UNITED NATIONS

ECONOMIC AND SOCIAL COUNCIL

GENERAL

E/CN.12/589

13 March 1961

ORIGINAL: ENGLISH

ECONOMIC COMMISSION FOR LATIN AMERICA
Ninth Session
Caracas, May 1961

COMPARATIVE PRICES AND THE PURCHASING POWER OF CURRENCIES IN SELECTED LATIN AMERICAN COUNTRIES

(Preliminary study covering capital cities in ten countries)

NOTE: This text is subject to editorial revision.

This study refers to particular months of 1960 which differ according to country as explained in the text.

CONTENTS

/INTRODUCTION

INTRODUCTION

The pattern of prices vary between countries for a variety of reasons - notably the differences in national resources, in the availability and efficiency of labour, the extent to which capital is utilised, the size of the market, the tastes of preferences of the consumer, the influence of freight costs, the incidence of taxation, the extent of governmental control - and so on. The present study has been designed to throw some light on price structures within Latin America and provide a means for measuring the level in one country relative to another. It aims at the same time to evaluate the purchasing power of each Latin American currency and to determine the rates of exchange which would equalize purchasing power throughout the region. What the study does not do is measure the purchasing power of the currency or the parity rate of exchange in terms of any non-Latin American currency (such as the dollar or the pound); and while this may be considered later, it has not been one of the present objectives.

The work has been divided into three stages and in this document only the results of the first stage are presented. The calculations so far made relate to the principal cities in ten selected countries for which price information on more than five hundred items were collected by ECLA during the period April-December 1960. The prices concerned were combined in such a way as to give an appropriate importance to each item and thus obtain a series of results for main types of expenditure in each country and for the overall price level.

The methodology used has been determined mainly by the objectives of the investigation and the statistical material which was available. The results shown in Chapter 5 are in many respects still preliminary and should be treated as such until the work has been completed for other parts of Latin America.

/The initial

The initial calculations would however indicate that the greatest degree of undervaluation of the national currency was evident in the case of Uruguay, followed closely by Argentina, and Brazil, and then Paraguay. At the other extreme were Chile and Panama - the remaining countries (Peru, Colombia, Mexico and Ecuador) being at an intermediate level. If Mexico is considered as a base, the price levels for the ten countries, in accordance with the prevailing free market rates are expressed by the following indexes:

Relative Price Levels (at free market exchange rates)

(Indexes : Mexico = 100)

Argentina	84	Chile	131	Paraguay	87
Brazil	85	Ecuador	103	Peru	92
Colombia	99	Panama	153	Uruguay	81

Since price levels afford a means of evaluating the purchasing power of currencies, the same data can be arranged in reciprocal form to give the following indicators:

Purchasing Power of Currencies (at free market rates of exchange)

(Indexes : Mexico = 100)

Argentina	118	Chile	76	Paraguay	114
Brazil	117	Ecuador	97	Peru	109
Colombia	101	Panama	66	Uruguay	124

This signified that, at prevailing exchange rates, the purchasing power of the currency was for Uruguay, 24 per cent more than in Mexico; for Argentina it was 18 per cent more (again compared with Mexico) and in Brazil, Paraguay, Peru and Colombia 17, 14, 9 and 1 per cent more. On the other hand for Ecuador, Chile and Panama it was respectively 3, 24 and 34 per cent less.

Other calculations with alternative countries used as the point of reference can be found in Chapter 5 and in the tables of the Statistical Annex. A set of parity rates of exchange is also shown, the following table (again based on Mexico) giving an indication of the results:

/Parity Exchange

Parity Exchange rates

(Units of national currency equivalent to one Mexican peso)

Argentina	5.59 pesos (Arg.)	Panama	0.12 balboas
Brazil	12.7 cruzeiros	Paraguay	8.42 guaranis
Colombia	0.564 pesos (Col.)	Peru	1.97 soles
Chile	0.110 escudos	Uruguay	0.739 pesos (Urug.)
Ecuador	1.46 sucres		

It must be stressed that these figures are in many respects tentative. Data for Panama in particular should be treated with caution as the price material for that country was not collected directly by members of ECLA's staff; and prices for some items may not be comparable with those of other countries. With regard to the remaining countries, certain information - for example costs of investment - still has to be elaborated in final form and the attention of the reader is therefore drawn to any qualifying statements which are made in the various chapters of the study.

Chapter I

THE NATURE OF THE PROBLEM

1. General

The establishment in Latin America of a Free Trade Zone and the progress towards a common regional market has focussed attention on three independent problems which have to some extent been a limiting factor in certain aspects of ECLA's work: the measurement of the real "worth" or the purchasing power of each Latin American currency; the measurement of relative price levels for the various countries; and the conversion into a single currency of prices or values which are initially expressed in different national currency units.

While to a large extent index numbers have furnished a means of establishing relative levels, and national currency figures have sufficed for measuring absolute levels or prices within a country, in the case of inter-country comparisons, neither index numbers, percentage figures nor even national values calculated at prevailing rates of exchange have provided indicators sufficiently reliable or meaningful for many analytical purposes. In post-war years a growing emphasis has been placed on macro-economic aggregates and interest in comparable national income statistics for individual countries or for the region as a whole has increased substantially. The lack of adequate measures for translating national data expressed in varying currency into reliable regional aggregates with a common monetary denominator has constituted an obstacle which usual statistical procedures have been unable to solve. In a similar way, in the formation of plans or proposals for economic integration - whether of the type envisaged for the Central American countries or that considered for the [illegible] region, a lack of information regarding relative price levels has hindered the work. Finally as mentioned above, the creation of a Free Trade Zone already covering the greater part of the Latin American population and production has brought into the open the need for adequate measures of the real "value" of each currency, the comparative cost structure, the relative price levels and the relationship between domestic prices and those applicable to internationally traded goods.

/2. The inadequacy

2. The inadequacy of prevailing exchange rates

The traditional method adopted for converting prices (or values) for one country into prices (or values) of another has been to apply the rates of exchange currently in use for international transactions. The complexity of the exchange rate systems for many Latin American countries in post-war years would in itself suggest the danger of adopting such a procedure. One would be left with the choice between free market rates, official rates, preferential and non-preferential rates, often fluctuating violently from one month to the next and certainly volatile over the course of years.

Even when a single rate is applied, exchange rates could only with difficulty be thought of as adequately reflecting the true "value" or purchasing power of domestic currencies. A glance at the price situation in Chile should suffice to make the point. In February 1959 the exchange rate for both trade and non-trade transactions was pegged at the level of 1,050 pesos to the dollar. If at that time it correctly reflected the "worth" of the peso, it could hardly do so in February 1961 when, with no alteration in the exchange rate, domestic prices have meantime risen 33 per cent (as in fact they have done). A similar situation is encountered in other countries e.g. Argentina and Uruguay where the exchange rate has been maintained at an arbitrary level, irrespective of the movement of internal prices.

That exchange rates fail to measure adequately the relative domestic price levels is of course logical. They apply basically to those items, and only those items, entering into transactions of an international nature - the export and import of goods and services (including shipping and insurance), the expenditure of tourists, the remittance of interest and profits, the donations from residents of one country to another, the flow of short-term capital and loans of a longer nature. The exchange rate or the system of exchange rates is that which maintains in equilibrium the inflow and outflow of funds relating to such transactions. Governmental action in controlling outflows is, however, often a dominant factor in equalizing both sides of the national balance of payments, and as a result it can be said for only a few Latin American countries that the inflows

/and outflows

and outflows are truly in equilibrium or that the current rates of exchange could conceivably measure the comparative values of currencies - even considering only those transactions which figure directly in the inter-country relationships e.g. the import or export of goods, flow of capital, etc.

When other transactions not figuring in the inter-country relationships are taken into account, the use of prevailing exchange rates for a measurement of purchasing power is even less appropriate. The bulk of final goods and services consumed or used in a country is not internationally traded; and while the role of trade in determining the level of national income cannot be over-emphasized, it must be observed that the value of imported goods is low compared with national production. If services are added, practically all of which are produced domestically (international transportation, communications, tourism, certain aspects of banking, together with consular services being amongst the few exceptions) it will be appreciated that an exchange rate determined by international transactions would be scarcely appropriate for valuing the totality of a country's production, income or expenditure.

3. The scope of the enquiry

As Professor Kravis puts it, in the classical cost-of-living problem the question to be asked is: "What expenditure in situation A is necessary to yield an equivalent level of well-being in situation B?"[1/] "Well-being" has of course to be defined. Should it, for instance, include access to culture, arts, recreation facilities, availability and efficiency of public or personal services, or should it be limited to those attributes which command a monetary value in the countries concerned? Should a person with an income which enables him to buy precisely the same goods and services in Venezuela as in Bolivia be treated as enjoying a similar

1/ The Scope of Economic Activity in International Income Comparisons, National Bureau of Economic Research, Studies in Income and Wealth, Volume Twenty, page 351.

/level of

level of well-being? On the one hand he might consider his well-being affected by the altitude, in the other case by the climate. The extent to which health factors, working conditions, housing availabilities, personal satisfaction or preferences have to be considered is an open one, the accepted practice being to take into account only those elements which have a monetary value.

In this study only final products which can be bought and sold will be covered, including capital goods and durable consumer goods.[2/] This means that we must include current goods and services purchased by the government as well as governmental investment, seeing that, in maintaining a health service or providing protection, education, administrative services, roads, bridges, public buildings etc., the government is acting on behalf of the individual inhabitant, financing the cost out of funds provided directly or indirectly by the people.

The field of the enquiry covers the following items of national expenditure:

(a) Goods and services purchased by individuals for final consumption.

(b) Goods and services purchased by governments to provide collective services to the inhabitants.

(c) Fixed investment of individuals.

(d) Fixed investment of the government.

Changes in inventories are not included, because they do not reflect monetary transactions actually taking place.

4. The objectives defined

Given the scope of the study, it remains to define in more precise terms the three objectives which, if possible, are to be achieved. These may now be stated more definitely as:

(1) To measure the relative price levels between the various Latin American countries, based on all expenditure transactions (whether by individuals or by governments) which relate to final consumption or to investment.

2/ It may be observed that in accordance with accepted national accounting practices, final products must include goods consumed by the producer e.g. food on farms; also the imputed rent for owner-occupied houses.

/(2) To determine

(2) To determine the purchasing power of each currency, in terms of the comparative quantities of final products which can be bought.

(3) To determine the parity exchange rates which will equate the price levels applicable to final products in total for each of the countries concerned.

The way in which overall price levels can be "equated" is an aspect yet to be discussed. As with other types of price comparisons, some criterion of "equivalence" for the various situations must be introduced. This "equivalence" in most cases is considered to be an "equivalence in well-being" or an "equivalence in the satisfactions of wants or needs". "Equivalence in the satisfaction of wants" has however various interpretations. In accordance with one approach, a global concept is adopted, without considering each component item or service separately. That is to say, a collection or "basket" of goods and services is considered which gives in total the same satisfaction in one country that another "basket" of goods and services provides in another - irrespective of the composition of the "basket". The more usual approach is however to consider a "basket" which has an identical composition in both places - the assumption being that the same item affords the same amount of satisfaction in two places and that in total the items give a basket which (theoretically at least) affords the same level of well-being in the two situations. The cost of the basket in the two places would, it is contended, then measure the relative level of prices in the two places.

If the latter approach is adopted, the parity exchange rate may be defined as the rate which equates the cost of a representative basket of goods and services in one country with the cost of a similar basket in another. (If, for instance, 1,000 pesos in country A buys a representative basket which in turn costs 1,500 nacionales in country B and 50,000 centavos in country C, the parity rates of exchange would be as follows:

1 peso = 1.5 nacionales = 50 centavos).

Conversely, prices are in parity for two countries when, with a given rate of exchange, a unit of currency in country A buys the same quantity of goods and services that an equivalent number of currency units will in country B (the rate of exchange determining the equivalence in terms of currency units).

/Likewise, the

Likewise, the purchasing power of one country's currency compared with another's can be described as the relative amount of goods and services which can be purchased for a unit of currency in each of the countries concerned.

Finally, the purchasing power equivalent of two currencies is the number of units of the one currency which need to be paid in order to obtain the same quantity of goods and services purchasable for one unit of the other currency. It should be noted that the "parity exchange rate" concept relates to the aggregate of all goods and services which are classified as final products - not to a particular type of transaction or a particular group of commodities. There is, for instance, no "parity exchange rate" for food alone, nor for investment alone - since this would pre-suppose that the only transactions in the countries concerned were for food, or for investment. On the other hand, there is a "purchasing power equivalent" for each type of transaction, or each group of transactions, since the number of currency units which are needed to purchase a particular item or group of items can be considered independent of other items or other groups. The total of the purchasing power equivalents for all items, when combined in appropriate proportions, gives the overall purchasing power for the currency of the country relative to another, and in this way become a measure of the "parity exchange rate".

As an alternative, purchasing power equivalents could be calculated for an income of a particular magnitude (in which case they would refer to the relative quantity of goods and services obtainable for that income in each country). In this event, the combination of the equivalents for all income levels once again gives the overall purchasing power of the currency of each country, and hence an indication of the parity exchange rate.

/Chapter II

Chapter II

BASIC CONSIDERATIONS

1. Differences in income levels and expenditure patterns

Before deciding on a method which can be adopted for a study of this kind, a number of theoretical and practical points have to be taken into consideration. One of the main difficulties is the variation in income levels which exists between countries, and between population groups within the same country. Much truth lies in Keynes' statement that:

"We can give no meaning to a numerical comparison between the purchasing power of a money to a poor man and its purchasing power to a rich man, the two things being, so to speak, in different dimensions" 1/. There are amongst Latin American countries fundamental differences in levels of income, in degrees of industrialization, in the skill, intelligence and productivity of the people, in the use of capital, in consumer preferences, and so forth. To compare, to aggregate or to average statistical material relating to widely divergent economies raises innumerable questions of validity, justification, compatibility, homogeneity and identity, all of which need to be taken into account in deciding on the way price relatives or purchasing power equivalents are to be calculated and the manner in which they should be interpreted.

The difference in expenditure patterns is particularly important since in each country it is a resultant of the various factors relating to basic needs, disposable income, availability of goods and services, consumer preferences and the national price structure.

For each situation, the expenditure pattern is adjusted according to the level of prices in such a way as to maximise individual satisfactions - more of those commodities being purchased which are relatively cheap, and less of those which are expensive. 2/ The inter-relationship of prices, incomes and expenditure patterns creates special difficulties when the

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1/ A Treatise on Money, London, (1930) Vol. I, p. 98.

2/ This generalisation tacitly assumes other things e.g. tastes or customs, are equal. It also assumes perfect competition as well as the ability of the individual to spend in the way most advantageous to him.

assignment of appropriate weighting is considered; and has been the main reason why most inter-country price comparisons have been restricted to a series of binary relationships.

2. Differences in quality

While the same commodities may to all intents and purposes be available for sale in all or many of the countries, closer examination will show that there is rarely a complete identity in the commodities consumed. Food may be more nutritious in one country, textiles more durable, clothing less subject to shrinkage, doctors better qualified, machinery better maintained, and so on. Only in isolated instances e.g., where a particular model of a Swiss watch is obtained from the same source, are commodities identical in an absolute sense; yet even in the instance quoted, the investigator may find that the watch is fitted with one kind of a watch-band in one country and a different kind in another - alternatively, that the dealer gives a longer, or a more effective, guarantee in one of the two countries.

In some cases, the quality difference may be ill-defined. The price of a cinema performance may for instance relate to an identical film in two places, but differences may exist in the type or length of supporting programmes, the confort of the cinema or the quality of the sound reproduction. For transportation and for personal or preferential services, similar quality differences may, and usually do, apply. In the case of public utilities, newspapers, even shop service (including packaging), certain elements of quality difference exist that may be appreciated by the inhabitants but are difficult to define in monetary terms.

To what extent, and in what way they are to be taken into account in an inter-spatial price comparison is one of the many problems which have to be resolved in practical form before purchasing power equivalents, price relatives or similar statistical measures can be calculated.

/ 3. Problems

3. Problems of quantification

The difficulty of comparing the purchasing power of money for individuals in different income situations has already been referred to. A similar problem is the extent to which needs and satisfactions or well-being can be expressed in meaningful quantity terms capable of comparison between countries. A corollary to this is the validity of an average or an index number to express in singular form a whole array of data subject to wide divergencies or variations as between countries in component elements. Opinion on this point is divided; and while recent schools of thought have inclined to the view that indexes cannot meaningfully be used as indicators for comparisons of satisfaction, well-being, utility, etc., the question is a debatable one which is outside the immediate scope of this investigation.

The attitude adopted by the writers of this study is that, for those who consider indexes or averages as usable indicators in relation to expenditure patterns, price levels and purchasing power equivalents, the calculations made for Latin American countries may provide some useful and informative data not available from other sources.

4. Availability of information

It is obvious that, unless the basic material is available or is potentially available, no method or approach can be considered satisfactory, irrespective of its justification on theoretical grounds. In Latin America, all countries collect material of some kind in connexion with their wholesale and consumer price indexes. A certain amount of additional information is available from marketing statistics, from trade reports, from national accounts and from information collected by various governmental or commercial organizations. On closer examination it will be found that little of this material is satisfactory for direct use in place-to-place comparisons.

For retail price indexes, only a limited number of items is, for instance, covered (usually 50 to 100); and large blocks of expenditure e.g. education or the purchase of furniture is omitted entirely. Furthermore, no price data of any kind is generally available on prices of investment

/ goods, other

goods, other than a small amount of usable information on building materials collected for the wholesale price index. The price enquiries furthermore relate in most cases to the capital cities or federal districts only; while the outlets from which prices are obtained are those patronised by selected classes - generally at the lower income levels.

The items covered by the price collections differ as between countries; and only a few basic items - mainly foodstuffs - can be considered comparable intra-regionally. In the majority of cases a technical specification is missing - or if it exists, is in such ill-defined terms that adjustments to take account of quality differences between countries is impossible.

Information on patterns of consumption and investment is very meagre and is as a rule inadequate for establishing the relative importance of the component items within each country. Few comprehensive and reliable consumer expenditure surveys have been conducted (Colombia being an outstanding exception); and weights assigned to each item of the cost-of-living indexes are often obtained from obsolete surveys covering a few families within a particular income group in the capital city only. (In the worst of cases, weights appear to have no sound basis at all). If national accounts data are relied on for determining the pattern of consumption and investment, the position is improved to only a small degree; for while investment figures are available in total and by broad groups, no information is usually available for the more detailed component items; in addition, when compiling national accounts, consumption is frequently obtained as a residual and no detail is given by group of commodities or of services.

It will thus be appreciated that if a study of comparative prices is to be based only on data currently available in each country, and if undue attention is paid to the importance of a precisely calculated pattern of expenditure and investment, the project must be abandoned as impossible. The problem is then to devise some method which will utilise to the maximum the little data in Latin America appropriate for our purposes,

/ to supplement

to supplement this by material obtained specially for this enquiry, and to combine the whole in some way which will produce meaningful price relationships as between countries, taking duly into account the differences in quality of goods or services available, in levels of income, and in the pattern of consumption and investment within the area.

(Lest it will be inferred that the situation in Latin America is worse than in other regions, let it be said that, excluding a few statistically advanced countries in Europe and North America, a study of comparative price levels elsewhere would be no easier and in many cases more difficult).

/Chapter III

Chapter III

METHODOLOGY

1. Practical aspects

For any statistical study, the methodology adopted must depend specifically on the objectives to be achieved and the extent to which available data can be utilized in order to achieve those objectives. Above all, a method is required which is precise, simple to compute, comprehensive in coverage, readily understood and capable of yielding results which are readily interpreted and are at the same time compatible with the framework of the study. An approach which might have sound justification theoretically might thus have to be rejected if it was difficult to put into practice - alternatively if the results were difficult to interpret or were not in keeping with the basic design of investigation. For similar reasons, what might be appropriate for one study might have to be discarded as a possible approach for others.

For the present investigation, ECLA's choice of a method was guided by the desire to obtain mutually-compatible results for all countries within the region, rather than a series of independently-calculated results each of which was applicable to a restricted number of the countries concerned (as in the case of binary comparisons). In the same way, methods which were over-elaborate or were too difficult to put into practice with the resources and information available were considered unsuitable for the investigation and were rejected accordingly.

2. The concept

In virtually all time or place comparisons of prices, the approach to the problem has rested on the fundamental concept of equivalence in two or more situations. This equivalence may refer to: (a) a collection of items each of which is considered to satisfy "wants" or "needs" in the same or an equivalent way in the various situations; or (b) a collection

/of items

of items which in total provide the same or an equivalent amount of satisfaction (or well-being) in each of the situations concerned - even though individually the items may provide differing amounts of satisfaction.[1/]

The latter approach has been supported by many writers on the grounds that it avoids the difficulties attributable to the interdependence existing between the price of an item and the quantity consumed. In the same way, its use would circumvent the problems which are due to differing availabilities in different countries and to factors such as the climate which although influencing consumer costs, have in themselves no monetary value capable of adequate measurement, for price or cost comparison. Unfortunately, the approach has a number of disadvantages. It is for instance difficult to demonstrate that a given collection of goods and services actually provides a specific amount of well-being or that the satisfaction of wants or the levels of well-being are precisely equated in the various situations. The use of indifference curves and income elasticities of demand to indicate equivalence has been advocated; but at the present stage of statistical development, this global approach cannot be considered as one likely to provide practical results except in a very restricted number of cases.

