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ECONOMIC COMMITTEE

ASSESSMENT OF EAST/WEST COMPARISONS OF LEVELS
OF DEVELOPMENT

Note by the Secretary

The attached document, which has been provided by the French Delegation, will be one of the main contributions to the reinforced meeting, scheduled for 6th July, which has been called to discuss methods of evaluation of the gross national product of the USSR and the East European countries.

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N A T O U N C L A S S I F I E D

ASSESSMENT OF EAST-WEST COMPARISONS OF LEVELS
OF DEVELOPMENT

Note by the French Delegation

1. There is a certain paradox in international comparisons; namely that simple methods of comparison, based mainly on the use of exchange rates, are sharply criticized on theoretical grounds and yet the estimates which they provide are by far the most widely used.

2. It is true that for a long time these simple methods seemed hard to apply to East-West comparisons, given, inter alia, the very different structure of prices and of the monetary systems in the Eastern economies. An attempt has nevertheless been made in this paper to show that it is now possible to insert the Eastern countries without any difficulty into the general international comparative tables currently available by using quasi-exchange rates or "commercial exchange rates". The adoption of this position obviously calls for an explanation of the above-mentioned paradox. The fact is that traditional methods (direct comparison of prices and quantities and use of real indicators) rest on firm theoretical foundations but incorporate major misconceptions and above all are costly. The simple methods, on the other hand, have undeniable practical advantages and can, moreover, boast far from negligible theoretical justifications.

I. HEAVY METHODS

1. Relative theoretical advantages

3. Two main types of complex methods are traditionally used for the comparison of national products. The first, based on the model established in the fifties by M. Gilbert and I. Kravis to measure the relative level of development of five OEEC countries(1), consists in directly comparing quantities produced and prices in the selected countries. The second, which has become more widely known through work done by the United Nations, is based on an analysis of the relationship between the gross domestic product and a choice of real indicators of production and consumption(2). Most of the comparisons carried out in the East as well as in the West are more or less based on these two methods. They all have one feature in common, viz. they contain a preliminary critique of the use of exchange rates.

(1) M. Gilbert and I.B. Kravis: An International Comparison of National Products and the Purchasing Power of Currencies OEEC. Paris 1956.

(2) Economic Survey of Europe 1969. Part I - Chapter IV, pages 154-166. Economic Commission for Europe, Geneva. New York 1970

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The critique of exchange rates

4. The use of exchange rates for international comparisons presupposes that "the average relationship of the internal purchasing power of currencies is the same as the exchange rates used to convert the national products to common currency units"(1). However, those who formulated this fundamental prerequisite realized immediately afterwards that it could not be satisfied for three main reasons:

- (1) trade, which largely determines the exchange rate, is artificially restricted and consequently the latter cannot reflect a genuine market balance;
- (2) furthermore, and assuming that the various restrictions on trade were lifted, the latter is only in goods which are not properly representative of national products;
- (3) lastly, and again assuming that this argument can be set aside, the use of exchange rates implies that there will be only one solution to the problem which consists in comparing the national product of two countries. Yet it would appear that because of the differences in consumer patterns and in relative prices, there should be two solutions to the problem, reflecting the structures of each of the two countries concerned.

5. Another objection, to be added to the other two which are now long-standing, is that the recent upheavals in the international monetary system have destroyed most of the value which could be attached to the calculation of average exchange rates, a solution which was often applied empirically with a view to the partial scaling-down of the estimates of the effects of parity changes.

6. All these objections can be extended to the "commercial conversion rates" used by the Eastern country foreign trade bodies. These rates, it will be remembered, differ both from the official currency exchange rate and from the tourist exchange rate. They reflect the average ratio between the internal price (in national currency) and the international market price (in currency) of goods traded abroad.

(1) M. Gilbert and I. Kravis op.cit. page 15

7. These co-efficients cannot, at first sight, be assimilated to exchange rates, for at least two reasons:

- they relate only to the commercial aspect of foreign transactions(1) and the most reliable of them relate only in fact within the context of foreign trade, to exports;
- they are not really derived from international settlements to the extent that there are no dealings in Eastern country currencies on the foreign exchange market; it is striking, in this connection, that recent changes in these rates seem indirectly to be reflecting an increase in purchasing power of internal currencies for foreign currencies, even though the external financial situation of most of the Eastern countries would, under a system of free convertibility, call for a devaluation in relation to the dollar.

8. This being said, the concrete use of these rates, by the economic authorities of the Eastern countries, to measure the effectiveness of foreign trade and even as instruments of "active exchange policies" in Hungary and Poland - mean that they can be regarded as "quasi-exchange rates". This conclusion is borne out by observation of changes in these rates over a long period, showing for example a marked deterioration in the "reproduction cost" in dollar terms, of the Czechoslovak Crown between 1950 and 1968.

From the critique of exchange rates to a direct comparison of national products

9. To permit comparative studies resting on conceptually acceptable foundations, M. Gilbert and I. Kravis devised a system in 1955 which they described in the following terms: "This method involves securing appropriate quantities, prices and values for as detailed a breakdown of gross national product as is possible for any two countries to be compared, and then weighting the data for each country with the weights of first one and then to the other of them. This produces two indices of the real product relationship and of the internal purchasing power of the currencies"(2). Although they are clearly not in favour of the principle, the authors have also suggested that one average of the two indices be adopted for the practical purposes of comparison.

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- (1) From this point of view, the situation is relatively the same as the one created by the introduction at different times of two-tier exchange rates in France, in Switzerland, in the Benelux Union and in certain Latin American countries.
- (2) op.cit., page 18

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10. This method has been widely applied, with varying degrees of thoroughness(1), both in the East(2) and in the West, on a comprehensive basis as well as to the different sectors or chapters of national expenditure, to pairs or groups of countries and to different years. Some idea of these applications will be found at Annex I which lists the results of some of the comparative studies of the final production of the Eastern countries obtained with this type of method.

