

# COMPARISONS OF CONSTRUCTION COSTS IN LATIN AMERICA\*

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This note examines the level and structure of construction costs in Latin America in the late sixties, comparing them with those obtained in the early sixties by the Economic Commission for Latin America (ECLA). The cost trends over this period are then examined.

## CONSTRUCTING INTERNATIONAL INDICES

Investment goods are those purchased by businesses or government in order to aid in the production of other goods and services, some of which could even be investment goods themselves. They are generally of a durable nature. Three main categories can be distinguished: producer durables, construction, and changes in inventories. Construction can be subdivided into residential (houses and apartments) and nonresidential buildings, and infrastructure. Below these levels, specific types of items were selected to be costed in the Latin American countries, both in 1960 and the middle of 1968. When an identical item could not be found in a particular country, the cost of similar items was obtained.

The classification presented was constructed following the U.N. System of National Accounts, as generally adapted for use in Latin America. From each subdivision, types of items were selected on the basis of their importance in total construction expenditures, their general availability, and the ease with which they could be specified. The comparability attained in the construction items selected, as well as their relatively large number, make possible the comparison of construction goods costs at these levels of aggregation.

Various exchange rates could be used to express the country costs in a common currency. Which type of rate to use should depend on the purpose of the comparison, their availability, and so on. In this study, prevailing, rather

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than equilibrium or shadow rates, would seem the applicable ones. However, since there are several of these it was considered preferable to utilize official rather than free or other special rates, because they reflected the great majority of the transactions. In those cases where there were various official rates, the midpoints between the buying and selling rates of those in most frequent use in trade transactions were used. The index number formulations applied in the study were geometrically weighted means of cost relatives, with average Latin American expenditure shares used as weights in the computation of the international cost indices.

Finally, the countries included in these construction comparisons are those that participate in the Latin American Free Trade Association (LAFTA). These are Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Mexico, Paraguay, Peru, Uruguay, and Venezuela. Together they account for over 90 percent of Latin America in terms of population, production, expenditures, etc.

#### RESULTS FOR 1968

Construction cost relatives provide an indication of where the dollar funds of a hypothetical Latin American investor could be invested more cheaply, given a common Latin American basket. However, these costs are just one of the determinants of investment, with wages, interest rates, and product prices being particularly important also. A comparison of construction costs is presented in table 1. Clearly, Bolivia and Argentina had the highest construction prices in Latin America in 1968, about 40 percent above the average; Mexico and Colombia had the lowest, approximately 45 and 30 percent, respectively, below the Latin American average. The coefficient of variation was 0.27. Table 2 shows the various subcategories of investment in construction. The coefficients of variation corresponding to each of the subdivision indices, with one exception, are similar to each other and of the same order of magnitude as for overall construction.

The countries with highest and lowest prices vary somewhat from the pattern noted for construction investment as a whole. However, the low pattern of Mexican prices is apparent in every subdivision. This was probably due to its low producer durable prices, and most importantly, to the use of more up-to-date technology imported from its neighbor to the North. Another important factor contributing to the low prices of Mexican investment goods in 1968 was the relatively open and flexible import policy expressed through lower import barriers (see Bela Balassa, *The Structure of Protection in Developing Countries* [Baltimore, Md.: Johns Hopkins University Press, 1971]).

#### RESULTS FOR 1960

During 1960–62, ECLA conducted a research effort similar to the 1968 study outlined above. Since the latter was defined to maintain comparability with the ECLA effort, an examination of price changes between 1960 and 1968 can be undertaken. For this purpose, indexes with the same base have to be defined for these two years. It would have been convenient to use the average of all Latin

*T A B L E 1 Latin American Price Index for Construction, 1968*

<i>Country</i>	<i>Index</i>	<i>Ranking</i>
Argentina	138.4	(10)
Bolivia	144.1	(11)
Brazil	121.1	(8)
Chile	116.3	(6)
Colombia	69.9	(2)
Ecuador	83.8	(4)
Mexico	55.9	(1)
Paraguay	120.0	(7)
Peru	91.0	(5)
Uruguay	126.8	(9)
LAFTA Average	100.0	
Coefficient of Variation	0.2703	

*T A B L E 2 Latin American Price Indexes for Houses, Apartments, Nonresidential Buildings, and Infrastructure, 1968*