The first approach was to select a basket of goods and services which are individually assumed to provide the same or equivalent satisfaction in two or more situations - the implicit assumption being that the aggregate of the items will provide an equivalence in total satisfaction or total well-being in the countries being compared; and that the cost of the basket in the various situations will indicate the comparative level of prices, the comparative purchasing power and the exchange rate. The method has a number of limitations and disadvantages

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1/ A more direct but conceptually less sound technique often adopted for comparing price levels between countries is that of "adjusted" exchange rates - the "adjustment" being a price index applied to a rate selected from some so-called "normal" year in such a way that periods when the rate was at an unrealistic level are avoided. However, as exchange rates in the best of cases provide a measure of equivalence restricted to internationally-transacted items, and in no event take into account the relative price levels for goods and services which are domestically-produced or consumed, the approach cannot be considered in any manner to be reliable.

not encountered in the global approach. It demands precise identification of each individual item in each situation; it assumes that the same item meets the same needs and performs the same function, no matter which country is concerned; it requires the combination of items in such a way as to reflect their relative importance within the total on a comparative basis; it assumes a homogeneity, both of income and of expenditure (as well as of prices) within a country which may not, and usually is not, true; it demands a mass of precisely-calculated statistical material relating to prices, quantities, values, incomes etc. which is not readily available; and its results may be restricted in application by the limited coverage of the study and the methodology employed.

On the other hand, the approach has the over-riding advantage that it is mathematically precise, it is free from ambiguities in interpretation, and it does not rest on the subjective judgement of the statistician engaged in the investigation. In addition, its application can be extended through all sectors of expenditure, whereas the global approach advocated by Staehle, Frisch and others has so far been applied experimentally to only a restricted part of consumer expenditure, and to particular levels of income.

It was accordingly decided to adopt this approach in the ECLA study.

3. The problem of weights

For most studies where the "market basket" approach has been adopted, some prevailing exchange rate has been used in order to convert prices for all countries to a common monetary denominator; price relatives have then been calculated; and the weighting pattern of first one country and then the other has been used in order to combine the individual price relatives (the indexes which emerge providing in theory at least, measurements of the price relationship of the two countries, the purchasing power parities of the two countries and correction factors which, when applied to the official exchange, would indicate the parity exchange rate applicable to the currencies of the two countries). Since however, a weighting pattern representative of all the countries concerned has not been used, the results in practically all cases have been confined to a series of binary comparisons which serve a limited purpose.

/For the

For the ECLA study, it was considered important that the results be obtained in such a manner that they would be mutually valid as between all countries in the region. This signified the adoption of a common weighting system which, because of the nature of the study, had of necessity to be based on the average consumption pattern for the region - that is to say, the pattern with the greatest similarity to (or the least variation from) each of the patterns for individual countries. The consumption pattern could be expressed either as values spent (in which case they would be used to weight price relatives) or quantities consumed (which could be applied to weight prices directly). The averaging of values pre-supposed the existence of satisfactory exchange rates with which data expressed in national currencies can be converted and aggregated for averaging purposes. Since the study is designed precisely to measure such an exchange rate, this assumption could not be sustained. In addition, the use of price relatives involves the selection of a base country with which prices in other countries can be compared; and unless weights are chosen in accordance with the consumption pattern of the base country (which would be undesirable for an intra-regional comparison), the results are affected by the price level in the base country whenever two other countries are being compared.[2/] Where common quantity weights are employed, any country within the group may however serve as the reference point (or base) for the price comparisons. This is therefore, the system of weighting which has been chosen.

Two qualifying statements need to be made regarding the computation of weights. First: the main objective of the study is to compare one country with another country rather than to compute price levels or purchasing power equivalents for Latin America as a whole. The countries are of equal importance for the investigation; and any system of weighting which would give greater proportion to those with the greatest number of inhabitants has accordingly to be rejected (in this way avoiding the danger that the largest countries in the region e.g. Brazil so dominate

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2/ The same defect applies whenever value weights and prices have not been obtained in a consistent manner, e.g. values from one year, and prices from another.

the weighting structure that the results resemble a fixed weight index with the total quantities consumed in the largest country as weights - a clearly undesirable effect if the same weighting structure is to be employed in comparing the smaller countries e.g. Haiti and Paraguay).[3/] Secondly: quantities consumed per inhabitant depend on the purchasing power available which in turn is a function of the per capita income. The market basket has accordingly been based on the unweighted average of per capita quantities consumed in each of the countries concerned.

4. The approach defined

The approach which ECLA decided to use is based, then, on a basket of goods and services, the items of which are representative of average consumption patterns for all countries within the region. The per capita quantities consumed in each country provide the necessary weights - allowing however, a certain amount of substitution where different items are used in the different situations (e.g. potatoes and mandioc; light-weight or heavy-weight clothing; trains or buses etc.). Prices obtained for each item in each country are then applied to the quantity weights in order to yield a total cost for the basket in each country. The comparison of the costs in the various countries provides a measure of comparative prices (both for totals and for component groups), an estimate of the purchasing power equivalent to each currency, and an evaluation of the parity exchange rate.

The formula used to express the relationship of prices for two countries K and O within the region is explained more precisely in the Technical Notes but it may be noted here as:

3/ For a comparison with another region, however, the basket would need to be calculated in accordance with the importance of all individuals within the region and the average would be a weighted one - with greater importance to those countries with the greatest total purchasing power.

/where Pko

$$\bar{P}ko = \frac{\sum_1 qi\bar{o}.pik}{\sum_1 qi\bar{o}.pio} \qquad (k = a,b,c \ldots m \text{ countries}; \quad i = 1,2,3 \ldots n \text{ items})$$

where $\bar{P}ko$ is the price ratio of country K relative to country O (O being any other country within the group of countries)

$qi\bar{o}$ is the average per capita consumption of item i in all the countries concerned

pik is the price of item i in country K; and

pio is the price of the same item in any country O.

The purchasing power equivalent (Rko) of an item in country K relative to country O is equal to the reciprocal of the price ratio.

ie. $$R_{ko} = \frac{1}{P_{ko}}$$

or (for all items)[1]:

$$\bar{R}_{ko} = \frac{1}{\bar{P}_{ko}}$$

Reversing the purchasing power relationships we get

$$R_{ok} = P_{ko}$$

or $$R_{ko} = P_{ok}$$

When the calculation extends over all items of expenditure, the purchasing power relationships of two currencies is by definition equal to the parity exchange rate (E) for those currencies.

ie. $$E_{ok} = \bar{R}_{ok} = \bar{P}k_o = \frac{1}{\bar{P}_o k}$$

and $$Ek_o = \bar{R}k_o = \bar{P}_o k = \frac{1}{\bar{P}k_o}$$

Since the same weights are applied to the prices in each country, the results are mutually convertible and any country may be used as a reference point. In practice this signifies that the relationship of prices between say Argentina and Mexico, Mexico and Chile, Chile and Brazil will provide equally valid price relationships for Argentina - Chile, Argentina - Brazil, Mexico - Brazil, and so on for all twenty Latin American countries. What it

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1/ The sign " - " above a symbol signifies an average for all the commodities (or countries) concerned.

/will not

will not do is to provide a price relationship for one of the Latin American countries vis-à-vis United States or Europe; nor a parity rate of exchange expressed in dollars, francs or any non-Latin American currency. For such relationships, the work would need to be extended to introduce the weighting pattern and the price structure of the extra-regional territories.

Chapter IV

PRACTICAL ASPECTS

1. The general plan

Because of the difficulty of covering all countries completely at one and the same time, the present investigation was divided into various stages:

The first phase, now completed, applied only to main cities in selected countries - especially those where inflationary price movements could invalidate the results if the period in which prices were collected was too distant from that used for weighting purposes. In the second stage, (which has yet to be commenced) plans are to cover major cities in the remaining countries so as to give a first approximation to the price relationships and purchasing power equivalents which would apply to all countries in the region. The third stage would see the amplification of the study to include such other cities or zones within a country where different price patterns might apply. The combination of the three steps would then give representative results for all countries throughout the region and a means for calculating sub-regional and regional totals.

During 1960, prices were collected for nine countries; while in the case of one country, Ecuador, data were collected in the two principal cities of Quito and Guayaquil so as to determine the influence which price variations might have in a country possessing two or more zones of differing economic characteristics (such as income, occupation, housing, clothing, etc.). Since data of a reasonably comparable nature had previously been collected for a tenth country, Panama, for the year 1958, (price changes meantime being negligible), it was decided to include this country within the initial calculations.

2. The collection of price material

Two conflicting factors determined the lines which price collection took: (a) the need for local knowledge of shops, services, consumer preferences, marketing conditions, etc., (b) the need for ensuring comparability between all countries and the related problem of assessing adjustments which might have to be made to the prices of each item so as to take account of differences in tastes, customs, marketing conditions, etc.

/Pricing agents

Pricing agents familiar with local conditions were therefore, appointed to collect prices in a specified month of the year for each of the cities concerned. Precise specifications were drawn up for some 463 goods and services important in consumer expenditure and 87 investment items in such a way that identification of the item could be made in all countries. Instructions were formulated regarding the way in which data were to be obtained, the type of shop or outlet to be covered, the quantity of the item to be priced, and the variations in specifications which might be permissible to meet local conditions.[1/] The collection of prices was followed up by a visit to the country by a member of ECLA Statistical Section who was familiar with the work done elsewhere and could make on-the-spot decisions regarding problems which might have arisen. This procedure was deemed essential in order to cope with the many price-influencing differences which arose because of local conditions, many of them being difficult to express in monetary terms. Certain items, such as housing, transportation and services could not for instance be specified with sufficient precision to ensure strict comparability as between countries; and an element of subjective judgement had therefore to be introduced in order to ensure that similar goods or services were being priced. In some cases technical advice was sought either in the country concerned or upon return to ECLA headquarters when a careful appraisal of the material obtained for all countries could provide a basis for assessing price differences which were due to quality variation.

3. Adjustment for quality differences

Three classes of items could be distinguished in the price material gathered in the various countries[2/]:

(a) Identical items

These conformed precisely to the required specification in all countries. They referred for the most part to well-known brands or particular models of merchandise which conformed to manufacturer's specification e.g. "Kolynos toothpaste", "Kellog's corn flakes"; or a "Clinton 3.5 H.P. motor"; etc. In

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1/ e.g. the substitution of one type of furniture for another (price adjustments being later made to cover the quality differences).

2/ Adopting the terminology and the concepts referred to by Gilbert and Kravis in Empirical Problems in International Comparisons of National Product, International Association for Research in Income and Wealth: Income and Wealth, Series IV, pages 108-9.

/other cases,

other cases, the identification was a conventional one since no qualitative or quantitive tests were practicable within the framework of this study e.g. electricity, fuel oil, postal, telegraph and most other services (including doctors, dentists, domestic servants, hairdressers, etc.). Within this class were a large number of other items - particularly food - which although not precisely identical in all countries, differed in a very minor degree or in some intangible aspect (e.g. flavour) so that adjustment for price difference was impossible or unnecessary. In the same way, no account could be taken of variation in conditions under which goods were sold: e.g. the cleanliness of markets, even though considerable differences existed as between countries.

(b) Common items

While these items varied in some respects between countries, price adjustments could be made to take account of the points of difference. Comparability was thus obtainable indirectly throughout the region. This applied particularlly to durable goods, machinery and equipment where the makes or models differed somewhat as between countries, but not in a way which prevented an evaluation of the price element involved. (It might again be observed that if the difference for items in two countries was not measurable in monetary terms e.g. flavour, or if the variations involved no cost element - e.g. the cost of producing an "artistic" or an "unartistic" piece of furniture - the items were treated as identical).

(c) Unique items

These existed in only one or in only a small number of the countries concerned. Examples were common in the investment group, since many items e.g. paper making machinery could be located only in the more industrialized countries. In some cases, the item was one produced to satisfy local tastes or preferences - notably "maiz tupi" and "harina de mandioca" in Paraguay, "tortillas" in Mexico. In other cases its existence was determined, or influenced, by climatic conditions e.g. mangoes, papaya and pacae in tropical countries; apricots, nectarines and chestnuts in the more temperate zones - similarly heavy-weight (or light weight) clothing

/plus heating

plus heating (or air conditioning) for houses in the respective areas. Other examples could be found in the services groups - notably in the case of transporation where underground railways existed in one country, sub-urban trains, trolleys or boat-services in others.

In practice, it was found that virtually no items of importance in any one country were "unique" in an absolute sense. Most of the items in question were "unique" only if groups of countries were compared e.g. tropical and temperate zones. However, in most cases some country could be found where equivalent items suitable for substitution purposes in the different groups of countries existed e.g. in Peru where both tropical and temperate zones foodstuffs were available. Even in the case of machinery where an item was available for sale in some countries only, a theoretical price could be built up with exactitude for remaining countries on the basis of information relating to the original cost, freight, insurance, taxes, handling charges and distributor's profits. Unique items which had no counterpart in any other country - e.g. the underground railway (metro) in Buenos Aires - were not of fundamental importance since they could be assimilated to items performing a similar function (e.g. trains or buses in the instance quoted). The problems involved in dealing with unique products were therefore found in practice to be exaggerated out of all proportion by theorists who have written on this subject.

So far as common items and identical items are concerned, it was found that much depended on the degree of detail included in the specification and the faithfulness with which price enumerators had followed instructions. Where the items were adequately defined, identification was as a rule simplified and the necessity for price adjustments was eliminated. This was particularly true for those items where price was not proportional to size, and each size had to be treated as a separate variety or quality of the same item. In other cases, much depended on the interpretation of quality adopted by the enumerators (since that considered "good" in one country would sometimes be classed as "inferior" or "average" in another). However, the verification of price data by ECLA staff members familiar with the data in other countries reduced the number of common products substantially

/and left

and left fewer adjustments to be made in order to obtain precise comparability. Only in the case of house rentals, furniture, certain machinery items and the labour costs involved in construction did any serious doubts remain, once adjustments had been made for quality variations; and these doubts will, it is hoped, be corrected at a later stage of the study when additional information has been obtained.

4. The calculation of weights

In accordance with the approach adopted, the use of a regional basket of goods and services involved a weighting system which evaluated correctly the relative importance of each item. When value weighting is used - as in time-to-time indexes of prices within a country - the problem is simplified since the percentage of total expenditure allocated to each item furnished an acceptable estimate of its relative importance. For the quantity weighting chosen in this study, the situation was complicated by the fact that data were often expressed in different units of measurement; and even if the same unit was used, conversion could not be made directly from one item into equivalents of another (e.g. kilos of pears into kilos of apples). Conceptually, however, the principle of weighting proportional to the importance of items within the expenditure pattern still holds true; and the practical work resolved itself into an evaluation in quantity terms of each item consumed by the typical individual or family.

For the present investigation, the estimation of quantity weights was accordingly carried out in three stages:

I. An evaluation of the personal or governmental expenditure for each item in each country was made on the basis of national accounts data, family living studies, import or production statistics and governmental budgets.

II. The prices already collected in each country were divided into the corresponding value expenditure data in order to provide quantity figures for each item in each country.

III. The quantity figures for each item were summated regionally in order to provide averages of the quantities consumed in the region.

/The following

The following points may be noted:

(a) For no country was it possible to obtain values of personal expenditure broken down in the detail required for a study of this kind. National accounts statistics provided the basic figures for broad groups e.g. food, clothing, industrial machinery and equipment construction, governmental expenditure etc. A sub-division of the values concerned had in the case of consumer non-durable goods to be made on the basis of family living enquiries where these existed; and for the consumer durable goods, vehicles and machinery on the basis of trade or production data. For private construction, information was obtained from architects and builders regarding the relative importance of the component materials; while government accounts were used for the government sector. When national statistics were not sufficiently detailed to provide such fine discrimination as was required for this study, the sub-division was based on the expenditure pattern of a similar country.

(b) If a price was not available or was considered defective, a price based on that of some similar commodity was used. In a limited number of cases, the relationship of prices for two commodities in a similar country was used to make a price estimate. Where no suitable method of estimation was available, the value of the item was imputed to a similar item in order to maintain the correct importance of the group or sub-group. In no case were items omitted entirely from the weighting pattern if they were consumed in the country concerned.

(c) The imputation implicit in the selection and evaluation of representative items signified a certain amount of unreality in the quantity weights. A consumption figure of 10 kilos a head may for instance represent 9 kilos of lamb actually consumed and 1 kilo to cover, by imputation, the consumption of goat meat for which no price is separately collected. Imputation of quantities is, however, essential in the weighting structure if the price of one item is to be considered representative of similar items - which is the method universally adopted in the construction of price indexes.

/(d) Since the

(d) Since the value of consumption for each item related to per capita expenditure, the quantity figures were likewise on a per capita basis. The summation and averaging of the quantities therefore provided data which represent the average of the amount consumed per person in each of the countries covered by the enquiry.

(e) Since price figures have not yet been collected in all parts of the region, the weights refer meantime to ten countries only, and are subject to modification once the survey has been completed for the whole area.

5. Calculation of the results

The formula chosen involves the application of prices in each country to a common basket of goods and services. Applying this approach, the ECLA calculations provided for each item in each country a valuation expressed in the currency of the country covered. Summating items in each country, totals for groups and sub-groups of expenditure were obtained. When each of these was related to a corresponding group or sub-group in another country, a purchasing power equivalent was derived for that group or sub-group (the "purchasing power equivalent" showing the number of units of currency in each country which buy the same amount of the commodities in question). The aggregate of all groups provided the overall purchasing power equivalent for each country's currency vis-à-vis that of another. This by definition equals the parity exchange rate applicable to the currencies of the countries concerned.

Alternative calculations were also made in order to provide results in conformity with the prevailing exchange rates. This in theory involved the application of the exchange rate to individual prices for each country in order to place all data on a common monetary denominator. In practice, however, this was unnecessary since the same results could be obtained more simply by applying the exchange rates to the totals or sub-totals which had been determined in accordance with the proceeding paragraph. In this way, a series of price relatives expressed in accordance with prevailing exchange rates were obtained.

/The expression

The expression of price relatives signified the adoption of some country or countries as a reference point. Because of the methodology used, any country within the group could serve as such a point. Nevertheless for reasons of space, tabulations could not be presented according to all the alternatives (except for the basic table relating to overall totals). For the remaining tables, since Mexico appeared to be at a level intermediate between countries with high and those with low prices (considered in accordance with prevailing exchange rates), it was the country chosen as a point of reference. The adoption of a particular country as the reference point has, of course, the disadvantage that, not only is its general price level placed at 100 but so is the level for each individual product-class or group. It is thus not possible to judge the level of prices for a group of items in that country vis-à-vis other groups for the same country. In the same way, if prices in the reference country for the items concerned are low, the price relatives for other countries appear relatively high (and vice versa). To avoid these shortcomings, an additional set of price relatives were calculated with the average for all ten countries placed at 100. In this way, not only could an indication be obtained for each country's prices vis-à-vis other countries but also a valuation of price levels for each group of items or product class vis-à-vis other groups and product-classes for the country of reference.

Chapter V

THE RESULTS OF THE INVESTIGATION

1. The general price level

(a) Parity exchange rates

The parity exchange rate is by definition that which equates the overall price levels for the countries concerned - alternatively, the rate which, applied to the currencies of the various countries, equates the overall purchasing power of those currencies. In accordance with the methodology adopted by ECLA, this has been arrived at by comparing the cost of a given basket of goods and services in each country - the comparison of the cost in one country relative to another providing the desired parity rate. As ten countries are involved in the comparison, nine mutually - convertible rates emerge - the currency of the tenth country serving as the point of reference. Since any one of the countries may be the reference point, a net-work of eighty-one inter-related exchange rates can be obtained. These are shown in Table 1 - the currency for each country being expressed in terms of the remaining nine. It will for instance be seen that in the case of Argentina, one peso equals 2.27 cruzeiros, .101 Colombian pesos, .261 sucres, 1.51 guaranis and so forth. Similarly, for Chile one escudo equals in purchasing power 50.63 Argentine pesos, 9.06 Mexican pesos, 17.84 soles or 6.69 Uruguayan pesos. These are then the rates which would equate total purchasing power, or the general level of prices in the selected countries.[1/]

Since the variation between the parity and the prevailing rates of exchange is of interest, free market rates are also shown. It will be observed that for Argentina, Brazil, Paraguay and Uruguay the two sets of rates are not very divergent. Similarly, for Colombia, Ecuador and México, the rates are somewhat similar. However, for countries in one group as compared with countries in the other group - likewise for Peru (intermediate between the groups) and for Chile and Panama which are at still different levels - no equality between parity and prevailing exchange rates appears to apply. According to the free market rate, one Argentine peso equalled, for instance, .0855 Colombian pesos or .0127 escudos. The parity exchange rates calculated by ECLA would indicate however that one Argentine peso

1/ Pending correction for price disparities within a country, the level of prices in the cities covered by the enquiry have been considered representative of the whole country.

