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THE INCREASED INVESTMENT REQUIREMENTS PROVOKED BY THE RISE  
IN THE PRICE OF PETROLEUM

The first part of the paper discusses the importance of the study of the history of the United States. It is argued that a knowledge of the past is essential for a full understanding of the present. The author then goes on to discuss the various factors which have shaped the development of the United States, including the influence of the British, the Spanish, and the French. He also discusses the role of the American people in the creation of the new nation. The paper concludes by stating that the study of the history of the United States is a task of great importance, and that it is one which should be undertaken by all who are interested in the future of the country.

### Introduction

The sharp increase in the price of petroleum has quite definitely altered the growth prospects of most countries of the region. Only Bolivia, Colombia, Ecuador, Trinidad and Tobago and Venezuela are entirely self-sufficient in this field, while all the other Latin American countries have to augment their own supply in greater or lesser degree by means of imports.

What is important is not only the effect of increased expenditure on fuels on the balance of payments, but also the indirect effect that the new petroleum prices may have on the economies of Latin American countries. In addition to the internal problems caused, there are the restrictive effects deriving from the world economic situation as a whole. The following aspects are particularly significant:

- (i) Increased cost of maritime freight and transport in general;
- (ii) Increased cost of petrochemical products (especially fertilizers) that are basically dependent on petroleum;
- (iii) Increase in the prices of imported manufactured goods;
- (iv) Acceleration of world inflation;
- (v) Reduction in the rate of expansion of industrialized countries, with consequent decline in demand for the exports of developing countries;
- (vi) Possible reduction in flows of capital towards the developing countries.

All these factors will affect Latin American countries in various ways. The capacity of each to weather the crisis depends fundamentally on their reliance on petroleum imports, their capacity for import substitution, their export prospects, the level of their foreign currency reserves, and the magnitude and structure of their external financing, all of which in turn are major factors in the flexibility of their economy.

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It is in any case obvious that all the countries will see a change in the volume and structure of their capital formation, on the one hand because the criteria for allocating resources will be modified, and on the other because they will need more capital to finance a given volume of investment.

It is therefore highly relevant to measure the effect that the persistence of the increase in petroleum prices will have on capital formation. Changes in the composition of physical investment will of course first appear in the energy sector, since it can be assumed that other sources of energy not involving petroleum will make headway. It is accordingly probable that energy projects will be revised and that more attention than in the past will be given to such factors as foreign currency saving and social costs and benefits.<sup>1/</sup> While it is quite possible to foresee these changes, however, it is very difficult to calculate their exact magnitude. The following analysis therefore assumes that the structure of investment and the sources of energy remain constant.

In order to establish the volume of additional resources required to finance a given level of investment, a number of projections have been made on the basis of very simple hypotheses which are described below. Broadly speaking, it is assumed that the past rate of growth of the gross domestic product will be maintained, and the investment requirements have been calculated on the basis of this assumption. According to the criterion adopted in this study, this investment would be directly affected in two ways: in the first place, by the rise in the prices of capital goods following the increase in their actual cost and in transport costs in the case of imported goods, and by repercussions on the level of domestic prices in the case of national goods; secondly, by the reduction in the capacity to import resulting from the higher cost of purchasing more expensive fuel. This study therefore attempts to calculate the additional requirements of capital to which these two factors give rise.

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<sup>1/</sup> It is possible that, even without considering such factors, the high current price of liquid hydrocarbons will suffice to render alternatives more competitive.

/It therefore



It therefore establishes in turn, in the manner indicated below, the growth rate of the gross domestic product, total gross investment, total petroleum requirements, petroleum imports, and requirements as regards imported capital goods. It then introduces the new price of hydrocarbons and the hypotheses regarding its effect on the general level of prices and the value of imports of capital goods. By comparing the new set of figures with the initial situation, it is then possible to calculate the desired amounts

1. Growth trends and petroleum and investment requirements

The projections, which as already mentioned are intended to give a quantitative idea of the magnitude of the repercussions of the higher petroleum prices on capital formation, were carried out for Latin American countries which are net importers of petroleum and cover the period 1974 to 1980. Because the available information for them was not complete, the Caribbean countries have not been included.

Broadly speaking, the growth rates assumed for the product reflect the trend during the period 1967-1968 (see table 1). However, for purposes of comparison another projection was carried out taking as the minimum target (applied to the countries with low growth rates); an annual growth rate of 2.5 per cent for the gross per capita product; although the difference may be substantial at the national level, there is no appreciable variation in the figures for the group of countries as a whole (see table 2).

The product for 1973 was calculated on the basis of the latest available information, and then projected up to 1980 (presuming that growth will be constant up to that year).

Table 1

ANNUAL GROWTH RATE OF THE GROSS DOMESTIC PRODUCT AT MARKET PRICES

(Percentages)

	1968	1969	1970	1971	1972	1973	1968-1973 a/
Argentina	4.61	8.44	4.42	3.69	3.80	4.76	4.95
Brazil	9.31	9.00	9.50	11.28	10.38	11.40	10.14
Costa Rica	9.10	6.65	6.60	3.99	5.00	3.91	5.87
Chile	2.90	3.33	3.71	8.32	2.10	4.10	2.71
El Salvador	3.23	3.48	2.97	4.61	4.08	3.99	3.72
Guatemala	8.77	4.72	5.71	5.58	6.46	9.85	6.84
Haiti	3.92	3.28	4.69	5.74	3.68	5.78	4.52
Honduras	5.60	2.27	3.80	5.70	3.94	3.30	4.10
Mexico	8.13	6.32	6.92	3.40	7.53	7.50	6.63
Nicaragua	1.06	6.88	3.28	5.78	3.93	2.75	3.94
Panama	7.27	7.79	6.02	8.10	6.52	5.86	6.92
Paraguay	4.09	4.31	6.30	4.56	5.30	5.79	5.05
Peru	0.61	2.34	7.64	5.87	5.80	5.29	4.59
Dominican Republic	0.52	12.17	10.23	9.89	12.54	8.89	9.04
Uruguay	1.59	6.43	4.35	-0.98	-1.34	0.99	1.84
<u>Total</u>	<u>6.67</u>	<u>7.21</u>	<u>6.89</u>	<u>6.41</u>	<u>7.08</u>	<u>7.35</u>	<u>6.94</u>

Source: ECLA, on the basis of official statistics.

a/ Arithmetic mean.

