NATIONAL PRODUCT AT CONSTANT PRICES IN THE FEDERAL REPUBLIC OF GERMANY

BY DR. HILDEGARD BARTELS

Statistisches Bundesamt, Wiesbaden

With few exceptions, only *commodity flows* and *values* which can be determined *by means of commodity flows* (flows of goods and services) are calculated in constant prices in the official national accounts of the Federal Republic of Germany. Figures on the industrial origin and the final use of the national product are published, the former according to thirty industries, the latter according to the major types of uses of which in particular private consumption expenditure has been further analysed.

The computations at constant prices are based on *market* prices and not on factor costs. It is only on this basis that a uniform valuation of the production and the expenditure side can be made since the turnover tax, which is the most important indirect tax, is contained in the elements of final demand in varying shares and cannot be eliminated (the tax is part of the price and has cumulative effect).

The computation at constant prices presupposes a breakdown of the values in current prices according to quantities and prices. This raises a number of problems, e.g. because seller and buyer may consider differing aspects—*production costs, technical attributes*, etc., on the one hand, and *use* etc., on the other hand. In part there exist only vague ideas, or no ideas at all, as to what is to be considered—from a theoretical point of view—as quantity and price. In other cases the two values can only with great difficulties, if at all, be quantified, or there exists no market price and only the production costs are available. The author deals in greater detail with *differences in quality* and *new commodities*, the determination and treatment of quantities and prices for *services*, in particular for trade services (services attached to goods), the computation of *government services* at constant prices considering the *development of productivity* in public service, the determination of the *values calculated as balances*, above all the treatment of changes in the *terms of trade* for net exports of goods and services, the computation of the *contributions of industries* to the gross domestic product and, finally, the *reconciliation* of the production and the expenditure side.

In a third section the author deals with *index formulae* and the *base year*. In the majority of cases values are deflated; partly, however, they are currently adjusted by means of volume and quantity data. On the production side the two methods are in part combined.

In a concluding section a *survey* is provided of the *computation methods used* in the Federal Republic of Germany and on the available *material for the computations*. Mention is made of *depreciation* at constant prices.

I. RESTRICTIONS OF THE COMPUTATIONS AT CONSTANT PRICES TO COMMODITY FLOWS AND MARKET PRICES

With few exceptions, only commodity flows and values which can be determined by means of commodity flows are calculated in constant prices in the official national accounts of the Federal Republic of Germany. In the present state of the relevant work, the publication of data in constant prices is restricted to final expenditure and industrial origin of the national product. On the expenditure side are recorded private consumption expenditure classified into nine uses, government consumption expenditure, fixed asset formation classified into equipment and construction, changes in stocks, and net exports of goods and services classified by exports and imports as well as by goods and services. On the production

side we distinguish between enterprises, general government, private households and private non-profit institutions and, for the enterprise sector, between twenty-seven industries. An abridged grouping is used for the semi-annual computations.

In the enterprise sector, the contributions of industries to the gross domestic product are in principle calculated as the difference between gross output and inputs of intermediate goods and services. In some industries, we had, however, to resort to provisional solutions where only one of the two values mentioned or the contribution to the gross domestic product itself or else essential elements of this contribution more or less provided the basis for the computation. This applies to a greater extent to the contributions of the general government, private non-profit institutions and private households. In any case only the contributions of the industries to the gross domestic product are published in constant prices, not any figures on gross output and intermediate goods and services.

Input–output tables have so far been compiled only once in the official national accounts of the Federal Republic of Germany. Therefore the problem of computing these tables in terms of constant prices practically has not yet arisen.

The few values which are determined in constant prices and are not commodity flows include the net earned income and income from property accruing to residents from the rest of the world (which enables the transition from the gross domestic product to the gross national product) and depreciation.

Gross domestic product in constant prices is regularly related to the average number of economically active persons; this value serves as a measure for the development of productivity in the national economy as a whole. Such index numbers will soon be available for groups of larger industries, too.

The computation at constant prices is based on market prices and not on factor cost. A uniform valuation of the production and the expenditure sides of the national product computation is in the Federal Republic of Germany possible only on this basis, as the most important indirect tax, the turnover tax imposed at all levels, as well as some other indirect taxes, cannot be eliminated from the prices of final products. Thus it is unnecessary to decide which concept should in theory be preferred or which concept is more suitable for which analytical purposes. The same applies to the question of how indirect taxes and subsidies can be deflated with some degree of precision.

