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Regional Consumer Price Indices for Thailand

by

Dr. Oey Astra Meesook

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The Impact of Price Increases on Different Income Groups

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With October 1964 - September 1965 as the base year, the overall consumer price index for all urban areas had risen to 124.6 by December, 1972, to 149.7 by December, 1973 and to 176.4 by December, 1974. The rise was by no means uniform for all regions, ranging from an index in December, 1974 of 157.5 in the Northeast to 192.6 in the North.

This note, however, is less concerned with regional variations than with differences across income classes.[1/] We wish to discover whether the rich or the poor have suffered more from price increases over the past decade or so.

Increases in prices of consumer goods can be expected to affect different income groups to different extents because the proportions of total expenditure spent on different commodities are somewhat different for the groups. Since prices of all commodities have not risen in a uniform fashion, these increases are absorbed into the total price index in different proportions.

Ideally we need a breakdown of total consumption expenditure of each income class which is as detailed as the prices collected by the Department of Commercial Intelligence. This is not available anywhere and since the data tape for the 1962/3 Household Expenditure Survey

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1/ For regional variations in prices, see "Regional Consumer Price Indices for Thailand, 1970" by this author. (mimeographed, December 1974.)

from which the weights for the consumer price indices were obtained, has been destroyed, it is actually impossible now to ever get the information.

The only expenditure weights which are available by income class are in the published volumes of the Household Expenditure Survey, 1962/3. Unfortunately, they only cover major commodity groups such as food, clothing and housing. The weights are available for towns and villages separately for each of the regions.

With such aggregated weights it did not seem worthwhile to do all the calculations for the individual regions. This would have involved getting price indices for major commodity groups by region over time. The Bank of Thailand Monthly Bulletin reports consumer price indices for seven major groups for all urban areas together and for the Bangkok Metropolis. It seems sufficient to concentrate on these just to get an idea of the order of magnitude of the problem at this stage, although ideally speaking each region should be treated separately.

It is intended to calculate consumer price indices for different income classes for the last three years and for the most recent month for which price data are available, February 1975. One intermediate date is also picked to provide a comparison, the year 1968.

Table 1a gives the proportions of total expenditure spent on each of seven commodity groups for six income classes in the Bangkok-Thonburi municipal area.[2/] Certain tendencies can be observed here.

2/ The income classes are those in the tabulations of the 1962/3 Household Expenditure Survey and are given in 1962/3 prices.

Table 1a

Weights of Seven Major Commodity Groups in Total Expenditure, Bangkok-Thonburi Municipal Area, 1962/3

Household Income Class	Under ฿ 6,000	฿ 6,000 -11,999	฿ 12,000 -23,999	฿ 24,000 -35,999	฿ 36,000 -59,999	฿ 60,000 and over
Commodity Group	(in per cent)					
Food	56,9	55.8	50.9	48.4	44.5	36.4
Clothing	7.0	7.3	9.8	10.5	9.0	12.1
Housing	11.6	16.2	16.5	16.4	19.4	21.9
Personal and Medical Care	9.6	6.9	7.1	6.8	6.8	6.7
Transportation	6.3	4.2	5.3	6.4	9.1	10.5
Recreation, Reading and Education	3.8	4.1	5.3	6.7	7.2	7.7
Tobacco & Alcoholic Beverages	4.7	5.5	5.2	4.9	4.1	4.7

Source : Household Expenditure Survey, National Statistical Office, Prime Minister's Office, 1962/3.

The proportion spent on food declines with rising incomes, while those for clothing, housing and recreation, reading and education tend to rise with income.

The corresponding indices for the different commodity groups are given for 1968, 1972, 1973, 1974 and February 1975 in Table 1b. Two thirds of the total rise in prices in the decade under study has occurred since the end of 1972, with the years 1973 and 1974 accounting for 29% and 36% of the 1964/5 - February, 1975 increase. The major share of the rise in the overall index is attributable to the sharp increase in food prices over the whole period, and to the jump in the transportation index at the end of 1973 caused by the increase in petroleum prices. All other commodity groups have risen in price to a much smaller extent than these two categories.