/Table 1

Table 1

PARITY EXCHANGE RATES IN COMPARISON WITH FREE MARKET RATES

(Units of other currencies equivalent to one unit of the national currency)

Rate \ Currency	Peso (Argentina)	Cruzeiro (Brasil)	Peso (Colombia)	Escudo (Chile)	Sucre (Ecuador)	Peso (Mexico)	Balboa (Panama)	Guarani (Paraguay)	Sol (Peru)	Peso (Uruguay)
Argentina										
Units equivalent to one Peso										
Parity rate	x	2.27	.101	.0197	.261	.179	.0218	1.51	.352	.132
Free market rate	x	2.25	.0855	.0127	.214	.151	.0121	1.46	.324	.138
Brazil										
Units equivalent to one Cruzeiro										
Parity rate	.441	x	.0444	.00870	.115	.0788	.00961	.664	.155	.0582
Free market rate	.443	x	.0381	.00566	.0953	.0671	.00537	.648	.144	.0614
Colombia										
Units equivalent to one Peso										
Parity rate	9.91	22.50	x	.196	2.59	1.77	.216	14.93	3.49	1.31
Free market rate	11.69	26.28	x	.149	2.50	1.76	.141	17.02	3.79	1.61
Chile										
Units equivalent to one Escudo										
Parity rate	50.63	114.95	5.11	x	13.22	9.06	1.105	76.27	17.84	6.69
Free market rate	78.65	176.74	6.73	x	16.84	11.86	.949	114.47	25.50	10.85
Ecuador										
Units equivalent to one Sucre										
Parity rate	3.83	8.69	.385	.0756	x	.685	.0836	5.77	1.35	.506
Free market rate	4.67	10.49	.399	.0594	x	.704	.0563	6.80	1.51	.644
Mexico										
Units equivalent to one Peso										
Parity rate	5.59	12.69	.564	.1104	1.46	x	.122	8.42	1.97	.739
Free market rate	6.63	14.9	.567	.0843	1.42	x	.080	9.65	2.15	.915
Panama										
Units equivalent to one Balboa										
Parity rate	45.82	104.02	4.62	.905	11.97	8.20	x	69.02	16.15	6.06
Free market rate	82.88	188.25	7.09	1.522	17.75	12.50	x	120.63	26.88	11.44
Paraguay										
Units equivalent to one Guarani										
Parity rate	.664	1.51	.0670	.0131	.173	.119	.0145	x	.234	.0878
Free market rate	.687	1.54	.0588	.0087	.147	.104	.00829	x	.223	.0948
Peru										
Units equivalent to one Sol										
Parity rate	2.84	6.44	.286	.0560	.741	.508	.0619	4.27	x	.375
Free market rate	3.08	6.93	.264	.0392	.660	.465	.0372	4.49	x	.426
Uruguay										
Units equivalent to one Peso										
Parity rate	7.56	17.17	.763	.149	1.98	1.35	.165	11.39	2.67	x
Free market rate	7.25	16.28	.620	.092	1.55	1.09	.0874	10.55	2.35	x

/had the

had the same purchasing power as .101 Colombian pesos or .0197 escudos. That is to say, relative to the Argentine peso, the Colombian peso and the Chilean escudo were over-valued to the extent indicated by the rates quoted. In the same way, for Peru, the free market rates gave the sol as equivalent to 6.93 cruzeiros, .660 sucres; 4.49 guaranis or .0372 balboas. The parity exchange rates would indicate however the equivalence of 6.44 cruzeiros, .741 sucres, 4.27 guaranis or .0619 balboas.

The currencies of Panama and Chile were then found to be over-valued in relation to any other currency (since more balboas or more escudos were necessary to buy a given quantity of goods and services than the free market rates implied). The currencies of Ecuador, Mexico and Colombia were equitably related by the free market rates, inter se, but were over-valued in comparison with the currencies of either Peru or the Paraguay-Brazil-Argentina-Uruguay group where the greatest degree of under-valuation was apparent.

Because of the way in which they were calculated, the parity exchange rates in this study do not permit an evaluation of Latin American currencies in terms of any other currency - e.g. the pound sterling, the French franc or the U.S. dollar. To obtain such a relationship, the prices and the consumption pattern of the non-Latin American countries would also have to be taken into account so as to equate Latin American and non-Latin American price levels - and, while it is hoped at a future stage of the work such a measurement can be made, it is outside the scope of the present investigation. The parity exchange rates are accordingly measured only in terms of the currencies of the ten countries concerned.

This has, of course, the disadvantage that anyone unfamiliar with the places concerned might have difficulties in appreciating the purchasing power of the various currencies. To afford a rough illustration of the value of currencies at a level somewhat equivalent to a dollar, a tabulation has been made showing the number of units of other currencies which would correspond to a dollar spent in a given Latin America country (the dollar being converted at the free market rate of exchange). The relationships which result are expressed in Table 2.

/Table 2

Table 2

COMPARATIVE PURCHASING POWER OF ONE DOLLAR SPENT IN EACH COUNTRY a/

Base country	Natural currency equal to one dollar	Number of currency units with equivalent purchasing power									
		Pesos (Uruguay)	Pesos (Argentina)	Cruzeiros (Brazil)	Guaranies (Paraguay)	Soles (Peru)	Pesos (Colombia)	Pesos (Mexico)	Sucres (Ecuador)	Escudos (Chile)	Balboas (Panama)
Uruguay	11.4 pesos	11.4	86.2	196	130	30.4	8.70	15.4	22.6	1.70	1.88
Argentina	82.5 pesos	10.9	82.5	187	125	29.0	8.33	14.8	21.5	1.63	1.80
Brazil	186 cruzeiros	10.8	82.0	186	124	28.8	8.26	14.7	21.4	1.62	1.79
Paraguay	120 guaranies	10.5	79.7	181	120	28.1	8.04	14.3	20.8	1.57	1.74
Peru	26.9 soles	10.1	76.4	173	115	26.9	7.69	13.7	19.9	1.51	1.67
Colombia	7.08 pesos	9.3	70.2	159	106	24.7	7.08	12.6	18.3	1.39	1.53
Mexico	12.5 pesos	9.2	69.9	158	105	24.6	7.05	12.5	18.2	1.38	1.52
Ecuador	17.7 sucres	9.0	67.8	154	102	23.9	6.83	12.1	17.7	1.34	1.48
Chile	1.05 escudos	7.0	53.2	121	81	18.7	5.37	9.5	13.9	1.05	1.16
Panama	1.0 balboas	6.1	45.8	104	69	16.2	4.62	8.2	12.0	.90	1.00

a/ Converted into national currencies at free market rates of exchange.

/It must

It must again be emphasized that the data in no way purport to measure the purchasing power of a dollar in any of the Latin American countries. They merely illustrate the relationship which exists between the individual Latin American countries, for an amount of national currency which is equivalent to a dollar at the free market rate. A dollar in Argentina would for instance represent 82.5 pesos when exchanged for local currency. This amount of currency would in turn have the same purchasing power as 187 cruzeiros, 8.3 Colombian pesos, 1.63 escudos, 21.5 sucres and so on (see first line of Table 2). Alternatively, a dollar in Mexico would be converted into 12.5 Mexican pesos. This amount of currency would be worth 70 Argentine pesos or 159 cruzeiros, 7.0 Colombian pesos, 1.4 escudos, etc. (See 6th line of the table).

(b) Price relatives (at prevailing exchange rates)

The relationships between the parity exchange rates and the free market rates provide the most direct means of determining the relative level of prices in the various countries (valued at prevailing rates of exchange). These are given in table 3 (the figures in each horizontal column, or row, representing an index of prices with the country mentioned at the left of the table as the base).

Of the ten countries covered by the enquiry, the general level of prices, measured in accordance with free market exchange rates, was lowest for Uruguay. At a slightly higher level were Argentina, Brazil and Paraguay in that order. As also seen in Table 2 these countries formed a block with little variation when one was compared with the other. The other group of countries with overall price levels approximately equal (formed by Colombia, Ecuador an Mexico), was situated some twenty per cent above the level for the first group mentioned (with Peru intermediate between the two groups). At an extreme were Chile and Panama where price levels were considerably higher than those of other countries. Compared with Uruguay, for instance, the Panama price level was 89 per cent higher, Chile was 62 per cent higher, but Ecuador, Mexico and Colombia were only 28, 24 and 23 per cent higher respectively. If a comparison is made with Mexico, Panama was at a point 53 per cent higher,

/Chile 31

Chile 31 per cent higher, Peru 8 per cent lower, and Paraguay, Brazil, Argentina and Uruguay 13, 15, 16 and 19 per cent lower respectively.

(c) Comparative purchasing power of currencies (at prevailing exchange rates)

The purchasing power of a currency is directly proportional to the level of prices, and the data shown in Table 3 can be used to provide a comparison as between countries. In this case, since purchasing power is a reciprocal of the price relationship, the figures in the table should be compared vertically rather than horizontally; that is to say, each vertical column provides an index of comparative purchasing power, with the country mentioned at the head of the column as base.

It will, for instance, be seen that in accordance with the free market rate of exchange, the currency of Panama had only 66 per cent of the purchasing power of the Mexican peso, the Chilean currency 76 per cent and the Ecuadorian currency 97 per cent. On the other hand, for Paraguay, Brazil, Argentina and Uruguay, the same amount of currency would (at the free exchange rate) buy 14, 17, 18 and 24 per cent more goods and services than it would in Mexico. In like manner, one could obtain 62 per cent more goods in Uruguay, 43 per cent more in Peru and 27 per cent more in Ecuador than one could in Chile. In only one country - Panama - could more goods and services be obtained than in Chile for a given expenditure (at prevailing rates of exchange).

2. Analysis by main expenditure groups

(a) Purchasing power equivalents

In Table 1, the parity rates of exchange which applied to total expenditure were given. These, by definition, equated the overall purchasing power of the currencies. Purchasing power equivalents expressing the number of currency units necessary to buy a given amount of goods or services in each country have been calculated for main expenditure groups. Because of the number of series involved, the tables are not all reproduced in this chapter but are included in a Statistical Annex. However, in order to provide an indication of the overall pattern, Table 4 gives the purchasing power equivalents expressed for each country in terms of the Mexican peso.

Table 3

PRICE RELATIVES AND THE PURCHASING POWER OF CURRENCIES AT FREE MARKET RATES OF EXCHANGE

(Indexes: base country = 100)

Country	Uruguay	Argentina	Brazil	Paraguay	Peru	Colombia	Mexico	Ecuador	Chile	Panama
Uruguay	100	104	105	108	114	123	124	128	162	189
Argentina	96	100	101	103	109	118	118	122	155	180
Brazil	95	99	100	102	108	116	117	121	154	179
Paraguay	93	97	98	100	105	114	114	118	150	175
Peru	88	92	93	95	100	108	109	112	143	166
Colombia	81	85	86	88	92	100	101	104	131	153
Mexico	81	84	85	87	91	99	100	103	130	152
Ecuador	79	82	83	85	89	97	97	100	127	148
Chile	62	64	65	67	70	76	76	78	100	116
Panama	53	55	56	57	60	65	66	67	86	100

Note : Horizontal Columns = Indexes of prices
Vertical Columns = Indexes of purchasing power

/Table 4

Table 4

PURCHASING POWER EQUIVALENTS FOR MAIN EXPENDITURE SECTORS

(Units of national currency per mexican Peso)

Expenditure groups \ Country date of enquery and currency	Argentina VI-60 M$N	Brazil VII-60 Cr$	Colombia XI-60 $(Col.)	Chile I-61 E°	Ecuador XII-60 S/.	Mexico XI-60 $(Mex.)	Panama 1958 B/.	Paraguay V-60 G/.	Peru X-60 S/.	Uruguey - $(Ur.)
Free market rate	6.63	14.9	.567	.084	1.42	1.00	.08	9.65	2.15	.915
I. Foods, beverages and tobacco	4.45	10.1	.626	.086	1.53	1.00	.145	7.27	1.70	.706
a) Foods	3.97	10.4	.601	.084	1.41	1.00	.110	7.00	1.80	.553
b) Beverages	6.38	8.8	.809	.091	2.10	1.00	...	8.29	1.43	1.445
c) Tobacco	5.74	10.1	.278	.106	1.36	1.00	.093	8.14	.78	.460
II. Textiles and clothing	6.06	13.2	.487	.140	1.24	1.00	.089	8.84	2.02	.707
a) Clothing (including materials)	6.05	13.2	.492	.144	1.25	1.00	.082	9.05	2.03	.703
b) Footwear	6.09	12.9	.473	.126	1.20	1.00	.109	8.21	2.00	.722
III. Housing	6.37	17.2	.438	.159	1.51	1.00	.103	9.62	2.16	.779
a) Rent	5.41	20.3	.320	.152	1.28	1.00	.088	6.55	1.89	.480
b) Fuel, light, etc.	9.87	16.8	.574	.187	1.96	1.00	.204	20.73	1.80	1.42
c) Household goods	6.84	12.5	.589	.162	1.75	1.00	.096	11.32	2.70	1.06
IV. Transport and communications	7.00	23.7	.631	.106	1.79	1.00	.149	11.55	2.94	.897
V. Miscellaneous a/	4.99	11.4	.541	.129	1.32	1.00	.096	9.57	2.30	.660
a) Health care	4.87	12.0	.679	.168	1.76	1.00	.111	11.74	2.29	.835
b) Personal care, and domestic services	4.59	10.4	.400	.111	1.00	1.00	.098	8.21	2.23	.627
c) Recreation and entertainment	5.82	12.7	.681	.126	1.50	1.00	.079	10.07	2.43	.558
I-V. Total consumer goods	5.15	12.4	.567	.110	1.47	1.00	.126	8.27	1.92	.721
VI. Investment	8.87	15.0	.545	.108	1.34	1.00	...	9.50	2.27	.875
a) Machinery and equipment	6.13	15.7	.561	.114	1.28	1.00	...	11.83	2.29	.779
b) Vehicles	13.28	22.8	.822	.156	1.96	1.00	...	14.76	2.87	1.741
c) Construction	10.06	12.9	.473	.093	1.25	1.00	...	6.54	2.12	.763
Total expenditure b/	5.59	12.7	.564	.110	1.46	1.00	.122*	8.42	1.97	.739

a/ Excluding private education expenditure.
b/ Excluding education and government services.

/From this

From this, it will be observed that one peso spent in Mexico on Food bought as much as 4.45 m$n in Argentina, 10.13 cruzeiros in Brazil, 7.27 guaranis in Paraguay or 1.70 soles in Peru (the same relationship being shown in reciprocal form in the tables of the Annex where it may be observed that one peso spent on food in Argentina would buy as much as .225 Mexican pesos, 2.275 cruzeiros, 1.633 guaranis, .382 soles and so forth). For Clothing, on the other hand, one Mexican peso bought as much as 6.06 Argentine pesos, 13.16 cruzeiros, 8.84 guaranis, 2.02 soles and .706 Uruguayan pesos. In the case of Housing, one Mexican peso represented in purchasing power 6.37 Argentine pesos, 17.24 cruzeiros, 1.51 sucres and so forth.

The purchasing power equivalents may be related directly to each other so as to make a comparison of countries independent of Mexico. Thus, 10.13 cruzeiros buys as much food in Brazil as .626 pesos in Colombia, 1.53 sucres in Ecuador, 1.70 soles in Peru or .706 pesos in Uruguay.

Purchasing power equivalents have been calculated for certain sub-groups additional to those given in Table 4. Although not discussed in detail here, they are included in the Statistical Annex, as they may be of interest to economists engaged in a price study of the countries concerned.

(b) Price relatives (at prevailing exchange rates)

In order to express data in the form of price relatives, the purchasing power equivalent for each group has been compared with the free market rate, thus providing a set of indexes similar in presentation and in manner of interpretation to those shown for total expenditure in Table 3. The alternative arrangements of indexes for main groups in all countries are included in the Statistical Annex. However, once again in order to present a synthesis of the data, Table 5 has been compiled wherein for each main group the prices in each country are expressed relative to the average of prices in all the countries concerned. From this table, it will be observed that for Foodstuffs, Beverages and Tobacco, prices at prevailing exchange rates were lower in Argentina than in any other country - Panama being easily the most expensive, followed

/by Colombia,

by Colombia, Ecuador and Chile in that order. The group is not a homogeneous one - the price movements for the two smaller sub-groups (beverages and tobacco) diverging somewhat from the trend of food prices. This was to some extent a reflection of the tax systems relating to wines, alcohol, cigarettes etc., though in the case of beverages, it also indicates a wide disparity in the production costs of wines (these being notably cheap in Chile, Peru and Paraguay as well as in Argentina).

For Clothing, price levels were lowest in Uruguay, Colombia, Ecuador and Brazil - the most expensive country being Chile where prices, at prevailing rates of exchange, were double those of the first mentioned countries. No great disparity existed between the relative price levels within the group - footwear prices showing the same tendency, except in Panama where shoes were relatively dear; and (to a lesser extent) Chile and Paraguay where shoes were cheap relative to the clothing prices.

For Housing, Chile was again the most expensive country, Brazil also being at a high level (relative both to other countries and to other prices in the same country). The figures are however subject to an appreciable margin of error because of the difficulty of assessing average rentals, especially in countries where rent controls were enforced. For component sub-groups, attention might be drawn to the high cost of fuel, light etc. in Paraguay; and to the high cost of household goods in Chile (all other countries being at approximately equal levels).

Transport and Communication services were cheapest in Uruguay and Mexico; dearest in Brazil and Panama. The operation of privately-owned transport was notably expensive in Colombia, Ecuador and Argentina. However, in all these countries public transport was comparatively cheap. (The reverse relationship applied in Brazil, Panama and Peru where the operation of privately owned transport was cheap, but public transport comparatively expensive).

/Table 5

Table 5

PRICE RELATIVES (AT FREE MARKET RATES OF EXCHANGE)

(Indexes: Average of the countries = 100)

Expenditure group	Argentina	Brazil	Colombia	Chile	Ecuador	Mexico	Panama	Paraguay	Peru	Uruguay
I. Foods, beverages and tobacco	69	70	114	106	111	103	187	78	82	80
a) Foods	67	79	119	112	112	112	155	82	94	68
b) Beverages	71	44	105	80	109	74	289	63	49	116
c) Tobacco	107	84	60	155	118	123	143	104	44	62
II. Textiles and clothing	92	89	86	167	88	101	112	92	95	78
a) Clothing (incl. materials)	92	89	88	172	88	101	104	94	94	77
b) Footwear	92	88	84	150	85	101	137	86	94	84
III. Housing	88	106	70	171	97	91	117	91	91	77
a) Rent	85	141	58	187	94	104	114	71	91	54
b) Fuel, light and water	97	74	66	145	90	65	166	140	55	101
c) Household goods	87	71	88	162	104	84	101	99	106	98
IV. Transport and communication	83	125	88	99	99	79	147	94	108	77
V. Miscellaneous a/	75	78	96	155	94	101	121	100	108	73
a) Health care	63	70	103	172	107	86	120	105	92	78
b) Personal care and domestic services	77	78	79	147	79	120	138	95	116	77
c) Recreation and entertainment	78	84	118	119	103	98	97	102	111	60
I-V. Total consumer goods a/	77	82	99	130	103	99	146	85	88	78
VI. Investment	126	95	91	121	89	94	...	92	100	91
a) Machinery and equipment	88	101	95	130	87	96	...	118	103	82
b) Vehicles	129	99	94	119	89	65	...	99	86	123
c) Construction	157	89	86	113	92	103	...	70	102	86
Total expenditures b/	83	83	98	122	102	99	150 *	86	91	79

a/ Excluding private education expenditure.

b/ Excluding Government Expenditure.

/Other Consumer

Other Consumer Expenditures (mainly Health Services, Personal Care and Recreation) were cheapest in Uruguay - with Argentina and Brazil at a very slightly higher level. Chilean prices were the highest, followed by Panama, Peru and Paraguay (the latter two countries along with Colombia, being notably expensive for recreation and entertainment).

In total, Consumer goods were cheapest in Argentina and Uruguay; they were about 7 per cent more expensive in Brazil, 10 per cent more in Paraguay, 15 per cent more in Peru, about 30 per cent more in Colombia, Ecuador and Mexico, 70 per cent more in Chile and 100 per cent more in Panama.

Investment figures are of a very preliminary nature and are subject to modification once additional information on industrial equipment and labour costs in the construction industry has been obtained. Cheapest countries were Ecuador, Uruguay, Colombia and Paraguay - Argentina, followed by Chile, being the most expensive. This is to a large extent a reflection of the high cost of transport equipment and construction materials in the latter countries.

Vehicles, it may be noted, were very cheap, (comparatively speaking) in Mexico where the cost was only half that for Argentina and Uruguay. Other countries with low costs for transport equipment were Peru and Ecuador.

Construction costs were lowest in Paraguay, with Uruguay, Colombia, Brazil and Ecuador some twenty five per cent more expensive. At a high extreme was Argentina where the cost in Buenos Aires of timber, drainage pipes and to a lesser extent cement together with high labour costs no doubt influenced the results considerably.

Data for Machinery and Equipment were not in final form at the time this study was written and prices for a larger sector of industrial equipment have yet to be included in the enquiry (the items being mainly equipment with an irregular or a limited demand in the countries, e.g. weaving looms, printing presses, certain types of metal-working machines etc.). Initial calculations would suggest that costs were lowest in Uruguay, Ecuador, Argentina and Colombia (in that order); and highest

/in Chile

in Chile and Paraguay (high freight costs, duties, landing charges etc. undoubtedly being of importance for the latter country). At an intermediate level were the remaining countries - Peru, Brazil and Mexico. It should however be noted that prices for agricultural machinery and equipment had a very different pattern from those of industrial equipment. While Paraguay was expensive for the latter group, it was relatively cheap for agricultural equipment (different duties, etc. applying in the latter case). Argentina on the other hand was comparatively expensive for agricultural machinery - perhaps due to a difference in costs between national production and imported commodities (agricultural equipment being to an appreciable extent manufactured within the country whereas the majority of industrial machines were imported). A similar price relationship applied in the case of Brazil.

Government Expenditure data have yet to be elaborated in a satisfactory form since work on this subject has only recently been begun and much basic information is so far not available to ECLA. The results of the preliminary calculations have therefore not been taken into account when computing overall figures for parity exchange rates or purchasing power equivalents. The preliminary results have, however, been included in the tables of the Statistical Annex so as to afford an illustration of the probable relationships between countries - notwithstanding the fact that material for certain countries gave figures which appeared unrealistic in relation to other data for the same countries. No comment will be offered on the data at this stage, pending the elaboration of the material in more final form.

3. Comparative price structures

(a) Relative price levels (at parity exchange rates)

Once parity exchange rates have been established for the various countries, these can be used to measure in a more satisfactory form: (a) the dispersion of price levels for different items in a particular country; and (b) the comparative price structure for items in all the countries concerned. In order to do this and place prices at levels relative

/to (a)

to (a) the average prices of all items in the same country; and (b) the average of all prices for the same item in other countries, a further tabulation was made using the parity exchange rates to express all expenditures in a common currency.[2/] Average expenditure for each group of items was then calculated and expenditure for given items or groups of items in the individual countries was expressed relative to that average so as to provide a set of price relatives at parity rates of exchange. It follows that, since a common basket of commodities was used for all countries (quantities being identical, and prices being converted in accordance with the parity exchange rates) the aggregate expenditure for each country must be the same.[3/] The aggregate expenditure can be considered as 100 in all countries so as to express all data in index form. The price relatives then show, at one and the same time:

(a) The ratio which the price of the item has to the same items in all other countries; and

(b) The deviation of the price for the item concerned from the general price level of the same country.

