria	European Satellites a/
Additional estimates (Continued)							
Government purchases		43.5 g/					
GNP		26.9 g/					
Industrial production		26.1 g/					
Agricultural production		36.1 g/					
Industrial and agricultural production		27.8 g/					

a. Excluding Albania.
b. From Table 8, multiplied by population (see Appendix A, p. 20, below).
c. West German values from official sources; Satellite values in West German marks from Table 7, Appendix A, p. 18, below.
d. From Table 9, Appendix A, p. 22, below.
e. Value added in agriculture (see Appendix A, p. 19, below).
f. Indexes of industrial production and agricultural production weighted by value added in West Germany.
g. Estimates by this Office in 1936 marks.
h. Range of estimates given by price ratios calculated by the Polish Central Statistical Office (Glowny Urzad Statystyczny -- GUS) (see Appendix A, p. 23, below).

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personal consumption, where both a value conversion and a quantity index could be calculated. The Satellites were uniformly larger compared with West Germany in the quantity indexes of consumption than in the value conversions.

Thus there is every indication that the quantity index comparison considerably overstates consumption in the Satellites relative to that of West Germany because of an inadequate sample, including lack of adjustment for differences in quality. On the other hand, the value conversion estimate of personal consumption was based on value data that are believed to be generally reliable and from a considerable amount of information on prices.

The estimates of investment and government expenditures that are obtained by the value conversion method are considerably less reliable than those for personal consumption because of the crude nature of the price comparisons made for these components.

Among the quantity indexes, the most reliable undoubtedly is that for agricultural production because of the large size of the sample and the fact that the lack of adjustments for quality differences is unlikely to be a source of very large errors in the aggregate. The quantity index of personal consumption undoubtedly is the worst, for reasons mentioned above. The index of industrial production suffers from some of the same weaknesses as the quantity index of personal consumption, but to a far lesser degree, because part of the sample could be adjusted for quality differences and the most difficult area -- metalworking -- was compared by the value conversion method.

Although it was sometimes necessary to use a mixed set of weights, Satellite quantity weights generally were used in the price indexes and West German price weights were used in the quantity indexes. Formally a quantity index with West German price weights is equivalent to an index obtained by means of a price conversion with Satellite quantity weights. For reasons given earlier, the resulting estimates in marks almost certainly favor the Satellites. If parallel estimates could have been made by converting West German magnitudes into the respective Satellite currencies, these would have favored West Germany. However, such parallel estimates could not be calculated. It was necessary, therefore, to approximate a reasonable middle ground by rule of thumb.

The final estimates in marks for 1955 are intended to approximate the results that might be obtained by an average of estimates with Satellite weights and West German weights. In arriving

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at these estimates it was necessary to choose between alternative measures of various aggregates, to link series obtained by one method with series obtained by another method, and to adjust the original estimates in marks to account for differences in weighting systems. The original estimates in marks (shown in Table 5*) were lowered by factors of 5 to 10 percent varying from country to country and aggregate to aggregate, the largest adjustments being made for the least developed countries.

2. To compare the Satellites with countries and areas other than West Germany, estimates of Satellite GNP and personal consumption were converted from marks to US dollars, and estimates of Satellite industrial production relative to West Germany were linked to estimates of West German industrial production relative to other countries.

Mark estimates of GNP and personal consumption were converted to 1955 US dollars by means of mark/dollar price ratios given in a thorough study of relative purchasing power done for the Organization for European Economic Cooperation (OEEC).** This study presents price ratios for several Western European countries with both US and European quantity weights and also gives the geometric mean of these ratios. The geometric mean of the two sets of mark/dollar ratios was used for the present purpose. The dollar values of Satellite GNP and personal consumption, then, are compromise figures involving rough judgments and a mixture of weights. These compromise figures may differ significantly from the figures that might be obtained by taking the mean of the results of direct comparisons between the Satellites and the US. Table 6*** summarizes the final estimates for 1955 in terms of relatives, marks, and US dollars. The derivation of the final estimates is explained in Appendix A.†

In the case of industrial production, the estimates were kept in the form of relatives -- that is, in terms of indexes, not dollar values. The indexes relating the Satellites to West Germany were linked to indexes relating West Germany to the other Organization for Economic Cooperation and Development (OECD) countries. The latter set of relatives is the set of weights used by the OECD to calculate the combined index of industrial production of the member countries. These weights are estimates based on comparisons of consumption of some industrial materials, industrial employment, and value added in industry converted into a common currency at both official exchange rates and the purchasing power exchange rates calculated by the OEEC.