Special problems arise for the computation both at current prices and at constant prices for goods which have no market prices. In all cases where entrepreneurs withdraw goods and services for private consumption (e.g. own consumption of agriculture, use of owner-occupied dwellings) which are produced in their own enterprise, there is some justification in imputing a turnover at market prices, which by means of the usual methods can be calculated at constant prices. In those cases, however, where intra-organizational commodity flows have been valued at producers' costs as, for instance, own-account construction or changes in output-stocks, the computation at constant prices meets with particular theoretical and practical difficulties in regard to the cost elements which are not remuneration for goods and services (e.g. wages and salaries, depreciation). These difficulties have been avoided in the Federal Republic of Germany by assuming for such intra-organizational events the same price development as for the relevant goods and services traded on the market. This solution cannot be

applied to goods and services which have no market price, as for instance services of the general government and private non-profit institutions. In this case, the computation at constant prices has, as a rule, to be made from the cost side. The problems involved and the procedures applied will be dealt with in greater detail below.

II. Some General Problems of the Computation at Constant Prices

The computation of commodity flows at constant prices presupposes a subdivision of the values (in current prices) into quantities and prices and a valuation of the quantities at prices of the base year. Quantity and price will in general have to be what both purchasers and sellers consider as such. However, there are a number of cases where the opinions of the parties differ, e.g. because the seller considers the technical attributes or the production costs for a specific good and the purchaser the advantage which he expects to derive from the good. There are also cases where purchasers and sellers have only a vague, incomplete or no idea at all as to what is to be regarded—from a theoretical point of view—as the quantity and what as the price, or where it is difficult to quantify either of them, or where goods has no market price, etc. Some of the most important problems arising in this connection will be discussed in greater detail below, together with the solutions applied in the Federal Republic of Germany.

(*a*) *Consideration of Differences and Changes in Quality*

In general, it is easiest for commodities to indicate what is the quantity and what the price, but here also the exact delimitation and determination is frequently complicated by differences in quality. The coverage of quality changes and their elimination from price series is a general problem of price statistics to which much attention has been paid at the Federal Statistical Office. For various major price indices, careful investigations have, for instance, been made to determine for which of the goods (a) quality changes do not occur at all or only to a small extent, (b) quality changes occur periodically and are compensated in the course of time, (c) quality changes occur, are determinable and can be eliminated with sufficient precision, and, finally, (d) quality changes possibly occur but cannot be determined or eliminated[1].

Even if the results can be used only subject to some reservations, it has to be stated that the proportion of the cases mentioned under (d) where the problem of quality changes cannot be solved is not as high as is often assumed. This group comprises, above all, very differentiated goods and a number of services.

For the goods of group (c) everything has been done to adjust, as far as possible, the price series for quality changes. This can frequently be achieved by switching in time for the calculation of prices over to the new quality and by linking the price data for the old and the new quality with each other. This procedure has above all been used where several models of goods have for a certain

[1]Horstmann, K., and associates: "Qualitätsänderungen und Preisindices" in *Wirtschaft und Statistik*. 1963/10, p. 594 ff.

time simultaneously been on the market. The most suitable date for such a linking is when the old model is still marketable and the new one is already on the market. It can then be assumed that the two models compete with one another and that the price difference corresponds approximately to the difference in quality.

The situation is more difficult where a model is suddenly or within a very short time replaced by a new one. If an increased capacity (e.g. the washing effect of washing preparations, the h.p. capacity of an engine) can unambiguously be expressed in figures it is also in this case relatively easy to eliminate the change in quality from the price series. Frequently, however, several things change at the same time which it is difficult to quantify simultaneously (e.g. for a car the shape, inside fittings, road-holding facility, etc.). In these and other cases, attempts are often made to learn from the manufacturers what proportion they calculate for improvements of quality. For this procedure we must however take into account that manufacturers are inclined rather to overestimate than to underestimate the value of improvements and to see them perhaps too much from a technical point of view; checks must therefore be made. An adequate opinion can sometimes be given by the dealers who carry a wide range of goods and can compare the various makes. However, it is much more difficult, if not impossible, to get opinions of buyers suitable for generalization since buyers frequently do not purchase the same commodities on a continuous basis and since their judgement is often too much influenced by subjective elements. With new models of a commodity it is often possible only to determine whether a price change is mainly or hardly at all due to changes of quality. The entire price change is treated accordingly as a change of quality or as a real movement of prices.

For "one-time" manufactures the price observation is particularly dependent on comparative calculations of the producers which are made in different ways. A specific approach followed in the Federal Republic of Germany for determining the prices of more or less one-time goods and for eliminating quality changes concerns buildings and other construction. There we record the development of prices only for individual and clearly defined construction performances. The influence of changes in the quality of the buildings and other construction is eliminated by means of fixed weights when the prices for the individual construction performances are combined into a price for the building etc. as a whole.