The "real indicator" solution

11. Studies by the United Nations Economic Commission for Europe have helped to publicize another method the principles of which were defined by the Hungarian F. Janossy. The Geneva experts measured the relationship between a score or so real indicators of production and consumption and the gross domestic products (in \$) of 22 Western countries in 1965; they then, on the one hand, partly corrected the GDP assessment derived from the use of exchange rates for these same countries and, on the other hand, furnished a GDP estimate in dollar terms of the Eastern countries' economies; to this end, the ratio between real indicators and GDP in the West was applied to those economies for which only the first term was available.

12. Annex II shows some of the findings of these studies as well as updated figures provided by the World Bank in 1973. Annex II also sets out other estimates obtained from methods based on the same principle.

2. Inherent drawbacks

13. A comprehensive assessment of these "heavy" methods must also take account of a certain number of defects which detract from their relative theoretical advantages.

Constructional defects

14. If it is to avoid the charge levelled at the use of exchange rates - that it involves a distorting sample of compared products - the direct method must cover the widest possible range of goods and services: goods common to the compared countries, goods which are common but not identical,

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- (1) A. Woroniak "The problem of the dollar conversion of the rouble" Revue de l'Est, vol. 5 1974, No. 1, pages 5-54. The author of this article lists no fewer than 20 comparative USSR/USA studies and attempts to classify them in the light of certain quality criteria.
- (2) The COMECON countries have undertaken several internal comparisons of levels of development using this method. The results of these studies which covered 1959, 1964, 1970 and 1973 respectively have not been published.

goods which are not common. The wider the range, however, the more striking the differences between styles of consumption, the wider the gap between the monetary ratios finally obtained for each country and the less significant the average of these ratios. Another major difficulty is that the direct method is not very effective when it comes to the problems involving the comparative quality of products. The insufficient allowance made for differences of quality contributes to an artificial reduction of differences in income between the rich and poor countries to the extent that high income levels are generally associated with better quality goods. This, general, drawback is a particular handicap in the case of comparisons including Eastern countries which produce what are generally agreed to be relatively mediocre quality goods, inferior even to what could be expected given their general level of industrialization.

15. This point also applies to the real indicator method and in fact prompts those applying that method to restrict the number of these indicators. In so doing, however, they run the risk of generating doubt as to the representative nature of their sample. Depending on whether the "basket" chosen is made up primarily of goods for intermediate or final demand, for consumption or investment - for which a significant ratio with the level of GDP will in any case have been obtained - the result of the calculation will obviously be tilted in favour of a given type of economy.

Practical difficulties

16. From this point of view, the main objection to the Gilbert-Kravis method is that it is essentially "binary". By and large, it can only be applied to comparisons between two countries or, at best and with help of certain simplifying assumptions, to comparisons between a reference country and a group of countries(1). This considerably reduces the usefulness of the method the results of which cannot appropriately be inserted in a series of broader comparisons, particularly if other methods have been used for the latter. Thus, no purpose would be served by the "multilateralization" of a direct USA/USSR comparison using results furnished, by means of exchange rates, by a comparison between the USA and the other OECD countries. This is particularly true inasmuch as the direct method tends to underestimate differences in GDP levels while exchange rate comparisons tend to overestimate them.

(1) A comparison between several countries normally calls for as many binary comparisons as there are countries. These give as many purchasing power ratios as there are price systems and consumption patterns for each one of them. In order to "simplify" it is possible, after a series of binary comparisons, taking one of the countries as the common denominator, to calculate "average" prices for all the other countries. The multilateral problem is thus converted into a new binary problem.

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17. It should also be noted that the results of the temporal series obtained by the direct method - using growth rates adjusted to take account of relative price variations - become increasingly unreliable as the interval with the base year lengthens. An extrapolation of this kind - warranted by the expense of building a new base - rests on the hardly defensible assumption that internal price and consumption patterns remain unchanged over a long period.

18. The United Nations methodology raises comparable space-time homogeneity problems, as witness the World Bank's attempt to update 1965 basic estimates to 1973. The World Bank was able to establish that the results of these updating exercises were consistent for all the East-European countries, with the general level of GDP in the 22 Western pilot countries selected for 1965. However, it gave an estimate, for each one of the latter, based not on the extrapolation of the UN adjusted evaluations but on the use of exchange rates with the result that the relative level of GDP for 1973 in each of the Eastern countries and in each of the 22 countries of the Western sample no longer reflected the homogeneity rule. Another question is whether the choice of real indicators - assuming that it is relevant from the start - should not be adjusted in the light of a general trend to define new patterns of economic priorities.

19. Finally, it takes a very long time to obtain the statistical data needed to establish heavy methods. The advocates of real indicators criticized the Gilbert-Kravis method on the grounds that it was very costly and time-consuming. The results they achieved however did not apparently satisfy the United Nations which in 1968 set up an International Comparisons project in conjunction with the University of Pennsylvania and with the help of the World Bank and a series of international, national and private bodies(1).

20. This involvement of institutions is clear evidence that the quest for presumably more satisfactory solutions entails a sharp rise in costs and possibly, too, an increase in the time needed to complete the study. In the absence of any objective criteria to test the accuracy of an international comparison, there is a tendency to regard its reliability as being proportionate to the time spent on it. On the other hand, it is difficult to be entirely satisfied with a situation in which a research programme set in motion nearly a decade ago has produced only very fragmentary results for a reference year which now has little relevance.

(1) Partial results for 1970 were published in 1975: "A system of International Comparisons of Gross Product and Purchasing Power", KRAVIS, KENNESSY, HESTON AND SUMMER. The John Hopkins University Press, London, 1975.

II. A SIMPLE METHOD

21. The reference to recent changes in heavy methods raises two more general questions. The first is whether the scholars responsible for these developments have attached sufficient importance to world economic changes since they first embarked on their research. It can be argued that the growing internationalization of the world economy, in particular, is, at least in part, casting doubt on the theory of the non-admissibility of exchange rates. At the same time, the steep increase in demand from public and private services for foreign "operational" data seems wholly incompatible with the application by the economists of research methods which take abnormally long to mature. To give substance to these criticisms, the second part of the present paper will include comments on the results obtainable by the application of "commercial conversion rates" to the Eastern countries' accounting aggregates.