Table 2

PROJECTION OF GROSS DOMESTIC PRODUCT AT MARKET PRICES

(Millions of dollars at 1970 prices)

	Hypothesis A: Past growth rate (1968-1973)		Hypothesis B: Minimum per capita rate of 2.5 % per year		Annual growth rates for 1974-1980 (percentages)	
	1974	1980	1974	1980	Hypoth- esis A	Hypoth- esis B
Argentina	42 127.2	56 454.4	42 127.2	56 454.2	5.0	5.0
Brazil	76 940.2	136 303.0	76 940.2	136 303.0	10.0	10.0
Central America and Panama a/	10 617.5	14 901.8	10 672.3	15 437.1	5.8	6.3 a/
Chile	9 396.2	11 889.0	9 441.4	12 295.5	4.0	4.5
Haiti and Dominican Republic b/	3 040.3	4 417.0	3 047.3	4 482.8	6.4	6.6 b/
Mexico	60 247.7	90 413.8	60 247.7	90 413.8	7.0	7.0
Paraguay	1 158.0	1 551.9	1 174.6	1 713.9	5.0	6.5
Peru	8 978.2	12 379.1	9 020.7	12 796.0	5.5	6.0
Uruguay	2 935.7	3 306.1	2 993.2	3 787.4	2.0	4.0
<u>Total</u>	<u>215 441.0</u>	<u>331 616.1</u>	<u>215 664.6</u>	<u>333 683.2</u>	<u>7.5</u>	<u>7.6</u>

Source: ECLA, on the basis of official statistics.

a/ The minimum per capita rate of 2.5 % applies only to El Salvador, Honduras and Nicaragua.

b/ The minimum rate applies only to Haiti.

/The investment

The investment requirements were based on estimates of the capital product marginal ratios for each country, calculated on the basis of the past trend of accumulated gross fixed investment and gross domestic product during the period 1950-1968.<sup>2/</sup> Since these estimates are influenced by a series of factors that determine the relationship between capital formation and production (degree of utilization of capacity, for example), and since in several countries there has been a marked change in trends since 1968 (Brazil, for example, has enjoyed a boom in recent years), the investment ratios obtained were compared with the average values for recent years and the result adjusted when the differences were significant.<sup>3/</sup>

In other words, the projections were reconciled with existing data, save when past trends were very different from those that should apparently prevail in view of much faster rates of growth (see table 3).

The forecasts of the consumption of hydrocarbons are based on the projections of the global product and on the relationship between the growth of consumption of petroleum and petroleum products and the growth of the gross domestic product during the 1960s. Rates were thus established that are consistent with those given for the product (see table 4).

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<sup>2/</sup> See ECLA, "Latin America: Macroeconomic projections for the 1970s", (E/CN.12/865 Rev.1).

<sup>3/</sup> In fact, the capital product marginal ratios were only used for checking because they were available and because of the good statistical "fit" of the functions utilized.



Table 3

TOTAL GROSS INVESTMENT COEFFICIENTS WITH RESPECT TO GROSS DOMESTIC PRODUCT

(Percentages, on the basis of values at 1970 prices)

	1968	1969	1970	1971	1972	1973	1968-1972	1974-1980	
								A	B a/
Argentina	16.9	18.1	18.7	19.7	20.0	18.7	18.7	18.7	18.7
Brazil	16.5	16.3	16.5	17.5	18.7	20.2	17.3	20.0	20.0
Central America and Panama	17.4	16.9	18.8	18.9	17.4	17.8	17.9	17.9	19.7 b/
Chile	15.2	16.3	17.1	11.9	11.7	10.7	14.3	14.3	16.1
Haiti and Dominican Republic	11.4	13.2	15.2	15.9	16.2	17.0	14.6	15.3	15.4 c/
Mexico	20.1	20.9	20.9	20.3	21.0	21.7	20.6	20.7	20.7
Paraguay	15.4	15.6	14.8	14.8	16.2	17.2	15.4	15.3	19.9
Peru	12.9	13.0	12.2	12.8	11.7	12.3	12.4	14.7	16.0
Uruguay	7.2	8.6	9.2	10.0	8.9	8.6	8.8	9.6	19.2
<u>Total</u>	<u>17.2</u>	<u>17.7</u>	<u>18.0</u>	<u>18.2</u>	<u>18.7</u>	<u>19.2</u>	<u>18.0</u>	<u>19.1</u>	<u>19.5</u>

Source: ECLA, on the basis of official statistics.

a/ Hypothesis A: Past growth rate of the product (1968-1973).

Hypothesis B: Minimum per capita growth rate of the product of 2.5 %.

b/ The minimum rate applies only to El Salvador, Honduras and Nicaragua.

c/ The minimum rate applies only to Haiti.