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* P. 10, above.

** Milton Gilbert and Associates, Comparative National Products and Price Levels, Paris, OEEC, 1958.

*** Table 6 follows on p. 14.

† P. 17, below.

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Table 6

European Satellites and West Germany:
Final Estimates of National Products, Selected End Uses, and Sectors of Origin
1955

	West Germany	Czechoslovakia	East Germany	Hungary	Poland	Rumania	Bulgaria	European Satellites a/
Indexes: West Germany = 100								
Personal consumption	100	18.9	24.9	10.4	26.7	13.7	5.3	99.9
Gross investment	100	23.1	19.2	9.3	23.9			
Government purchases	100	40.9	43.5	16.4	41.0			
GNP	100	21.4	25.6	10.5	26.8	13.4	5.0	102.7
Industrial production	100	18.2	24.5	7.0	21.2	8.0	2.6	81.5
Agricultural production	100	37.2	38.4	29.2	77.2	52.5	21.2	255.7
Billion 1955 West German marks								
Personal consumption	102.4	19.3	25.5	10.6	27.3	14.0	5.4	102.1
GNP	175.6	37.6	44.9	18.4	47.1	23.5	8.8	180.3
Billion 1955 US $								
Personal consumption	32.9	6.2	8.2	3.4	8.8	4.5	1.7	32.8
GNP	57.6	12.3	14.7	6.0	15.4	7.7	2.9	59.0
Per capita: 1955 US $								
Personal consumption	669	473	457	347	323	260	224	353
GNP	1,171	939	821	612	564	444	383	636
Per capita indexes: West Germany = 100								
Personal consumption	100	71	68	52	48	39	33	53
GNP	100	80	70	52	48	38	33	54

a. Excluding Albania.

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The above weights show a relationship between the US and the UK that is fully consistent with the findings of another thorough OEEC study* -- the only one of its kind for comparisons by sector of origin.

* Deborah Paige and Gottfried Bombach, A Comparison of National Output and Productivity of the United Kingdom and the United States, Paris, OEEC, 1959.

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APPENDIX A

DESCRIPTION OF PARTICULAR METHODS

1. Value Conversions

GNP and its main end-use components in Poland, Czechoslovakia, and Hungary were converted into marks by applying calculated price indexes to values in the national currencies. The calculation is summarized in Table 7.* The value at domestic market prices of GNP and its components in these three countries for the year 1955 was made available by Thad Alton and his associates from the work of the project at Columbia University on national income in Eastern Europe. Data on personal consumption in the national accounts were broken down in as much detail as possible and were supplemented by information on the composition of retail trade and other data. The result was a distribution of consumption by category of consumption (for example, retail purchases and farm consumption in kind) and, wherever possible, by type of goods purchased.

Price ratios for each category of goods were calculated from various sources of West German and Satellite price information. The principal sources of price data were official statistical publications, but price data collected by US Embassy personnel for purposes of calculating cost of living adjustments also were used, both to fill gaps in the official data and to verify the comparability of products for which official price data were available. Where a category was represented by more than one item, detailed weights were obtained from consumer budget studies, retail sales data, and other sources. The most detailed weights were available for Poland, and these were also used to calculate some price indexes in Czechoslovakia and Hungary. The result of the calculation was a detailed breakdown of the value of personal consumption in the three Satellite countries in marks. In calculating the price ratios, efforts were made to compare items of equivalent quality, but errors no doubt were made in many instances.

In the cases of investment and of government purchases of goods, it was not possible to obtain either a distribution of expenditures by type of goods or useful price data. Calculation of price indexes for investment goods from comparisons of prices for typical products would have required a much more intensive and time-consuming effort than could be attempted here. Instead, a shortcut was used that may be as reliable as, or even more reliable than, the sample method. Price ratios for investments and for government purchases of goods were calculated from

* Table 7 follows on p. 18.