1. Arguments for the rehabilitation of exchange rates

International trade and national products

22. In the twenty years which have elapsed since Gilbert and Kravis questioned the exchange rate method, the most important development in world economic activity has been its internationalization. The effect of this development and its many and widely appreciated implications is that foreign trade is now far more representative of national production. On the one hand, the foreign trade levels of the various national economies have risen considerably under the impetus of a much quicker rate of growth of international trade than of national products. On the other hand, the development of all forms of internationalization of economic activity, including production, has led to the creation of patterns of consumption which are undeniably more homogeneous.

23. It is doubtless not possible to conclude that exchange rates now perfectly reflect the purchasing power ratios of national products. Certain important sectors of national economies - such as construction and agriculture - are still largely by-passed by international trade or are heavily protected. The fact that the international monetary system has been in a state of flux for so long, means that the notion of a general balance can no longer be entertained. There is no such thing as a general tendency of the monetary system towards "balanced priorities". Likewise, as already stated, exchange rates undoubtedly bring a special bias into any international comparison. The comparative levels of development of two national production systems can be extremely close and yet one may have a sharp competitive edge over the other in what is a particularly sensitive area, namely, foreign markets. To the extent that exchange rates indirectly reflect comparative competitiveness, they undoubtedly accentuate the real differences in development levels.

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24. On the other hand, the reliability of exchange rates is undoubtedly greater than it was originally. What is not by any means clear, however, is whether they give a poorer picture of real purchasing power ratios than the results of calculations based on less "natural" product selection criteria.

Economic significance of commercial exchange rates

25. The Eastern countries have not been by-passed by the underlying trend towards the internationalization of economic activity, particularly after the spectacular growth in East/West trade which is being constantly liberalized. It is this which has no doubt prompted attempts by the authorities of those countries to slot their economies more effectively into the international economy by means of commercial conversion rates. The principle behind these conversion rates and the method by which they are established consequently give them a genuine economic significance.

26. The realistic approach which prevailed when these rates were fixed is apparent even in some of their shortcomings. For example, the Eastern countries did not follow the advice of those experts who, in the interests of strict orthodoxy, proposed that they should immediately be determined the canons of marginal analysis, the probable reason being a desire to begin by getting some idea of the average external purchasing power level of exported goods. The frequent non-inclusion in the calculation of imports - the switch from the external to internal prices of which is often a poor guide - reflects the same desire to be realistic. The latter is found again in the practice which consists in differentiating between conversion rates according to geographical areas to take account of the greater competitiveness required in relations with convertible currency countries.

27. Looking ahead, there is every reason to hope that this type of ratio will be refined and put into general use, given the prospects for the ever increasing incorporation of the Eastern countries into the international trading system. Furthermore, the use of this type of ratio for the purposes of international comparisons will no doubt be facilitated by the consolidation of other tendencies in the general development of the Eastern countries, namely:

- a tendency towards the alignment of the relative national price systems of the COMECON countries, an important prerequisite for genuine transferability (in other words, convertibility within the area);
- a better adjustment to world prices, following the adoption of the "Moscow yardstick" for the calculation of intra-COMECON trade prices;

- the alignment, now underway, of national accounting systems which would reduce the uncertainties surrounding the evaluation of the product of sectors which do not currently come within the Eastern definition of "national income".

Changes in the conditions of access to conversion rate data

28. As important as these theoretical arguments, and perhaps even more so, is the future possibility of access to data from the Eastern countries which will directly provide the commercial conversion rates of internal currencies into "transferable roubles". Some years ago, the correct calculation of these rates, on the basis of inter-industry exchange tables, could be compared, in terms of effort required, to the application of a "heavy method". This being so, these methods enjoyed the relative theoretical advantage which is generally deemed to be theirs. Publication in the East of these rates now puts a different complexion on the problem. The direct availability of "ready-for-use" average rates is not without its drawbacks inasmuch as certain ancillary benefits derived from research based on TEI will now be lost. There is no denying however that documentation and research costs will be practically eliminated. Consequently the problem of the "comparison of comparisons" will more or less boil down to the question of whether the relatively greater reliability which may be obtained by using heavy methods will offset the absolute costs of establishing this method and applying it over a prolonged period of time.

2. Application of conversion rates: 1973 results

29. Table B of Annex III provides details of the method of evaluating the GNP of the COMECON countries on the basis of commercial conversion rates. The first step is to calculate, in internal currency, the value of the national accounts aggregates which are not included in the definition of the net material product ("national income") but which must be included in the gross domestic product: depreciation and added value in the non-productive area. The gross domestic product having thus been calculated, the results were converted into transferable roubles on the basis of information for 1973 contained in an East European publication. Lastly, the dollar value of the GDP was obtained by applying the official exchange rate for the transferable rouble - which is the same as the currency rouble - and the dollar as indicated in the United Nations yearbooks.

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Problems of method

30. There are two problems of method which call for comment. While total depreciation is, in most cases, given in current prices, added value in the non-productive area is notoriously harder to pinpoint(1). Hungary is the only Eastern country to include data in its yearbooks on the net material product on the one hand and on the gross domestic product on the other hand. The proportion of the product of other countries represented by this sphere has been extrapolated on the basis of the present relationship in Hungary between added value and employment in the non-productive sector. The figures obtained in this way are obviously not foolproof but the method is at least logical.

31. The choice of a conversion rate on the other hand can have more significant repercussions on the quality of the estimates. Use has been made of an internal currency/dollar rate derived from a comparison between the domestic currency value and the foreign currency value of exports earmarked primarily for the COMECON countries. However, price levels in that commercial area, and access to that area, are governed by a certain number of specific rules which obviously have a bearing on the final domestic currency/dollar ratio. In actual fact each country works out conversion rates by zone, depending on the destination (and consequently the structure) of the exports. Thus, in addition to a COMECON zone rate, there are rates for the West and for the developing countries. In the interests of consistency, therefore, the natural inclination would be to apply to GDP expressed in national currency a weighted rate which takes account of each country's geographical pattern of trade. The decision finally taken only to use the intra-COMECON trade rate was prompted by two considerations.