Particular problems arise when entirely new products appear on the market. They are included in the price indices only when general revisions are made and even then only if they have already become of some importance. This is why the sharper reduction of prices or the reduced increase of prices, to which many new commodities are subject at the beginning due to increasing demand and the reduction of costs, is not reflected in the price indices. This causes some overstatement in the price indices.

Corrections of the above nature by which price statistics are adjusted to changing economic conditions are in part effected on a current basis, in part only in the course of major index revisions, above all if the indices are rebased.

Questions of this type arise with all quantity statistics. A detailed description of the methods used in this connection will however be dispensed with here, since in computing the national product at constant prices many more values are deflated than quantities currently adjusted.

(*b*) *Quantities and Prices of Services*

The computation of services at constant prices (in this connexion only services performed by the enterprise sector) is much more problematical than that of the commodities. This is in part due to the fact that the breakdown of the relevant values into quantities and prices frequently raises particular difficulties both in theory and practice and in part because in the Federal Republic of Germany services are covered statistically to a much lesser extent than commodities.

There is so far no completely satisfactory solution to the question of how to cover those services which are attached to commodities. This is of particular importance in trade. When dividing trade turnover into quantity and price, both sellers and buyers tend to consider as quantity only the commodities traded. In the imagination of the people involved the invisible trade service is mostly superceded by the visible commodity. The same applies, for instance, to the selling services of the producer. The solution to this problem is complicated by the fact that many trade and selling services cannot be quantified. Nevertheless, a clear distinction is made in turnover and price statistics according to the level of producer, wholesaling and retailing. Thus the differing volume and the differing type of selling and trade services are accounted for at least to some extent. In some measure separate price series at one and the same level also account for the fact that the selling of the same type of commodity may involve different trade and selling services. In connection with the observation of mineral oil prices *ex* refinery, for instance, the varying shipping capacity is considered by covering separately the prices for oil shipped by tank car, tank wagon or lighter. Within certain limits the price series for wholesale and retail trade are distinguished according to self-service shops and conventional shops, according to the location of the shops in relation to the residential areas, according to the wider or smaller range of goods traded, by domestic and imported goods, according to the differing type of service (installation of vending machines, delivery free of charge, etc.), according to the purchase of large or small quantities (quantity discount), etc.

In many cases, however, it is assumed, or has to be assumed for simplification, that the selling and trade services for the individual commodities depend on the quantities traded and thus can be neglected in the computation at constant prices.

For transport services it is in general somewhat easier to determine the quantity and the price. There are various data available on transport charges, freight rates, etc., as well as on the quantities involved. However, the quantities recorded for the various modes of transport frequently are restricted to the quantities carried (persons, goods, communications) and the distances. As to the charges and freight rates there is frequently a greater differentiation which makes it possible to account more or less roughly for the activities of loading and unloading, the use of special containers and facilities, the regularity and speed of transportation, etc.

As far as other services are concerned, the breakdown by quantity and price in part meets with almost insuperable difficulties. This applies above all to services rendered by the liberal professions for which there are at best only very rough quantity measures, and to services which are paid more or less on a global basis or indirectly, such as banking and insurance services. Rather satisfactory price

data are available only for some few sectors. Material of quite good quality exists for the hotel and restaurant industry and other service sectors which are included in the cost-of-living index (e.g. cinemas, hairdressers, laundering and dry cleaning). For some services, such as cinemas, radio, television, physicians, there is also quantitative information available on attendants, listeners or cases treated which may be used for a provisional current adjustment. For the ownership of dwellings it is possible to draw upon data on the number of dwellings and rooms, on rents and building prices. For the rest of services it has often been necessary to proceed for the computations from the cost side, mostly by means of figures on persons engaged and agreed wages, as well as provisional indicators for other costs.

On the whole, the figures on services are no doubt less well founded than those for the commodities for which much more material is available on values, quantities and prices. The services which are not offered on the market, in particular the services supplied by the general government, will separately be dealt with below.

(c) General Government Services at Constant Prices

The services provided by general government have in national accounts of the Federal Republic of Germany been computed in current and constant prices exclusively from the cost side, i.e., by way of personnel expenditure and expenditure on goods and services bought by general government (including depreciation and net rent). This gave, among other problems, rise to the difficult problem of deflating the wages and salaries of government employees not only by considering all parts of income and of the qualification groups, but also by accounting for the development of productivity. This was based on the assumption that there is a certain productivity improvement in public service due to better training, increased exchanges of experience on an international basis, improved organization and the growing use of technical means (electronic data-processing machines, duplicators, teleprinters, radio equipment, traffic lights, modern weapons, etc.). The above factors result, among other things, in changes in the structure of the personnel, i.e. in a relative increase in the more qualified and better paid positions. The extension of the number of these jobs available is therefore in part considered as a real improvement of quality and productivity and accounted for in deriving the quantitative development. The rest has been treated as a hidden salary increase. There is further a small correction factor for productivity improvements which are not shown directly by a better grading and remuneration of public service employees. For further details concerning the calculation of general government services at constant prices including the expenditure on materials, see the description of the computation methods used on the production and the expenditure side below.