Table 4

GROWTH RATES OF THE GROSS DOMESTIC PRODUCT AND REQUIREMENTS OF PETROLEUM  
AND PETROLEUM PRODUCTS, 1974-1980

	Past trend		Hypothesis: 2.5 % per capita	
	Gross domestic product	Requirements of petroleum and petroleum products	Gross domestic product	Requirements of petroleum and petroleum products
Argentina	5.0	7.0	5.0	7.0
Brazil	10.0	13.0	10.0	13.0
Central America and Panama	5.8	9.0	6.3 <sup>a/</sup>	10.0
Chile	4.0	6.5	4.5	7.0
Haiti and Dominican Republic	6.4	8.0	6.6 <sup>b/</sup>	8.4
Mexico	7.0	10.0	7.0	10.0
Paraguay	5.0	7.0	6.5	9.0
Peru	5.5	8.0	6.0	8.5
Uruguay	2.0	4.0	4.0	8.0

Source: ECLA, on the basis of official statistics.

<sup>a/</sup> Only El Salvador, Honduras and Nicaragua. The past per capita growth rates of the other countries are over 2.5 %.

<sup>b/</sup> Only Haiti. The past per capita growth rate of the Dominican Republic is more than 2.5 %.

/Although the

Although the usual procedure is to estimate the global consumption of energy resources and then establish its distribution among the various types of energy, it was decided that because petroleum is the main energy source in Latin America it would be simpler to deal directly with the demand for hydrocarbons (see table 5). It must not be forgotten, however, that the projections implicitly reflect the substitution of petroleum products by other sources of energy <sup>4/</sup> that took place during the reference period. Although it is possible that some substitution may occur as a result of the rise in the price of petroleum, no such assumption has been made in the projections and the substitution they reflect derives from the procedure used. In any case, the estimates aimed at quantifying the magnitude of the effect of the higher petroleum prices are more likely in reality to underestimate that effect even bearing in mind that it is unlikely that any major change in the structure of consumption of commercial energy will take place in the short term.

In determining imports of petroleum and petroleum products, the composition of the supply in 1970 was used as a basis. In the absence of any hydrocarbon production forecasts, it was assumed that this composition would continue unchanged up to 1980 (see table 6).

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<sup>4/</sup> The share of petroleum products in the consumption of commercial energy in Latin America dropped from 68 per cent to 64 per cent between 1961 and 1970.

Table 5

APPARENT CONSUMPTION OF PETROLEUM a/  
(Millions of dollars)

	Hypothesis A <u>b/</u>		Hypothesis B <u>c/</u>		Hypothesis C <u>d/</u>	
	1974	1980	1974	1980	1974	1980
Argentina	596.5	895.0	1 897.8	2 847.6	2 711.2	4 068.0
Brazil	864.5	1 800.1	2 750.7	5 527.7	3 929.6	8 182.4
Central America and Panama	153.1	256.6	487.2	816.5	696.0	1 166.4
Chile	119.9	175.1	381.4	557.2	544.8	796.0
Haiti and Dominican Republic	26.4	41.7	84.0	132.7	120.0	189.6
Mexico	774.0	1 371.6	2 462.9	4 364.1	3 518.4	6 234.4
Paraguay	6.2	9.3	19.6	29.7	28.0	42.4
Peru	122.8	195.0	390.9	620.5	558.4	886.4
Uruguay	42.6	53.9	135.5	171.4	193.6	244.8
<u>Total</u>	<u>2 706.0</u>	<u>4 798.3</u>	<u>8 610.0</u>	<u>15 267.4</u>	<u>12 300.0</u>	<u>21 810.4</u>

Source: ECLA, on the basis of official statistics.

a/ On the basis of the projection of the gross domestic product according to the 1968-1973 trend.

b/ Price per barrel of petroleum: 2.20 dollars FOB Persian Gulf for Saudi Arabian 34 API light crude.

c/ Price per barrel of petroleum: 7.00 dollars FOB Persian Gulf for Saudi Arabian 34 API light crude.

d/ Price per barrel of petroleum: 10.00 dollars FOB Persian Gulf for Saudi Arabian 34 API light crude.

Table 6

## SUPPLY OF IMPORTED PETROLEUM

(Million of dollars)

	Percent- age total consump- tion	Hypothesis A b/		Hypothesis B c/		Hypothesis C d/		Hypothesis B - Hypothesis A		Hypothesis C - Hypothesis A	
		1974	1980	1974	1980	1974	1980	1974	1980	1974	1980
Argentina	12.5	74.6	111.9	237.2	355.9	338.9	508.5	162.6	224.0	264.3	396.6
Brazil	68.0	587.8	1 224.1	1 870.5	3 894.8	2 672.1	5 564.0	1 282.7	2 670.7	2 084.3	4 339.9
Central America and Panama	100.0	153.1	256.6	487.2	816.5	696.0	1 166.4	334.1	559.9	542.9	909.8
Chile	63.0	75.5	110.3	240.3	351.0	343.2	501.5	164.8	240.7	267.7	391.2
Haiti and Dominican Republic	100.0	26.4	41.7	84.0	132.7	120.0	189.6	57.6	91.0	93.6	147.9
Mexico	10.0	77.4	137.2	246.3	436.4	351.8	623.4	168.9	299.2	274.4	486.2
Paraguay	100.0	6.2	9.3	19.6	29.7	28.0	42.4	13.4	20.4	21.8	33.1
Peru	20.0	24.6	39.0	78.2	124.1	111.7	177.3	53.6	85.1	87.1	138.3
Uruguay	100.0	42.6	53.9	135.5	171.4	193.6	244.8	92.9	117.5	151.0	190.9
<u>Total</u>	-	<u>1 068.2</u>	<u>1 984.0</u>	<u>3 398.8</u>	<u>6 312.5</u>	<u>4 855.3</u>	<u>9 017.9</u>	<u>2 330.6</u>	<u>4 328.5</u>	<u>3 787.1</u>	<u>7 033.9</u>