- In the first place, the three rates referred to above are not available for all the countries. This applies in particular to rates in respect of trade with the developing countries. To take only the East-West conversion rate into account would be tantamount to an excessive "penalization" of the COMECON countries to the extent that the high cost in domestic prices of exports to the West are largely due to marketing problems which are not indicative of the level of development in the East.

(1) On the other hand, information on employment in the non-productive sector is readily available.

- In the second place, the present trend in world market prices on the one hand and in the Socialist zone on the other hand has smoothed out the differences in conversion rates relative to each zone. A fairly good example of this development is provided by Hungary where the difference between the two rates was 65% in favour of the dollar in 1968 as compared with 20% at the present time.

Comparison of comparisons

32. Table C of Annex III which contains data for the two "institutional" economic groupings, viz. the Nine on the one hand and the COMECON on the other, makes it possible to compare the results obtained by the three methods described in this paper. Fairly sharp differences will be found both as regards relative levels of development in East and West and as regards relative levels within the COMECON itself.

Relative East-West levels

33. The three series of estimates converge on at least one point, namely, that the level of development and the strength of the Eastern countries is substantially lower than in the West. Among the Western European countries, only Italy and Ireland (and, according to the World Bank, the United Kingdom) are at a level of development comparable with the more advanced COMECON countries.

34. There are, nonetheless, marked differences between the estimates. It will be found, by and large, that the results obtained by the application of the conversion rates bring out sharper differences in levels of development than results produced by the other two methods. Thus, the total GDP of the COMECON in relation to the GDP of the European Nine, starting from a base of 100, is 79 by the Gilbert-Kravis method, 72 by the United Nations method and 60 by the conversion rates method. On a per capita basis, the figures are 57, 52 and 43 respectively. These figures provide confirmation of the "discriminatory" nature of the exchange rate as an instrument of comparison and of the "equalizing" effect of the heavy methods. It can perhaps be added here that the equalizing effect of the different heavy methods varies according to the country. The real indicator method is more sensitive in the case of the smaller Eastern and Central European countries while the Gilbert-Kravis method is more sensitive in the case of the USSR.

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35. In addition, the difference between estimates also differs according to the countries. It is practically nil in the case of Bulgaria where the GEPI estimate is 1% lower than the World Bank and 2% higher than the JEC estimates. In the case of Poland, on the other hand, the differences are sizeable with the World Bank producing a per capita GDP which is 66% higher and the JEC estimate 28% lower than the GEPI estimate(1).

Relative intra-COMECON levels

36. Some general results are again common to the three methods. The GDR and Czechoslovakia, at the top of the table, vie, as could be expected, for first place (although the JEC slots the USSR between these two countries). Likewise, Rumania is given the place traditionally assigned to it by common sense, official statements and the majority of analytical studies.

37. There is no denying, however, that the differences between the estimates outnumber the points on which they tally, both as regards relative levels and, more simply, as regards placings. It will, thus, be noted that the World Bank estimate of the gap between the richest and the poorest country is greater than the GEPI estimate despite the fact that, as noted previously, the latter accentuates differences in development levels(2). It will also be seen that Bulgaria ranks fourth in one case (GEPI) and sixth in another (World Bank, JEC), the per capita GDP being respectively 88%, 78% and 65% of the average for the area. It is Poland, however, which is the principal victim of methodological hazards, ranking either last (with 71 in relation to a zone average of 100) according to the GEPI, fourth (with 102) according to the World Bank and fifth (with 68) according to the JEC.

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- (1) It will be remembered that according to a recent study, per capita consumption in Poland is equal to 46% of the French figure. If it were possible to extend these results to domestic product as a whole, it could be claimed that the World Bank estimates are the closest to the conclusions of that study. It is, however, true that the France-Poland comparison is based mainly on consumption in the two capitals. It is also true that, in the opinion of certain Polish specialists, the 1973 commercial rate, worked out jointly for the first time, was underestimated. The same remark can also apply to Hungary.
- (2) The "equalizing" effect of heavy methods is most felt, therefore, in the case of groups of countries which are far from each other rather than in the case of a group of countries with comparable levels.

East-South comparison

38. While the COMECON countries are, on average, some way behind the rest of the West European countries as regards per capita GDP, they are well ahead of the richest developing countries, particularly those of Latin America (Table C bis of Annex III). This is an important point when seen against the practical problem of inserting the East in the classification drawn up by international institutions. It is also of interest from a more general point of view, particularly as a starting point for any reflections on the history of economic development. Table C bis includes data on the countries of Southern Europe, where the level of development is roughly the same as in the COMECON countries, and on Japan, which entered the phase of what S. Kuznets calls "modern economic growth" at the same time as Russia.

39. The results of the conversion rate method must, therefore, obviously be handled, like the other methods, with the greatest care. While they can provide one of the yardsticks for assessing the economic situation in the Socialist countries, other data will continue to be necessary. For the present, the proposed estimates comply in a general way with a whole series of consistency criteria: they tally, in particular, with our knowledge of other parameters of development in those countries, of their productivity and consumption problems and of their financial position vis-à-vis the West. The gradually increasing availability of information on these rates which can be expected in the future, together with the continuation in depth of current work, particularly by the establishment of sets of figures from which trends in per capita GDP over a long period can be worked out, will make it possible to arrive at more sophisticated results. In any case, recent and fairly reliable estimates of the GDP in dollar terms of the USSR and the Central and East European countries can now be obtained reasonably quickly.

SOME COMPARISONS BASED ON THE GILBERT-KRAVIS METHOD

A. 1964 Per Capita GNP (in 1963 \$)

(The figures between brackets give levels relative to Czechoslovakia = 100.)