For certain government services, e.g. in education, it might also be possible to measure the result of government activities directly by quantity, i.e., from the output and not from the input side. The relevant investigations are, however, not to be made until the breakdown of government consumption expenditure by functions is available which is at present being prepared.

(*d*) *Values Determined as Balances, in Particular Net Exports of Goods and Services and Contributions to the Gross Domestic Product*

In the national accounts of the Federal Republic of Germany the following items are computed as the balance of commodity flows or stocks: net exports of goods and services, changes in stocks and—in principle—the contributions of the various sectors of economy to the gross domestic product.

The net exports of goods and services are obtained as the balance of the exchanges of goods and services with the rest of the world. If exports exceed imports, there result as a rule claims against the rest of the world, and liabilities in the opposite case. For the price adjustment of net exports of goods and services the obvious solution seems to be to determine which goods could or should have been imported or exported to balance the claims or liabilities. In the former case import prices would have seemed appropriate for deflating exports and imports or the net exports of goods and services, and in the latter case export prices equally for imports and exports or the net exports of goods and services. However, this method of deflating (both sides with the same price index) introduces into the computations a speculative element since it is impossible to say which goods and services would actually have been imported or exported and what the prices would have been if the claims and liabilities against the rest of the world had actually been realized. It should be more appropriate to stick to the actual processes and to effect the price adjustment for the goods actually imported and exported by means of the import and export prices actually obtained. It is only in this way that the production and the expenditure side in the calculations of the national product can be reconciled and only in this way can corresponding values for net exports of goods and services at constant prices be obtained for the various countries which in the end are offset in world trade.

With the solution adopted here it may happen that a positive value for net exports of goods and services at current prices may turn into a negative value at constant prices, and vice versa. This is the consequence of a sensible change in the terms of trade. This phenomenon is, however, not restricted to external transactions. It may very well also occur in connection with profits on the production side of the national product computations. If the relations between output and input prices have substantially changed as compared with the base year, a profit in current prices might well turn into a loss for the computation at constant prices, and vice versa. This problem will again have to be dealt with in connection with the question of the base year.

The contributions of the sectors to the gross domestic product at constant prices (market prices) are in principle determined by balance, i.e., by the separate calculation of gross output and intermediate goods and services. There are for practical reasons a number of variants and also some deviations from the general principle. About six methods may be distinguished, viz.: deflating of gross output in current prices by means of output price indices or current adjustment of gross output in constant prices by means of quantity indices, both methods combined either with deflating of intermediate goods and services at current prices or the determination of the intermediate goods and services in constant prices with quotas of the base year; and further—as an exception—the direct deflating of the contribution to the gross domestic product in current prices mainly by means of

indices of agreed wages or average wages and salaries or current adjustment of the contribution to the gross domestic product at constant prices with figures on the persons engaged and an addition for productivity. For a large part of the economy, in particular in the manufacturing industries and in trade, the quotas of the base year (for intermediate goods and services and contributions to the gross domestic product) have for several years at a time to be applied to the deflated gross output, so there is for these periods basically simple deflation (the intermediate goods and services thus determined are converted by means of input price indices to current prices). When reconciling the production and the expenditure side, any deviations of the intermediate goods and services in constant prices from the quotas of the base year are, however, accounted for. Direct computation of the contribution to gross domestic product prevails in the service sectors outside trade, transport and ownership of dwellings.

(*e*) *Reconciliation of the Production and the Expenditure side in the Computation of the National Product.*

Though the production and the expenditure side of the national product computations are calculated separately at constant prices, there are various connections between the two computations which facilitate their reconciliation. Input-output tables are not currently compiled at constant prices, but for the major sectors of the economy complete production accounts are established comprising gross output and intermediate goods and services (not published) which provide certain indications as to the interrelationships inside the enterprise sector. Private consumption expenditure is further computed on the basis of the turnover of the supplying sectors, and capital formation according to the commodity-flow method. In both cases the same or similar data are used on the production and the expenditure side. Despite this fact the two sides do not conform entirely—sometimes the deviations are small, sometimes they are more important —so that in the end it is necessary to adapt them to each other in the light of rather complicated considerations as to the reasons for the deviations. In times of stronger economic growth the production side normally exceeds the expenditure side, while the opposite applies during times of little growth.