These data are given in Table 6 (the weighting pattern in the table, it may be observed, reflects the share of each group in the total expenditure, valued in accordance with the parity exchange rates. While implicit in the previous calculations, these weights could not be explicitly quantified in percentage value terms until the parity exchange rates had been determined).

(b) Analysis by country

Examining each country individually, it will be seen that in Argentina the price level was influenced considerably by the low cost of food (which has a weight of 39 out of 100 in the total). While

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2/ Any of the ten currencies would serve for this purpose as the parity rates are mutually convertible. In practice, the Mexican peso was used.

3/ By definition, the parity rate is that which equates the cost of a representative basket of goods and services in each of the countries concerned.

/Table 6

Table 6

COMPARATIVE PRICE STRUCTURES (AT PARITY RATES OF EXCHANGE)

(Index numbers: average of the countries = 100)

	Percentage weight a/	Argentina	Brazil	Colombia	Chile	Ecuador	Mexico	Panama	Paraguay	Peru	Uruguay	Average 10 countries
I. Food, beverages and tobacco	47	85	85	118	83	111	106	127	92	92	102	100
of wich												
Food	39	80	88	112	87	111	113	112	91	100	105	100
II. Textiles and clothing	12	110	105	88	128	86	101	74	107	104	97	100
a) Clothing (including materials)	9	109	106	88	132	86	101	68	109	104	96	100
b) Footwear	3	112	104	86	116	84	102	91	100	104	100	100
III. Housing	16	105	125	71	132	95	92	78	105	100	97	100
a) Rent	8	102	168	59	145	92	105	76	82	101	69	100
b) Fuel, light and water	2	117	88	67	112	89	56	111	163	60	127	100
c) Household goods	6	103	83	88	124	101	84	66	113	116	121	100
IV. Transport and communication	4	98	147	88	75	97	79	96	108	117	95	100
V. Miscellaneous	8	91	92	98	119	92	102	80	116	119	91	100
a) Health	2	77	83	106	134	106	88	80	123	103	100	100
b) Personal care and domestic services	4	99	93	80	114	78	114	91	111	129	97	100
c) Recreation and entertainment	2	102	98	118	113	100	97	63	117	120	74	100
I-V Consumer expenditure b/	87	93	99	102	102	100	104	104	99	99	99	100
VI. Investment	13	146	109	89	90	84	92	...	104	106	109	100
a) Machinery	5	103	116	94	94	89	94	...	102	110	99	100
b) Vehicles	2	147	112	90	88	83	62	...	109	90	146	100
c) Construction	6	181	102	84	85	86	100	...	78	108	104	100
Total c/	100	100	100	100	100	100	100	100	100	100	100	100

a/ Percentages are based on per capita expenditure average for the ten countries (not based on aggregate expenditure in the ten countries, different percentages would be obtained).

b/ Excluding private education expenditure.

c/ Excluding education and government services.

/prices for

prices for other goods and services differed very little from the regional average,[4/] investment was comparatively expensive - due mainly to high costs of vehicles and construction (though not for machinery, which although expensive relative to food, was at about the average price level for all items in all countries).

For Brazil, foods were also cheap but housing (especially rent) was expensive - likewise transport and communications where results have no doubt been influenced by the high level of urban bus fares - suburban and other forms of transportation being relatively cheap but (because of the weighting system adopted) not with much importance in the overall totals. The cost of investment, it may be observed, was higher than the average price level either for the country or for the other countries in the region.

In Colombia, foods were comparatively expensive. However, almost all other items (excluding health care and recreation, but including investment) were some ten per cent or so below the regional average.

In Chile, when prices are converted at parity rates rather than free market rates, a better picture can be drawn of the relative price structure. Foods and investment were, it will be noted, relatively cheap, but clothing, housing and health services unusually expensive (being about 30 per cent above the average price level for the region). Highest of all was rent where the relative price index rose to 145.

In Ecuador, the situation resembles that in Colombia, food being virtually the only expenditure group (except health care and recreation) where prices were above the regional average.

In Mexico, price levels showed remarkably little disparity - fuels and vehicles being the only sub-groups where any marked variation from the regional average was apparent (both being relatively cheap at levels which were 66 and 62 per cent respectively of the regional average).

4/ For reasons of clarity and simplicity, the ten countries are considered in this analysis as a complete region and their average price level is spoken of as "regional average". This should not be considered as an average for all Latin America. Nor should it be considered an "optimum" or a normal level since it is merely a statistically-calculated reference point based on prices in the ten countries concerned.

/Food, it

Food, it may be noted, was somewhat expensive - being at the same level as in Ecuador and Colombia.

For Panama, much of the information is provisional. Nevertheless, the elimination of distortions introduced by the use of prevailing exchange rates in previous tables shows more clearly the price structure within the country. It will now be observed that the relative price level for food was similar to that for Mexico, Ecuador and Colombia - i.e. about 12 per cent above the general price level and about 25 per cent above the level for food prices in Argentina, Brazil and Chile. Beverages (not shown separately in this table) were on the other hand exceptionally expensive; clothing, rent and household goods were reasonably cheap; fuel, light and water, expensive. No figures have yet been calculated for investment goods.

Paraguay was outstandingly expensive for the fuel, light group - also for machinery where prices were 32 per cent above the regional average. Construction costs were on the other hand low, while prices for food conformed to the pattern for the countries in the temperate zone - being 9 per cent below the average for the region. Clothing, household goods, transportation, health care, personal services and recreation were comparatively expensive.

In Peru, investment in machinery and construction was somewhat expensive both in comparison with prices elsewhere and with other prices in the same country. Personal care and recreation were, however, the groups with the highest relative price levels. Those comparatively cheap were fuel, light and water and (to a lesser extent), the purchase of vehicles.

In Uruguay, (where at prevailing rates of exchange the general price level was the lowest of the ten countries considered), the application of parity rates of exchange reveal a price pattern with few unusual features other than a very high level for investment in vehicles, a moderately high level for fuel, light and household goods, and a very low level for rent, recreation and entertainment. Other prices were at approximately the average level for the region.

(c) Observations

(c) Observations for main expenditure groups

Food: It is interesting to note that among the countries with relatively low prices, three are in the temperate zone; on the other hand, the highest level corresponds to countries for which prices have been collected in the "Altiplano" area, plus Panama.

Clothing and footwear: Among the countries with a low price level, two - Ecuador and Panama - rely heavily on imports for satisfying their needs. Within the group, a close similarity may be observed in the price levels for clothing and for footwear - the exception being Chile where footwear was cheaper and Paraguay where the reverse applied.

Rent: This group is based on what is probably the weakest data of the enquiry, and small differences in levels are therefore meaningless. It can be said however that prices were exceptionally high in Rio de Janeiro and Santiago. Prices were extremely low in Colombia but this may reflect the fact that the controlled rents which were retained for this enquiry could underestimate the true level.

Fuel, light and water: The availability of local services of energy, particularly petroleum products, has undoubtedly been a big influence - Peru, Venezuela and Mexico having the lowest price levels.

Household goods: The group combines locally-made goods such as furniture, chinaware etc. with imported goods like refrigerators. It is not surprising, therefore, to find that Panama and Ecuador are again on the low side. In Brazil the explanation of the low price level is probably to be found in the scale of the market.

Transport and Communications: Prices for this group are often influenced by government policy - fares lagging behind other prices when inflationary pressures exist. This is probably the case for Chile where public transportation was notably inexpensive. The inverse correlation which exists between the prices of public transportation and the operation of privately-owned transport has already been referred to earlier in this chapter (likewise the high level of prices in Brazil where insufficient weight may have been given to sub-urban and inter-city transport).

/Health care

Health care represents both medical or dental attention as well as drugs and medicines. The price patterns may therefore differ considerably for these sub-groups. The highest level - for Chile - was obtained in a country where all sub-groups were expensive. It is interesting to note that in the three largest countries - Argentina, Brazil and Mexico - price levels were on the low side.

Investment: The relative cost of investment is an interesting indicator in economic analysis. Unfortunately, the present enquiry has not yet reached the stage where coverage can be considered adequate and the price data truly representative. The results must therefore be interpreted with caution.

Machinery and equipment are still mainly of foreign origin in Latin American countries and the import policy is a main determinant in the relative price level. Preliminary calculations indicate that the dispersion is not very large for this group, except for Paraguay where the cost of imported equipment is abnormally high. The position of Brazil reflects the limitation of imports, while for Ecuador a reverse situation applies.

Vehicles includes both private cars and commercial vehicles. Once more results reflect the import policy of the countries concerned - notwithstanding the fact that a sizeable part of the group relates to planes, ships and railway rolling stock for which duties are as a rule nil or negligible.

Construction was extremely costly in Argentina (Buenos Aires) due largely to the transportation cost, since most of the materials have to be obtained from elsewhere in the country or from abroad.

4. Further work in this field

As emphasized throughout this study, the work so far done is only the first part of an investigation designed eventually to cover all aspects of expenditure in all parts of Latin America. Future work should, according to present plans, proceed along the following lines:

/(a) The

(a) The calculation of similar data will be carried out for the remaining ten countries in Latin America in order to obtain information for the whole region.

(b) For the ten countries already included in the calculation, an improvement will be made in basic data relating to, notably, government services, investment, education and rent, where material so far used is considered somewhat inadequate.

(c) The collection of information covering price levels has to be completed in the smaller cities so as to obtain results fully representative of each country. (This, it is hoped, could be done with the cooperation of national statistical offices since information of this kind would complement material already collected for national price indexes).

(d) Information relating to prices paid by particular sectors of the population e.g. farmers, would be desirable so as to provide a basis for comparison with the same sectors in other countries.

At a subsequent stage, it is hoped that ECLA's work for Latin America can be related to similar studies in other parts of the world so that, not only will a system of parity exchange rates and purchasing power equivalents be available in terms of Latin American currencies, but each currency can also be expressed in units of other currencies such as the franc, the mark, the pound or the dollar.

/Statistical Annex

Statistical Annex

Table I

PURCHASING POWER EQUIVALENTS OF NATIONAL CURRENCIES: BY EXPENDITURE GROUPS

(Units of national currency per mexican peso)

Expenditure groups / Country, currency and free market rate	Argentina M$N 6.63	Brazil Cr$ 14.9	Colombia $ .567	Chile E° .084	Ecuador S/. 1.42	Mexico $ 1.00	Panama B/. .080	Paraguay G/. 9.65	Peru S/o 2.15	Uruguay $ .915
I. Food, beverages and tobacco	4.45	10.1	.626	.086	1.53	1.00	.145	7.27	1.70	.706
a) Foods	3.97	10.4	.601	.084	1.41	1.00	.110	7.00	1.80	.553
1) Meat and poultry	2.78	7.1	.420	.082	.90	1.00	.064	2.86	1.75	.424
2) Milk products, eggs and honey	4.45	10.7	.618	.070	1.60	1.00	.133	10.38	2.11	.701
3) Fish	1.92	9.9	.676	.062	.42	1.00	.028	6.69	.84	.118
4) Cereals and cereal products	4.05	11.3	.704	.074	1.98	1.00	.161	8.82	1.77	.382
5) Fruits	7.30	13.5	.526	.143	.95	1.00	.128	5.38	2.70	1.365
6) Vegetables	7.49	12.2	.931	.154	2.69	1.00	.090	16.55	2.98	1.124
7) Sugar and sugar products	7.92	11.8	.777	.145	1.80	1.00	.177	10.73	1.43	.978
8) Fats and oils	4.96	20.3	.856	.104	1.68	1.00	.095	6.89	1.65	.910
9) Other food products	4.92	10.0	.567	.180	2.45	1.00	.075	14.65	1.39	1.781
b) Beverages	6.38	8.8	.809	.091	2.10	1.00	...	8.29	1.43	1.445
1) Non alcoholic beverages	3.95	5.8	.220	.096	1.70	1.00	.202	4.94	1.30	1.755
2) Alcoholic beverages	9.72	12.9	1.616	.086	2.65	1.00	...	12.87	1.62	1.021
c) Tobacco	5.74	10.1	.278	.106	1.36	1.00	.093	8.14	.78	.460
II. Textiles and clothing	6.06	13.1	.487	.140	1.24	1.00	.089	8.84	2.02	.707
a) Clothing (incl. materials)	6.05	13.2	.492	.144	1.25	1.00	.082	9.05	2.03	.703
b) Footwear	6.09	12.9	.473	.126	1.20	1.00	.109	8.21	2.00	.722
III. Housing	6.37	17.2	.408	.159	1.51	1.00	.103	9.67	2.16	.779
a) Rent	5.41	20.3	.320	.152	1.28	1.00	.088	6.53	1.89	.480
b) Fuel, light and water	9.87	16.8	.574	.187	1.96	1.00	.204	20.73	1.80	1.42
c) Furniture, equipment, appliances	8.70	14.6	.675	.200	1.89	1.00	.090	13.13	3.16	1.220
1) Furniture and utensils	8.58	14.5	.645	.209	1.70	1.00	.087	12.29	3.24	1.150
2) Equipment and appliances	9.13	15.0	.778	.171	2.59	1.00	...	16.11	2.88	1.46
d) Non durable consumer goods	4.04	9.2	.460	.104	1.55	1.00	.105	8.59	1.99	.810
IV. Transport and communication	7.00	23.7	.631	.106	1.79	1.00	.149	11.55	2.94	.897
1) Public transport	5.45	29.1	.466	.086	1.41	1.00	.165	12.20	3.34	1.080
2) Operation of private transport	15.38	18.9	1.501	.176	3.64	1.00	.077	15.00	2.37	.716
3) Communications	3.94	5.6	.339	.111	1.30	1.00	.165	4.63	1.85	.306
V. Miscellaneous a/	4.99	11.4	.542	.129	1.32	1.00	.096	9.57	2.30	.660
a) Health care	4.87	12.0	.479	.163	1.76	1.00	.111	11.74	2.29	.835
1) Drug and medicines	5.48	10.8	.755	.135	2.50	1.00	.119	16.92	2.74	.855
2) Services	4.32	13.1	.646	.197	1.00	1.00	.103	7.01	1.88	.816
b) Personal care and domestic services	4.59	10.4	.397	.111	1.00	1.00	.098	8.21	2.23	.627
1) Personal care	6.30	14.8	.760	.162	2.12	1.00	.130	18.17	2.90	.931
2) Domestic services	3.56	7.8	.178	.080	.33	1.00	.078	2.22	1.82	.444
c) Recreation and entertainment	5.82	12.7	.681	.128	1.50	1.00	.079	10.07	2.43	.558
VI. Investment	8.87	15.0	.545	.108	1.34	1.00	...	9.50	2.27	.875
a) Machinery and equipment: total	6.13	15.7	.561	.114	1.28	1.00	...	11.83	2.29	.779
1) Industrial machinery and equipment	5.80	14.8	.529	.116	1.26	1.00	...	11.90	2.27	.713
2) Agricultural machinery and equipment	8.53	22.4	.795	.095	1.48	1.00	...	11.34	2.47	1.269
b) Vehicles	13.28	22.8	.822	.156	1.96	1.00	...	14.76	2.87	1.741
c) Construction	10.06	12.9	.473	.093	1.25	1.00	...	6.54	2.12	.763
1) Buildings	8.31	11.3	.406	.083	1.35	1.00	...	7.93	2.60	.991
2) Other construction	12.42	14.9	.564	.106	1.10	1.00	...	4.67	1.49	.456
VII. Government services b/	9.02*	16.6*	.54*	.26*	1.25*	1.00	.47*	6.66*	2.44*	.50*
Health services	6.52*	14.0*	.55*	.22*	1.24*	1.00	.39*	5.77*	2.05*	.58*

Table II

PRICE RELATIVES: AT PREVAILING EXCHANGE RATES

(Indexes: average of the countries = 100)

Expenditure group	Argentina	Brazil	Colombia	Chile	Ecuador	México	Panama	Paraguay	Peru	Uruguay
I. Foods, beverages and tobacco	69	70	114	106	111	103	187	78	82	89
a/ Foods	67	79	119	112	112	112	155	82	94	68
1) Meat and poultry	63	72	112	147	96	151	121	45	123	70
2) Milk products, eggs, honey	68	73	110	83	114	101	168	109	99	77
3) Fish	50	116	208	128	52	174	61	121	68	23
4) Cereals and cereal products	61	76	124	87	139	100	200	91	82	42
5) Fruits	98	81	83	151	60	89	143	50	112	133
6) Vegetables	82	60	119	132	138	73	82	125	101	89
7) Sugar and sugar products	96	64	111	138	102	81	178	90	54	86
8) Fats and oils	70	128	141	116	110	93	111	67	72	93
9) Other food products	60	54	81	173	140	81	76	123	52	158
b) Beverages	71	44	105	80	109	74	289	63	49	116
1) Non alcoholic beverages	58	38	38	110	117	98	246	50	59	187
2) Alcoholic beverages	81	48	158	56	103	55	322	74	42	62
c) Tobacco	107	84	60	155	118	123	143	104	44	62
II. Textiles and clothing	92	89	86	167	88	101	112	92	95	78
a) Clothing (including materials)	92	89	88	172	88	101	104	94	94	77
b) Footwear	92	88	84	150	85	101	137	86	94	84
III. Housing	88	106	70	171	97	91	117	91	91	77
a) Rent	85	141	58	187	94	104	114	71	91	54
b) Fuel, light and water	97	74	66	145	90	65	166	140	55	101
c) Furniture equipment appliances	97	73	89	176	99	74	84	101	109	99
1) Furniture and utensils	98	74	87	187	90	76	82	96	114	95
2) Equipment and appliances	93	68	93	144	123	68	...	143	91	108
d) Non durable consumer goods	65	66	87	133	117	107	141	96	99	95
IV. Transport and communications	83	125	88	99	99	79	147	94	108	77
a) Public transport	65	154	65	80	78	79	163	100	123	93
b) Operation of private transport	142	73	163	128	157	61	59	96	68	48
c) Comunications	70	44	68	154	107	117	242	56	101	39
V. Miscellaneous a/	75	78	96	155	94	101	121	100	108	73
a) Health care	63	70	103	172	107	86	120	105	92	78
1) Drugs and medicines	65	57	100	127	143	79	118	138	100	74
2) Services	62	84	110	223	67	96	123	69	84	86
b) Personal care and domestic services	77	78	79	147	79	120	138	95	116	77
1) Personal care	70	73	99	142	110	74	120	139	100	75
2) Domestic services	88	86	52	156	39	164	160	38	139	80
c) Recreation and entertainment	78	84	118	119	103	98	97	102	111	60
V. Total consumer goods a/	77	82	99	130	103	99	156	85	88	78

/Table II (cont. 2)

Table II (cont'nd 2)

	Expenditure group	Argentina	Brazil	Colombia	Chile	Ecuador	Mexico	Panama	Paraguay	Peru	Uruguay
VI	Investment	126	95	91	121	89	94	...	92	100	91
	a) Machinery and equipment total	88	101	95	130	87	96	...	118	103	82
	1) Industrial machinery and equipment	86	98	92	137	88	99		122	105	77
	2) Agricultural machinery and equipment	105	122	115	92	85	81	...	96	93	113
	b) Vehicles	129	99	94	119	89	65	...	99	86	123
	c) Construction	157	89	86	113	91	103	...	70	102	86
	1) Buildings	129	78	74	101	98	103	...	85	125	111
	2) Other construction	196	105	103	136	81	104	...	51	72	53
	Total expenditure b/	83	84	98	129	102	99	150	86	91	79

a/ Excluding education.

b/ Excluding education and government services.