Since it is the lower income classes which have a larger share of food in total expenditure it is not surprising to find that their consumer price index has gone up more than on average. Table 1c gives consumer price indices for different income groups, where the indices reflect differences due to variations in the composition of total household expenditure alone, and not to differential rates of price increase by income class. There is a definite negative correlation between the rate of increase in prices and the income level. The poorer families thus suffer the further disadvantage of having to pay more for their basket of commodities relative to what better-off families pay for theirs. While the top income class has been experiencing an average rate of price

Table 1b

Price Indices for Major Commodity Groups, Bangkok Metropolis

Commodity Group	October 1964 - September 1965	1968	1972	1973	1974	February 1975
Food	100	118.1	131.8	150.8	193.8	199.7
Clothing	100	100.7	104.3	119.2	140.5	145.9
Housing	100	103.0	111.5	120.3	130.6	132.2
Personal & Medical Care	100	107.9	113.9	118.1	135.7	142.0
Transportation	100	102.8	113.2	129.0	179.5	181.0
Recreation, Reading & Education	100	101.9	107.4	114.8	135.2	136.4
Tobacco & Alcoholic Beverages	100	99.9	101.2	103.7	116.7	118.7
All Items	100	110.5	120.6	134.8	166.2	170.6

Source : Bank of Thailand Monthly Bulletin, Table V.15

Table 1c

Consumer Price Indices for Different Income Classes, Bangkok Metropolis

Household Income Class (in 1962/3 prices)	Under ฿ 6,000	฿ 6,000 -11,999	฿ 12,000 -23,999	฿ 24,000 -35,999	฿ 36,000 -59,999	฿ 60,000 and over
October 1964 - September 1965	100	100	100	100	100	100
1968	111.7	111.4	110.6	110.2	109.6	108.3
1972	122.3	121.8	120.6	120.0	119.5	117.6
1973	136.9	136.3	134.8	134.2	133.3	130.8
1974	170.4	168.4	166.2	165.3	164.1	160.0
February 1975	175.2	173.0	170.7	169.7	168.3	163.0

Source : Calculated from data in Tables 1a and 1b.

increase of around 5.1% per year, the rate has been 5.8% for the poorest class.

Tables 2a-c give the picture for all urban areas for the same period. Very similar results are in evidence here, but the differential in the rate of price increase between the poorest and richest groups is less marked. This can in part be traced to a smaller decline in the proportion of total expenditure spent on food between the bottom and top income classes as defined here.

The impact of price increases on different income groups in rural areas cannot be measured directly since a time series for rural prices is not available. Table 3a presents the expenditure weiths by income class for rural households. In Table 3b we have calculated overall price indices by income class, where the urban price indices for commodity groups have been used. This may not be so drastic as it sounds. It has not been assumed that rural and urban prices are identically the same; they could still have been very different in the base year. Using the urban indices does not create a major problem as long as the rise in prices for each commodity group has been similar for urban and rural areas over time. This is the case if urban and rural prices of commodities by major groups bear a reasonably constant relationship to each other, so that rural food prices have also gone up more rapidly when compared with other commodities. The consumer price indices obtained reflect the differential impact of price increases on different income classes due to different consumption patterns between rural and urban

Table 2a

Weights of Seven Major Commodity Groups in Total Expenditure, All Urban Areas, 1962/3

Household Income Class (in 1962/3 prices)	Under ฿ 3,000	฿ 3,000 -5,999	฿ 6,000 -11,999	฿ 12,000 -17,999	฿ 18,000 and over
Commodity group	(in per cent)				
Food	50.4	51.7	47.1	41.5	39.0
Clothing	13.9	13.4	16.0	16.1	15.9
Housing	16.4	13.5	14.7	16.5	17.3
Personal and Medical Care	8.1	8.5	8.0	7.7	7.6
Transportation	3.1	3.1	2.9	5.1	7.5
Recreation, Reading and Education	3.6	4.2	5.5	8.5	8.3
Tobacco & Alcoholic Beverages	4.4	5.6	5.8	4.7	4.4

Source : Household Expenditure Survey, National Statistical Office, Prime Minister's Office, 1962/3

Table 2b

Price Indices for Major Commodity Groups, All Urban Areas

Commodity Group	October 1964-September 1965	1968	1972	1973	1974	February 1975
Food	100	118.8	127.8	153.7	198.8	207.4
Clothing	100	101.0	108.7	125.9	149.7	155.7
Housing	100	105.1	112.9	125.8	146.0	148.3
Personal & Medical Care	100	104.7	114.4	118.7	134.1	142.4
Transportation	100	100.4	106.1	115.0	159.0	164.6
Recreation, Reading & Education	100	101.7	112.5	121.2	138.4	141.5
Tobacco & Alcoholic Beverages	100	100.5	102.4	105.4	121.7	122.6
All Items	100	110.9	119.5	138.1	171.7	178.2

Source : Bank of Thailand Monthly Bulletin, Table V.13.