<i>Country</i>	<i>Houses</i>		<i>Apartments</i>		<i>Nonresidential Buildings</i>		<i>Other Construction</i>	
	<i>Index</i>	<i>Ranking</i>	<i>Index</i>	<i>Ranking</i>	<i>Index</i>	<i>Ranking</i>	<i>Index</i>	<i>Ranking</i>
Argentina	123.4	(10)	150.3	(11)	110.0	(6)	179.1	(10)
Bolivia	119.4	(9)	138.6	(10)	154.4	(11)	167.9	(8)
Brazil	169.9	(11)	129.0	(9)	110.8	(7)	89.6	(6)
Chile	114.5	(7)	114.3	(8)	130.2	(10)	107.7	(7)
Colombia	64.9	(2)	67.4	(1)	69.0	(2)	79.1	(3)
Ecuador	85.6	(4)	91.7	(4)	79.0	(3)	79.7	(4)
Mexico	64.8	(1)	71.8	(3)	57.3	(1)	37.1	(1)
Paraguay	93.5	(5)	104.9	(6)	115.2	(8)	181.5	(11)
Peru	84.8	(3)	92.3	(5)	107.1	(5)	82.0	(5)
Uruguay	115.1	(8)	106.0	(7)	118.6	(9)	177.3	(9)
Venezuela	106.2	(6)	71.5	(2)	89.5	(4)	55.9	(2)
LAFTA Average	100.0		100.0		100.0		100.0	
Coefficient of Variation	0.2768		0.2573		0.2583		0.4568	

American countries included in the 1968 results; however, this was not used as a base in the ECLA study. The most straightforward solution, then, is to take a particular country as the base; of these, Mexico seems best qualified.

Indexes for construction and subcategories corresponding to 1960 are presented in tables 3 and 4. In constructing these indexes, the country prices had to be converted into a common currency; for comparability with the results

presented earlier, it was decided to use the official exchange rates as conversion factors. ECLA utilized such rates except in the cases of Ecuador and Colombia, in which the free exchange rates were used. In these cases the ECLA results were recomputed using the official exchange rates.

As can be noted, the rankings and price relatives change significantly from the 1968 results. However, the price dispersion, as indicated by the range and the coefficient of variation, was somewhat greater in infrastructure than in residential and nonresidential buildings, as in 1968. The construction comparisons in 1960 were not as disaggregated as those for 1968, as the three building subdivisions were combined into one subcategory. But it is still possible to make intertemporal comparisons by taking account of these differences in the analysis and considering the 1968 results with Mexico as a base.

A comparison for buildings, by examining the coefficients of variation, shows that the dispersion was just slightly lower in 1968. Ecuador and Colombia, countries with low prices in 1960, still had them by 1968. Bolivia and Brazil exchanged positions with Mexico and Venezuela: the former countries had low construction prices in 1960 and high ones for 1968, while the reverse was true for the latter. On the other hand, Argentina, Chile, and Uruguay were characterized by high construction prices at the beginning and the end of the period.

The price dispersion in infrastructure was certainly higher in 1968. Again, some countries changed positions, while others remained stable with either high or low prices; among these were Ecuador and Colombia (low), and Paraguay and Argentina (high). On the other hand, Mexico and Venezuela experienced

TABLE 3 *Price Indexes of Construction, for Latin American Countries, 1960 and 1968 (Mexico = 100)*

Country	1960		1968	
	Index	Ranking	Index	Ranking
Argentina	126	(10)	248	(10)
Bolivia	87	(3)	258	(11)
Brazil	93	(5)	217	(8)
Chile	100	(6)	208	(6)
Colombia	83	(2)	125	(2)
Ecuador	72	(1)	150	(4)
Mexico	100	(6)	100	(1)
Paraguay	101	(8)	215	(7)
Peru	91	(4)	163	(5)
Uruguay	103	(9)	227	(9)
Venezuela	188	(11)	140	(3)
Coefficient of Variation	0.2844			

Source: U.N. Economic Commission for Latin America, *A Measurement of Price Levels and The Purchasing Power of Currencies in Latin America, 1961-1962* (Mar del Plata, Argentina, 1963) p. 198 and calculations by the author.