/Table III

Table III

PURCHASING POWER EQUIVALENTS FOR MAIN EXPENDITURE GROUPS

Country	Unit of national currency	Units of other currencies which correspond to one unit of the national currency									
		Argentina M$N	Brazil Cr.$	Colombia $	Chile E°	Ecuador S/-	Mexico $	Panama B/-	Paraguay G/-	Peru S/o	Uruguay $
(a) Foods, beverages and tobacco											
Argentina	1 peso	x	2.28	.141	.0194	.343	.225	.033	1.63	.382	.159
Brazil	1 cruzeiro	.441	x	.062	.0085	.151	.099	.014	.72	.168	.070
Colombia	1 peso	7.11	16.2	x	.138	2.44	1.60	.23	11.6	2.71	1.13
Chile	1 escudo	51.6	117.6	7.26	x	17.70	11.59	1.68	84.3	19.7	8.19
Ecuador	1 sucre	2.92	6.64	.410	.056	x	.655	.095	4.76	1.11	.463
Mexico	1 peso	4.45	10.13	.626	.086	1.53	x	.145	7.27	1.70	.706
Panama	1 balboa	30.7	69.8	4.32	.59	10.5	6.90	x	50.1	11.7	4.9
Paraguay	1 guarani	.61	1.39	.086	.012	.210	.138	.020	x	.234	.097
Peru	1 sol	2.62	5.96	.368	.051	.90	.589	.085	4.28	x	.416
Uruguay	1 peso	6.36	14.34	.887	.122	2.16	1.42	.205	10.30	2.41	x
(b) Clothing and textiles											
Argentina	1 peso	x	2.17	.080	.023	.204	.165	.015	1.46	.334	.117
Brazil	1 cruzeiro	.461	x	.037	.011	.094	.076	.007	.67	.154	.054
Colombia	1 peso	12.4	27.0	x	.286	2.55	2.05	.183	18.2	4.15	1.45
Chile	1 escudo	43.3	94.0	3.49	x	8.87	7.17	.64	63.1	14.5	5.07
Ecuador	1 sucre	4.90	10.61	.394	.113	x	.806	.072	7.15	1.64	.572
Mexico	1 peso	6.06	13.16	.487	.140	1.24	x	.089	8.84	2.02	.707
Panama	1 balboa	68.1	147.8	5.47	1.57	13.90	11.24	x	99.4	22.7	7.94
Paraguay	1 guarani	.69	1.49	.055	.016	.140	.113	.010	x	.229	.080
Peru	1 sol	3.00	6.51	.241	.069	.611	.50	.044	4.37	x	.349
Uruguay	1 peso	8.57	18.6	.689	.197	1.75	1.41	.126	12.50	2.86	x
(c) Housing											
Argentina	1 peso	x	2.71	.069	.0250	.237	.157	.016	1.52	.339	.122
Brazil	1 cruzeiro	.369	x	.025	.0092	.088	.058	.0060	.56	.125	.045
Colombia	1 peso	14.5	39.4	x	.363	3.45	2.28	.235	22.1	4.93	1.78
Chile	1 escudo	40.3	108.4	2.75	x	9.50	6.29	.648	60.8	13.6	4.90
Ecuador	1 sucre	4.22	11.42	.290	.105	x	.662	.068	6.40	1.43	.516
Mexico	1 peso	6.37	17.24	.438	.159	1.51	x	.103	9.67	2.16	.779
Panama	1 balboa	61.8	167.4	4.25	1.54	14.66	9.71	x	93.9	21.0	7.56
Paraguay	1 guarani	.66	1.78	.045	.0164	.156	.103	.011	x	.223	.081
Peru	1 sol	2.95	7.98	.203	.074	.699	.463	.048	4.48	x	.361
Uruguay	1 peso	8.18	22.13	.562	.204	1.94	1.28	.132	12.41	2.77	x
(d) Transport and communications											
Argentina	1 peso	x	3.39	.090	.0151	.256	.143	.021	1.65	.420	.128
Brazil	1 cruzeiro	.295	x	.027	.0045	.076	.042	.0063	.49	.124	.038
Colombia	1 peso	11.1	37.6	x	.168	2.84	1.58	.236	18.3	4.66	1.42
Chile	1 escudo	66.0	223.6	5.95	x	16.89	9.43	1.41	109.0	27.7	8.46
Ecuador	1 sucre	3.91	13.24	.353	.059	x	.559	.083	6.45	1.64	.501
Mexico	1 peso	7.00	23.7	.631	.106	1.79	x	.149	11.55	2.94	.897
Panama	1 balboa	47.0	159.1	4.23	.71	12.01	6.71	x	77.5	19.7	6.02
Paraguay	1 guarani	.61	2.05	.055	.0092	.155	.087	.013	x	.255	.078
Peru	1 sol	2.38	8.06	.215	.036	.609	.340	.051	3.93	x	.305
Uruguay	1 peso	7.80	26.4	.703	.118	2.00	1.11	.166	12.88	3.28	x

/Table III (cont. 2)

Table III (cont'nd 2)

Country	Unit of national currency	Units of other currencies which correspond to one unit of the national currency									
		Argentina M$N	Brazil Cr.$	Colombia $	Chile E°	Ecuador S/-	Mexico $	Panama B/-	Paraguay G/-	Peru S/o	Uruguay $
(e) Other consumer expenditure											
Argentina	1 peso	x	2.29	.108	.0259	.265	.200	.019	1.92	.461	.132
Brazil	1 cruzeiro	.437	x	.047	.0113	.116	.088	.0084	.84	.201	.058
Colombia	1 peso	9.24	21.2	x	.239	2.44	1.85	.178	17.7	4.26	1.22
Chile	1 escudo	38.7	88.5	4.19	x	10.23	7.75	.74	74.2	17.8	5.12
Ecuador	1 sucre	3.78	8.65	.409	.098	x	.758	.073	7.25	1.74	.500
Mexico	1 peso	4.99	11.42	.540	.129	1.32	x	.096	9.57	2.30	.660
Panama	1 balboa	52.0	119.0	5.63	1.34	13.75	10.42	x	99.7	24.0	6.88
Paraguay	1 guarani	.52	1.19	.056	.0135	.138	.104	.010	x	.240	.069
Peru	1 sol	2.17	4.97	.235	.056	.574	.435	.042	4.16	x	.287
Uruguay	1 peso	7.56	17.3	.818	.195	2.00	1.52	.145	14.50	3.48	x
(f) Total consumer expenditure											
Argentina	1 peso	x	2.40	.110	.0215	.285	.194	.0245	1.61	.373	.140
Brazil	1 cruzeiro	.416	x	.046	.0089	.119	.081	.0102	.67	.155	.058
Colombia	1 peso	9.08	21.8	x	.195	2.59	1.76	.222	14.6	3.39	1.27
Chile	1 escudo	46.5	111.8	5.12	x	13.28	9.03	1.14	74.7	17.3	6.51
Ecuador	1 sucre	3.50	8.42	.386	.075	x	.680	.086	5.63	1.31	.490
Mexico	1 peso	5.15	12.38	.567	.111	1.47	x	.126	8.27	1.92	.721
Panama	1 balboa	40.9	98.2	4.50	.88	11.67	7.94	x	65.6	15.2	5.72
Paraguay	1 guarani	.62	1.50	.069	.0134	.178	.121	.015	x	.232	.087
Peru	1 sol	2.68	6.45	.295	.058	.766	.521	.066	4.31	x	.376
Uruguay	1 peso	7.14	17.2	.786	.154	2.04	1.39	.175	11.47	2.66	x
(g) Total investment											
Argentina	1 peso	x	1.69	.061	.0122	.151	.11?	...	1.07	.256	.099
Brazil	1 cruzeiro	.590	x	.036	.0072	.0089	.066	...	.63	.151	.058
Colombia	1 peso	16.28	27.6	x	.198	2.46	1.83	...	17.9	4.17	1.61
Chile	1 escudo	82.2	139.3	5.05	x	12.42	9.27	...	88.0	21.0	8.11
Ecuador	1 sucre	6.62	11.22	.407	.080	x	.746	...	7.09	1.69	.653
Mexico	1 peso	8.87	15.03	.545	.108	1.34	x	...	9.50	2.27	.875
Panama	1 balboa	...	...	...	...	...	...	x	...	...	...
Paraguay	1 guarani	.93	1.58	.057	.0114	.141	.105	...	x	.239	.092
Peru	1 sol	3.91	6.62	.240	.048	.590	.441	...	4.19	x	.385
Uruguay	1 peso	10.14	17.22	.623	.123	1.53	1.14	...	10.86	2.59	x
(h) Machinery and equirment											
Argentina	1 peso	x	2.56	.91	.019	.209	.163	...	1.93	.374	.127
Brazil	1 cruzeiro	.391	x	.36	.0073	.082	.064	...	.76	.146	.050
Colombia	1 peso	10.93	27.9	x	.293	2.28	1.78	...	21.1	4.08	1.39
Chile	1 escudo	53.9	137.7	4.93	x	11.25	8.79	...	104.0	20.1	6.84
Ecuador	1 sucre	4.73	12.24	4.38	0.89	x	.761	...	9.24	1.79	.609
Mexico	1 peso	6.13	15.67	5.61	.114	1.28	x	...	11.83	2.29	.779
Panama	1 balboa	...	...	...	...	...	...	x	...	...	...
Paraguay	1 guarani	.52	1.32	.047	.010	.108	.085	...	x	.194	.066
Peru	1 sol	2.68	6.84	2.95	.050	.559	.437	...	5.17	x	.340
Uruguay	1 peso	7.87	20.1	.720	.146	1.64	1.28	...	15.19	2.94	x

/Table III (cont. 3)

Table III (cont'nd 3)

Country	Unit of national currency	Units of others currencies which correspond to one unit of the national currency									
		Argentina M$N	Brazil Cr$	Colombia $	Chile E°	Ecuador S/-	Mexico $	Panama B/-	Paraguay G/-	Peru S/°	Uruguay $
(i) Vehicles											
Argentina	1 peso	x	1.72	.062	.012	.148	.075	...	1.11	.216	.131
Brazil	1 cruzeiro	.582	x	.036	.007	.086	.044	...	.65	.126	.076
Colombia	1 peso	16.16	27.8	x	.190	2.38	1.22	...	18.0	3.48	2.12
Chile	1 escudo	85.0	146.1	5.262	x	12.55	6.40	...	94.5	28.4	11.15
Ecuador	1 sucre	6.78	11.64	.419	.080	x	.510	...	7.53	1.46	.888
Mexico	1 peso	13.28	22.82	.822	.156	1.96	x	...	14.76	2.87	1.741
Panama	1 balboa	...	...	...	...	...	...	x	...	...	...
Paraguay	1 guarani	.90	1.55	.056	.011	.133	.068	...	x	.194	.118
Peru	1 sol	4.63	7.95	.286	.054	.683	.348	...	5.14	x	.607
Uruguay	1 peso	7.62	13.1	.472	.090	1.13	.574	...	8.48	1.65	x
(j) Construction											
Argentina	1 peso	x	1.28	.047	.0092	.124	.099	...	.65	.211	.076
Brazil	1 cruzeiro	.782	x	.037	.0072	.097	.078	...	.51	.165	.059
Colombia	1 peso	21.26	27.2	x	.197	2.64	2.11	...	13.8	4.48	1.61
Chile	1 escudo	108.2	138.3	5.09	x	13.44	10.75	...	70.3	22.8	8.20
Ecuador	1 sucre	8.05	10.29	.378	.074	x	.800	...	5.23	1.70	.610
Mexico	1 peso	10.06	12.86	.473	.093	1.25	x	...	6.54	2.12	.763
Panama	1 balboa	...	...	...	...	...	...	x	...	...	...
Paraguay	1 guarani	1.54	1.97	.072	.014	.191	.153	...	x	.324	.117
Peru	1 sol	4.74	6.07	.223	.044	.590	.472	...	3.08	x	.360
Uruguay	1 peso	13.18	16.9	.620	.122	1.64	1.31	...	8.57	2.78	x
(k) Government expenditure											
Argentina	1 peso	x	1.84	.060	.029	.14	.11	.052	.74	.27	.055
Brazil	1 cruzeiro	.54	x	.033	.016	.075	.060	.028	.40	.15	.03
Colombia	1 peso	16.7	30.7	x	.48	2.31	1.85	.87	12.3	4.52	.93
Chile	1 escudo	34.7	63.8	2.08	x	4.81	3.85	1.81	25.6	9.38	1.92
Ecuador	1 sucre	7.22	13.26	.43	.21	x	.80	.38	5.33	1.95	.40
Mexico	1 peso	9.02	16.56	.54	.26	1.25	x	.47	6.66	2.44	.50
Panama	1 balboa	19.19	35.28	1.15	.55	2.66	2.13	x	14.17	5.19	1.06
Paraguay	1 guarani	1.35	2.49	.081	.039	.19	.15	.071	x	.37	.075
Peru	1 sol	3.70	6.80	.22	.11	.51	.41	.19	2.73	x	.20
Uruguay	1 peso	18.04	33.2	1.08	.52	2.50	2.00	.94	13.32	4.88	x
(l) Total expenditure (excluding government)											
Argentina	1 peso	x	2.27	.101	.0197	.261	.179	.0218	1.51	.352	.132
Brazil	1 cruzeiro	.441	x	.044	.0087	.115	.079	.0096	.664	.155	.058
Colombia	1 peso	9.91	22.5	x	.196	2.59	1.77	.216	14.9	3.49	1.31
Chile	1 escudo	50.6	115.0	5.11	x	13.22	9.06	1.11	76.3	17.8	6.69
Ecuador	1 sucre	3.83	8.69	.386	.076	x	.685	.084	5.77	1.35	.506
Mexico	1 peso	5.59	12.69	.564	.110	1.46	x	.122	8.42	1.97	.739
Panama *	1 balboa	45.8	104.0	4.62	.90	11.97	8.20	x	69.0	16.2	6.06
Paraguay	1 guarani	.66	1.51	.067	.0131	.173	.119	.014	x	.234	.088
Peru	1 sol	2.84	6.44	.286	.056	.741	.508	.062	4.27	x	.375
Uruguay	1 peso	7.56	17.2	.763	.149	1.98	1.35	.165	11.39	2.67	x

a/ Expenditure on Private Education is also excluded.

/Table IV

Table IV

INDEXES OF PRICES AND PURCHASING POWER: AT PREVAILING EXCHANGE RATES

(Base country = 100)

Horizontal columns = price indexes
Vertical columns = indexes of puchasing power equivalents

Country	Argentina	Brazil	Colombia	Chile	Ecuador	Mexico	Panama	Paraguay	Peru	Uruguay
					(a) Food, beverages and tobacco					
Argentina	100	101	164	153	160	149	273	112	118	115
Brazil	99	100	163	150	158	147	261	111	117	114
Colombia	61	62	100	93	98	91	163	68	72	70
Chile	66	67	108	100	105	98	177	74	77	75
Ecuador	62	63	103	95	100	93	169	70	74	72
Mexico	67	68	110	102	108	100	181	75	79	77
Panama	37	37	61	56	59	55	100	42	44	43
Paraguay	89	90	146	136	143	133	241	100	105	102
Peru	85	86	139	129	136	127	228	95	100	98
Uruguay	88	88	143	132	139	130	235	98	103	100
					(b) Clothing and textiles					
Argentina	100	96	94	181	95	109	124	100	103	85
Brazil	104	100	97	187	99	113	130	104	107	88
Colombia	107	103	100	192	102	116	129	107	109	90
Chile	55	53	52	100	53	60	67	55	57	47
Ecuador	105	101	99	190	100	114	128	105	108	89
Mexico	91	88	86	166	87	100	111	92	94	77
Panama	82	79	77	149	78	90	100	82	85	69
Paraguay	100	97	94	183	95	109	122	100	103	84
Peru	97	94	91	176	93	108	118	97	100	82
Uruguay	118	114	111	214	113	130	144	118	122	100
					(c) Housing					
Argentina	100	120	80	197	111	104	134	104	105	88
Brazil	83	100	67	163	92	86	111	87	87	74
Colombia	124	150	100	244	138	130	167	130	130	111
Chile	51	61	41	100	56	53	68	53	53	45
Ecuador	90	109	73	177	100	94	121	94	95	80
Mexico	96	116	77	189	106	100	129	100	100	85
Panama	75	90	60	146	83	78	100	78	78	66
Paraguay	96	116	77	188	106	99	129	100	100	85
Peru	96	115	77	188	106	100	128	100	100	85
Uruguay	113	136	91	221	125	117	151	118	118	100

/Table IV (cont. 2)

Table IV (cont'nd 2)

Country	Argentina	Brazil	Colombia	Chile	Ecuador	Mexico	Panama	Paraguay	Peru	Uruguay
				(d) Transport and communications						
Argentina	100	151	105	119	120	95	176	113	130	93
Brazil	66	100	70	79	79	63	117	75	86	62
Colombia	95	143	100	113	114	90	167	108	123	88
Chile	84	127	88	100	100	80	148	95	109	78
Ecuador	84	126	88	100	100	79	148	95	109	78
Mexico	106	159	111	126	126	100	186	120	137	98
Panama	57	85	60	68	68	54	100	64	73	53
Paraguay	88	133	93	105	105	83	157	100	114	82
Peru	77	116	81	92	92	73	136	88	100	72
Uruguay	108	162	113	128	129	102	190	122	140	100
				(e) Other consumer expenditure						
Argentina	100	102	126	204	124	132	159	132	142	96
Brazil	98	100	124	200	122	131	157	129	140	94
Colombia	79	80	100	160	98	105	126	104	112	76
Chile	49	50	62	100	61	65	78	65	70	47
Ecuador	81	82	103	165	100	108	129	107	115	78
Mexico	75	77	95	153	93	100	120	99	107	72
Panama	63	64	79	128	77	83	100	83	89	60
Paraguay	76	77	96	154	94	100	121	100	108	72
Peru	70	72	89	143	87	94	112	93	100	67
Uruguay	104	106	132	212	129	139	166	137	148	100
				(f) Total consumer expenditure						
Argentina	100	107	129	169	133	128	202	110	115	101
Brazil	93	100	120	158	125	120	192	103	108	95
Colombia	78	83	100	131	104	100	157	86	89	79
Chile	59	63	76	100	79	76	120	65	68	60
Ecuador	75	80	97	127	100	97	152	83	87	76
Mexico	78	83	100	131	104	100	158	86	89	79
Panama	49	53	63	83	66	64	100	54	57	50
Paraguay	91	97	117	153	121	116	181	100	104	92
Peru	87	93	112	147	116	112	176	96	100	88
Uruguay	98	105	127	167	132	128	200	109	113	100
				(g) Investment						
Argentina	100	75	72	96	71	75	...	73	79	71
Brazil	133	100	95	127	94	99	...	98	105	95
Colombia	139	105	100	133	98	104	...	102	110	100
Chile	105	79	75	100	74	78	...	77	83	75
Ecuador	142	107	102	136	100	106	...	104	112	101
Mexico	134	101	96	128	94	100	...	98	106	96
Panama	...	...	...	...	...	...	...	...	...	...
Paraguay	136	103	98	131	96	101	...	100	107	97
Peru	127	96	91	121	89	95	...	93	100	90
Uruguay	140	106	100	134	99	105	...	103	110	100

/Table IV (cont. 3)

Table IV (cont'nd 3)

Country	Argentina	Brazil	Colombia	Chile	Ecuador	Mexico	Panama	Paraguay	Peru	Uruguay
					(h) Government expenditure					
Argentina	100	82	70	228	65	73	...	51	83	40
Brazil	121	100	86	283	79	89	...	62	104	49
Colombia	143	117	100	322	92	105	...	72	119	58
Chile	44	36	31	100	29	32	...	22	37	18
Ecuador	155	126	108	354	100	114	...	78	129	62
Mexico	136	111	95	308	88	100	...	69	113	55
Panama	...	...	...	...	...	...	...	...	...	...
Paraguay	197	162	138	446	129	144	...	100	166	79
Peru	120	98	83	281	78	88	...	61	100	47
Uruguay	249	204	174	565	161	183	...	126	208	100
					(i) Total					
Argentina	100	101	118	155	122	118	180	103	109	96
Brazil	99	100	116	154	121	117	179	102	108	95
Colombia	85	86	100	131	104	101	153	88	92	81
Chile	64	65	76	100	78	76	116	67	70	62
Ecuador	82	83	97	127	100	97	148	85	89	79
Mexico	84	85	99	131	103	100	153	87	92	81
Panama	55	56	65	86	67	66	100	57	60	53
Paraguay	97	98	114	150	118	114	175	100	105	93
Peru	92	93	108	143	112	109	166	95	100	88
Uruguay	104	105	123	162	128	124	189	108	114	100

/TECHNICAL NOTES

T E C H N I C A L N O T E S

1. Earlier Research

Few studies designed to evaluate the purchasing power of national currencies and establish relative levels of prices have been attempted; and of these, most have placed the emphasis on real wages or real income - that is to say, on the amount of goods and services which can be purchased, or for a given level of income. The relationship of wage levels relative to prices in the various countries has been the main interest; and as in computing the wage price ratio for any country, the exchange rate automatically drops out (applying both to the numerator and the denominator of the ratio in question), the problem of determining a purchasing power equivalent for each country has been avoided. Those calculations which were made along lines designed to establish purchasing power parities have had a limited scope and as a rule applied only to a particular type of expenditure - as for food or clothing - where the commodities purchased are fairly well defined and the differences in quality amongst countries are (rightly or wrongly) considered to be of minor significance.

The main work in relating wages or income to prices has been that carried out by the International Labour Office; and although not the actual pioneers in this field, the ILO has undoubtedly done more intensive study over a longer period of time than any other organization. Beginning with the First International Conference of Labour Statistics held in Geneva in 1923, the office has collected a valuable set of material relating to the consumption of working class families and the price levels of food, fuel, electricity and (until 1937) rent. In 1931, a special ILO study known as the Ford-Filene enquiry was conducted with the objective of determining what wages would have to be paid to employees of the Ford Motor Company so that their levels of living in each of the fourteen European countries should be comparable to that enjoyed by the same class of workers in Detroit, U.S.A.[1]; and while the design of the study - especially its application to one type of workers only - limited its usefulness, the enquiry was for some time the only source of comprehensive international statistics available for direct place-to-place

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1/ A Contribution to the Study of International Comparisons of Costs of Living, Studies and Reports, Series N. N° 17, International Labour Office (Geneva 1932).

/comparisons. A

comparisons. A further study - limited to workers in the cotton and woollen textile industries in certain countries - was undertaken in 1951 in order to evaluate the food purchasing power of wages.[2] In addition considerable statistical information covering prices of individual commodities within the food, beverage and tobacco groups has been published regularly in the Yearbook of Labour Statistics - the same material being used to calculate a series of indexes relating to comparative food prices in selected countries. More recently a highly informative document International Comparisons of Real Wages[3] has discussed both practical and theoretical problems involved in the measurement and comparison of prices as well as of wages.

The predecessor to the ILO studies was one carried out by the United Kingdom Board of Trade in the early years of the century. Again, the main interest was in prices relative to wages, the enquiry relating to food and rents (measured in terms of room-number, notwithstanding differences in room size) and covered four countries - Germany, France, Belgium and the United States - vis-à-vis the United Kingdom.[4]

Another early study (known as the "Unilever Enquiry") was conducted by the Unilever Corporation (Lever Bros. Ltd.) during 1930 in order to establish the salaries necessary to give a standard of living equivalent to that enjoyed by people with incomes varying between £ 500 .- and £ 3,000.- in England.[5]

The outstanding empirical study prior to the Second World War was that which Colin Clark incorporated in the various editions of his "Conditions of Economic Progress"; and even though the author is far from explicit regarding the method and the data, the book has been widely used for the inter-country comparisons of income and prices which it contains. For his material Clark drew heavily on the Ford-Filene and Unilever enquiries, on prices collected periodically by

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2/ Textile wages: An international study, Studies and Reports, New Series, N° 31, International Labour Office (Geneva 1952).

3/ International Labour Office, Geneva, 1956.

4/ See Official British Publication Cd 3864 (1908); Cd 4032 (1908); Cd 4512 (1909); Cd 5065 (1910) and Cd 5609 (1911).

5/ Summarized in The Economist (London) November, 1930.