Table 2c

Consumer Price Indices for Different Income Classes, All Urban Areas

Household Income Class (in 1962/3 prices)	Under ฿ 3,000	฿ 3,000 -5,999	฿ 6,000 -11,999	฿ 12,000 -17,999	฿ 18,000 and over
October 1964 - September 1965	100	100	100	100	100
1968	110.9	111.1	110.3	109.3	108.9
1972	119.3	119.4	118.5	117.6	117.2
1973	137.9	138.0	136.6	134.9	134.1
1974	171.2	171.5	169.1	166.4	165.6
February 1975	177.8	178.1	175.5	172.6	171.6

Source : Calculated from data in Tables 2a and 2b.

Table 3a

Weights of Seven Major Commodity Groups in Total Expenditure, All Villages, 1962/3

Household Income Class (in 1962/3 prices)	Under ฿ 3,000	฿ 3,000 -5,999	฿ 6,000 -11,999	฿ 12,000 -17,999	฿ 18,000 and over
Commodity group	(in per cent)				
Food	51.8	47.5	44.1	39.6	33.1
Clothing	18.7	19.2	20.9	19.8	17.8
Housing	12.0	13.0	13.1	14.4	16.9
Personal & Medical Care	8.0	8.6	8.0	7.6	6.6
Transportation	2.8	3.5	4.4	7.1	13.4
Recreation, Reading and Education	2.2	3.4	4.8	6.3	7.5
Tobacco & Alcoholic Beverages	4.4	4.8	4.7	5.2	4.6

Source : Household Expenditure Survey, National Statistical Office, Prime Minister's Office, 1962/3

Table 3b

Consumer Price Indices for Different Income Classes, All Villages*

Household Income Class (in 1962/3 prices)	Under ฿ 3,000	฿ 3,000 -5,999	฿ 6,000 -11,999	฿ 12,000 -17,999	฿ 18,000 and over
October 1964 - September 1965	100	100	100	100	100
1968	111.0	110.3	110.0	108.9	107.8
1972	119.3	118.5	117.9	117.0	115.8
1973	138.4	136.9	135.9	134.2	131.9
1974	172.2	169.8	168.2	165.9	163.4
February, 1975	179.0	176.4	174.6	172.1	169.3

Source : Calculated from data in Tables 2b and 3a.

* Urban commodity group price indices are weighted by village expenditure weights to obtain the total indices.

households, while ignoring differential price changes of similar commodities in the different locations over time. In fact, for the few years in which rural prices are available, it has been found that the urban/rural differential is small.[3/] Thus the assumption that the movements of rural prices follow those of urban prices is very reasonable.

Again the declining weight of food in the total budget with the income level shows up in a higher rate of increase of the general consumer price index for poorer families.

Apart from the usual problems encountered in constructing price indices the comparison here suffers from aggregation, the fact that there are only seven commodity groups. The price indices for the major groups are not the same for all income classes to the extent that prices of individual items have gone up at different rates and these items have different weights in the group for different income classes. It is not immediately clear what effect this has on the results. If the same tendency exists for items within the group as does for the major groups, namely that items which have larger weights in the budgets of poorer households are the ones which have also experienced the more rapid increase in prices, then we must conclude that the consumer price index for poor families has gone up even more and that for rich families even less than we have found using aggregated commodities. If the opposite tendency exists, then the use of only a few major commodity groups has

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3/ See "Regional Consumer Price Indices for Thailand, 1970".

exaggerated the differences between the inflation rates of high and low income classes. However, the results so far indicate such a definite negative correlation between the consumer price index and income class that we are inclined to think that this pattern will persist if the more refined indices could be constructed.

The deficiencies in the data suggest that in order to determine the extent to which price increases affect various income groups differently, it would be necessary to construct price indices corresponding to different income classes by region and location. Expenditure weights must therefore be available and in addition the prices paid for the same commodities by different income groups must be collected. But insofar as the urban/rural price differential within a region is small, and if it should be the case that the differences in prices of consumer goods paid by different income classes are small relative to the differential price increases between major commodity groups over time, which seems plausible, then our results indicate how price increases which involve consumer goods with larger weights in the poor's commodity basket result in a more rapid increase in their consumer price index relative to the rich. The poor suffer more first of all because total expenditures form a larger percentage of their incomes so that there is less of an income margin, if any, to enable them to keep real consumption at a constant level. Moreover, when real consumption declines for the poor it is a serious problem if they are near or already below the subsistence level. Our calculations show that further aggravation of the problem is brought on by the unfavourably larger overall price increase

facing the poor during recent years.