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Table 7

Poland, Czechoslovakia, and Hungary:
Conversion of Gross National Products into West German Marks
1955

	Value a/								
	In National Currency (Billion)			In West German Marks (Billion)			Price Ratios		
	Poland (Zlotys)	Czechoslovakia (Crowns)	Hungary (Forints)	Poland	Czechoslovakia	Hungary	Zlotys/ Marks	Crowns/ Marks	Forints/ Marks
Personal consumption	173.0	83.2	66.4	30.1	20.3	11.8	5.7	4.1	5.6
Retail purchases	115.0	63.9	38.2	17.7	14.4	6.4	6.5	4.4	5.9
Foods	47.5	33.9	15.8	7.3	5.9	2.4	6.5	5.7	6.7
Alcoholic beverages	13.8	4.8	4.1	2.2	1.4	1.1	6.4	3.4	4.0
Tobacco	6.2	2.5	1.5	0.8	0.6	0.4	7.5	4.3	4.3
Textiles, clothing, and leather	28.9	10.5	10.1	2.2	1.3	0.8	13.0	8.1	12.1
Other nonfood items	18.6	12.2	6.7	5.2	5.1	1.9	3.6	2.4	3.6
Farm market purchases	8.2	1.1	4.0	1.4	0.2	0.5	5.8	4.6	7.6
Services and housing	13.3	11.6	9.0	4.9	4.0	2.4	2.7	2.4	3.7
Farm consumption in kind	29.6	5.7	10.5	5.4	1.6	2.0	5.4	3.6	5.2
Other consumption	6.9	0.9	4.7	0.7	0.1	0.5	9.9	9.0	9.4
Government purchases	37.3	31.4	17.0	9.8	9.8	3.9	3.8	3.2	4.3
Health, culture, and welfare	13.9	15.7	6.0	3.6	4.9	1.4	3.8	3.2	4.3
Administration	9.0	3.1	4.8	2.4	1.0	1.1	3.7	3.2	4.2
Defense and public security	14.4	12.6	6.2	3.8	3.9	1.4	3.8	3.2	4.4
Gross investment	66.6	36.5	37.2	11.8	11.4	4.6	5.6	3.2	6.0
Additions to fixed capital	45.4	31.3	16.4	8.7	9.8	2.7	5.2	3.2	6.0
Increase in inventories	15.9	4.6	10.3	3.1	1.4	1.7	5.2	3.2	6.0
Net foreign investment	5.3	0.7	10.4		0.2	0.2			
GNP	276.9	151.2	120.6	51.7	41.5	20.3	5.3	3.6	5.9

a. Because of rounding, components may not add to the totals shown.

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price ratios for goods entering foreign trade. In all three countries, data were available, or could be estimated, on the value of imports and exports (and sometimes on the value of imports and exports of machinery and equipment) in internal prices. By comparing these values with the values of imports and exports in foreign prices (devisa currency,* which can readily be translated into marks), aggregate price ratios were obtained.

The conversion of value added by government (wages of government employees) necessarily is somewhat arbitrary. Satellite expenditures of this type were converted into marks by using ratios of average wages, on the assumption that a person employed in government services is as productive in the Satellites as in West Germany.

2. Quantity Comparisons

a. Personal Consumption

The quantity indexes were constructed from a sample of consumer goods and services in physical units weighted by West German prices and values. The sample consists of data on broadly defined commodities (such as grain products, milk, cotton fabrics, and bicycles) that are unadjusted, or little adjusted, for differences in quality and assortment. Price-weighted samples were constructed for six categories of consumption, and the indexes for these categories were averaged using as weights the distribution of consumer expenditures in West Germany. The indexes are shown in Table 8.** Because inadequate allowance is made for quality, these indexes almost certainly overstate consumption in the Satellites relative to West Germany and also in the less developed Satellites relative to the more developed ones. The comparison among the Satellites, however, is better than that of the Satellites with West Germany because it involves a large sample.

b. Agricultural Production

The quantity index for agricultural production (including forestry and fishing) represents a calculation of value added in the sector in each of the Satellites in terms of 1955 marks. Estimates of value added were obtained by deducting the value of industrial inputs for agriculture from the value of agricultural output (the value of agricultural output is equal to gross production minus inputs of agricultural products). To obtain the value of output, the quantity of each

* Devisa currency is the domestic equivalent of foreign currencies at official rates of exchange. In Soviet Bloc countries the official rates of exchange frequently have little or no economic significance.
** Table 8 follows on p. 20.