/by the

by the ILO, and on a variegated assembly of national data. To what extent his basic data is comparable between countries is an open question, and the statistically-minded reader is left with the impression that a collection of items often widely divergent in specification has been used in a manner for which the material was never designed. The work nevertheless remains an outstanding contribution in the determination of purchasing power equivalents and the measurement of real income.

In the post-war period, increased attention has focussed on the problem of comparative prices and some highly informative studies relating to prices, wages, income and consumption levels have been carried out. Chief amongst these are the two OEEC studies: An International Comparison of National Products and the Purchasing Power of Currencies;[6] and Comparative National Products and Price Levels.[7] Unlike previous investigations the main interest in the work of Gilbert, Kravis and their associates related to the levels of real product. A considerable amount of price information was collected for selected European countries and the United States - partly from the official records of national statistical offices, partly by direct enumeration and partly derived from available value and quantity data (to this extent representing average or unit values rather than prices in the strict sense of the word). In that the studies were designed primarily to measure relative levels of production, the comparative prices levels were not fundamentally ends in themselves; and although the authors have calculated an extremely useful and informative array of price indexes and purchasing power equivalents, the question might perhaps be asked if the study would have followed the same lines had the only objective been that of evaluating one currency in terms of another.[8] Differences of opinion also exist as to whether the

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6/ M. Gilbert and I.B. Kravis: OEEC (Paris) 1954.

7/ M. Gilbert and Associates: OEEC (Paris)

8/ The imputation of price or quantity data for items not directly included in the calculations would possibly have proceeded along different lines; less reliance would have been placed on the comparability of prices obtained from national statistical offices or derived as unit values from value and quantity statistics; while presumably the treatment of changes in investories and the balance of trade would not have been the same

/the weighting

the weighting pattern of the first study was the most appropriate for intra-European comparisons since it was influenced to some extent by the expenditure pattern of the United States. Finally the expression of results as a series of alternatives can create in the mind of the reader a number of doubts as to their usability or their reliability. Leaving aside, however, points of technical detail, the two studies represent a meritorious achievement in the field of real product measurement and the comparison of inter-country price levels. This is particularly so since, while preceding work was limited merely to food and in certain cases a few selected groups of consumer expenditure, in the OEEC studies the field was extended to cover not only all aspects of consumer expenditure (whether private or governmental) but also investment.

Another project of note in the post-war period is the study of living costs and real wages in selected countries of Northern Europe, conducted jointly by a committee of statisticians from Denmark, Finland, Norway and Sweden.[9/] Prices related to consumer goods in the cities of Copenhagen, Helsinski, Oslo and Stockholm (Reyjavik also being included for a Norway-Iceland comparison), and were converted into a common currency denominator in accordance with bank selling rates. With the adoption of weighting systems based (for three countries) on consumer expenditure surveys carried out in connexion with the construction of the cost-of-living index series and (for Norway) on a special Oslo budget, a series of binary comparisons were made which illustrated rather strikingly the divergent results obtainable according to the weighting pattern used, even in the case of countries with somewhat similar economic structures.

Another interesting study is that conducted in 1954 by the High Authority of the European Coal and Steel Community.[10/] While the main interest was in prices relative to wages - the scope of the study being

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9/ Leunadskostnader och reallöner i de nordiska Lunndstäderna, Nordisk Statistisk Skriftserie N° 1 (Stockholm) 1954.

10/ Informations Statistiques, High Authority, European Coal and Steel Community, Vol. 2, N° 5 Aug-Sept 1955 (Luxemburg).

/confined to

confined to steel workers and coal miners in Belgium, France, the Federal Republic of Germany, Italy, Luxembourg, the Netherland and the Saar. Special wage data were collected for the workers in the countries concerned, while a direct collection of prices was made in 2 000 shops in the principal coal and steel centres of the countries in working-class households.[11] The weighting system was determined by applying the percentage distribution of expenditures for the various goods and services, as revealed by family living studies, to a special estimate of earnings for the workers concerned in each country. As with the OEEC study, a series of binary comparisons was made using the weights first of one country and then of the other in accordance with the Laspeyres and Paasche formulae.

An entirely different type by comparison was that made by the U.S. Bureau of Labour Statistics for adjusting civil servants' wages to take into account cost of living differences between Washington D.C. and San Juan, Puerto Rico on the one hand; and Washington D.C. - Honolulu on the other.[12] The work was mainly experimental and was based not on the prices of identical goods or services but on the cost of obtaining an equivalent level of consumption - that is to say, evaluating the amount which would have to be paid by a person in each of the two situations in order to obtain an equivalent measure of satisfaction. The method adopted was as follows: (a) the expenditure on different items of consumption in San Juan (or Honolulu) and in Washington was computed as a percentage of family income (using family income and expenditure studies carried out in those cities in 1950); (b) items were classified according to the relationship of expenditure to income (dividing them into the so-called "necessities" which were purchased by the same or a decreasing proportion of families as money

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11/ Rent was based partly on official data and partly on private information.

12/ Measuring Comparable Living Costs in Cities with Differing Characteristics, op.cit.

/income rose,

income rose, and "luxuries" for which purchases increased as money income rose); c) a graph was prepared plotting for each city the relationship of income to expenditure for items within the necessity group, and curves were fitted to the observations; d) a calculation was made in order to determine how much the curve for San Juan (or Honolulu) would have to be adjusted in order to obtain equivalence with Washington. The results showed that the curve for San Juan was at a level 118 per cent above that of Washington - the interpretation being that living costs were 18 per cent higher for the families in question in the first-named city. Insofar as a different solution exists for each level of income, the method has a number of disadvantages, both practical and theoretical - particularly since "equivalent measures of satisfaction" are subject to a multitude of interpretations and are difficult to define statistically.

The empirical studies conducted by the U.N. Statistical Office in order to determine the salary-levels appropriate for international civil servants in various parts of the world follow more orthodox lines.[14/] Expenditure patterns are determined for staff members stationed in the various cities, while prices for goods and services (including rent) are collected directly. The latter data are converted at prevailing rates of exchange and are compared with the prices for equivalent items in New York. Price relatives are then weighted, first according to the expenditure pattern of New York and secondly according to the pattern of the city concerned, the two results being averaged geometrically in order to obtain a measure of price differences between the two cities and an evaluation of the purchasing power of the salaries for the officials concerned. The comparisons are essentially binary in character, the base city being New York in all cases.[15/] In accordance with the objectives of the study only consumption expenditure is considered; the expenditure pattern relates to a class of officials not representative of the country in which they are stationed; the quality of many items priced is better than that generally consumed; while the shops and outlets from which price information is obtained are generally in neighbourhoods frequented by international officials and are not typical for other residents in the city. The results, nevertheless, constitute the most comprehensive series of inter-country comparisons so far elaborated; and even if they have to be interpreted with care because of coverage and representativity, the work is of considerable interest from a theoretical and practical point of view.

14/ Retail price comparisons for international salary determination, Statistical Papers Series M,No. 14 and M,No. 14, Add.1 and Add.2, United Nations (New York).

15/ More recently, Geneva has been introduced as a base city.

2. Alternative approaches

(a) Adjusted exchange rates

Three main approaches have been made to the problem of measuring relative price levels and evaluating the purchasing power of national currencies. The first and most simple method is the adjustment of the prevailing exchange rate in some arbitrary way so as to reflect more accurately the real value or "worth" of one currency relative to another. In most cases, a reference period when conditions were considered to be "normal" is chosen, and the rate of exchange which applied in that period is projected forwards or backwards by means of index numbers which supposedly measure the movement of prices in the countries concerned. Let us assume, for instance, a year such as 1938, is considered "normal" and that the exchange rate applicable to international transactions in that year gave a relationship of 100 pesos = 120 cruzeiros for countries A and B. Between 1938 and 1960, prices in A have risen 250 per cent and in country B 200 per cent. The currency relationship in 1960 would be taken as 40 pesos = 60 cruzeiros; alternatively, 100 pesos = 150 cruzeiros.

This method has been frequently used in past years by organizations such as the U.N. Statistical Office, ECE, OEEC, and ILO in order to avoid the distortions which have arisen in recent decades with the widespread adoption of arbitrary or multiple rates of exchange, often maintained at levels which have little or no relation to parity conditions. All calculations so far made by ECLA for national income figures expressed in U.S. dollars were based on this

/approach.[16]

approach.[16] However, as ECLA and other offices using the method have recognized, the adoption of a so-called "normal" year in no way solves the problem of correctly evaluating purchasing power in other years. It reduces the amount of error by avoiding period when rates were "abnormal" - that is to say, when the influence of special factors causes the rate to be widely divergent from an equilibrium rate of exchange. For a year when the rate of exchange fluctuates violently, or when structural changes are introduced into the system (e.g. with the application of a new preferential rate) there is probably no single rate which could be designated as a typical, much less an equilibrium one, for a country. Similarly, when the rate has been maintained artificially, notwithstanding a marked alteration in the relationship of domestic to international prices, the ruling rate has to be considered as an arbitrary one which is not indicative of the true value of the currency vis-à-vis other currencies. The adoption, then, of a reference year when problems of the kind mentioned above are unimportant can eliminate some of the error-creating factors. It does not however, eliminate any inaccuracy inherent in the exchange rate system for the year chosen. It merely assumes that, in the reference year, the exchange rate correctly measures the relationship between prices or values in the various countries. For reasons which have already been referred to in a previous chapter, such an assumption is unwarranted, and at the best, the exchange rates equates only these values which apply to a country's international transactions. It would be coincidental that the price structures over the full range of transactions - both domestic and international - were equated, as they would have to be in order to achieve parity in purchasing power.

16/ For information regarding the concepts and methods used, see Economic Bulletin for Latin America, Vol. 1 No. 2, pages 32-38. The conversion factors adopted are given in the Explanatory Notes to Volume V, No.2.

/A further

A further inaccuracy exists insofar as the price indexes used to project the exchange rate from the reference year to another time-period are not designed for such a purpose. Available indexes relate, as a rule, merely to consumer prices for a particular income-group in a selected city. Price changes for investment goods, for certain consumer goods, for government purchases, for other income groups and for other parts of the country are not therefore taken into account, except to the extent that they might follow the pattern of the consumer price index. Furthermore, in view of the structural changes continually taking place in the composition of expenditure and investment, the longer the period during which the index series is used to project the exchange rate, the greater the likelihood (and the greater the magnitude) of error.17/

The method of adopting an "equilibrium" exchange rate in a selected year and adjusting it for subsequent changes in prices of the countries concerned must then be discarded as statistically unsatisfactory so far as the measurement of the purchasing power for two or more currencies is concerned.

(b) Equivalent wants and satisfactions

An alternative method which has been advocated by some writers is the equation of levels of income in accordance with the similarity - or dissimilarity - in the patterns of expenditure or consumption.

Such an approach would, it is contended, obviate the necessity for comparing prices directly or for combining the prices concerned into aggregates which may be meaningless if consumption patterns differ to any extent in the various situations. The rationale of the approach is that the structure of expenditure varies according to price levels; and that in a given situation a person's consumption habits would be different from that in another situation where a different price pattern prevailed. Ragner Frisch contended that : "The very concept of a basket full of commodities, the content of which remains

17/ In the third Edition of his Conditions of Economic Progress (pages 43-44) Colin Clark, for instance, drew attention to the weakness of some of the index numbers he used for projecting price levels from one period to another.

/unchanged while

unchanged while prices change, is therefore a contradiction to ideas that are basic to the central body of price theory".[18] In order to avoid the direct use of price and quantity information, Frisch, Staehle, Wold and others endeavoured to locate some economic parameter that could be used as a criterion of equivalence for pairs of income in two situations. A parameter of this kind was suggested by the relationship of food expenditure for various income levels, observed by Engel and embodied in the often-quoted Engel's Law. The existence of such a relationship, or the extent to which it holds true, above and below certain income levels is open to question.[19] Nevertheless, in the work of the economists and investigators mentioned above, the percentages of total expenditure allocated to particular categories of consumption goods at successive income levels has been accepted as the criterion by which equivalence for two situations can be obtained (the fraction of the expenditure devoted to the class of goods or services in two or more situations being used to establish the identify between consumption levels or incomes).[20]

In its simplest form, the method would suggest that if, say, 70 per cent of total expenditure for families earning 4 000 pesos a year was devoted to food in country A and 70 per cent was spent by families earning 6 000 nacionales a year in country B, an income of 4 000 pesos in A is equivalent to 6 000 nacionales in B. Variations on this central theme have been suggested, but in the essential aspects, the equivalence of purchasing power has rested basically on some degree of similarity in the expenditure or consumption pattern in the countries being compared.

18/ Some Basic Principles of Price of Living Measurements, Memorandum fra Universitets Socialkonomiske Institutt (Oslo) 25 June 1953 (mimeographed) Page 2.

19/ On this point see Dorothy S. Brady and Abner Hurwitz: Measuring Comparative Purchasing Power, Studies in Income and Wealth, Volume Twenty, National Bureau of Economic Research, (U.S.A.) Pages 317-8.

20/ Some writers have used less restrictive methods of matching than that implied by the Engel ratios. Aagner Frisch based his equivalence of income in two situations on the flexibility of the marginal utility of money with respect to an increase in income while Staehle proposed a method whereby differences in the cost of living would be measured in accordance with the location in two countries of income groups for which the consumption pattern differs least.

/It will

It will of course be observed that, for different income levels, different points of equivalence could be established. In the example above, for instance, the expenditure on food might be 60 per cent for incomes of 6 500 pesos and 9 000 nacionales in A and B respectively; 50 per cent for incomes of 10 000 pesos and 14 000 nacionales respectively; and so on - thus giving a curve of income equivalence for the two situations. Exponents of the method have not been explicit as to the way in which the relationship or equivalence should be averaged in order to obtain an overall measure of the purchasing power for the country - an exception being the Bureau of Labour Statistics in its study of comparative living costs for civil servants in San Juan (Puerto Rico), Honolulu and Washington D.C.[21/] It is furthermore difficult to envisage how the methodology would be applied to all aspects of expenditure, including investment.

Notwithstanding, then, the illustration given by the Bureau of Labour Statistics, we must conclude that the limitations of a method of this type would make it impracticable for application to a region like Latin America where the basic data would be deficient and the results too restrictive in character to meet the objectives we have in mind.

(c) Direct Price Comparisons

The third method to be discussed is that classically used in the inter-temporal comparisons of prices for a city or a country: the selection of a basket of goods and services which is priced at the various points of time, the component items in the basket being combined in such a way as to reflect their relative importance within the aggregate (the comparison of the aggregates in each time-period affording the basis from which the inter-temporal index numbers are obtained).

While such a method is commonly used for indexes of retail prices, wholesale prices, market prices of shares, rents, wage or labour costs etc., it is not so easy to apply inter-spatially. In the first place, its accuracy depends upon the identification of specific commodities for each point of comparison; and while this is generally a minor

21/ Described briefly in Chapter III. It should be noted that the study referred to one class of salary-earners only, and not to people in general.

problem for inter-temporal indexes (since a commodity identified in one time-period can as a rule be identified again in succeeding time periods), this is not the case inter-spatially. As noted in an earlier chapter, even if an item is described by the same name, it may be of quite different quality in two countries or it may be marketed under completely different conditions. When more countries are included in the comparison, the problems of identification are multiplied proportionally.

In the second place, the combination of items so as to accord appropriate importance to each is complicated by the widely varying consumption patterns which exist as between countries. For a wholesale or retail price index, the difference in the relative importance of commodities for successive time-periods is not sufficient to cast doubts on the validity of the index unless the time-periods are extended too far, e.g. ten or more years, or unless some fundamental change has occurred meantime, e.g. the outbreak of war. However, inter-spatially, the difference in consumption patterns between countries (and even for cities within the same country) is usually appreciable; and if income levels, climatic and geographic conditions, tastes and customs, tax structures, transport costs and above all, the relative cost of producing the items differ to any extent, the consumption patterns can be so divergent that the adoption of any common weighting system becomes problematical.

The third factor which distinguishes inter-temporal from inter-country comparisons is the expression of prices and values in different currencies. Thus, while in country A the price of commodity i can be compared directly with that of commodity j (and similarly in country B), the comparison of prices for commodity i in countries A and B (or commodity j in the same two countries) is complicated by the use of different monetary denominators.[22/] The magnitude of the conversion

22/ It may be noted that in constructing world indexes of agricultural production, The Food and Agricultural Organization endeavoured to circumvent the problem by expressing prices of agricultural products as relatives of the price of a selected commodity - wheat. With the latter price as a common base in all countries, weighted averages of the various price relatives were constructed so as to provide world averages. The problem of converting to a common denominator is not, however, solved in this way as the procedure assumes that the price of wheat in all countries adequately reflects the purchasing power (or the "worth") of currencies in those countries. Such an assumption may have had some validity in the 1934-38 period used as the FAO time-base; but it is certainly not so at the present time.

/factor required

factor required to place prices in a uniform or common currency is the unknown which this study is designed to measure.

The final difference between inter-temporal and inter-spatial comparisons of the kind envisaged in this study is the scope and the nature of the investigation. For wholesale price indexes, the comparison is limited to transactions at that level; for cost-of-living studies - or more correctly consumer expenditure comparisons - the enquiry relates to the final goods and services which are destined for consumption by private individuals - thus excluding government expenditure as well as investment. Also for cost of living indexes, more generalized assumption may be made regarding items for which no data are available (thus, if no price or unit-cost figures are readily available for education or vacation expenditure or if difficulty exists in identifying a representative type of furniture or of personal services, these items can be assimilated to similar ones or an assumption made that their prices would vary for each point of time in the same way that other prices have varied). Imputation for missing price data cannot usually be made with such case in inter-spatial comparisons since the price movement of individual items rarely conforms to any strict pattern. Lastly, it should be observed that while consumer expenditure indexes refer to a specific income class e.g. wage-earners in a particular city, the inter-country comparisons of the kind contemplated in this enquiry should ideally give results which are representative of all classes within the community - failing which they could not be considered fully representative of the country.

Because of difficulties in obtaining either strict identify in commodities used, or comprehensive data for weighting purposes, inter-country price comparisons using the common-basket approach have in many cases been restricted to one class of consumer goods - namely, foodstuffs. In other cases, the scope of the comparison has been enlarged to include clothing, and, with difficulty, rent.[23] Only in post-war years have

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23/ See Technical Notes, section 1, above.

the calculations extended to cover all consumer expenditure;[24] while as far as investment goods are concerned, these have been included only in the comparisons made by Gilbert, Kravis and associates for the O.E.E.C.[25] Although food prices may be informative for the consumption of real wage levels (food representing between 40 and 50 per cent of consumer expenditure in most Latin American countries), the variations between the levels for food prices and for other prices is often very great indeed. A study based on food only is therefore subject to serious limitations. Likewise, since investment represents about one-quarter or one-fifth of total expenditure, and no reason exists for assuming that the prices for investment goods in Latin American countries would conform to the patterns for food or other consumer goods, the omission of this sector could affect the representativity of the results to a substantial degree. The problem of covering all classes of expenditure, including investment, is a practical rather than a conceptual one since, in the same way that (theoretically at least) an appropriate basket of consumer goods and services can be selected, so a basket of investment goods comprising tractors, trucks, lathes, generators, roads and buildings etc. can be priced in the different situations in order to yield inter-temporal or inter-spatial comparisons.

Other practical problems also exist - as in determining the weights which can, or should, be used. These are however discussed elsewhere. For the moment, the assumption is made that both price data and quantity data can be obtained (an assumption not always valid under Latin American conditions); and that the basic problem is how they should be combined in order to provide average price relatives and an evaluation of comparative purchasing power.

24/ Notably the study of the High Authority of the European Coal and Steel Community published in Informations Statistiques op.cit. Vol. 2, No. 5.

25/ An Interantional Comparison of National Products and the Purchasing Power of Currencies and; Comparative National Products and Price Levels op.cit.

3. The choice of a formula

(a) Basic equations

Two variations of a basic index number formula are commonly used for inter-temporal or inter-country comparisons. The first involves the application of prices in the various situations to a set of quantity weights; and may, in its most elementary form, be expressed as:

$$\bar{P}ko = \frac{\sum_i Wi.p_{ik}}{\sum_i Wi.p_{io}}$$

Where K and O are two countries being compared;

$\bar{P}ko$ is the price relationship of country K to country O;

i is any item (i = 1,2,3 .....n items);

P_{ik} and P_{io} are the prices of item i in countries K and O respectively

The second alternative involves the application of some chosen weights (usually values) to the ratio of prices for each item in the various situations - the formula in elementary form being:

$$\bar{P}ko = \frac{\sum_i Wi. \frac{p_{ik}}{p_{io}}}{\sum_i Wi}$$

In the first instance, the quantity weights for the items being priced are generally those from either of the countries concerned or from some third source. If no problem of exchange rate conversion is involved and prices are already expressed in a common currency, the formula may then be expressed as either:

$$\bar{P}ko = \frac{\sum_i q_{io}.p_{ik}}{\sum_i q_{io}.p_{io}} \quad \text{(using weights of country O);} \quad \ldots\ldots\ldots\ldots\ldots\ldots(1)$$

or

$$\bar{P}ko = \frac{\sum_i q_{ik}.p_{ik}}{\sum_i q_{ik}.p_{io}} \quad \text{(using weights of country K);} \quad \ldots\ldots\ldots\ldots\ldots\ldots(2)$$

/or $\bar{P}ko$ =

or $$\bar{P}ko = \frac{\sum_i q_{ij} \cdot p_{ik}}{\sum_i q_{ij} \cdot p_{io}}$$ (using weights of some third source J. e.g. average regional quantities) .....(3)

where q_{io}, q_{ik} and q_{ij} are the quantities consumed of item i in the situations 0, K and J respectively

If the second alternative is adopted, the values used as weights are as a rule again chosen from one of the countries concerned or from a third source. Expressing values as a product of quantities and prices, the formulae may be expressed in the alternative ways:

$$\bar{P}ko = \frac{\sum_i q_{io} p_{io} \frac{p_{ik}}{p_{io}}}{\sum_i q_{io} p_{io}}$$ with weights of country 0 .....(4)

or $$\bar{P}ko = \frac{\sum_i q_{ik} p_{ik}}{\sum_i q_{ik} p_{ik} \frac{p_{io}}{p_{ik}}}$$ with weights of country K .....(5)

or $$\bar{P}ko = \frac{\sum_i q_{ij} p_{ij} \frac{p_{ik}}{p_{io}}}{\sum_i q_{ij} p_{ij}}$$ with weights chosen from a third country or region J .....(6)

A few points need be noted:

(a) In equation (4), the formula corresponds to the Laspeyres type index; in equation (5), to the Paasche type (the geometric crossing of these two calculations resulting in a Fisher type index).