Furthermore, if it should be the case that the consumer price indices for the lower income groups rise significantly faster than the index for all classes together, as seems to have been the case for Bangkok-Thonburi although not for all urban or all rural areas, then this would provide an additional reason for the construction of separate indices for different income groups, in addition to region and location. The index pertaining to the lower groups corresponding to those who are affected by minimum wage legislation is the appropriate one to use for the adjustment of the minimum wage over time to counter the increase in the price level, not the average index which pertains to all income classes together.

Government efforts to hold down food prices, to the extent that they check a larger increase in the overall price index of the poor compared to the rich, can be said to have a favourable impact on the income distribution. Price increases such as have been experienced during the past decade have had an adverse effect on the level of total income equality and should be adequately dealt with.

Appendix

The purpose of this appendix is to indicate more precisely the causes of different rates of increase over time of the general consumer price index for different population groups, which may be income classes as in this paper, or regions of a country, or any other classification of the population.

A general consumer price index at time t is given by

$$P^t = \frac{\sum_{i=1}^{n} Q_i^o P_i^t}{\sum_{i=1}^{n} Q_i^o P_i^o} \cdot 100$$

where Q_i^o is the quantity of commodity i consumed in the base period,

P_i^o is the price of commodity i in the base period,

P_i^t is the price of commodity i in period t,

and n is the number of commodities in the price index.

The index P^t is usually rewritten in terms of relative prices to involve expenditure weights instead of quantity weights as follows:

$$P^t = \frac{\sum_{i=1}^{n} Q_i^o P_i^o \left(\frac{P_i^t}{P_i^o}\right)}{\sum_{i=1}^{n} Q_i^o P_i^o} \cdot 100 = \sum_{i=1}^{n} W_i \left(\frac{P_i^t}{P_i^o}\right) \text{ where } W_i = \frac{Q_i^o P_i^o}{\sum_{i=1}^{n} Q_i^o P_i^o} \cdot 100$$

Consider two population groups and assume that the prices of all commodities facing them are identical in the base period, but that

their expenditure weights for the commodities are different. Suppose also that the price increases for various goods over time need not be the same for the two groups. Using superscripts A and B to denote the groups, we have, in period t,

$$P^{At} = \sum_{i=1}^{n} W_i^A \left(\frac{P_i^{At}}{P_i^o} \right)$$

$$\text{and} \quad P^{Bt} = \sum_{i=1}^{n} W_i^B \left(\frac{P_i^{Bt}}{P_i^o} \right)$$

$$\text{Let} \quad \Delta W_i = W_i^B - W_i^A$$

$$\text{and} \quad \Delta P_i^t = P_i^{Bt} - P_i^{At}$$

$$\text{Then} \quad P^{Bt} = \sum_{i=1}^{n} \frac{(W_i^A + \Delta W_i)\ (P_i^{At} + \Delta P_i^t)}{P_i^o}$$

$$\text{and} \quad P^{Bt} - P^{At} = \sum_{i=1}^{n} \Delta W_i \cdot \left(\frac{P_i^{At}}{P_i^o} \right) + \sum_{i=1}^{n} W_i^A \cdot \left(\frac{\Delta P_i^t}{P_i^o} \right) + \sum_{i=1}^{n} \Delta W_i \cdot \left(\frac{\Delta P_i^t}{P_i^o} \right)$$

So the consumer price index for group B will be greater than that for group A in period t, that is the rate of general increase in prices will be greater for group B, if the three components of price change on the right-hand side of the equation sum to a positive number.

The first term represents the compositional effect. Ignoring the possibility of having price increases of individual commodities

over time which are different for the two population groups, the term measures the effect of different expenditure weights for the two groups under the same pattern of price increases. If food prices have risen rapidly and group B has a larger weight for food than group A, then ΔW_i for food is positive and P_i^{At} is large so that we have a large positive term going into the compositional effect. There will be some negative terms representing commodities for which the weights are larger for group A than for group B, for example transportation, but if the rate of price increase over time for them is smaller and if in addition the difference in weights, ΔW_i, is small, then the total compositional effect will still be positive.