Source: ECLA, on the basis of official statistics.

a/ On the basis of the projection of the gross domestic product according to the 1968-1973 trend.

b/ Price per barrel of petroleum: 2.20 dollars FOB Persian Gulf for Saudi Arabian 34 API light crude.

c/ Price per barrel of petroleum: 7.00 dollars FOB Persian Gulf for Saudi Arabian 34 API light crude.

d/ Price per barrel of petroleum: 10.00 dollars FOB Persian Gulf for Saudi Arabian 34 API light crude.

/Finally, the

Finally, the imports of capital goods were calculated in the light of two factors: the behaviour of the imported component of investment between 1960 and 1970 (and in some cases up to 1972), and preliminary projections of production and demand for manufactured products up to 1985.<sup>5/</sup> As a rule, except when the ratios differed substantially from previous figures, the latter were used, the production and demand for machinery and transport equipment (divisions 36, 37 and 38 of the ISIC) being taken as representative of investment.

Using these elements, it was possible to calculate the percentage share of imported capital goods in total investment (see table 7) and accordingly to determine the volume of imports of machinery and equipment.

An important aspect of the estimates made is the procedure used for giving a value to the macroeconomic aggregates employed. Although preliminary data are available for 1973, the comparable figures in dollars are expressed at 1960 prices. Since the changes in relative prices modify the structural ratios significantly, the closest possible base year to 1973 was chosen. Because of the lack of information at current prices, the figures could only be expressed at 1970 prices, and the projections are therefore given in dollars at 1970 prices.

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<sup>5/</sup> Latin American Institute for Economic and Social Planning (ILPES), América Latina: Proyecciones de la demanda interna, valor bruto de producción e importaciones del sector manufacturero 1975-1985, (mimeographed document for internal use).



Table 7

PROJECTION OF TOTAL GROSS INVESTMENT AND IMPORTS OF  
CAPITAL GOODS, 1974 AND 1980 a/

(Millions of dollars at 1970 prices)

	Total gross investment		Imports of capital goods		Share of imports of capital goods in investment (percentages)	
	1974	1980	1974	1980	1974	1980
Argentina	7 878	10 557	1 024	1 372	13.0	13.0
Brazil	15 388	27 261	1 503	2 181	9.8	8.0
Central America and Panama	1 900	2 686	884	1 237	46.5	46.0
Chile	1 344	1 700	392	454	29.2	26.7
Haiti and Dominican Republic	461	684	188	277	40.8	40.5
Mexico	12 471	18 716	1 746	2 620	14.0	14.0
Paraguay	177	237	73	97	41.1	40.8
Peru	1 320	1 820	356	491	27.0	27.0
Uruguay	282	317	51	58	18.0	18.2
<u>Total</u>	<u>41 221</u>	<u>63 978</u>	<u>6 217</u>	<u>8 787</u>	<u>15.1</u>	<u>13.7</u>

Source: ECLA, on the basis of official statistics.

a/ On the basis of the projection of the gross domestic product according to the 1968-1973 trend.

/Special mention

Special mention should be made of investment ratios, which are affected considerably. There were changes in the ratios as compared with the 1960 figures in most countries, but the reductions in the investment ratio in Argentina, Uruguay, Peru and Haiti were particularly striking. Thus, taking the figures for 1970, the ratios calculated at 1970 prices were 18.7 per cent, 9.2 per cent, 12.2 per cent and 5.6 per cent, respectively, while at 1960 prices the corresponding values would be 21.9 per cent, 15.1 per cent, 16.6 per cent and 7.6 per cent. The level of these ratios at 1970 prices is substantially lower than those usually taken for purposes of calculation, and so the values shown in the attached tables do not correspond to those utilized in other ECLA studies, although they are consistent with them.

## 2. Petroleum prices and their impact on investment

### (a) General aspects

The increase in the prices of crude oil and petroleum products obviously affects different Latin American countries in different ways. For the net exporters of petroleum, the sharp increases in their earnings from these exports are likely to significantly increase their foreign exchange reserves, fiscal revenue and import capacity. The problem which they have to face is how to make the most efficient use of these increased resources, since with their appreciably greater investment possibilities they could intensify the growth rate of the product. It is thus a matter of the adequate planning of this additional potential. Even if adverse factors were to appear (a possible world recession, increase in the prices of their imports, reduction in the prices of other primary products, etc.), it is feasible to suppose that they would be amply offset by increased earnings from petroleum, which is the most important energy resource in the contemporary world.

For the countries which are net importers of petroleum, the situation is completely different. They have to face pressure not only on their balance of payments but also on their production costs

/and ultimately

and ultimately on their growth capacity. For them, the higher prices of petroleum imply a significant loss in the real resources available to each country, and in the long run this will affect investment levels.

Expansion potential really depends to a large extent on the capacity for capital formation, since although there are great differences - open to various interpretations - between countries as regards the productivity of capital, the degree of use made of the installed capacity and the structure of investments, it could be maintained that a sustained rate of growth of the product must be based on a corresponding increase in investment.

It is not only the actual conditions of an economy which influence the process of capital formation, but also the capacity for mobilizing the financial resources needed to make use of the country's real potential. Even where real bases exist for increasing capital formation, it may happen that the lack of financial resources prevents this.