III. Index Formulae And Base Year

Cases where values of the national product computations are currently adjusted by means of quantity data are rather rare; in general, values (at current prices) are deflated. Extensive price material is available for deflation, in particular of commodities, viz.: producer prices for agriculture and industry, wholesale prices, retail prices, prices of restaurants, transport charges, freight rates, postal charges, purchase and selling prices for foreign goods, purchase prices for farm supplies, building prices, consumer prices, etc. Among the quantity data and the volume indices used for the computations or for checking them should in particular be mentioned: figures on harvested quantities, indices of industrial production, quantity indices on the performance of the various modes of transport, volume

indices for the imports and exports of commodities, figures on building work completed, on persons engaged, etc.

The available volume and price indices are based on the Laspeyres formula. Except for the fact that they had in part to be rebased to the base year of national accounts (so far 1954), volume indices according to Laspeyres meet the requirements of national product computations at constant prices. Major conversions are, however, needed for the price indices since they have to be provided with the weights for the relevant reference years (Paasche indices). In general this conversion to the shopping basket of the reference year can be effected only for greater aggregates. For many of the partial values which constituted the smallest component parts of the computation at constant prices, partial indices according to the Laspeyres formula had to be used. All values published in constant prices have been computed in a very differentiated form.

Base year for the computation of the national product at constant prices has so far been the year 1954; the conversion to 1962 is being prepared. It is intended to link the two computations in a suitable year between 1954 and 1962. The base year probably should have been changed already at an earlier date because the more the price relations of the reference year are removed from those of the base year, the more unrealistic becomes the picture provided at constant prices. Apart from reasons connected with the available material, the enormous time and effort involved have impeded the relevant changes. For purposes of the European Economic Community a provisional computation has been made in 1958 prices.

IV. Survey of the Computation Methods Used

1. Industrial Origin of the National Product

On the production side, gross output (or total performance), intermediate goods and services and—where possible as a balance—the contributions to the gross domestic product at market prices, are in general computed in constant prices. Only the latter are published. The statistical unit for the enterprise sector is the enterprise. General government comprises all authorities, institutions and bodies of central and local government as well as of social security (excluding public enterprises).

(a) Agriculture, Forestry, Fisheries

For agriculture in the narrower sense the values of gross output in constant prices are currently adjusted with quantity data, while the intermediate goods and services in current prices are deflated by means of input-price indices. For this purpose figures on annual crop quantities and an index of purchase prices for farm supplies (Laspeyres) are available.

The same procedure is applied for tree nurseries. However, only figures on the cultivated area are available for the current adjustment of gross output. For other special forms of holdings in agriculture (flowers and ornamental plants, seed growing), and in commercial gardening and commercial animal keeping, however, the values of gross output as well as intermediate goods and services are deflated at current prices, viz. by means of the relevant indices of producer prices and—

provisionally—with the index of purchase prices for farm supplies which has already been mentioned above.

For forestry and fisheries the values of gross output at constant prices are currently adjusted with quantity data (timber cutting and fisheries), while, in the absence of other material, intermediate goods and services are computed by means of quotas of the base year.

(b) Goods Producing Industries

For all branches of this sector—mining, electricity, gas, manufacturing, manufacturing handicrafts and construction—largely the same method is used. The values of gross output in current prices are deflated by means of output price indices. The intermediate goods and services in constant prices are in part computed with quotas of the base year. Where at several years' intervals new material becomes available on intermediate goods and services in current prices and where also input indices have been compiled, the values are deflated, while computations with constant quotas are made only for the in-between years.

For computing gross output in constant prices we use: the index of producer prices for electric power, gas and water (Laspeyres), the index of producer prices for mining and manufacturing industries (special index for national product computations according to the Paasche formula which for the time being includes only prices for domestic sales but is to be extended by including prices for export goods), further a provisional index of producer prices for handicrafts (from price series for handicraft services, principally the cost-of-living index, from corresponding producer prices of industry and retail trade prices, from wages of workers, etc.), the price indices for the various types of buildings (weighted by means of the relevant turnover from building reports). For checking the computations for industry (in the Federal Republic of Germany always excluding goods-producing handicrafts), the index of industrial net production (volume index according to Laspeyres) is also used.

It has already been mentioned that in reconciling the production and the expenditure side account is taken of the fact that the quotas of the base year or of specific more recent years which are used for the computation of intermediate goods and services may change in the course of time. For deflating the data collected at several years' intervals for intermediate goods and services in current prices a special input price index has been constructed for national accounts which, however, relates only to industry.

(c) Trade

For wholesale and retail trade total performance is deflated by means of output-price indices; for computing intermediate goods and services the quotas of the base year are used. For commercial agencies, on the other hand, price indices are constructed on the basis of major cost elements, i.e. from the input side.