1. France	1,730 (135)	8. Italy	910 (71)
2. Federal Republic of Germany	1,720 (134)	9. Hungary	880 (69)
3. Belgium	1,560 (122)	10. Poland	770 (60)
4. Netherlands	1,290 (101)	11. Bulgaria	600 (47)
5. <u>Czechoslovakia</u>	1,280 (100)	12. Rumania	590 (46)
6. <u>GDR</u>	1,220 (95)	13. Greece	550 (43)
7. Austria	1,120 (88)		

Source: Maurice Ernst "Postwar Economic Growth in Eastern Europe" (a comparison with Western Europe) in Joint Economic Committee - Congress of the United States: "New Directions in the Soviet Economy". Washington, 1966, Part IV, page 877.

Notes:

- (1) GNP for West European countries has been obtained by application of the 1963 official exchange rate.
- (2) The estimated GNP of the East European countries has been obtained by the updating of a comparison for 1955 between those countries, on the one hand, and the Federal Republic of Germany on the other hand, using a "direct comparison of quantities and prices". The GNP growth rates for 1955/1964 have been calculated by M. Ernst. The "updated" relative levels have been converted into dollars on the basis of Federal Republic GNP in dollar terms.

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A bis. 1964 Per Capita GNP (in 1963 \$)

(The figures between brackets indicate levels relative to Czechoslovakia = 100.)

1.	France	2,010 (137)	8.	Italy	1,140 (76)
2.	Federal Republic of Germany	1,980 (135)	9.	<u>Hungary</u>	1,020 (69)
3.	Belgium	1,890 (129)	10.	<u>Poland</u>	890 (60)
4.	Netherlands	1,710 (116)	11.	<u>Bulgaria</u>	690 (47)
5.	<u>Czechoslovakia</u>	1,470 (100)	12.	Greece	690 (47)
6.	<u>GDR</u>	1,400 (95)	13.	<u>Rumania</u>	680 (46)
7.	Austria	1,290 (88)			

Source: Maurice Ernst "Postwar Economic Growth in Eastern Europe" ... op cit.

Notes:

- (1) Estimated per capita GNP in the Western countries, and ipso facto, in the Federal Republic, the keystone of the East/West comparison, has been obtained by updating the results for 1955 given by M. Gilbert and I. Kravis. Calculation of the 1963 dollar value has been based on the United States GNP implicit deflator. Greece and Austria, which were not included in the basic study, have been treated separately: M. Ernst has assumed that the gap between GNP obtained by the direct comparison of quantities and prices, on the one hand, and the application of the exchange rate, on the other hand, was the same as in the Federal Republic (in the case of Austria) and in Italy (in the case of Greece).
- (2) As regards the East European countries, estimated GNP was also obtained by the comparison described in Note 2 to Table A. The updated relative values were also converted into dollars on the basis of the estimates obtained for the Federal Republic. Thus, in relation to Table A, it is only absolute per capita value of GNP in the Federal Republic which has been modified, leading to a parallel modification of the absolute values for the Eastern countries.

B. 1967 Per Capita GNP (in 1967 \$)
(Czechoslovakia = 100)

1. France	2,343 (146)	8. Italy	1,339 (84)
2. Belgium	2,042 (128)	9. <u>Hungary</u>	1,080 (68)
3. Federal Republic of Germany	2,065 (121)	10. <u>Poland</u>	920 (58)
4. Netherlands	1,820 (114)	11. <u>Bulgaria</u>	870 (54)
5. <u>Czechoslovakia</u>	1,600 (100)	12. <u>Rumania</u>	840 (53)
6. <u>GDR</u>	1,480 (93)	13. Greece	808 (51)
7. Austria	1,466 (92)		

Source: Thad Alton "Economic Developments in countries of Eastern Europe" in J.E.C. "Economic Structure and Growth in Eastern Europe". Washington, 1970, page 49.

Notes:

- (1) The method for the East European countries is the same as the one described in the note to Table A. GNP growth rates applied to the results of the 1955 comparison have, however, been recalculated.
- (2) Western country GNP in dollar terms obtained by application of the 1967 exchange rate has been added here to permit comparison with Table A.

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C.	<u>1972</u>	<u>Per Capita GNP (in 1972 \$)</u>	
	(Czechoslovakia = 100)		
1.	Federal Republic of Germany	4,245 (173)	8. Italy 2,159 (88)
2.	France	3,823 (156)	9. <u>Hungary</u> 1,620 (66)
3.	Belgium	3,664 (149)	10. <u>Poland</u> 1,430 (58)
4.	Netherlands	3,442 (140)	11. <u>Bulgaria</u> 1,410 (58)
5.	Austria	2,740 (112)	12. <u>Rumania</u> 1,380 (56)
6.	<u>Czechoslovakia</u>	2,450 (100)	13. Greece 1,377 (56)
7.	<u>GDR</u>	2,210 (90)	

Source: Thad Alton "Economic growth and resource allocation in Eastern Europe" in J.E.C. "Reorientation and commercial relations of the economies of Eastern Europe". Washington, 1974.

Notes: cf. Notes 1 and 2 to Table B.

D. Estimated Per Capita National Income published by the Soviet Central Statistical Office (in \$)

	1965	1967	1968	1969	1970	1971	1972	1973	1974	1975
USSR	1,076	1,244	1,373	1,485	1,568	1,673	1,717	1,927	2,117	2,235
USA	2,060	2,348	2,552	2,714	2,819	2,971	3,090	3,460	3,783	3,975
France	n.d.	1,535	1,643	1,550	1,810	2,120	n.d.	2,410	n.d.	n.d.
Federal Republic of Germany	1,425	1,479	1,671	1,502	1,760	2,000	n.d.	2,265	n.d.	n.d.
Italy	761	817	912	979	1,105	1,250	n.d.	1,480	n.d.	n.d.
Netherlands	n.d.	1,280	1,359	1,510	1,775	2,080	n.d.	2,220	n.d.	n.d.
Belgium	n.d.	1,200	1,255	1,480	1,740	1,995	n.d.	2,250	n.d.	n.d.
United Kingdom	1,164	1,104	1,300	1,435	1,600	1,870	n.d.	1,920	n.d.	n.d.
Denmark	1,428	1,457	1,627	1,538	1,825	2,100	n.d.	2,315	n.d.	n.d.