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Table 8

European Satellites and West Germany:
Quantity Indexes of Personal Consumption Per Capita
1955

West Germany = 100

	Czechoslovakia	East Germany	Poland	Hungary	Rumania	Bulgaria
Foods	101	88	81	80	72	60
Alcoholic beverages	111	102	62	73	64	64
Tobacco and products	187	113	150	125	65	39
Textiles, clothing, and leather	71	76	49	42	32	32
Other consumer goods	32	42	21	19	11	12
Housing and utilities	84	83	58	58	46	47
Total personal consumption	87	81	66	65	54	47

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major agricultural item produced (after deduction for the use of this product for feed, seed, and waste) was multiplied by the average price paid to West German farmers in 1955. To obtain the value of industrial inputs, the main categories of such inputs in West Germany (such as fertilizers, fuel, and repairs) were represented by a sample of inputs (such as the various types of fertilizers) or by rough indicators (such as the size of the tractor park). Both output and inputs then were given their full West German weight, and value added was obtained by subtraction.

c. Industrial Production

The industrial indexes, presented in Table 9,* are methodologically similar to most industrial indexes which compare production in one country at different times. They are constructed mainly from production data in physical units for a sample of products. The weights for industrial categories are estimates of value added in West Germany in 1955 (based on West German ratios of value added to value of sales in 1950 and 1954 and on data for value of sales in 1955). The weights for individual commodities within categories (when a category is represented by more than one item) are West German prices in 1955 or, in a few cases, estimated value added per unit. The index of metalworking output, however, was obtained differently. For East Germany, Czechoslovakia, Poland, and Hungary it represents a conversion of value of metalworking production in domestic currencies (after deduction of sales to other plants within the same industry) into marks. The conversion ratios were obtained mainly from price relationships of machinery and equipment in foreign trade (the ratios between the internal and the devisa value of exports or exports plus imports of machinery and equipment). These ratios do not reflect the relative prices of a selected sample but represent a much larger number of items than could possibly be covered in such a sample. For Rumania and Bulgaria the index of production of machinery and equipment was obtained by assuming that the value of production per metric ton of steel consumed in these economies was the same as in Poland. Steel consumption data also provided a check on the reasonableness of the value conversion for the other countries. These data and the estimates obtained by the conversion of values of metalworking production imply that inputs of steel underwent more processing in East Germany than in West Germany, slightly less in Czechoslovakia, considerably less in Hungary, and about half as much in the other Satellites.

The industrial index is believed to be most reliable for mining, energy, and some types of basic materials because of the broad coverage of the sample and the fact that quality differences either are small or in some cases could be adjusted for (for example, expressing

* Table 9 follows on p. 22.

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Table 9

European Satellites and West Germany:
Quantity Indexes of Industrial Production
1955

West Germany = 100

	East Germany	Poland	Czecho-slovakia	Rumania	Hungary	Bulgaria	European Satellites a/
Energy (electric power and gas)	31.2	22.7	18.7	4.6	7.9	2.7	87.8
Mining	13.7	39.8	15.2	16.6	6.4	1.5	93.2
Manufacturing	26.5	21.9	19.5	8.3	7.8	3.0	87.0
Metallurgy	10.8	18.6	16.4	3.9	6.7	0.4	56.8
Metalworking	21.9	10.2	17.6	2.9	5.0	0.7	58.3
Chemicals and rubber b/	40.2	18.7	14.2	14.7	4.7	1.7	94.2
Construction materials	23.7	25.7	18.9	10.3	10.7	5.8	95.1
Wood and paper	31.1	40.1	31.6	17.2	3.3	5.6	129.0
Textiles and leathers	24.5	32.8	21.1	13.0	16.1	5.6	113.1
Foods	43.9	60.1	33.0	18.1	18.5	12.5	186.1
Total industry (West German weights)	25.7	23.3	19.1	8.8	7.7	2.9	87.5

a. Excluding Albania.
b. Including petroleum refining.

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coal production in standard units). The sample is much less adequate for the consumer goods industries such as textiles and foods, and it is largely unadjusted for what are undoubtedly very large differences in quality (for example, a square meter of "wool" fabrics probably has a much lower wool content in Poland than in West Germany). Moreover, a number of important consumer industries (for example, clothing, shoes, plastics, and wood products) are not covered at all because of a lack of usable data and the fact that the output of such items by handicrafts is included to different degrees in the statistics of the various countries. Undoubtedly the indexes for the consumer goods industries are strongly biased in favor of the Satellites. Because of the relatively small weight given to these industries in the calculated index for all industry, however (all of the metalworking industry but only 55 percent of value-added in the consumer industries are covered), the bias probably does not have a very great effect on the over-all index.