(b) Theoretically, equations (4) and (5) are equivalent to equations (1) and (2). In practice, this holds true only if values and prices have been obtained consistently i.e. if the prices used as price relatives are the same as those used to determine value weights. (In most place-to-place and even time-to-time comparisons, the two prices are <u>not</u> usually identical.)

/(c) The

(c) The use of third country weights in expression (5) makes correspondence with expression (3) impossible unless the prices in country K are compared with those of the third country J - in which case, (6) becomes identical in form with (4). The point is important if regional weighting is to be used.

For the above expressions, the assumption has been made that prices are already in the same currency and that no conversion problem is involved. Since the parity exchange rate is by definition that which equates the price levels in two different countries, the application of the formulae to data expressed in different currencies will give a measurement of the parity exchange rate, providing always that "i" extends over the whole range of goods and services, including investment. In this case, the parity exchange rate Eko for country K in terms of the currency units of country O is equal to the inverse of the price ratio $\bar{P}ko$.

$$\text{i.e.} \qquad Eko = \frac{1}{\bar{P}ko} \qquad \text{.....(7)}$$

$$\text{and} \qquad Eok = \bar{P}ko \qquad \text{.....(8)}$$

These formulae merely state the number of currency units in the one country which have to be "exchanged" for currency units of the other country in order to make the cost of a representative market basket equal in the two situations. Extending this one step further, if the parity exchange rate Eko (which expresses the currency of country K in units of O's currency) is applied to the prices used in any of the formulae (1) to (6), and "i" extends over all items, the result must be unity (or parity) for the equations. For example, (using quantity weights chosen from the patterns of country O):[26]

$$\frac{\sum_i q_{io} \cdot (p_{ik} Eko)}{\sum_i q_{io} \cdot p_{io}} = 1 \qquad \text{.....(9)}$$

26/ If weighting is from country K or from any other country J, the equations would be in a form similar to (2) and (3) or (5) and (6).

/or (if

or (if value weights from the same base country are used):

$$\frac{\sum_i q_{io} \cdot p_{io} \frac{p_{ik} \cdot Eko}{p_{io}}}{\sum_i q_{io} \cdot p_{io}} = 1 \quad \ldots\ldots\ldots\ldots\ldots\ldots (10)$$

Should some other exchange rate (not being the parity rate) be used, the results will not give unity, but will provide an index of prices applicable for that particular rate of exchange (a different exchange rate naturally providing a different index). The reciprocal of this index is the purchasing power equivalent for the two countries when using the given exchange rate. The result may be interpreted in alternative manner as the coefficient which should be applied to the given rate of exchange in order to obtain a parity exchange rate (since in correcting the given rate, the index now becomes unity). Where the calculations do not extend over the whole range of goods and services we obtain a price index for each group or sub-groups, the reciprocal of which is the purchasing power equivalent for that group measured in accordance with the given rate of exchange.

(b) Multi-lateral comparisons

As observed in Section 3 of the Technical Notes, in most cases inter-spatial comparisons have been limited to a series of binary relationships - using first the weights of one country and then of another - thus endeavouring to avoid the selection of a common basket of goods and services which has appropriately- assigned weights for each item. The consequence has generally been a confusing series of alternative solutions, some applicable to one situation and some only to another. In the study made by the High Authority of the European Coal and Steel Community,[27] there were, for instance, no fewer than thirty results indicative of the binary relationships of six coal producing areas, and forty-two results for the seven areas producing steel - over seventy solutions in all when six mutually -

27/ op.cit.

/convertible solutions

convertible solutions would perhaps have been the ideal. In the work of the O.E.E.C., a commendable attempt was made to reduce the number of alternative answers by adopting average weights for European countries vis-a-vis the United States; and while the formula used in their first study[28] allowed the United States weighting patterns to influence intra-European comparions, this shortcoming was rectified in their later work.[29]

Compromise solutions have been attempted by some organizations, arrived at by geometrically crossing the results obtained first with one set of country weights and then the other. While this may be justifiable for calculations where a binary comparison is the main interest, it in no way solves the problem of intra-regional comparisons where as many as twenty countries are of equal interest. As the I.L.O. states: "Despite the popularity of Fisher's formula for place-to-place comparison, it has no objectively verifiable claim except in its ability to satisfy the rather arbitrary factor-reversal and time-reversal (or price-reversal) tests".[30] The I.L.O. rightly pointed out the limitations that apply for the formula of a compromise type when the adoption of alternative weights result in answers of the opposite sign (Country A being higher than country B with one set of weights but lower than B with the other).

Another compromise solution which has often been advocated[31] is the chaining of countries in a way which utilizes the binary comparisons between each of them, or between groups of them (as when countries have been arranged in zones or blocks, and all countries within that block are compared with a common country - the common country in turn being compared with a similar country in another block). This method was however

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28/ An International Comparison of National Products and the Purchasing Power of Currencies, op.cit.

29/ Comparative National Products and Price Levels, op.cit., pp. 153-7

30/ The International Comparison of Real Wages, op.cit., p. 36.

31/ e.g. by Everett E. Hagen of the Massachusetts Institute of Technology in his Comment on The Scope of Economic Activity in International Income Comparisons (by I.B. Kravis), Studies in Income and Wealth, National Bureau of Economic Research (New York), Volume 20, page 385.

/rejected by

rejected by the Fourth International Conference of Statisticians held in Geneva in 1931; and there are no new reasons why it might be considered justifiable in the present study.

A somewhat different apprcach based on a multilinear comparison of price levels amongst groups of countries was suggested by Dorothy Brady and Abner Hurwitz of the Bureau of Labour Statistics who reasoned that: "Just as in many problems of geometry the move from two to three or more dimensions reduces the number of indeterminate solutions, an increase in the scale of price comparisons might limit the number of answers to the same question".[32/] Basing their methodology on an approach advocated earlier by Smith and Jablon,[33/] they advocated the estimation of comparative purchasing power by a series of successive approximations which, when applied to the exchange rate used in the proceeding step would gradually achieve parity in the price relationships for the group of countries. The fundamental characteristic of their solution was the comparison of the national price of each item (converted at exchange rates which gradually approximated the parity rate) with the weighted average of all available prices for the same item in all countries in which it was consumed. The calculations appended to the article of Mrs. Brady and Hurwitz are not as convincing as the text of their study. Nevertheless, the method they advocate has much to recommend it, and merits more attention than it has so far received by research workers in this field.

An alternative solution along rather similar lines was developed by R.C. Geary and included in a paper presented at the U.N. Seminar on National Income Statistics held in Rio de Janeiro in 1959.[34/] Geary's approach consisted in solving simultaneously a number of equations - one for each country - which related the exchange rate to the price of each

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32/ Measuring Comparative Purchasing Power, Studies in Income and Wealth, Volume 20, National Bureau of Economic Research (New York) 1957.

33/ Described in a master's thesis by John O. Coleman: An Inquiry into the Problem of International Comparisons of Food Costs, The American University, June 1953.

34/ A Note on the Comparison of Exchange Rates and Purchasing Power between Countries; also Nuevo método de comparación del poder adquisitivo de las monedas de diversos países, Seminario de las Naciones Unidas sobre Cuentas Nacionales para América Latina, Rio de Janeiro 11-26 de junio de 1959, United Nations (New York) pp. 519-528.

/item as

item as compared with an "international" price - quantities consumed being introduced for weighting purposes.[35] The method was applied to the data collected by the High Authority of the European Coal and Steel Community,[36] and exchange rates were calculated which reduced the number of solutions from thirty to five (the sixth country, Germany, being used as the point of reference). The results of the calculation emphasized the desirability that parity exchange rates be mutually convertible; but the question must be asked if the method used to combine national data and solve the set of simultaneous equations could be practicable for an area like Latin America where as many as twenty individual countries were concerned. It certainly seems that the magnitude of the undertaking would necessitate the use, not of ordinary machine tabulating methods adopted for the European countries, but electronic computers - which at the present time would be impracticable and excessive in cost for most national or international organizations - certainly for ECLA.

A first essential of any formula is then, that it be practicable; and much though the approaches advocated by Mrs. Brady and Hurwitz or Geary might have to recommend them, they cannot be considered if the amount of work involved is beyond the capabilities of the investigating agency. On the other hand one cannot accept a binary-type comparison if the results are unsatisfactory for the purpose of the investigation. The binary comparison is particularly objectionable if the two countries are measured relative to a third country in such a way that the price or quantity pattern of the third country affects the results. The problem is very similar to that encountered for time-to-time indexes when the comparison

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35/ The basic equations were:

$$Ci = \frac{\sum_k E_k \, p_{ik} \, q_{ik}}{\sum_k q_{ik}} \qquad (i = 1,2,3 \ldots\ldots\ldots n \text{ items})$$

and

$$E_k = \frac{\sum_i Ci \, q_{ik}}{\sum_i p_{ik} q_{ik}} \qquad (k = a,b,c \ldots\ldots\ldots m \text{ countries})$$

(where Ci is the international price of commodity i in a chosen currency; E_k is the number of currency units of the chosen currency equivalent to a unit of the national currency; and other symbols retain the significance to them in this chapter).

36/ Op.cit.

/of two

of two periods, neither of which is the base period, may be seriously affected by structural changes which have taken place since the base period. The adoption of the "third country" weights may thus give an unrealistic importance to the various items which are priced. The use of European weights, or United States weights for comparing the prices of Brazil with say, Argentina, would inevitably lead to inconsistences or abnormalities since the expenditure patterns of the countries in question are so divergent. Third country weights should not therefore be introduced into the formula.

The situation is however different if the "third country" weights are averages for the countries being compared (as in the second of the O.E.E.C. studies relating to selected European countries).[37/] Conceptually the use of average regional weights has much in its favour since they represent the consumption pattern with the greatest similarity to, or the least variation form, the patterns of the individual countries. The approach is, above all, practical, while alternative approaches, or other weighting systems, may not be. For few countries in Latin America have adequate expenditure surveys been conducted; cost-of-living indexes have in most cases a limited breakdown and apply only to a selected part of the community; the country detail of investment is confined to the broad aggregates for each type of investment which are specified separately in national accounts. For some countries e.g. Uruguay, nothing exists which can be used with confidence for weighting purposes. The adoption of separate weights for each Latin American country is thus a virtual impossibility under present statistical conditions. On the other hand, if national accounts data are judiciously combined with the consumer expenditure or cost-of-living material available for each country, and if, where need be, certain assumptions are made that the distribution of expenditure would be the same in one country as in a similar one ("similar" referring either to income level, or to climatic and other living conditions), it is possible to work out for Latin America a weighting pattern which reflects the "average" expenditure for each item within the region as a whole.

37/ Comparative National Products and Price Levels, op.cit.

/Finally, it

Finally, it must be noted that the adoption of common regional weights gives results which are logical, easily understood and above all useable for a study of this kind. The purchasing power equivalents and the parity exchange rates are reduced to a minimum number of solutions; and these are applicable in a convertible (or reversable) form for all countries within the group.

(c) The computation of regional averages

The adoption of regional averages - whether these be regional prices, regional quantities or regional values - raises the question of how the averages should be computed. More specifically: "Should they be calculated in such a way that countries like Brazil and Argentina with the greatest population and the greatest economic resources dominate the results by virtue of the weights assigned to them; or should each country be considered as of equal interest and of equal importance in the study?" The answer lies in the objectives of the study. Were it to be a comparison of Latin American prices with those in Europe or the United States, the larger countries should certainly influence the regional total directly in proportion to their population or to their economic resources.[38/] For an intra-regional comparison of prices of purchasing power, the position is somewhat different. As previously stated, the purchasing power of a nation's currency can be expressed as the amount of goods and services (or the amount of satisfaction) which a unit of currency will buy. For one country compared with the next the comparative purchasing power is the amount which a person with a unit of currency can buy in the first country relative to the amount bought by a similar individual with a unit of currency in the second country. Each individual is of equal importance and our concept is a per capita rather than a total one. Accordingly, if "average quantities" are to be obtained for weighting purposes, they must be obtained in a manner consistent with this approach and must be the arithmetic average of the quantities which the representative individual can buy with the income available to him in

38/ As in compiling regional prices for Latin American exports, when the weights for each country are proportional to the volume of their export trade.

/each of

each of the various countries. In a similar manner, the concept of "average values" must relate to the average spent by the representative individual in each of the countries, and will accordingly reflect the level of per capita income (but not of total income) in the countries concerned.

Finally, the concept of an "average regional price" (though it will not be used by ECLA in the earlier stages of this investigation since it assumes the existence of exchange rates adequate for converting prices to common denominator) should, for the purposes of inter-country comparisons, relate to the unweighted average of prices for the same commodity or service in all countries of the region - notwithstanding the contrary viewpoint expressed by other investigators (notably OEEC, The High Authority of the European Coal and Steel Community, Geary, Brady and Hurwitz, etc. who favoured the weighted average).39/

(d) Conclusions

Considering, then, the questions of practicability as well as theoretical desirability, the formula most suitable for comparing price-levels within Latin America, for calculating purchasing power equivalents and for establishing parity rates of exchange is considered to be:

$$Eok = \bar{P}ko = \frac{\sum_i q_{i\bar{o}} \cdot p_{ik}}{\sum_i q_{i\bar{o}} \cdot p_{io}} \quad \text{.....(11)}$$

where o is any country within Latin America;

$\bar{o}$ is the average of all countries in Latin America; and other symbols maintain the significance that they have previously had in this study.

39/ On the other hand James Tobin of the Yale University, when commenting on the method advocated by Mrs. Brady and Hurwitz drew attention to the danger that "a large country may so dominate the calculation.... that the model gives a fixed-weight index with the large country's quantities as weights". (Problems in the International Comparison of Economic Accounts, National Bureau of Economic Research, Studies in Income and Wealth, Volume 20, page 345).

/(a) The

(a) The formula, it will be observed, compares the cost of a regional quantity basket (i $q_{i\bar{o}}$) in any given country K, with that of some other country (o = a,b,c, ...m countries). K or O may be any country within the group and the results are mutually convertible. The parity exchange rates which emerge will therefore give a unique set of relationships between all Latin American currencies - the result which we are aiming for.

(b) The price denoted by p_{ik} and p_{io} is the market quotation for any item "i" in national currency - "i" being a final consumption or investment product for the countries concerned (i = 1,2,3 .....n items).

(c) The quantity weight $q_{i\bar{o}}$ is the per capita consumption (in quantity units) of item "i" averaged for all countries of the region.

$$\text{i.e.} \quad q_{i\bar{o}} = \frac{i}{m} \cdot \sum_{m} \frac{q_{io} \cdot p_{io}}{No. p_{io}} \qquad (O = 1,2,3 \ldots\ldots m \text{ countries}) \qquad \ldots\ldots\ldots\ldots\ldots\ldots (12)$$

where No. is the population of country o, and $q_{io}p_{io}$ is the total expenditure on item "i" in the same country ($\frac{q_{io}p_{io}}{No}$ being according the per capita expenditure on item "i").

(d) The parity exchange rates (Eok and Eko) can be calculated only if i extends over all goods and services. The parity rates then correspond to the purchasing power equivalents $\bar{R}ok$ and $\bar{R}ko$ of the currencies in countries O and K respectively. These in turn equals the reciprocal of the price relation for all items in the two countries concerned.

$$\text{i.e.} \quad Eok = \bar{R}ok = \frac{1}{\bar{P}ok} = \bar{P}ko \qquad \ldots\ldots\ldots\ldots\ldots\ldots (13)$$

$$\text{and} \quad Eko = \bar{R}ko = \frac{1}{\bar{P}ko} = \bar{P}ok \qquad \ldots\ldots\ldots\ldots\ldots\ldots (14)$$

(e) As the basic formula is expressed in aggregative form, the results may be obtained by summating sub-groups, groups and sectors. For each of these, an inter-country price ratio or a purchasing power equivalent can be computed. A parity exchange rate cannot however be computed at the group or sector level since by definition, it applies only to the total expenditure transactions in a country.

/(f) In

(f) In the basic formula, prices are expressed in national currencies since this gives the most direct evaluation of purchasing power equivalents and (in the case of total expenditure) the parity exchange rate. For some purposes, it may be desirable to introduce a prevailing exchange rate so as to convert prices in the various currencies to a common denominator. This does not affect the validity of the results, but merely charges the interpretation. The formula now becomes

$$\bar{P}'ko = \frac{1}{\bar{R}'ko} = \bar{R}'ok = \frac{\sum_i q_{io}(p_{ik} \cdot E'k)}{\sum_i q_{io}(p_{io} \cdot E'o)} \quad \ldots\ldots\ldots\ldots\ldots(15)$$

where E'k and E'o are the conversion factors necessary to put prices of K and O in a common currency;
R'ko is the purchasing power equivalent of K to O when the exchange rates E'k and E'o are applied;
R'ok is the purchasing power equivalent of O to K using the same exchange rates; and
P'ko is the price ratio for countries O and K, again when the exchange rates E'k and E'o are applied.

This variation to the basic formula does not provide a direct evaluation of the parity exchange rate. However, since $\bar{P}'ko$ measures the relative level of prices between the two countries when exchange rates E'k and E'o are employed, it represents the correction factor which must be applied in order to equate the selected and the parity exchange rates.

$$\text{i.e.} \quad Eok = E'ok \times \bar{P}'ko = \frac{E'ok}{\bar{P}'ok} \quad \ldots\ldots\ldots\ldots\ldots\ldots(16)$$

$$\text{and} \quad Eko = E'ko \times \bar{P}'ok = \frac{E'ko}{\bar{P}'ko} \quad \ldots\ldots\ldots\ldots\ldots\ldots(17)$$

/4. The design

4. The design of the project

(a) Preliminary investigations

Because of the magnitude of the study and the large number of difficulties to be surmounted, it was considered essential that a certain amount of experimental work be carried out before finalizing the design of the investigation and the detailed methodology which would be applied, both in the determination of prices and quantity weights as well as in the elaboration of results for purchasing power equivalents and comparative price levels. To a large extent this decision was influenced by the lack of useable statistical material for nearly all aspects of expenditure, and specially in the case of consumer durable equipment and investment goods. With this in mind, a pilot study was made in 1958 for two countries - Brazil and Chile - in order to ascertain the types and models of investment goods which were available in both places and to establish a list of durable goods which could be considered representative of investment patterns in the region - information being gathered regarding technical specifications, conditions of sale and prices ex-factory, ex-port or at the point of distribution. No attempt was made to combine the price material into overall totals nor to establish inter-country relationships since the work was entirely of an exploratory nature designed to ascertain the difficulties which would be encountered when the enquiry was extended to all parts of Latin America.

For consumer goods, studies of retail price levels and the pattern of expenditure in Chile had already provided ECLA with a certain amount of practical knowledge regarding the problems involved and the solutions which might be attempted. During 1959, experimental work was carried one step further in an unpublished study which was designed to afford an indication of the level of real wages in three countries - Panama, Venezuela and Colombia. The retail price material collected by national statistical offices, together with weighting patterns used for the cost-of-living indexes in each of the capital cities provided the main information upon which relative price levels for the year 1958 were based. At the same time, the material was co-ordinated with other data, taken mainly from the ILO Yearbook of Labour Statistics (for food) and

/from the

from the U.N. Statistical Office investigations of retail price levels for international salary determination purposes [40] in order to obtain preliminary estimates of the parity exchange rates applicable to the currencies of a number of Latin American countries.

Profiting by the practical aspects of studies made by other investigators - notably Gilbert and Kravis of the O.E.E.C. [41] - ECLA in 1960 expanded its work into a more ambitious project designed eventually to cover all Latin American republics and afford a link with countries or regions in other parts of the world where similar studies might be carried out. The deficiencies in coverage, specification and comparability of nationally-compiled material left ECLA with no alternative than to make a special collection of price data - selecting items on the basis of national consumption patterns, specifying them in accordance with the quantities or varieties generally consumed and obtaining the price material from the expenditure outlets normally patronized by typical families or by an average of families in each city covered.

(b) Selection of items

The consumer price material available for some Latin American countries - notably Panama, El Salvador, Peru, Ecuador and Chile - provided a certain amount of information regarding the important items in a family budget. Unfortunately, only one family expenditure survey (conducted by Colombia in 1952) was available in very great detail; while in most cases, only a few representative items in main groups were specified. Certain expenditure categories - notably education, hotels and restaurants, and to a large extent consumer durable goods - were omitted entirely from the consumer expenditure surveys and the cost-of-living indexes. In order to obtain an adequate expenditure breakdown within the framework of the available material, items used by the United States Bureau of Labour Statistics for its consumer price index and by the U.N. Statistical Office and the International Labour Office in their comparisons of international price levels were examined in order to ensure that all aspects of consumer expenditure were fully covered.

40/ Statistical Papers, Series M N° 14, Add.1 and Add.2.

41/ Op.cit.

For investment, virtually nothing of a detailed nature was directly available from national statistics, other than information on imports. The work done by Gilbert and Kravis from the O.E.E.C. 42/ did however provide a useful list of machinery and equipment items which served to supplement the investigations ECLA had already carried out in Brazil and Chile. Main difficulty centered around construction seeing as investment in roads, buildings, etc. are influenced to a large extent by wage costs. Two approaches were therefore adopted - the pricing of individual materials used - cement, timber, etc.; and the pricing per square metre, or per unit, of the finished construction e.g. cost per square metre of paved roading. In the case of industrial machinery, problems were also encountered because of the large amount of equipment imported directly by the user to meet a specific need; while a sizeable proportion of machinery entering a country in one year has no counterpart in the same country in other years, or in other countries in the same year.