Any attempt at quantifying the impact of a given factor on investment thus calls for consideration of both the real and the financial profiles. However, the complexity of the capital formation process and the chain reactions which occur make it very difficult to isolate the effects of a specific factor. The problem must therefore be restricted to certain very specific aspects.

The present document, which endeavours to show the effects of the increase in petroleum prices, concentrates on import capacity and on the increased cost of investment. The results are presented in terms of the amount of additional resources required to achieve specific growth rates.

The first of these aspects is connected with the real investment potential, for since the availability of capital goods depends basically on imports, owing to the scanty importance of the sector producing these goods in the Latin American economies, the supply of capital goods is linked with the development of the import capacity.

/Thus, if

Thus if, the capacity for external payments is limited, investment possibilities are restricted also. An endeavour has therefore been made to evaluate the additional cost of petroleum imports - which involves a reduction of the funds available for other imports - in order to demonstrate how much the resources for imports must be increased because of the higher prices of hydrocarbons. Although it is obvious that a drop in the supply of imported capital goods could be avoided by changing the structure of imports to the detriment of consumer goods and imported inputs, it should not be forgotten that any modification of this type would be reflected in an additional internal effort (except in the case of non-essential imports).

The second aspect is connected with the financing of capital formation. Once the growth rate of the product and the physical investment requirements have been established, the financial means for materializing them will be affected if there are any changes in the relative prices. When the prices of capital goods rise above the general level of prices, a given volume of investment goods will represent a larger outflow of financial resources. An attempt has been made to estimate the magnitude of this additional volume of resources on the basis of various hypotheses detailed below.

It is important to note, in connexion with both aspects, that the aim of this document is only to determine the direct effect of the price increase in question on the variables mentioned. Consequently, no reference is made to possible different extents of coverage.

(b) Quantification of the impact

An explanation has already been given of the procedure followed for fixing the quantity of imported petroleum likely to be required by each Latin American country which is a net importer of petroleum. In order to place a value on these imports, an estimated average price of 2.20 dollars per barrel FOB was used for 1973, while FOB prices of 7 dollars (minimum) and 10 dollars (maximum) per barrel were assumed

/for 1974



for 1974.<sup>6/</sup> The difference makes it possible to quantify the repercussions of the increase in international fuel prices (see table 6).

At another level of the problem, the additional cost of investment requirements was determined on the basis of the following hypotheses:

- (i) Increases of a minimum of 119 per cent and a maximum of 130 per cent in the final market price of a barrel of crude. These increases, which are compatible with the FOB prices indicated above (2.20, 7 and 10 dollars per barrel), are taken from final market prices of 6.42 and 8.55 dollars in 1973 and 14.75 and 18.70 dollars in 1974.<sup>7/</sup>
- (ii) Upward pressure on the general level of prices, attributable to the increase in the price of imported crude oil. The estimate was made at the national level on the basis of the contribution of the energy sector to the gross domestic product and the share of imports in supplies of refined petroleum in each country (see table 8).<sup>8/</sup>
- (iii) An increase of 5 per cent in the prices of imported capital goods as a result of the increase in the prices of these goods in the industrialized countries and the rise in transport tariffs.

In order to estimate the impact of the increase in petroleum prices on the prices of investment goods, the gross capital formation was expressed in terms of the gross domestic product, imports, consumption and exports, and the price indicated in the previous hypotheses was applied to each component. For this purpose, imports were broken down into petroleum, capital goods and others, the price index of consumer goods being assumed to be similar to the average.<sup>9/</sup>

<sup>6/</sup> See ECLA, Latin America and the current energy problem.

<sup>7/</sup> Ibid.

<sup>8/</sup> Ibid.

<sup>9/</sup> This price index of consumer goods was applied to the residual term, which includes consumption and the balance between exports and the rest of imports, the determining factor being of course, consumption.



Table 8

UPWARD PRESSURE ON THE GENERAL LEVEL OF PRICES AND INCREASE IN IMPLICIT INVESTMENT  
PRICES RESULTING FROM INCREASES OF 119 % (MINIMUM) AND 130 % (MAXIMUM)  
IN PETROLEUM PRICES  
(Percentages)

	Upward pressure on general level of prices <u>a/</u>		Implicit increase in investment prices <u>b/</u>			
	1974		1974		1980	
	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum
Argentina	1.0	1.0	3.02	3.16	3.20	3.36
Brazil	9.4	10.5	12.95	14.31	13.40	14.81
Central America and Panama	6.0	7.0	14.64	15.98	16.34	17.83
Chile	6.0	6.0	11.07	11.60	11.93	12.59
Haiti and Dominican Republic	6.0	7.0	12.06	13.23	12.49	13.69
Mexico	1.0	1.0	2.27	2.34	2.40	2.48
Paraguay	6.0	7.0	12.35	13.54	13.21	14.47
Peru	2.2	2.2	6.00	6.29	6.45	6.78
Uruguay	6.0	7.0	21.30	23.49	23.19	25.55
<u>Total</u>	<u>4.6</u>	<u>5.1</u>	<u>7.50</u>	<u>8.18</u>	<u>8.34</u>	<u>9.17</u>
	<u>5.0 c/</u>	<u>5.6 c/</u>				

Source: ECLA, on the basis of official data.

a/ Based on the share of the value added in the energy sector in the total gross domestic product and on the percentage of imported supplies of hydrocarbons.

b/ Also includes the hypothesis of an increase of 5 % in imported capital goods.

c/ For 1980, owing to changes in the structure of the gross domestic product by countries.

/The implicit

The implicit price index for gross domestic investment was then calculated (i.e., the index that gives the same result after the prices of each component have been applied).