T A B L E 4 Price Indexes of Buildings and Infrastructure of Latin American Countries, 1960 and 1968 (Mexico = 100)

Country	1960					1968									
	Buildings		Infrastructure		Houses	Buildings		Apartments		Nonresidential		Infrastructure		Other	
	Index	Ranking	Index	Ranking		Index	Ranking	Index	Ranking	Index	Ranking	Index	Ranking	Index	Ranking
Argentina	134	(10)	118	(10)	190	(10)	209	(11)	192	(6)	483	(10)			
Bolivia	82	(2)	93	(5)	184	(9)	193	(10)	270	(11)	453	(8)			
Brazil	95	(4)	90	(4)	262	(11)	180	(9)	193	(7)	241	(6)			
Chile	101	(8)	96	(6)	177	(7)	159	(8)	227	(10)	290	(7)			
Colombia	87	(3)	79	(2)	100	(1)	94	(1)	120	(2)	213	(3)			
Ecuador	75	(1)	68	(1)	132	(4)	128	(4)	138	(3)	215	(4)			
Mexico	100	(7)	100	(7)	100	(1)	100	(2)	100	(1)	100	(1)			
Paraguay	98	(5)	104	(9)	144	(5)	146	(6)	201	(8)	489	(11)			
Peru	98	(5)	83	(3)	131	(3)	129	(5)	187	(5)	221	(5)			
Uruguay	103	(9)	102	(8)	178	(8)	148	(7)	207	(9)	478	(9)			
Venezuela	178	(11)	201	(11)	164	(6)	100	(2)	156	(4)	151	(2)			
Coefficient of Variation	0.2603		0.3252		—		—		—		—		—		

Source: See table 3.

large declines in their price relatives, being the countries with lowest prices in 1968.

The changes over the sixties for buildings and infrastructure were somewhat different, as has been shown. Overall, the dispersion of construction declined, as an examination of the coefficients of variation makes evident. The various price indexes for construction tended to show little agreement between 1960 and 1968, with Spearman's coefficient of rank correlation being 0.214 for construction as a whole, which is not significant even at the 15 percent level.

#### DISCERNIBLE TRENDS IN CONSTRUCTION GOODS PRICES OVER THE SIXTIES

If changes in the price relatives across time are examined, trends in the prices of construction goods in the various Latin American countries can be determined. It should be stressed that, because these price increases are measured after conversion into a common currency, price trends can be due as much to internal price changes as to variations in the exchange rates. Also, any change in the prices of the country chosen as the base complicates the interpretation of these trends. However, in selecting Mexico, such problems have been minimized, since its exchange rate was steady throughout these years.

In the building subdivisions only Venezuela experienced a relative decline in its prices over the sixties, when compared with those of Mexico. Or to put it differently, the lowest rates of increase in building prices over the sixties, when these are expressed in a common currency, were those of Venezuela and Mexico. Just the opposite was the case of Bolivia and Brazil, where construction prices increased the fastest. Contrasting the rates of change in infrastructure prices over the sixties, again it is found that Venezuela and Mexico experienced the lowest, and Bolivia and Ecuador had the highest, rates.

#### APPENDIX: PRINCIPAL AND AIDING MEMBER INSTITUTES IN ECIEL'S PRICE AND ECONOMIC POLICY WORKING GROUP, BY COUNTRY

Argentina: FIEL (Fundación de Investigaciones Económicas Latinoamericanas); Instituto de Tella, INDEC (Instituto Nacional de Estadística y Censos).

Bolivia: IBEE (Instituto Boliviano de Estudios Economicos); Universidad de San Andrés, Instituto Nacional de Estadística.

Brazil: Fundação Getulio Vargas.

Chile: Universidad de Chile; Instituto Nacional de Estadística.

Colombia: Universidad de Los Andes; DANE (Departamento Administrativo Nacional de Estadística).

Ecuador: INEC (Instituto Nacional de Estadística y Censos).

México: El Colegio de México; Dirección General de Estadística.

Paraguay: CEPADES (Centro Paraguayo de Desarrollo Económico y Social); Banco Central del Paraguay.

Perú: Universidad Católica del Perú.

Uruguay: Universidad de la República; Banco Central del Uruguay.

Venezuela: Banco Central de Venezuela; Universidad Central de Venezuela.

U.S.: The Brookings Institution.