For wholesale and retail trade, indices of selling prices (Laspeyres) are available which at a specific stage are converted to Paasche indices.

For commercial agencies provisional price indices are constructed from price series for intermediate goods and services typical of the various branches and

from average wages and salaries; they are used for deflating total performance, intermediate goods and services and contribution to the gross domestic product.

(d) Transport and Communications

Differing methods are used for transport. For passenger and goods transport in road traffic total performance in constant prices is currently adjusted by means of quantity indices of passenger and ton-kilometres; intermediate goods and services are determined by means of the quotas of the base year. There are no quantity data available for taxis and short-distance goods transport; in future it will perhaps be possible to deflate the values in current prices.

For inland waterways transport and sea-borne shipping, total performance in current prices is deflated by means of indices of freight rates. In inland waterways transport the price series are weighted according to the situation in the relevant reference year; for the price index of sea-borne shipping, which is composed of freight rates for line, tanker and tramp shipping, constant weights have, however, to be used. For determining intermediate goods and services, what was said for road transport applies.

For railways, transportation by pipeline and communications total performance in constant prices is currently adjusted by means of quantity indices, while intermediate goods and services in current prices are deflated. For this purpose the following are available: quantity indices for goods, passenger and luggage transport of railways (separately by rail, bus and sea-borne transport), quantity indices for the various services of the postal administration (postal services, postal travel service, telephone, telegraph, postal cheque and postal savings services) and information on the ton-kilometres carried by pipelines. The input price indices for railway and postal services which are used for deflating intermediate goods and services are at a specific stage converted to Paasche indices. Output price indices have recently also become available for postal service, postal travel service and postal cheque service; they will be incorporated into the computations during the revision which is now under way.

For seaports, air transport and airports, forwarding and storage trades as well as transport agencies the values are provisionally deflated by means of the major cost elements (including indices of wages and salaries).

(e) Other Service Branches of the Enterprise Sector

The data available for computing the national product at constant prices for this part of the enterprise sector are rather poor. There are still rather good leads available on the development of prices and/or quantities in those spheres which, among other things, are of some importance for the cost-of-living indices, e.g., for services of the hotel and restaurant industry, large parts of handicraft services, ownership of dwellings, cinemas, radio, television, etc. As a measure for the services performed by the physicians, the cases treated are known for the members of social health insurance, etc. In part, however, the computations have primarily to be based on "price-adjusted" totals of wages and salaries (deflation by indices of earnings and agreed wages) or on the development of the number of persons engaged (with an addition for productivity); this applies, among others, to credit institutions and insurance enterprises.

(f) General Government, Private Non-profit Institutions and Private Households

The main problems relating to the computation of the contribution of general government to the gross domestic product in constant prices have already been discussed under II(c) so that they need not be dealt with here.

For the private non-profit institutions and domestic services resort to figures on the persons engaged (with certain addition for productivity) as a measure for the development at constant prices was unavoidable.

(g) Net Income from the Rest of the World

The net income from the rest of the world which has to be considered in order to derive from the gross domestic product at market prices the gross national product at market prices can be deflated only provisionally. For computing income from employment at constant prices, data on the development of total gross wages and salaries per person engaged (inside the country) have been made use of; for incomes from entrepreneurship and property, deflation with the "price index" of the final domestic use of the national product seemed to be the most significant approximation.

(h) Depreciation

Not only gross national product at market prices, but also net national product at market prices is recorded in constant prices. For this purpose depreciation has to be deflated. Depreciation in current prices is computed by means of the cumulated capital formation and of more or less well founded assumptions on the economic life-time of fixed assets (at replacement cost). For deflating the same price series are used as for the computation of capital formation at constant prices. The weights used for the depreciation of equipment are the shares of the various groups of goods in total equipment considering their economic life-time. Construction is deflated according to housing, government, agricultural and other construction.

2. Expenditure on the National Product

(a) Private Consumption Expenditure

Private consumption expenditure in current prices (national concept) is mainly computed on the basis of data concerning the turnover of the immediate suppliers; deflation is made on the same basis. For computations at constant prices the price indices which are available for the individual supplying sectors are used. They are converted according to the composition of private consumption expenditure and thus—though not entirely, but in rather great detail—to Paasche indices.

A great part of the goods of private consumption are supplied by retail trade for which good price material is available. For the own consumption of agriculture and the direct sales of farmers to private households we generally use indices of producer prices. The prices for electric power and gas are calculated separately according to quantities consumed and the basic fee or rent for the gas-meter; the data used are in part producer prices and in part data from the cost-of-living index (4-person households of wage and salary earners with medium income). In the

case of goods directly supplied by industry and wholesale trade to private households, indices for the relevant branches of retail trade had to be drawn upon instead of producer and wholesale prices which mostly were not available according to this specification. For production of handicrafts we use either the corresponding indices of producer prices for industrial products, the corresponding price indices for retail trade or parts of the cost-of-living index (the latter in particular in the case of butchers and bakers). In some branches of industry and handicrafts (including construction), price indices are constructed from indices of producer prices, retail prices and/or parts of the cost-of-living index. This applies especially to those branches which supply, install or repair commodities.