The resulting prices were applied to projections for 1974 and 1980 in order to gain an idea of the magnitude of the additional resources required to maintain the rate of development in the light of the price increase expected for 1974. To include larger rises for 1980 would accentuate the effect of this increase. It should be noted that the hypotheses formulated are exclusively concerned with the increase in petroleum prices and no attempt is made to anticipate or include the performance of prices in general.

(c) The results

Although an attempt is made to give an overall panorama, obviously the higher petroleum prices will not affect all the countries to the same degree nor in the same form, for among the Latin American countries which are net importers of petroleum there are several which can absorb these prices with greater ease. This is the case in Argentina, Mexico and Peru, which satisfy a large share of their petroleum requirements with their own output, and in Brazil, on account of its dynamic exports and its international reserves position. The remaining countries, however, are facing a very serious situation.

According to the estimates made on the basis of the hypotheses described, the Latin American countries which are net importers of petroleum will require at least about 3,000 million dollars to finance the additional cost of their imports of hydrocarbons in 1974. Since this figure is equivalent to 16 per cent of the value of imports in 1973 (see table 9) and thus, more or less reflects the same proportion of import capacity, foreign exchange reserves would have to increase by this amount during 1974 simply to satisfy petroleum requirements.

Table 9

EFFECT OF THE INCREASE IN PETROLEUM PRICES ON TOTAL IMPORTS

(Millions of dollars and percentages)

	Total imports (CIF) 1973	Estimated imports of petroleum for 1974 a/			Additional cost of petroleum imports owing to increased prices			
		2.86	9.10	13.00	Cost		Proportion of 1973 imports	
		dollars	dollars	dollars				
		CIF per barrel	CIF per barrel	per barrel				
		of petroleum (A)	of petroleum (B)	of petroleum (C)	(B)-(A)	(C)-(A)	(B)-(A)	(C)-(A)
Argentina	2 090.0	97.0	308.4	440.6	211.4	343.6	10.0	16.4
Brazil	6 760.0	764.1	2 431.6	3 473.7	1 667.5	2 709.6	24.7	40.1
Central America and Panama	2 335.3	199.0	633.4	904.8	434.4	705.8	18.6	30.2
Chile	1 651.8	98.2	312.4	446.2	214.2	348.0	13.0	21.1
Haiti and Dominican Republic	558.8	34.3	109.2	156.0	74.9	121.7	13.4	21.8
Mexico	4 143.0	100.6	320.2	457.3	219.6	356.7	5.3	8.6
Paraguay	121.9	8.1	25.5	36.4	17.4	28.3	14.3	23.2
Peru	980.8	32.0	101.7	145.2	69.7	113.2	7.1	11.5
Uruguay	295.0	55.4	176.2	251.7	120.8	196.3	40.9	66.5
<u>Total</u>	<u>18 536.6</u>	<u>1 388.7</u>	<u>4 418.6</u>	<u>6 311.9</u>	<u>3 029.9</u>	<u>4 923.2</u>	<u>16.0</u>	<u>26.0</u>

Source: ECLA, on the basis of official data.

a/ The CIF prices correspond to FOB prices of 2.20, 7.00 and 10.00 dollars.

/The size

The size of this figure is particularly striking if it is compared with the estimated requirements of imports of capital goods for 1974, since it accounts for around 40 per cent of the value of such imports (at 1973 prices), and if the maximum hypothesis is taken, the additional expenditure on imports of petroleum would amount to practically 5,000 million dollars (26 per cent of total imports in 1973 and 65 per cent of estimated requirements for imports of capital goods in 1974).

If these amounts cannot be covered by higher export earnings from increases in volume or prices, by larger capital transfers, or by making use of reserves, a deterioration in the growth rates will necessarily take place. If imports are restricted as a result of smaller import capacity, there will be a slackening off, either separately or jointly, of investment consumption and domestic production (due to the reduced availability of imported goods). It is possible, however, that expenditure under this heading will decrease as a result of smaller growth of demand, thus diminishing the impact of situation.

As already noted, this general position is the result of markedly different situations at the country level. Thus, in Argentina, Mexico and Peru, where local production covers a substantial share of petroleum consumption, the additional cost of fuel imports, as a percentage of the total imports in 1973, will be between 10 and 16 per cent in Argentina, 5 and 9 per cent in Mexico and 7 and 12 per cent in Peru (see table 9), according to whether the maximum or minimum hypothesis for the price of petroleum in 1974 is considered. In Uruguay, however, which is one of the countries most affected by the petroleum crisis, the corresponding percentages are over 40 and 67 per cent. Brazil also shows substantial adverse effects (25 and 40 per cent of 1973 imports), but its absorption capacity, as already stated, is much greater. The rest of the countries are in a more or less serious plight on account of this situation, aggravated by their heavy dependence on imported petroleum.

/The trend



The trend of the total amount of additional resources needed to finance petroleum imports may be observed by comparing the results for 1974 and 1980 (see table 6). Between these two dates, the additional foreign exchange requirements nearly double, and for 1980 they amount to more than 4,300 million dollars,<sup>10/</sup> even taking the minimum price of 7 dollars per barrel. This means that the additional requirements would be increasing at an annual rate of nearly 11 per cent between the years in question. If the magnitude of these complementary resources is compared with imports, it will be seen that the import capacity - again supposing that this is approximately equal to the value of imports - would have to increase at the rate of 1.5 per cent per year over and above the 1974 level merely to be able to cover them (and the latter level would already have to be 16 per cent higher than in 1973).