Source: Narodnoe Khozjajstvo SSSR v 1965... 1975.

Notes:

- (1) The Central Statistical Office has only given the following indication as regards method: "in accordance with the methodology used in Soviet statistics, i.e. without double accounting of income from the non-productive sector" and "in accordance with the price ratio."
- (2) This table has been prepared for the record only. The implicit growth rates indicated (annual or pluri-annual) frequently seem unlikely. The table does, however, illustrate the extent to which the Soviet Union's economy is lagging behind, particularly by comparison with the USA.

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E.	<u>1964</u>	<u>Per Capita GNP (in 1964 \$)</u>
1.	USA	3,273
2.	Federal Republic of Germany	2,154
3.	France	1,953
4.	United Kingdom	1,910
5.	<u>USSR</u>	<u>1,289</u>
6.	Italy	1,187
7.	Japan	1,040

Source: Stanley H. Cohn "Soviet growth retardation: trends in resource availability and efficiency" in J.E.C. "New directions in the Soviet economy". Washington, 1966, page 108.

Notes:

- (1) Estimated GNP for the Western countries is derived from the "conversion rates" fixed by M. Gilbert and I. Kravis for 1955 with allowance for the relative trend of prices in those countries and in the USA between 1955 and 1964.
- (2) The estimate for the USSR has been obtained by updating the information given by Morris Bornstein (J.E.C, 1960, page 385), this exercise having been based extensively on a comparison of United States and Soviet retail prices for 1950.

F. 1955-1970 USSR/USA Comparisons:
Some results of United States studies
on Per Capita GNP (in \$)

	Stanford Research Institute		Department of Commerce		US Arms Control Disarmament Agency		Morris Bornstein	
	USSR	USA	USSR	USA	USSR	USA	USSR	USA
1955	934	2,399	-	-	-	-	1,078	2,396
1965	1,775	3,525	-	-	-	-	-	-
1968	2,232	4,306	2,085	4,987	-	-	-	-
1970	2,628	4,754	2,270	4,993	2,047	4,754	-	-

Source: R.W. Campbell, M.M. Earle, H.S. Levine, F.W. Dresch, "Methodological problems comparing the US and USSR economies" in J.E.C. "Soviet Economic Prospects for the Seventies". Washington, 1973, page 124.

Note: It would seem, although confirmation has not been obtained, that all these estimates have been derived from methods based on the direct comparison of quantities and prices.

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N A T O U N C L A S S I F I E D

SOME COMPARISONS BASED ON THE REAL INDICATOR METHOD

A.	<u>1965</u>	<u>Per Capita gross domestic product</u> (in \$)	
		(Czechoslovakia = 100)	
1.	USA	2,597 (182)	8. <u>Czechoslovakia</u> 1,427 (100)
2.	Belgium	1,886 (132)	9. Italy 1,190 (83)
3.	FRG	1,854 (130)	10. <u>USSR</u> 1,053 (74)
4.	Netherlands	1,796 (126)	11. <u>Hungary</u> 1,015 (71)
5.	France	1,616 (113)	12. <u>Poland</u> 989 (69)
6.	Austria	1,459 (102)	13. <u>Bulgaria</u> 877 (61)
7.	<u>GDR</u>	1,437 (101)	14. Greece 758 (53)
			15. <u>Rumania</u> 697 (49)

Source: Economic Survey of Europe 1969. Part 1.
New York 1970, page 164.

Note: The following real indicators have been taken into account (Per capita unless otherwise stated):

1. Steel consumption (Kg)
2. Cement " (Kg)
3. Apparent sulphuric acid consumption (Kg)
4. Non-ferrous metal consumption (Kg)
5. Energy " (Kg)
6. Power " (Kw/h)
7. Plastics " (Kg)
8. Textile fibres " (Kg)
9. Animal protein " (g)
10. Grain " (Kg)
11. Sugar " (Kg)
12. Milk yield (Kg)
13. Working agricultural population (%)
14. Number of television sets (per 1000 inhabitants)
15. Paper consumption (Kg)
16. Number of letters sent by inland post
(per 1000 inhabitants)
17. Number of telephone sets (per 1000 inhabitants)
18. Proportion of students (per 1000 inhabitants
between the ages of 20 and 24)
19. Number of persons per room

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20. Infant mortality (number of deaths between 6 and 11 months per 1000 live births)
21. Number of privately-owned cars (per 1000 inhabitants)

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B.	<u>1965</u>	<u>Per Capita gross national product</u> (in 1960 \$)		
		(Czechoslovakia = 100)		
1.	USA	2,831 (318)	8.	<u>Czechoslovakia</u> 890 (100)
2.	FRG	1,464 (164)	9.	Italy 713 (80)
3.	Belgium	1,438 (162)	10.	<u>Poland</u> 660 (74)
4.	Netherlands	1,297 (146)	11.	<u>Hungary</u> 622 (70)
5.	France	1,210 (136)	12.	<u>Bulgaria</u> 552 (62)
6.	Austria	1,095 (123)	13.	<u>Rumania</u> 507 (57)
7.	GDR	1,013 (114)	14.	Greece 476 (53)

Source: E. EARLICH "Economic Development and Personal Consumption Levels: an International Comparison". in Acta Oeconomica, Volume 6, Number 3, p. 171. Budapest, 1971.