No explicit estimate is made for handicraft production because of the varying statistical treatment of handicrafts in the countries being compared and the lack of comparable production and employment data for handicrafts. Instead, an attempt was made to select the sample of products so as to leave out the types of items that are usually produced to a substantial extent by handicrafts. This was the reason for leaving the production of shoes out of the sample. The only included industry where the sample series probably reflects a significant amount of handicraft production is the food industry.

3. Other Estimates

The estimates described above were supplemented by or compared with independent estimates of some of the same relationships. The principal one of these is this Office's comparison of East Germany with West Germany by sector of origin and end use of GNP. The comparison uses a common prewar (1936) standard of valuation for both parts of Germany and relies mainly on quantity indexes, but also to some extent on deflated values.

Another independent calculation is the comparison made by the Polish Central Statistical Office (Glowny Urzad Statystyczny -- GUS) of the relative purchasing power of the zloty and the mark with respect to consumer goods and services. This calculation made use of detailed Polish and West German workers' budgets rather than of a breakdown of consumption in the national accounts. The zloty/mark price ratios obtained in this study are remarkably consistent with those estimated here. As might be expected because of the greater detail and probably also the precision of the Polish study, the zloty/mark ratio for the Polish consumer basket is somewhat lower (the purchasing power of the zloty is higher) than in the present study -- 5.3 zlotys per mark compared with 5.7. On

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the other hand, the zloty/mark ratio for the German consumer basket (not calculated in the present study) is much higher -- 7.3 zlotys per mark. The final estimate of Polish consumption implies a ratio of 6.3 zlotys per mark.

Various other international comparisons involving the Satellites also appear in Soviet Bloc publications, although there is no information on how they were obtained. On the whole, they are roughly consistent with the estimates of this study.

4. Derivation of Final Estimates (Table 6)*

a. Indexes

(1) Personal Consumption

The final estimate is intended to approximate the results that might have been obtained using an average of estimates with Satellite weights and West German weights. To arrive at the final estimate, first, a consistent series was calculated with Satellite quantity weights (or West German price weights), and, second, these figures were lowered by various percentages.

The value conversion estimates for Poland, Czechoslovakia, and Hungary were accepted as rough approximations of consumption with Satellite quantity weights. This Office's estimates for East Germany were assumed to give similar results to those of a hypothetical estimate with East German quantity weights. This Office's estimate for East Germany and the value conversion estimate for Czechoslovakia imply that total East German consumption was 32 percent higher than total Czechoslovak consumption, compared with a figure of 26 percent higher according to the calculated quantity index for consumption -- a sufficiently close relationship for present purposes. The estimates for Rumania and Bulgaria were obtained by multiplying the value conversion estimate for Poland by the calculated quantity indexes for consumption.

On the assumption that the range of results obtained with alternative sets of weights is greater the larger the difference in per capita income or output relative to West Germany, the estimates with Satellite quantity weights were lowered by 5 percent for East Germany and Czechoslovakia and by 10 percent for the other Satellites to obtain the final estimates. The results for Poland are near the midpoint of the range of results obtained by using the GUS price ratios.

* P. 14, above.

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(2) Gross Investment and Government

The value conversion results for Czechoslovakia, Poland, and Hungary and this Office's results for East Germany as shown in Table 5* were used. Because the conversion ratios for these categories were not calculated with a selected set of weights, no adjustment of the data in Table 5 was called for.

(3) GNP

For East Germany, Czechoslovakia, Poland, and Hungary the sum of the estimates for consumption (with Satellite quantity weights), investment, and government were used after the following adjustments: East Germany, a 5 percent reduction; Poland and Hungary, a 10 percent reduction; and Czechoslovakia, a 10 percent reduction. The reduction in Czechoslovakia is larger for GNP (10 percent) than for personal consumption (5 percent) because it is believed that the estimates for investment, government, or both, are overstated. The basis for this belief is the fact that the unadjusted estimate of GNP in Czechoslovakia is higher (in relation to West Germany) than the unadjusted estimate of industrial and agricultural production combined, whereas it is lower in the other Satellites for which direct GNP calculations could be made. It does not appear that a difference of this kind and extent can be justified by available data on services.

In Rumania and Bulgaria, GNP is assumed to be in the same relation to that in Poland as is the case for the sum of industrial and agricultural production.

(4) Industrial Production

Calculated indexes with West German price weights in Table 5 were reduced by 5 percent in East Germany and Czechoslovakia and by 10 percent in the other Satellites.