The second term in the above equation is the effect of differential price increases for the two population groups. Even if the compositions of consumption for the groups are the same, there will be a difference in their consumer price indices at time t if the two groups experience different rates of price increases for identical commodities purchased. The term can be positive or negative depending on the signs of the ΔP_i^t's and the sizes of their corresponding weights. A positive effect would indicate that on the whole group B faces larger price increases over time than group A, even though for individual commodities the price increases for group A may be more rapid. The differential price increase effect can therefore either reinforce or counteract the compositional effect.

The last term is the interaction effect of including both compositional and differential price increase effects together. Its magnitude is smaller than the other two terms since it consists of second-order terms but should still be included.

If it is assumed that different population groups face roughly the same prices for identical commodities, then the second and third terms are zero. Differences in the overall consumer price index then result solely from the compositional effect, and the behaviour over time of prices of commodities having large weights in the price index is the important determinant of differences in the consumer price indices for different population groups. This explains why the poor are found to have experienced a more rapid rise in the consumer price index over time; food prices have gone up much faster than other prices and food has a larger weight in the consumption basket of the poor than the rich.

It is theoretically possible that the result might be reversed if the second and third terms could be included. But the size of the ΔP_i^t terms is not likely to be large; the poor and the rich may pay different prices for identical commodities but it is unreasonable to think that the differences will be very significant. It can be expected that the first term, the compositional effect, will dominate in the determination of differences in the consumer price indices for the rich and the poor over time.

Revised

Regional Consumer Price Indices for Thailand*

by

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Regional Consumer Price Indices for Thailand

Introduction

The purpose of this brief note is to report the results obtained in the construction of consumer price indices by region and location for Thailand, as well as some of the problems encountered, thereby making explicit the limitations of the indices presented here.

In our work on income distribution in Thailand the need for consumer price indices by region and location became very apparent. Without adjusting for prices, the income differentials between regions would be distorted, the actual direction of the distortion being unknown. Even more serious is the fact that the disparity in incomes between rural and urban areas would be exaggerated, if it should turn out as commonly expected that the cost of living in rural areas is substantially lower than that in urban areas. Short of constructing consumer price indices by region and location it is impossible to say how serious the problem is, and this seems to be a rationale in itself for the whole exercise.

Once the regional consumer price indices have been obtained, they can be used in a number of ways. In general, regional comparisons of income stand to benefit from some adjustment for the price level. For our own purposes the indices are essential for a study on income distribution for at least two reasons. First, regardless of the method used, in any decomposition of total income inequality the contributions of region and location are distorted without the adjust-

ment, since the total inequality index necessarily depends on the average income levels by region and location. Second, in terms of making a comparison of the standard of living by region or location, for instance by making use of such a measure as family income per capita, the comparison is necessarily invalid without price adjustments, the problem being more serious the larger is the price differential between two regions or locations in relation to the income disparity under consideration. In addition, some cost-of-living adjustment is desirable in any work on migration, to the extent that otherwise the attraction of a higher money income in the city or in some other region does not correctly reflect the real income gain facing a potential migrant.

Existing Consumer Price Indices

The Department of Commercial Intelligence of the Ministry of Economic Affairs has been collecting data on prices since 1960.[1] Using family expenditure figures collected in the Household Expenditure Survey by the National Statistical Office in 1962/3, the Department has been able to calculate consumer price indices for Bangkok-Thonburi and the five regions of Thailand, the Northeast, North, East, Centre and South. The indices are reported, for example, in the Bank of Thailand Monthly Bulletin.

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1 However, the price data did not become available for the whole Kingdom until October, 1964.

The price indices constructed by the Department of Commercial Intelligence appear as indices over time, one for each of the six regions and with October 1964 - September 1965 as the base year in each case.[2] These cannot easily be converted to give a comparison of the level of prices across all regions at any point in time. On the face of it, if we could only get the relative price indices for one of the years, say the base year, then the time-series data could be converted such as to reflect price differentials across regions for every year.

The problem, however, is that the quantity weights which are appropriate for the time-series case are inappropriate for the cross-section case. From the Household Expenditure Survey, the Department of Commercial Intelligence has obtained what amounts to quantity weights corresponding to each region, and these have been used, correctly so, to get a series of consumer price indices over time by region. Thus we are able to compare the price of a 'typical' basket of commodities consumed by a household in a particular region as the prices of the individual commodities change over time. It will thus be noted that at any point in time the quantity weights used to combine the prices are different by region. This is as it should be: each of the regional indices is concerned only with one region whose weights must be used in the construction of its price index each year.