Note: (a) The author has not provided estimates for the USSR.
(b) Physical consumption indicators used:

1. Annual grain consumption (Kg per inhabitant)
2. Daily animal protein consumption (g/inhabitant)
3. Annual sugar consumption (Kg/inhabitant)
4. Combined annual coffee, cocoa and tea consumption (Kg/inhabitant)
5. Annual cotton and wool consumption (Kg/inhabitant)
6. Annual synthetic fibre consumption (Kg/inhabitant)
7. Number of persons per room
8. Number of housing units with more than 3 rooms as a percentage of the total
9. Number of housing units with a bathroom as a percentage of the total
10. Annual power consumption per household (Kw/h)
11. Number of privately-owned cars (per 1000 inhabitants)
12. Number of telephone sets (per 1000 inhabitants)
13. Number of radio and television sets (per 1000 inhabitants)
14. Number of beds in medical institutions (per 1000 inhabitants)

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15. Annual consumption of newsprint (Kg/inhabitant)
16. Annual volume of letters sent and received
(inland post) per inhabitant
17. Number of inhabitants per commercial sector
job.

C. <u>1973</u>	<u>Per Capita gross national product</u> (in \$)	
1. USA	6,200 (216)	8. <u>Czechoslovakia</u> 2,870 (100)
2. FRG	5,320 (185)	9. Italy 2,450 (85)
3. Belgium	4,560 (159)	10. <u>Poland</u> 2,090 (73)
4. France	4,540 (158)	11. <u>USSR</u> 2,030 (71)
5. Netherlands	4,330 (151)	12. Greece 1,870 (65)
6. Austria	3,510 (122)	13. <u>Hungary</u> 1,850 (64)
7. <u>GDR</u>	3,000 (105)	14. <u>Bulgaria</u> 1,590 (55)
		15. <u>Rumania</u> 890 (31)*

Source: World Bank Atlas. Washington, 1975.

Note: The estimates for the East European countries have been obtained by updating the results given by the ECE (Geneva) for 1965 (cf. Annex 2, table A) and the estimates for the Western countries have been obtained by applying a 1972-1974 average exchange rate.

* The estimate for Rumania has been furnished by the Rumanian Government on the basis of lei 20 to \$1.

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D. Per Capita National Income Indices for Central and East European Countries

(Czechoslovakia = 100)

	1955	1959	1962	1964
GDR	103	104	99	99
Czechoslovakia	100	100	100	100
Hungary	62	67	66	67
Poland	62	64	63	62
Bulgaria	37	51	55	58
Rumania	36	41	46	49

Source: L. KÖSZEGI, G. SZILÁGYI, Statisztikai Szemle No. 7, 1968.

Note: (a) The comparison relates to each year taken separately.

(b) The following real indicators have been taken into account (per capita, unless otherwise stated):

1. Fuel consumption (Kg)
2. Power consumption (Kw/h)
3. Cement consumption (Kg)
4. Steel production (Kg)
5. Sulphuric acid production (Kg)
6. Newsprint consumption (Kg)
7. Chemical fertilizer consumption per hect. of arable land
8. Number of tractors in use
9. Number of telephone subscribers
10. Number of radio sets in use
11. Number of television sets in use
12. Number of housing units per 1000 inhabitants
13. Infant mortality rate (%).

E. Per Capita National Income in the COMECON member countries (1960-65) (in \$)

	1960		1965	
	in \$	Czechoslovakia = 100	in \$	Czechoslovakia = 100
GDR	705	105	860	119
Czechoslovakia	670	100	720	100
USSR	475	71	600	83
Hungary	425	63	510	71
Poland	405	60	515	72
Bulgaria	340	51	440	61
Rumania	290	43	435	60

Source: Ju. N. BELJAEV "Sbliženie urovnej ekonomičeskogo razvitigja socialističeskikh stran". Izd. "Mysl'", Moscou 1967, p. 246.

Note: The author gives no clear indication either of his sources or of the methods used or of the \$ value taken for the purposes of the comparison. It can be assumed however that these estimates are derived from Hungarian estimates which have been established on the basis of the real indicator method provided by:

- (a) F. JÁNOSSY "a gazdasági fejlettség méhretősege és ug mérési módszere (measurement of development levels: a new method). Közgazdasági és Jogi Könyvkiaco. Budapest, 1963.
- (b) L. CSEH-SZOMBATHY: article published in "The Standard of Living". Budapest, 1962.

COMPARISONS BASED ON THE CURRENCY VALUE OF
EXPORTS AND IMPORTS

A. 1964-1970 164 per capita GNP in \$ terms

	1964		1967	
	\$	Czechoslovakia = 100	\$	Czechoslovakia = 100
GDR	930	126	1,250	124
USSR	n.d.	n.d.	1,110	110
Czechoslovakia	740	100	1,005	100
Hungary	680	92	890	89
Bulgaria	510	69	880	88
Poland	430	58	595	59
Rumania	400	54	560	56

Sources: Economic integration and political tensions in Eastern Europe. G.E.P.I. Note, 1969.

International comparisons. G.E.P.I. Note 1972.

Note: The method, based on the application of "sectorial coefficients for the conversion of exports and imports" is explained in "Essai d'inventaire économique des pays de l'Est", Travaux et Recherches, La Documentation Française, Paris 1969.

N A T O U N C L A S S I F I E DANNEX III to
AC/127-T/552B. 1973 Per capita GDP in \$ in 1973

	1	2	3	4	5	6	7	8	9
	National Income (*)	Depreciation	Value added for the non-productive sector	Gross Domestic Product (*)	Transferable roubles by monetary unit	GDP in milliards of roubles	GDP in milliards of \$	Population	Per capita GDP (in \$)
Czechoslovakia	357.7	45.4	35.8	<u>438.9</u>	0.056	24,578	32,934	14.56	2,262
GDR	126.8	15.1	13.3	<u>155.2</u>	0.182	28,246	37,849	16.98	2,229
USSR	337.2	38.5	38.4	<u>414.1</u>	0.833	344,945	462,226	249.75	1,851
Bulgaria	12.15	2.13	0.86	<u>15.14</u>	0.667	10,098	13,551	8.62	1,570
Hungary	354.0	44.3	28.7	<u>427.0</u>	0.025	10,675	14,304	10.43	1,371
Rumania	293.0	38.1	14.7	<u>345.8</u>	0.057	19,711	25,413	20.83	1,268
Poland	1,062.5	124.1	68.0	<u>1,254.6</u>	0.025	31,365	42,029	33.36	1,260
TOTAL						469,618	629,286	354.53	1,775

(*) milliards of units, national currency.