(5) Agricultural Production

The calculated indexes shown in Table 5 were used.

b. Values in Marks

West German values for personal consumption, gross investment, government, GNP, and income originating in industry and agriculture are from the official series first published in 1956. Satellite values in marks are the products of the West German values and the calculated

* P. 10, above.

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quantity indexes or of the Satellite values in domestic currencies and the ratios of mark prices to Satellite prices.

c. Values in US Dollars

West German dollar values for GNP and investment are the geometric means of the values obtained by Milton Gilbert and Associates for the OEEC, using US and Western European weights. In the case of personal consumption and government expenditures the OEEC values had to be adjusted to account for the fact that the present comparisons and the official West German data for personal consumption exclude government expenditures for services used by the population (that is, public education and health) and place them under government expenditures, while the OEEC study includes these services under personal consumption and not under government expenditures. The adjustment of the OEEC figures consists in applying the OEEC mark/dollar ratio for government to the more comprehensive mark value of government expenditures used here and in calculating the dollar value of personal consumption as a residual in the dollar value of GNP.

d. Per Capita Dollar Values

To obtain per capita values, the dollar values of total GNP and personal consumption were divided by the following population figures for 1955:

Country or Area	Thousand Persons (Midyear or Yearly Average)
West Germany (excluding the Saar and West Berlin)	49,203
East Germany	17,944
Czechoslovakia	13,093
Poland	27,278
Hungary	9,805
Rumania	17,325
Bulgaria	7,575
European Satellites	93,020

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APPENDIX B

SELECTED BIBLIOGRAPHY

Official statistical publications of the individual countries being compared are the principal sources used in this report. These were supplemented by a large number of other sources, mainly periodical articles but also monographs and UN and US government publications. The official sources most generally used throughout the comparisons are the yearly statistical yearbooks published by the statistical offices of the individual countries:

West Germany -- Statistisches Jahrbuch fuer die Bundesrepublik Deutschland, 1957-61.
East Germany -- Statistisches Jahrbuch der Deutschen Demokratischen Republik, 1956-61.
Czechoslovakia -- Statisticka rocenka, 1956-62.
Poland -- Rocznik statystyczny, 1956-62.
Hungary -- Statisztikai evkonyv, 1949-55 and 1961.
Rumania -- Anuarul statistic al R.P.R., 1957-62.
Bulgaria -- Statisticheski godishnik, 1958-60.

In addition, the following sources were important for particular purposes:

1. Value of national product and its components in Poland, Czechoslovakia, and Hungary in terms of domestic currencies: manuscripts provided by Thad Alton and his associates from the project at Columbia University on national income in Eastern Europe.

2. Calculation of price ratios for the above countries relative to West Germany:

Poland -- Annex to Biuletyn statystyczny, No. 1, 1959.
Poland -- Statystyka Polski, Series F, Statystyka cen, 1957.
Hungary -- Statisztikai idoszaki kozmenyek, arakulas Mayarorszagan, 1938 ban es 1949-1955 ben.
All countries -- US Department of State despatches (UNCLASSIFIED) providing comparative price information for purposes of calculating cost of living adjustments for US government personnel living abroad.

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3. Calculation of quantity index of consumption: various UN, ECE, and FAO documents, as well as those listed under 5, below; special West German and Polish official publications on agriculture and foreign trade.

4. Index of industrial production:

All countries -- UN Statistical Yearbooks.
Poland -- Statystyka Polski, Series E, Statystyka przemyslu, 1956.
East Germany -- Wolfgang Stolper, The Structure of the East German Economy, Cambridge, Massachusetts, Harvard University Press, 1960.
West Germany -- Der Aussenhandel der Bundesrepublik Deutschland.

5. Index of agricultural production:

West Germany -- Statistisches Jahrbuch ueber Ernaehrung, Landwirtschaft, und Forsten.
Poland -- Statystyka Polski, Produkcja globalna i brutto rolnictwa.
East Germany, Hungary, Rumania, Bulgaria -- US Department of Agriculture publications under the series The Agricultural Situation in Eastern Europe.
Czechoslovakia -- Gregor Lazarczik, Production and Productivity in Czechoslovak Agriculture, Ph.D. dissertation, Columbia University.

6. Supplementary estimates:

Poland, consumption -- article by Bohdan Szulc on a comparison of consumption in Poland and West Germany in Gospodarka planowa, No. 7, 1959.

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Deborah Paige and Gottfried Bombach, A Comparison of National Output and Productivity of the United Kingdom and the United States, Paris, OEEC, 1959.

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