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2 The base year (1962=100) was later shifted to October 1964-September 1965 = 100, but the 1962/3 weights are still being used.

But in order for a cross-country comparison of prices to be made, we need to know the price of the same basket of commodities purchased in different regions at the same point in time. This involves selecting one region as the base region and using its quantity weights to construct the price indices for all the regions. It follows then that there is no painless way of going from the existing time-series price indices to the cross-section indices. The raw prices must be recombined in such a way that the weights used are identical for every region concerned.

The consumer prices collected by the Department of Commercial Intelligence are usually for urban areas alone and thus only urban price indices are calculated and published. However, between 1966 and 1970, prices were collected for both municipal and nonmunicipal areas for all regions. Since then the collection of nonmunicipal or rural prices has been suspended and apparently will only be resumed after new consumer expenditure weights become available from the Household Expenditure Survey to the conducted by the National Statistical Office in 1975. It is fortunate that for the brief period between 1966 and 1970 we have some basis for comparing prices by urban/rural location as well as by region.

Method

Our objective is merely to utilize the existing information in constructing the regional consumer price indices. Thus we accept without question price and expenditure data supplied by the Department

of Commercial Intelligence.[3] Moreover, we make no attempt to grapple with the theoretical problems encountered in index-number theory. We simply follow the usual procedure of constructing indices, also employed by the Department of Commercial Intelligence.[4]

The price index for any region R is given by

$$P^R = \frac{\sum_{i=1}^{n} Q_i^o P_i^R}{\sum_{i=1}^{n} Q_i^o P_i^o} \cdot 100$$

Where Q_i^o is the quantity of commodity i consumed in the base region,

P_i^o is the price of commodity i in the base region,

P_i^R is the price of commodity i in region R

and n is the number of commodities in the price index.

The index P^R can be rewritten in terms of relative prices to involve expenditure weights instead of quantity weights:

$$P^R = \frac{\sum_{i=1}^{n} Q_i^o P_i^o \left(\frac{P_i^R}{P_i^o}\right)}{\sum_{i=1}^{n} Q_i^o P_i^o} \cdot 100 = \sum_{i=1}^{n} \frac{Q_i^o P_i^o}{\sum_{i=1}^{n} Q_i^o P_i^o} \cdot \left(\frac{P_i^R}{P_i^o}\right) \cdot 100$$

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3 The Department of Commercial Intelligence staff were very helpful in supplying the data and answering questions concerning them.

4 See, for example, Consumer Price Index for Bangkok-Thonburi, Department of Commercial Intelligence, Bangkok, 1965.

This formula is the more convenient one to use in actual practice. The following steps are taken in the calculation:

1. The absolute prices of commodities appearing in the consumers' goods basket are collected for a point in time for all regions.

2. Bangkok-Thonburi is taken as the base region and the regional absolute prices are converted to relative prices with Bangkok-Thonburi taken as 100 for each of the individual commodities.

3. Within each commodity subgroup of the seven major commodity groups, expenditure weights for Bangkok-Thonburi are calculated.[5] The relative prices belonging to each subgroup are weighted to give a price index for the subgroup applying to each of the regions.

4. Using expenditure weights within each major commodity group the subindices are combined to give indices for the seven major groups by region.

5. Finally, the weights of the major commodity groups in total expenditure are used to combine the major indices into an overall price index for each region.

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5 The weights are taken from table A-6 (Items Included in the Index Calculation and Their Weights as of January 1964) in Consumer Price Index for Bangkok-Thonburi, Department of Commercial Intelligence, Ministry of Economic Affairs, Bangkok, 1965, pp. 176-192.

Some Problems in the Construction of Consumer Price Indices

Most of the problems were encountered when absolute prices were compared by region. In general, it is desirable to include as many commodities as possible since an index is less reliable if it is based on fewer items, the price behaviour of which may not reflect the whole group they represent.

The Department of Commercial Intelligence has done quite a respectable job of selecting goods to represent each of the subgroups. On the whole the same items appear in both locations of all regions for the period 1966-1970. However, since the prices are collected for the purpose of constructing price indices over time, some of the commodities are not comparable across region. Such incomparability does not in any way affect the time-series results as long as within each region the data are comparable over time, which seems to be the case. Some of the problems met are discussed below.