Sources: Column 1: Yearbook of national accounts statistics 1974 United Nations, New York, 1975.
Current Prices: except for national income (Net Material Product) in the GDR which is expressed in 1967 prices and for the Net Material Product for Rumania which is as given (without source or indications) in the ECE-Geneva Yearly Report.

N A T O U N C L A S S I F I E D

Column 2: Yearbook of national accounts statistics 1974

Current Prices except as regards depreciation in the GDR which is as entered in the national yearbook and as regards Rumania for which no information is available. It has been estimated that depreciation as a proportion of the Net Material Product of the latter country is about 13%.

Column 3: It was felt that the relationship between the ratios for

Population employed in the non-material sector
Population employed in the material sector

and

Production in the non-material sector
Production in the material sector

available for Hungary could be used to determine the value of non-productive services in the other countries. This is the same as saying that relative prices in the two spheres are the same in all the countries. Production in the non-productive sphere as a proportion of the Net Material Product would therefore be 7.1% for Bulgaria, 10.5% for the GDR, 6.4% for Poland, 5.0% for Rumania, 11.4% for the USSR, 10% for Czechoslovakia (8% for Hungary).

Column 4: Columns 1 + 2 + 3

Column 5: according to Harriet Matejka "Convertibility in East Europe". Annales d'Etudes Internationales No. 5, 1974. These are commercial conversion rates adopted in October 1973.

Column 6: in accordance with the 1973 transferable rouble rate: 1 rouble = \$1.34

Column 8: estimated population in mid-1973 (United Nations).

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B bis. 1973

Per capita GNP in \$
(Czechoslovakia = 100)

1. USA	6,167 (273)	8. <u>Czechoslovakia</u>	2,262 (100)
2. FRG	5,671 (251)	9. <u>GDR</u>	2,229 (99)
3. France	4,797 (212)	10. <u>USSR</u>	1,851 (82)
4. Belgium	4,662 (206)	11. Greece	1,816 (80)
5. Netherlands	4,435 (196)	12. <u>Bulgaria</u>	1,570 (69)
6. Austria	3,752 (166)	13. <u>Hungary</u>	1,371 (61)
7. Italy	2,515 (111)	14. <u>Rumania</u>	1,268 (56)
		15. <u>Poland</u>	1,260 (56)

Sources: - Yearbook of national accounts statistics, 1974
Volume III, United Nations, New York, 1975

- Table B of Annex III.

Note: The GNP of Western countries is calculated by the United Nations on the basis of the exchange rate for the year.

Table C

	Total GDP (millions of \$)			Per capita GDP (\$)		
	GEPI	World Bank	JEC	GEPI	World Bank	JEC
USA	1,297,510	1,304,530	1,297,510	6,167	6,200	6,167
FRG	351,450	329,670	351,450	5,671	5,320	5,671
Denmark	27,570	26,140	27,570	5,481	5,210	5,481
Luxembourg	1,827	1,730	1,827	5,221	4,940	5,221
France	250,043	236,610	250,043	4,797	4,540	4,797
Belgium	45,498	44,470	45,498	4,662	4,560	4,662
Netherlands	59,601	58,180	59,601	4,435	4,330	4,435
United Kingdom	172,723	171,380	172,723	3,088	3,060	3,088
Italy	138,072	134,520	138,072	2,515	2,450	2,515
Czecho- slovakia	32,934	41,820	38,351	2,262	2,870	2,634
GDR	37,849	50,850	40,786	2,229	3,000	2,402
Ireland	6,495	6,520	6,495	2,144	2,150	2,144
USSR	462,226	506,490	639,360	1,851	2,030	2,560*
Bulgaria	13,531	13,710	13,214	1,570	1,590	1,533
Hungary	14,304	19,320	18,722	1,371	1,850	1,795
Rumania	26,413	21,767	31,620	1,268	1,405**	1,518
Poland	42,029	69,860	53,610	1,260	2,090	1,607
Σ European Nine	1,053,279	1,009,220	1,053,279	4,106	3,933	4,106
Σ COMECON	629,286	723,817	853,663	1,775	2,042	2,357
COMECON-USSR	167,060	217,327	196,303	1,594	2,074	1,873

* The JEC publishes separate estimates for the USSR on the one hand and the other COMECON countries on the other. An updated average estimate, based on the Gilbert-Kravis method, has been adopted here for the USSR. (cf. Annex I, table F).

** Since the data for Rumania published by the World Bank are not taken from the same source as those published for the other Eastern countries, the present figures are derived from the updated results of the ECE-Geneva comparison for 1965 which provided the basis for the estimates.

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Table C bis East-South Comparison

	Total (millions of \$)		Per capita GDP (\$)	
	GEPI	World Bank	GEPI	World Bank
Japan	409,771	393,000	3,782	3,630
Czechoslovakia	32,934	41,820	2,262	2,870
GDR	37,849	50,850	2,229	3,000
USSR	462,226	506,490	1,851	2,030
Greece	16,160	16,720	1,816	1,870
Spain	61,052	59,360	1,751	1,710
Bulgaria	13,531	13,710	1,570	1,590
Hungary	14,304	19,320	1,371	1,850
Portugal	11,278	12,690	1,317	1,410
Rumania	26,413	21,767	1,268	1,405
Poland	42,029	69,850	1,260	2,090
Argentina	25,733*	39,760	1,076*	1,640
Uruguay	2,907	2,850	972	950
Iran	29,548	27,830	944	870
Mexico	49,656	49,830	914	890
Brazil	77,853	76,950	765	760

* Data for 1972