If the maximum hypothesis (10 dollars per barrel) is adopted, the situation is even worse, for in this case the additional foreign exchange requirements for 1980 would exceed 7,000 million dollars. Although this figure assumes the same annual growth rate as the previous case (11 per cent), it requires an annual increase in import capacity of over 2 per cent as from 1974 (when a level 26 per cent higher than in 1973 would be required). It should be pointed out that this increase is based on the assumption that prices remain constant at the 1974 level: any additional increase would produce even greater problems.

The other aspect of the problem which it is desired to illustrate also reveals a bleak picture. According to the hypotheses for 1974 described earlier, the prices of investment goods would increase as a result of the higher petroleum prices by around 8 per cent (see table 8), while the general level of prices would increase by approximately 5 per cent. This means that over 1,100 million dollars more (at 1970 prices) would be required in 1974 to give a

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<sup>10/</sup> It should be noted that FOB values have been used; if CIF values were used, the differences would be even greater.

level of gross capital formation high enough to sustain an annual growth rate of 7.5 per cent in the product (see table 10). Of this amount, more than 303 million (equivalent to 382 million at 1973 prices), is attributable to the increase in the prices of imported capital goods. If the above is considered simultaneously with the direct effect of imports of petroleum (which, as may be seen from table 9, would amount to over 3,000 million dollars), foreign exchange requirements come to over 3,400 million dollars (18 per cent of 1973 imports).

The major part of this total additional cost of investment would be accounted for by Brazil (see table 10), which would require approximately 500 million dollars (43 per cent of the total), followed by Argentina with 165 million (13.6 per cent), Mexico with 160 million (13.5 per cent) Central America and Panama with 156 million (13 per cent) and Chile with 67 million (5.6 per cent). The rest of the countries together would account for only 130 million dollars (11 per cent of the total).

The importance of these figures may be seen if they are compared with total gross investment, since they signify a 3 per cent average increase (see table 10). In other words, this additional percentage of financial resources is required in order to reach the same proposed growth rate of the gross domestic product. The country situation shows more or less marked differences. For Uruguay, the increase in the cost of investment is over 14 per cent, for Central America and Panama it is more than 8 per cent, while for Haiti, the Dominican Republic and Paraguay it is around 6 per cent. In the remaining countries the extra requirements are smaller but no less significant.

Table 10

ADDITIONAL INVESTMENT RESOURCES AS REQUIRED AS A RESULT OF THE INCREASE IN THE PRICES  
OF PETROLEUM AND IMPORTED CAPITAL GOODS <sup>a/</sup>

	Millions of dollars at 1970 prices <sup>b/</sup>				Percentage of total gross investment			
	1974		1980		1974		1980	
	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum
Argentina	157.6	168.5	230.0	246.7	2.0	2.1	2.2	2.3
Brazil	499.3	530.6	996.7	1 063.3	3.2	3.4	3.7	3.9
Central America and Panama	154.9	159.5	262.0	271.9	8.2	8.4	9.8	10.1
Chile	64.3	71.0	95.1	104.7	4.8	5.3	5.6	6.2
Haiti and Dominican Republic	26.3	26.8	41.8	42.7	5.7	5.8	6.1	6.3
Mexico	156.8	165.5	259.4	274.2	1.3	1.4	1.4	1.5
Paraguay	10.6	10.8	16.1	16.6	6.0	6.1	6.8	7.0
Peru	49.1	52.8	75.7	81.5	3.7	4.0	4.2	4.5
Uruguay	40.7	43.4	51.5	55.0	14.4	15.4	16.2	17.3
<u>Total</u>	<u>1 159.6</u>	<u>1 228.9</u>	<u>2 028.3</u>	<u>2 156.6</u>	<u>2.8</u>	<u>3.0</u>	<u>3.2</u>	<u>3.4</u>

Source: ECLA, on the basis of official data.

<sup>a/</sup> Hypothesis used for growth of product: past rate, 1968-1973 (7.5 % annually).

<sup>b/</sup> Hypothesis used for price increases: see table 8.

/The 382 million

The 382 million dollars corresponding to the extra cost of imported investment goods are distributed in approximately the same proportions over the various countries, except that in this case Mexico occupies the first place and Brazil the second. As this involves larger foreign exchange requirements, however, the situation as regards import capacity tends to be more adversely affected. Thus, for example, Paraguay would require 4 million dollars more (3 per cent of its 1973 imports), which, added to the extra 17 million dollars (minimum hypothesis) needed for petroleum imports, would require an increase of at least 17.3 per cent in import capacity for 1974. In the remaining countries the additional cost of imported capital goods varies from 1.1 per cent of total imports for 1973 in Uruguay to 2.9 per cent in Argentina.

To evaluate investment in 1980, the same price hypotheses were used as were applied for 1974. This means that compared with 1974, the amounts obtained include only the changes in the physical volume of capital formation. Relatively speaking, compared with total gross investment the results for 1980 are very similar to those for 1974, such differences as there are being due to modifications in the structure of total supply and demand. The additional resources required to finance investment in 1980 will be appreciably greater (see table 10), since a total of over 2,000 million dollars will be required (at 1970 prices), representing an annual increase of 9.8 per cent over and above the level estimated for 1974. Of this total, around 440 million is attributable to higher prices of imports of capital goods.

With reference to the increased cost of investments, the problem of financing these should also be mentioned. It is obvious that national saving will be affected by the changes in prices, but it is very difficult to say exactly how or how much. The situation described above could be improved or aggravated by this possible modification of savings. What is certain is that external savings (or net financing from abroad) have played an important role in the financing of gross capital formation in Latin American countries,

/and will



and will probably continue to do so. Indeed, the repercussions of the rise in petroleum prices on the balance of payments - which have been indirectly quantified above - enable this to be clearly foreseen. The petroleum crisis has thus become a factor which aggravates the structural trend towards external imbalance.