In general, however, it was found that, despite the different climatic conditions, the differing levels of income and the different stages of economic development in Latin American countries, it was possible to select a list of items which were adequately representative of consumer expenditure and investment throughout Latin America. The number of important consumer goods which existed in some countries but not in all was limited in the main to tropical foodstuffs, to heavy winter clothing, to fuels (notably gas), and to certain forms of transportation. In general, ECLA experience thus suggested that the emphasis placed by theoreticians on the dissimilarity in availabilities of consumption items was out of all proportion to the number of items or the percentage of expenditure involved. Only in the case of industrial machinery was the problem at all a serious one. Even here, it must be noted that, outside of a narrow range of industries, capital requirements for Latin American countries are satisfied by imports rather than by local production, and statistics built up from the import side suggest an alternative approach with comparable results

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42/ An International Comparison of National Products and the Purchasing Power of Currencies, op. cit., pages 189-192.

even for those items which can be classified as only potentially available in a given country (duties, freight costs, handling charges, import mark-ups etc. being in most cases relatively uniform as between different classes of machinery).

Although many items had to be rejected later on the grounds of unsuitability or incomparability between countries, the goods and services selected by ECLA for price collection purposes involved the following number of items:

For consumption,

Food, beverages, tobacco	:	146
Clothing and textiles	:	97
Housing	:	92
Transportation	:	28
Miscellaneous	:	100

and for Investment,

Industrial machinery and equipment	:	33
Agricultural machinery and equipment	:	13
Transport equipment	:	10
Construction (materials and costs)	:	31

giving a total of 463 consumption and 87 investment items (many of the latter being sub-divided so as to cover a range of sizes and designs).

(c) Specifications

The problem of obtaining a specification sufficiently precise for each item of consumer goods to be identified accurately in each country was facilitated by the existence for Panama of a detailed set of such information for all items covered by its consumer price index. This material was supplemented for certain items with specifications elaborated by the International Labour Office for the purpose of comparing prices used for salary determination purposes; and while in many cases the items concerned were of higher quality than those envisaged for the Latin American enquiry, this was taken care of by suitably modifying the specifications in question.

/As prices

As prices are to some extent dependent on the cost of packaging, and are not directly proportionate to size, a selection of alternative sizes available was made so that the variety of the item represented that which was purchased by a "typical" or representative family in each country. Thus, if coal was sold by the quintal or by the ton (with a smaller unit price for larger quantities), the quintal was preferred on the grounds that it represented better the typical purchase. (Similar examples exist in the case of canned or bottled goods, pharmaceutical products, toilet articles and in general all commodities where the method of packaging is influential in determining prices). In other cases, e.g. consumer durable goods, the concept of a "typical" or representative family was adopted as a guide to the quality or the size of the item which was included in the study.

For investment goods, the sizes or models were specified to represent as far as possible those most commonly used in industry, commerce, agriculture, construction, etc. - though in view of the difficulty in obtaining precisely comparable information, a greater latitude was given to the pricing agent, on the assumption that the necessary adjustment could be made later to take account of differing points of technical detail as between countries.

(d) Selection of prices

As already noted, the study has been designed to measure representative prices paid by the consumer or the investor in different countries. The level of prices for consumer goods is then at the point of retail, inclusive of indirect taxes and net of subsidies which normally figure in the prices of the countries concerned, and after deducting all discounts which are made on a more-or-less general basis. (Special discounts granted to selected customers or in accordance with abnormal sale conditions e.g. for very large quantities, are however ignored.) The concept thus relates to "market prices" rather than "factor cost" (which is the summation of the payments made to the various factors of production associated with producing and distributing the product).

In the case of investment goods, the bulk of the transactions are at the wholesale or ex-factory level. The prices paid by the builder for cement, bricks and structural steel, or by a manufacturer for a generating

/plant or

plant or a metal-working press are not normally retail ones. The inter-country comparisons must again relate to prices paid by the typical purchaser; and are in most cases accordingly at the wholesale level. This does not however apply to consumer durable goods, nor to transport equipment since these are most commonly sold retail; the latter prices being accordingly used.

In general, from three of five prices were considered desirable for each item in each city covered so as to avoid distortions due to unrepresentative quotations. It was accordingly planned that whenever possible, these quotations should be obtained in such a way that the income distributed within a city was adequately taken into account. The ECLA study in the case of consumer goods therefore aimed to select more prices from the working class ("obrero") districts, and only about one-third from the shops patronized by the employee ("empleado") class. Higher-income groups were attributed a correspondingly smaller share of price quotations, except for such items as consumer durable goods, furniture, etc. where the bulk of the expenditure originated from the more well-to-do inhabitants.

(e) Seasonal influences

The problem of reasonable price variation is one which can be solved only with an adequate knowledge of prices in all periods of the year. The comparison of a January price for tomatoes or pears in two countries may give a very unrealistic relationship when it is the peak season for one country and the off-season for another. Even for countries in the same hemisphere e.g. Paraguay and Argentina, the adoption of the same month for the comparisons can lead to erroneous price relationships. To overcome this problem, ECLA deemed it essential to collect price data for fruit, vegetables and eggs in various periods for each of the countries; and though this information will not be fully available for use in the calculation included in this study, a certain amount of national material exists which is used in an attempt to overcome this problem.

/(f) The timing

(f) The timing of the enquiry

The sequence of countries for the collection of prices was determined by two factors:

(i) The ease or difficulty with which data in any particular area could be obtained; and

(ii) The desirability of covering at a date corresponding as closely as possible to the weighting period (mid 1960) those countries where prices were subject to frequent change.

Data were accordingly obtained in the following months for the cities indicated:

Montevideo, Uruguay	:	April-May, 1960 43/
Asunción, Paraguay	:	May 1960 43/
Santiago, Chile	:	May 1960 and January 1961
Buenos Aires, Argentina	:	June 1960
Rio de Janeiro, Brazil	:	July 1960 43/
Mexico City, Mexico	:	October 1960
Bogota, Colombia	:	November 1960
Lima, Peru	:	November 1960
Quito, Guayaquil) Ecuador	:	November-December 1960

Data for Panama, which were included on a provisional basis only, referred originally to the year 1958, but were extrapolated to 1960 (price changes meantime being negligible).

Prices for other cities within the countries mentioned have been obtained as far as possible from the records of national statistical offices; and when additional data has been collected directly by ECLA, this should provide a means for adjusting the initial calculations so that the results are representative of the whole country. (In the same manner, it is hoped to make calculations for later years.) Plans for the work in other countries in Latin America have been formulated and it is hoped that most of the data involved can be collected during the middle months of 1961.

43/ Additional information on investment goods - particularly construction materials - was obtained for Brazil (Sao Paulo) in August 1960, and for Montevideo and Asunción in February 1961.

/(g) Classification

(g) Classification of items

Since national income statistics formed the framework for the determination of expenditure weights, the initial classification of items covered by the enquiry followed the main lines of the national accounts data. This applied especially to broad groups like foodstuffs, clothing, transportation, recreation, medical care, etc., within which items had to be located in order to avoid duplication or omission in the weighting structure. Since, however, the calculation of purchasing power equivalents and price relatives are made in aggregative form, a subsequent re-arrangement of items or of groups so as to satisfy alternative needs - e.g. information on processed versus unprocessed commodities; or goods versus services - provides no difficulty. For the first presentation of results, the regrouping made by ECLA was limited to an arrangement of expenditure categories along the following lines:

I. Food, beverages and tobacco;
II. Textiles and clothing;
III. Housing;
IV. Transport and communications;
V. Miscellaneous consumer expenditure;
VI. Investment;
VII. Governmental services.

Unfortunately, within the government sector it was not generally possible to distinguish the goods and services which represented the end-use of the funds concerned, since most accounts were arranged along other lines e.g. "Expenditure on defence" rather than "Foods for troops, clothing, equipment, etc.". A further problem existed with education since governmental and private expenditure were frequently inter-related.44/

44/ While generally speaking, private schools were financed by private individuals, and public (or governmental) schools by the government, some expenditure by private individuals went towards the financing of public schools; and some government expenditure went to subsidize private schools.

/The following

The following points of detail regarding the classification adopted should be noted:

I. Foods, beverages and tobacco

Consumption away from home (in hotels, restaurants, etc.) was excluded from this group since it was considered to form part of recreational expenditure. Fruit and vegetables include dried and canned products as well as fresh. "Sugar" includes the derivatives of sugar, such as candy, caramels, panela, etc.

II. Textiles and clothing exclude household linen and drapery. Other fabrics are included if used principally for the manufacture of clothes. "Clothing" covers ready-made articles as well as the cost of tailoring customer's own material. School uniforms, maids' uniforms, etc. are included. Footwear is included as a separate sub-group.

III. Housing covers the following sub-groups:

(i) Rent (including the imputed rent of owner-occupied houses);
(ii) Heat, light, water and municipal services;
(iii) Furniture, household equipment and utensils (including kitchen utensils, table earthenware and china, glassware, cutlery, household tools and drapery);
(iv) Non-durable household goods (including cleaning materials).

Heat includes coal, coke, firewood, charcoal, fuel oil and those items such as gas, electricity and kerosene which are also used for lighting purposes.

Furniture excludes office furniture. Equipment and appliances cover only items such as radios, refrigerators, stoves, vacuum cleaners, etc. which are normally bought by the tenant as distinct from the owner or builder of a house (hot-water heaters thus being included in construction materials).

IV. Transport and communications refers only to public transportation and the operation of privately-owned vehicles. The purchase of motor-cars, etc. is treated as "Investment".

Communications cover both postal and telegraphic services as well as cables.

/V. Miscellaneous

V. Miscellaneous consumer expenditure cover all items which relate to the person rather than the home. The sub-groups are:

(i) Health
(ii) Education
(iii) Personal care and domestic services
(iv) Recreation and entertainment
(v) Other consumer expenditure

Health services relate to the fees of doctors, dentists, midwives and opticians; also hospitalization; X-ray costs, etc. Drugs, medicines and other pharmaceutical requisites are considered separately.

Education covers fees paid to public and private schools, exclusive of meals and transportation. The cost of commercial courses (such as stenography) is also being taken into account. Administration expenses of public authorities are on the other hand considered within the governmental sector. School books are also excluded since they are included within "Reading and writing materials". (Collection and tabulation of prices and costs has not yet been completed and the sub-group is omitted from the first results.)

Personal care cover hairdressing, shoe and hosiery repairs, laundering and dry-cleaning. Toilet articles are also included in this product class.

Domestic services are based on the wages paid to maids, gardeners, housecleaners, etc., exclusive of the cost of food and lodging which are assumed to be included in the corresponding groups.

Recreation and entertainment consisted of the following product classes:

(i) Cinemas, theatres and sports gatherings;
(ii) Sporting equipment and toys;
(iii) Reading and writing materials;
(iv) Hotels, restaurants and cafes;
(v) Other recreational expenditure (including photography, records, etc.)

/"Miscellaneous expenditure"

"Miscellaneous expenditure" covers all items not classified elsewhere - notably legal fees, bank services, funeral expenses, religious services, donations, insurance payments and other personal business services. It should be noted that most of the items have no price or cost which can be compared internationally, since the expenditure depends not on the magnitude of the service involved but on the capacity or the willingness of the person concerned to pay. (As with education, no price or cost comparisons will be included for this sub-group in the first results.)

VI. Investment is divided into Machinery and equipment, Vehicles and Construction. Changes in stocks are excluded since no transaction involving actual expenditure takes place.

(a) Machinery and equipment is sub-divided along lines comparable to trade and industry statistics: i.e.

(i) Industrial machinery and equipment

(ii) Agricultural machinery and equipment (including tractors for agricultural purposes - whether wheel or track type - irrigation pumps, etc.)

(b) Vehicles are sub-divided into four types:

(i) Motorized road vehicles;

(ii) Other road vehicles;

(iii) Railway rolling stock;

(iv) Ships and planes.

Motorized vehicles cover trucks and buses, station wagons, cars and jeeps - whether used for private, commercial or agricultural purposes. (Railway rolling stock, ships and planes presented difficulties in pricing and have meantime been included by imputation only.)

(c) Construction covers both private and governmental building, whether for residential or non-residential use. (For each of these classes combination of costs for materials and costs of finished construction is made in order to obtain an overall price-relationship.) Other construction (mainly roads, bridges, dams, railways, telephonic and electrical systems, gas and sewage networks etc.) are given as a separate sub-group.

/VII. Government

VII. Government services. As mentioned earlier, a lack of adequate information for expenditure by type of product has prevented an adequate classification of this sector. The ECLA Statistical Section is currently engaged on the collection and tabulation of comparable material and hopes to present results at a later date. The sector (representing some 7.5 per cent of total expenditure) has meantime been omitted.

/5. Problems

5. Problems of price collection

(a) Personal consumption expenditure

In the Food, beverages and tobacco category, most items could be readily identified and quality variations were generally of minor importance. The exceptions to this were meat, fish, fruit, vegetables and wines. In the case of meat the method of dividing the carcass differed considerably as between countries, and it was not possible to identify a particular cut which was common to all. Reliance had therefore to be placed on an arbitrary grading into first, second and third categories, determined with the advice of the trade. For fish, the types available varied considerably, especially between the Atlantic and Pacific Coast and between salt-water and fresh-water regions (e.g. Paraguay and Uruguay). Again, a classification system had to be adopted so as to ensure comparability. Wines were of very different quality throughout Latin America, while in many countries they were replaced by beer or mineral waters for consumption with meals. So far as possible a system of equivalences was accordingly used.

Fresh fruit, vegetables and eggs introduced the problem already referred to of seasonal variation; and although a correction was provided for by collecting prices at all seasons of the year, the solution is one which takes a minimum of twelve months to perfect. Nevertheless, as far as possible spring prices were compared with spring prices and autumn prices with autumn ones. A problem of another nature was the existence of certain items in some countries only, e.g. mangoes, pine-apples, chirimoyas, coconuts and - to some extent - apples, pears, apricots, peaches, etc. which, if available in limited quantities could not be considered representative items of popular consumption. Similar difficulties existed for certain vegetables, such as mandioc on the one hand and potatoes on the other. However, insofar as in some countries, notably Peru, products of both the tropical and temperate zones were available, some means of determining equivalence in consumption values was possible. Only for those products such as "maíz tupí" in Paraguay which

/had no

had no counterpart in the remaining countries did the item have to be omitted from the direct price comparison (but included by imputation with other items of a similar type). A minor inconvenience also existed in that many items were sold by number rather than by weight. This involved the weighing of representative quantities in order to express prices on a comparable basis.

For Textiles and Ready-made Clothing climatic differences introduced a series of incompatibilities. In most cases, however, both summer-weight and winter-weight clothing were readily available somewhere within the country e.g. in Quito or Bogota where heavy-weight cloth is used, despite the proximity to the equator. In any event, the existence of all types of cloth in many countries presented a method of price-equivalences which could be used for substitution purposes in countries where one or other of the items or the qualities was not available. A more serious problem was that of ensuring identity for materials described by the same name in the various countries. The system of thread-count is not commonly used in Latin America and specification along those lines is not generally practicable. In addition, even if thread-count is identical, differences in durability, shrinkage, colour-retention, etc. to a large extent invalidate the comparability which would otherwise exist. In consequence, whenever possible, samples of the material concerned were requested in order to obtain technical advice, while additional information was gathered regarding durability, etc. from consumers familiar with the item concerned in the various countries. Work on this problem is still proceeding and the figures included in this study are approximate only.

Housing presented the principal difficulty experienced in the whole enquiry since satisfactory data for rents were almost impossible to obtain. In some countries, e.g. Chile, the situation presented no major problems since houses could be precisely classified and representative rental figures obtained. In other cases - notably Argentina - the enforcement of controls maintained the rent of many houses at extremely low levels, even though for new building, a rental determined by demand supply factors

/applied. Between

applied. Between the two extremes were other countries such as Uruguay and Peru where rent controls existed, but not to the same degree. A further difficulty existed in Paraguay where the quality and the type of housing available differed very much from that in other countries. The availability of hot water and other facilities had also to be taken into account - particularly since heating of houses was not needed in some areas (e.g. Panama and Guayaquil); running water was not commonly available in certain cities (e.g. Asunción); municipal taxes for garbage collection services, etc. were appreciable in one country (Peru) but negligible in others; and so on. Many items such as pipeline gas were in fact not available in a number of countries - likewise fuel oil for heating or charcoal for cooking purposes. Because of the difficulties involved, a considerable amount of further investigation has to be done before fully comparable data can be obtained - the rental figures so far used reflecting to a considerable extent the subjective judgment of ECLA enumerators familiar with housing in the various countries.

For Household articles, including durable household equipment, no major problems in price collection were encountered, except to the extent that furniture differed considerably in specification from country to country. The method adopted was accordingly to locate in each country a type and quality which was known to exist in another country, equating the resulting price series in order to obtain an approximate measure of comparability throughout the range of countries. For other durable goods e.g. stoves, radios, refrigerators, etc., most were well-known name-brands with a valuation that could be ascertained fairly easily in all areas. Greater difficulty on the other hand arose in the correct identification of the minor household items such as kitchen utensils, cutlery, glassware, table earthenware, etc. since these were largely of national origin, and of quality that differed substantially from place to place. Again, a great reliance had to be made on the subjective judgment of the enumerator or the ECLA investigator, based on comparable models in other countries.

/For Transport

For Transport and Communication the quality of the services provided and the distances involved prevented at first a precise identification of items in the various cities. To a large extent, this was overcome by specifying a typical distance. The existence of a variety of concession fares - e.g. workers' tickets for use prior to 8 a.m.; or twelve-trip weekly tickets - also necessitated a pre-selection of the type of travel typical of the countries concerned. The widespread use of a collective taxi system in some cities, but not in others, presented a further element which had to be taken into account. Communications, on the other hand, appeared to be fairly uniform in character; and even if some telephone services were not available in certain countries (e.g. public call-boxes in Paraguay), the collection of representative price material was not a troublesome problem.

In contrast, Personal Services, Health and Education raised frequent doubts as to the comparability of the price data. A hospital in one country provided, for instance, very different attention from that in another; a school in one place had a different standard of education from another; a maid in one city was more efficient (or less efficient) than her counterpart in some other area; and so on. Price data was accordingly restricted to those items capable of definition in precise terms which were sufficiently uniform between countries. Assumption had still to be made that many professional services (e.g. doctors) satisfied needs in an equivalent manner; and that the quality of, say, dentistry was precisely the same, notwithstanding differences of opinion expressed by residents or non-residents of the various countries. For education and for miscellaneous services, no figures have so far been included in the study, pending the completion of the current work in that direction.

(b) Investment goods

For machinery and equipment, major problems were at first encountered in obtaining price quotations for items such as railway rolling stock, weaving looms, printing presses, etc. which were imported directly by the user on a "personal-order" basis. Nevertheless, a large number of items

/relating to

relating to agriculture, industry and commerce were encountered for which prices could be obtained and technical specifications set out in very fine detail. The approach adopted initially by ECLA was to specify the item and try to locate it in each city. This was not generally practicable and an alternative approach was adopted - the item being indicated in broad terms and sufficient technical data then obtained to permit a price adjustment for quality differences. For some items, price quotations were theoretical, since they were not obtained for items actually in stock, but were calculated by the distributor or representative on the basis of prices in the country of export plus freight and insurance charges, customs duties, bank charges, interest, handling, inland transportation and distributor's or dealers' mark-ups. To the extent that this system permitted a more direct comparison measure between countries (since the same procedure could, with a few exceptions, be applied to the same item in all countries) the results were in many cases superior to those obtained by the means of direct quotations for items currently in stock. Furthermore, since the greater part of investment goods - other than assembled vehicles, construction and a small amount of industrial equipment - are imported into Latin America, the procedure has much to recommend it.

ECLA's work in building up a comparable information of this kind is still only in the initial stages and for the calculations used in this study a mixture of "direct" and "indirect" quotations have been adopted. These should be treated as approximate only. The results may also be affected substantially when a better coverage has been obtained since many classes of machinery have yet to be included in the calculations.

For Transport equipment, the ability to specify with precision the type of truck, car or vehicle simplified the work, even if the items in question were in some cases imported and in other cases constructed or assembled locally. Railway rolling stock, ships and aeroplanes did however present difficulties and have not been included directly in the first calculations. As with other items for which prices have not been obtained, they were however included by imputation.

/Construction materials

Construction materials in general provided no obstacle, though quality differences emerged in the case of timber, bricks, and even cement. Labour costs provided an obstacle as these involved a different level of efficiency and therefore productivity in each country. On the other hand, information was obtained for the finished-construction cost of factories, apartments, roads and sidewalks - thus providing an indirect measure of the labour factor as well as of the materials employed.

(d) Governmental expenditure

While governmental purchases of investment items was to a large extent covered by the data referred to above (as in the cost of buildings, roads and sidewalks), this was not the case for goods and services destined for consumers' use.

The main consumption expenditure items are defence, health, education, justice, protection of property, maintenance of parks or reserves and general administration. The wage element is very important and presents particular difficulties unless some unit of measurement be introduced. From one approach, this could be in terms of productivity per man-hour; but obvious difficulties emerge if such a concept is applied to public administration. Adopting another approach, the cost per inhabitant (or cost per recipient of a benefit) could be considered. However, while this might hold true in a limited number of cases e.g. justice and education, it has definite weakness when applied to the majority of government expense items. The assumption for instance that the administrative, health or pension services are qualitatively equal in all countries is fundamentally untrue and the method is considered suitable only for the two cases mentioned.

The solution for the remainder seems to be, then, to sub-divide the governmental expenditure as finely as possible into groups and items similar to the consumer expenditure breakdown, and endeavour to obtain some measure of quantification for the "services" element (including salaries) which remain. ECLA's work in this field has recently been started and results are not yet available for inclusion in this study.