1. Units Where identical items appear but with different units an attempt is made to adjust the prices to correspond to the same unit in order to avoid having to leave out the price series altogether. For example, soda water comes in litres in all regions except the Northeast where it comes in bottles. Using the fact that a standard bottle of soda water contains 440 c.c. or .44 litres we are able to get the litre price for the Northeast. In some cases it is not possible to make the price data comparable. For example, bus fares in different regions refer to different, but unspecified, distances so that the figures cannot be converted to the same unit.

2. Quality Where, as in the above cases, the unit problem is obvious our task is easier than when we merely suspect the problem. For example, face powder is given in grams for all regions, but the prices for the Northeast and Centre & East are so out of line with the rest that we cannot accept the figures. Here we face the problem of apparently identical units but with the units probably meaning somewhat different things in different regions. Manufactured products suffer from this a great deal, whereas foodstuffs do not. This is to be expected since there is much more variation possible with manufactured goods which are nominally the same. This is in spite of the effort on the part of the Department of Commercial Intelligence to ensure that identical commodities enter in the price index calculation. In a large number of cases brand names have been specified: "Fab" for soap powder, "Pepsi-Cola" for soft drinks, and so on. Other items are more troublesome and the problem can be grouped under "quality differences". For instance, with a number of clothing items it is suspected that regional price variations reflect differences in the quality or type of the products.

As a general rule, we try to keep as many commodities in the index as possible, omitting only those which we think are definitely wrong. The omission may involve either some or all of the regions, the latter case occurring when the price data for the other regions seem incompatible with the Bangkok-Thonburi figure.

3. Missing data The majority of the absolute-price series are complete for all regions. In the event that data are unavailable

for one or more regions, two cases can be distinguished. The first is that in which the price for Bangkok-Thonburi is missing. Here we have no choice but to leave out the whole series since it is impossible to calculate relative prices when the base is missing. Incidentally, one of the rationales behind the choice of Bangkok-Thonburi as the base region is the fact that it has the smallest number of missing prices. In the second case where the prices for one or more regions outside Bangkok-Thonburi are unavailable, we leave in the ones which we have.

In all three cases, whether a price is unavailable or has been omitted on the grounds of incomparable unit or quality, the expenditure weights are adjusted so that the remaining commodities make up the total basket, either at the subgroup or major group level. At each level of aggregation, the weights sum to unity. The advantage of weighting the prices in steps lies precisely in its treatment of missing data. Each missing price is here assumed to behave in a similar fashion to the index of the subgroup to which it belongs. If the weighting is done in just one giant step the assumption would be that the overall price index reflects accurately all the missing prices. Since the items are grouped in such a way that closely related goods appear in the same subgroup it seems more reasonable to assume that the prices of the missing commodities follow the price index of the subgroup rather than the overall regional price index. Needless to say, if the price information were complete, then whether the weighting is carried out in stages or not would have no effect whatsoever on the final results.

The Regional Consumer Price Indices

Although consumer prices have been collected since 1960, for most of the years they are available for municipal areas only. The only years for which prices were also obtained for nonmunicipal areas were 1966-1970, and of these the data were incomplete except for the year 1970. We have therefore chosen to construct regional consumer price indices for this year. The relationship between regional price levels is expected to be quite stable over such a short period for which nonmunicipal prices were collected, so that it does not matter very much which year is in fact selected.[6]

For 1970 prices are available for four regions, the Northeast, Centre & East, Northeast and South, for both municipal and nonmunicipal areas, as well as for the Bangkok-Thonburi municipality.[7] Altogether 232 price items were collected, of which 202 were eventually used in the construction of the indices. The remaining items were eliminated because of problems involving the units used, quality differences or missing data. The combined weight of the items included is 89% of the total so that the indices obtained should be a fairly good reflection of the true indices, had there been no problems of data comparability.[8]

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6 In preliminary calculations in which urban price indices were constructed for 1965 and 1969, only minor differences were found in the pattern of regional price differentials.

7 Appendix A lists the districts in each region for which the prices were collected.

8 Appendix B lists the number of items and the weight, both used and omitted, associated with each commodity subgroup.

Some differences might be expected in the price variations across regions for different times of the year. However, these should not be serious for nonfood items for which prices are relatively stable. In order to be sure that we are not biasing the results by picking a nonrepresentative month, while at the same time to avoid having to calculate average prices for the whole year which would be very time-consuming, we use four price series for food items but only one for nonfood items. Food prices are collected on a weekly basis and we average the weekly figures to get four monthly price series. The four months are February, May, August and November so that each of the quarters is represented. Thus we generate four food price series at all levels of weighting. There is much less variation in the prices of the other major commodity groups. This is reflected in the fact that prices are collected on a monthly basis for clothing and for the remaining commodity groups only every three months. We use the price series for nonfood commodities for May and there should be no major differences in the pattern of prices across region if some other month had been picked.