To sum up, the possibility of maintaining the growth rate achieved in recent years by the Latin American countries which are net importers of petroleum depends on their being able to obtain the additional resources that the necessary investment requires. This calls for a greater domestic saving effort while it will also be necessary to achieve an import capacity which will guarantee adequate availability of imported capital goods.

3. Some observations on the possible long-term repercussions of the new petroleum prices on the amount and structure of investment

The above estimates are based on a series of structural conditions which were regarded as constant, the aim being merely to show the magnitude of the impact of the new petroleum prices. It is obvious, however, that the radical changes which have taken place in the world economy make necessary a number of long-term structural adjustments.

In the first place, when considering future energy requirements it is important to take into account the supply structure. Up to now, petroleum continues to be the main source of energy in Latin America, and the important repercussions of its new prices may be attributed to a large extent to this fact. It is precisely these repercussions which suggest that each country should establish a clearly-defined energy policy for the future, with a view to ensuring supplies of energy in the amounts and forms and at the times that its development requires. This calls for a clear definition of the prospects of each source of energy and the resources which would be required to develop, so that a decision can be made on the advisability of adopting it.

/Although it

Although it is true that the rise in petroleum prices has increased the volume of economically usable petroleum deposits, and that many projects for the prospection and development of local crude oil which previously were not viable can now be implemented, it is no less true that this has produced a situation which makes a more efficient use of energy resources absolutely necessary.<sup>11/</sup>

It is thus probable, especially in the countries which depend heavily on petroleum imports, that petroleum will be replaced in part by other sources of energy, and that this will produce an increase in investment requirements and a change in the orientation of investments. One of Latin America's natural resources which has been relatively little used, for example, is hydroelectric energy, but the use of this requires more capital expenditure per unit of installed capacity.

The increase in foreign exchange requirements will probably be reflected in attempts to create new production capacity for exportable goods or in a search for new import substitution possibilities in order to alleviate external pressures. This would lead to changes in the existing production capacity and require additional investment. It would of course be desirable for these efforts to take place in a regional context in order to help to solve the problem of external strangulation and make capital formation more independent of the external sector.

It should not be forgotten that decisions are being taken in this context in the international community with the aim of alleviating the repercussions of the petroleum crisis on the developing countries. Thus, agreements and measures are being worked out between the petroleum-producing countries and the international financial institutions with a view to ensuring, at least partially the flow of additional resources required by the developing countries.

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<sup>11/</sup> The spectacular increase in petroleum prices is causing it to lose its comparative advantages and to a certain extent is stimulating the development of other energy resources.

/Furthermore, the

Furthermore, the need for a more efficient use of energy resources may cause changes in the existing or planned structure of production. The evaluation of new projects may undergo radical changes in the light of fuel requirements. Similarly, existing activities will have to adapt themselves to the new situation by changing their production processes or products in order to endeavour to maintain their economic efficiency.

Although the developing countries have traditionally been importers of technology, the present crisis could make them seek their own production techniques, and this in turn would lead to new requirements for resources and changes in the way they are used.

#### 4. Conclusions

1. The big increase in petroleum prices has modified the growth prospects of the developing countries. The direct repercussions represent a loss of resources available for investment.
2. Investment will be affected by the increase in petroleum prices in two ways: through the increase in prices of imported capital goods, and through the reduction of import capacity stemming from the increased costs of fuel imports.
3. In order for the Latin American countries which are net importers of petroleum to finance the fuel imports needed to maintain the 1968-1973 growth rate they will require additional resources of at least 3,000 million dollars in 1974, owing to the increase in the price of petroleum (Saudi Arabian 34 API light crude, FOB Persian Gulf) from 2.20 dollars per barrel to 7.00 dollars. The additional resources required will increase to 5,000 million dollars for a price of 10 dollars per barrel.
4. Merely to cover these increased costs of importing liquid hydrocarbons, the import capacity of the Latin American countries which are net importers of petroleum would have to increase at an annual rate of 2 per cent between 1974 and 1980, even supposing that prices remain constant at the level anticipated for 1974. Furthermore, the 1974 import capacity must be at least 16 per cent higher than in 1973.

5. As a result of the increase in petroleum prices of between 119 and 130 per cent, it is estimated that the upward pressure on the general level of prices in Latin America will be around 5 per cent for 1974. This pressure, plus the estimated increase of 5 per cent in the cost of imports of capital goods, means that implicit investment prices will rise by approximately 8 per cent.

6. In view of the rise in the relative prices of investment goods, over 1,100 million dollars more (at 1970 prices) will be required in 1974 to finance the capital formation needed to maintain the growth of the gross domestic product of the Latin American countries which are net importers of petroleum at a rate similar to that recorded between 1968 and 1973. The corresponding amount required in 1980 will be over 2,000 million dollars (even assuming that prices are the same as for 1974).

7. The maintenance of the growth rate recorded in recent years by the Latin American countries which are net importers of petroleum depends on the possibility of obtaining the additional resources which their investment requirements demand. This means that a greater domestic saving effort will be needed, or else it will be necessary to achieve an import capacity which will ensure sufficient availability of imported capital goods.

8. The crisis stemming from the increased prices of fuels will sooner or later change the structure of energy investment. At the same time, as the criteria for assigning resources will also be modified, it is possible to foresee a change in the orientation of other investments and of production in general, as well as possible changes in the technological processes used.