Data for the services of the transport industry and the postal administration are mainly derived from the cost-of-living index. For the ownership of dwellings we consider, apart from the rental as provided by the cost-of-living index, new additions of dwellings the rental of which is estimated on the basis of the estimates of construction costs. There is a separate price index available for the restaurant industry which can be used with the appropriate composition for private consumption expenditure. Other services can in part be deflated by series from the cost-of-living index, in part by other partial indices.

Public fees paid by private households are in the Federal Republic of Germany for the most part considered as purchases of households; for them special price indices are constructed for the corresponding personnel and material expenditure of general government. Domestic services are currently adjusted by means of figures of persons engaged and certain addition for productivity.

The travel expenditure of residents abroad and the corresponding expenditure of non-residents inside the country (deduction item), the purchases effected by employed persons in the canteens of their enterprises, consumption on business expenses (deduction item) and the purchases of private non-profit institutions are deflated according to their presumptive composition by means of the most suitable price series.

(b) Government Consumption Expenditure

Government consumption expenditure comprises the services provided by general government valued at production costs insofar as they are not sold but rather consumed by the general public without specific remuneration. In the Federal Republic of Germany most of the chargeable services are also considered to be sales. As has already been mentioned in Section II (c), deflation of general government is done from the input side. The computation of the personnel expenditure of the general government has also been discussed there.

For the deflation of material expenditure (current purchases of goods and services), a distinction is made between purchases for civil and for defence purposes. Purchases for civil purposes also include transfers in kind effected by social insurance. Purchases for defence purposes are separately deflated according to construction, equipment produced in the country, equipment from abroad and other purchases. Data for the composition of the various types of material expenditure are of differing quality; in part rough estimations have to be made. There are no specific price indices for government purchases; the most suitable

selling price indices of the suppliers and in part also average values have to be used.

The calculation of depreciation (buildings, equipment) and of net rent will not specifically be dealt with here.

(c) Fixed Asset Formation

Investments in buildings and other construction are in general deflated by means of prices for individual construction performances. Paasche price indices are computed on the basis of the data for the various types of construction (several types of residential buildings and business buildings, office buildings, roads, bridges, etc.) for the output of the construction industry (including handicrafts) as well as for the services of architects. For the industrial assembling of buildings and other construction we use the relevant indices of producer prices.

From the deflated output of the construction industry and the services of architects, repairs and defence construction are deducted and own construction of enterprises outside the construction industry (as well as own construction of general government) are added; the price development for these items has necessarily to be considered as running on about parallel lines with other construction performances.

Investment in equipment in current prices is calculated according to the commodity-flow method from the individual types of commodities from statistics on industrial production and from foreign trade statistics. The results of these computations are supplemented by information on handicraft production of investment goods, on trade and transport performances and on own-account construction, and deductions are made for defence material (software), the private use of motor vehicles owned by enterprises, the scrapping of fixed assets, the sales of used assets to private persons, and the increase in stocks of investment goods. Interzonal trade is also included in the computations.

Producer price indices for sales inside the country are available for the equipment produced and remaining in the country; they are converted to the proper composition of the commodities and to Paasche indices. For deflating imported investment goods the corresponding price indices of purchase prices for foreign goods are made use of; the average values of import statistics have in this case proved of little use. No separate price indices can be computed for the above addition and deduction items.

(d) Changes in Stocks

We deflate stocks at the beginning and the end of the reference year. Deflation is based on book values which are supposed to correspond to the price level of the last 2 to 3 months in the case of rising prices and to the price level at the date of the balance sheet in the case of falling prices. For deflating output stocks, producer price indices are available; for deflating input stocks we use price indices which are calculated according to the types of goods contained in intermediate goods and services on the basis of producer prices for industrial products and purchase prices for foreign goods. In the absence of the appropriate material this method

is relatively rough and uncertain. So it is, for instance, by no means sure that stocks have the same composition as gross output or intermediate goods and services.

(e) Net Exports of Goods and Services

The value of net exports of goods and services in constant prices is arrived at by deflating imports and exports.

For deflating imports and exports of goods as covered by foreign trade statistics there are two pairs of indices available: the index of purchase prices for foreign goods and the index of selling prices for export goods, on the one hand, and the unit value indices of foreign trade statistics, on the other. The former are Laspeyres indices recording the prices upon the conclusion of the business transaction. The unit value indices are arrived at by dividing the value of the goods imported and exported (in the most detailed breakdown of the German commodity classification) by the quantities (mostly kg). Since the individual items of foreign trade statistics in part still comprise commodities of rather differing value per kg (due to differing type, quality, etc.), changes in composition have a rather disturbing effect on the price comparisons. This disadvantage is matched by the advantages that the time of coverage for the totals of imports and exports is the same as for the unit values and that the unit value indices relate to the relevant quantities of the reference period (Paasche indices). The computation of imports and exports of goods is largely based on the unit value indices, but does not entirely disregard the trends which become obvious in the light of the price indices for import and export goods.

For deflating the exchanges of goods with the Soviet-occupied zone of Germany and the Soviet-occupied sector of Berlin, which are not covered by foreign trade statistics, we use provisionally the index of producer prices for industrial products. The same applies to the purchases of goods effected in the country by allied forces stationed in the Federal Republic (which rank with services).

Much more difficult than the deflation of the exchanges of commodities is the deflation of imports and exports of services. The travel expenditure of residents abroad in constant prices can, in the absence of information on the breakdown of the expenditure by countries visited and types of goods as well as of the corresponding price indices, be determined only by relatively vague estimations. The totals of the relevant expenditure which are derived from the balance of payments are in the course of the computations by estimation distributed among the individual groups of goods and then deflated by means of the price indices for the corresponding purchases of goods inside the country. The same procedure is applied in the opposite case for deflating the travel expenditure of non-residents in the country (which relates also to foreign civil employees of the foreign armed forces stationed in the country).

The sea-freight receipts of residents from non-residents are converted to constant prices by means of the sea-freight index which is also used for deflating the total performance of German sea-borne shipping. The sea-freight paid by residents to non-residents is deflated by means of the unit value index for imports which has already been referred to above.

The deflation of earned income from property between residents and the rest of the world has already been dealt with under IV 1 (f).

Due to the lack of special price series, we use for the deflation of all other flows between residents and non-residents which become part of net exports of goods and services the price index of final domestic use of the national product.

A part quelques exceptions, les flux de marchandises et les valeurs qui peuvent être déterminées aux moyens des flux de biens et services ne sont calculés qu'à prix constants dans la comptabilité nationale officielle de la République Fédérale d'Allemagne. Des données sur l'origine industrielle et l'emploi final du produit national sont publiées; les premières pour trente industries, les secondes pour les principaux types d'utilisations, parmi lesquelles les dépenses de consommation privée ont été analysées.

Les calculs à prix constants sont basés sur les prix de marché et non sur les coûts de facteurs. C'est seulement sur cette base qu'une évaluation uniforme des côtés dépenses et production peut être faite. En effet, la taxe sur le chiffre d'affaires, qui est le plus important impôt indirect, est comprise dans les composantes de la demande finale en montant variable et ne peut être éliminée. (La taxe fait donc partie du prix et a un effet cumulatif.)

Les calculs à prix constants présupposent une décomposition des valeurs aux prix courants selon les quantités et les prix. Cela pose une série de problèmes notamment parce gue vendeur et acheteur peuvent avoir des perspectives différentes: utilisation pour celui-ci, coûts de production, qualités techniques pour celui-là. Il n'y a parfois que des idées vagues ou pas d'idées du tout quant à ce qu'il faut considérer — sur le plan théorique — comme quantité et comme prix. Dans d'autres cas, les deux valeurs ne peuvent être quantifiées qu'au prix de grandes difficultés, ou encore il n'existe pas de prix de marché et l'on ne dispose que des coûts de production. L'auteur aborde avec plus grand détail les sujets suivants: différences en qualité; nouveaux biens; détermination et traitement des quantités et prix des services, en particulier, les services commerciaux; calcul des services gouvernementaux à prix constants, compte tenu du développement de la productivité dans les services publics; détermination des valeurs calculées des soldes principalement, étude des modifications dans les termes de l'échange pour exportations nettes de biens et services; calcul des contributions des industries au produit intérieur brut et finalement réconciliation des côtés production et dépenses.

Dans une troisième section, l'auteur traite de formules d'indice et de l'année de base. Dans la majorité des cas, les valeurs sont escomptées au taux de déflation; il arrive cependant qu'elles soient ajustées grâce aux données sur les volumes et les quantités. Du côté production, les deux méthodes sont partiellement combinées.

Dans une dernière section, en guise de conclusion, l'auteur passe en revue les méthodes de calcul utilisées en République Fédérale d'Allemagne et les matériaux dont on dispose pour ces calculs. Il est fait mention des dépréciations à prix constants.