Table 1 gives price indices for subgroups making up the major commodity groups for 1970. The Central and Eastern regions have been combined into one by the Department of Commercial Intelligence.

The subindex which is most troublesome is public transportation (5.2). This is based on four individual price series and it is clear that the distances involved in different regions are not the same.

Table 1

Consumer Price Indices by Commodity Subgroups, 1970*

Subgroup \ Region	URBAN					RURAL			
	North	Centre & East	North-east	South	Bangkok-Thonburi	North	Centre & East	North-east	South
1.1 Rice cereals and flour products	86	91	86	84	100	84	94	112	76
1.2 Meat, poultry and fish									
1.2.1 Meat	89	97	100	94	100	91	96	89	102
1.2.2 Poultry	88	90	93	86	100	A/	98	98	95
1.2.3 Fish and sea food	112	95	113	99	100	134	98	112	82
1.3 Vegetables and fruits									
1.3.1 Vegetables	97	94	105	113	100	107	85	117	123
1.3.2 Fruits and berries	96	84	104	67	100	88	78	109	63
1.4 Eggs and milk products	102	100	101	94	100	116	90	108	86
1.5 Other food bought in market	115	107	136	125	100	129	100	125	12[illegible]
1.6 Nonalcoholic beverages	122	109	123	122	100	125	96	130	143
1.7 Prepared food	96	91	121	133	100	100	86	100	150
2.1 Men's and boy's clothing	82	74	85	98	100	72	80	80	100
2.2 Women's and girl's clothing	90	91	85	86	100	80	91	78	99
2.3 Cloth and sewing services	93	106	89	102	100	84	111	86	99
3.1 Shelter	107	72	106	118	100	109	108	114	112
3.2 Furniture and equipment	97	114	81	116	100	80	78	81	130
3.3 Paper and cleaning supplies	91	104	108	98	100	92	100	103	107
3.4 Household textiles	97	97	81	91	100	55	82	75	112
3.5 Household operation	148	154	150	170	100	128	150	149	193
4.1 Medical care	58	51	80	59	100	66	88	46	66
4.2 Personal care	104	99	109	108	100	98	106	87	111
5.1 Vehicles	104	91	98	109	100	105	94	105	124
5.2 Public transportation	-	-	-	-	100	-	-	-	-
6.1 Recreation	91	90	97	110	100	87	88	86	109
6.2 Reading and education	61	66	63	67	100	74	65	62	83
7.1 Tobacco & alcohol	100	101	101	102	100	100	101	100	104

* All the rounding was done only for the purpose of presentation here. More significant figures were used for the next steps in weighting.

A/ Prices were not collected.

The unit given is a "stop" instead of some specified distance, in kilometres for example. Since there is not even one single series which is reliable enough to represent the whole subgroup, we have decided to leave this subindex out of the transportation index altogether. Unfortunately, public transportation expenditures form 70% of the total transportation index while vehicles (5.1) form only 30%.

The indices for the seven major commodity groups are presented in Table 2. For food and beverages the indices for the four different months are given as well as their average. These monthly food indices are combined with the other indices for major commodity groups to generate four sets of consumer price indices by region, in addition to the set based on the average values for food price indices.

There are three major conclusions to be drawn from these price indices. First of all, it has been shown that seasonal variations are not of any significance. Even though food prices fluctuate over the course of the year, the pattern of relative prices across region does not change much. Food prices are the least stable of all prices, so that having examined these in detail for four different months of the year and found the same pattern emerging, we are confident that our conclusion that the total price indices bear roughly the same relationship to each other throughout the year is quite robust.

Secondly, there are some significant differences in the price level by region. For the average series of the total price index, we see that the North and Centre & East have price levels similar to

Table 2

Consumer Price Indices by Major Commodity Groups, 1970

Major group \ Region	URBAN					RURAL				
	North	Centre & East	North-east	South	Bangkok-Thonburi	North	Centre & East	North-east	South	Expenditure Weight
1. Food and Beverages	98	95	109	107	100	105	92	107	111	.4805
February	100	95	109	109	100	104	90	110	116	
May	99	95	106	104	100	109	89	108	112	
August	98	94	109	108	100	103	93	108	108	
November	98	95	111	106	100	103	95	105	110	
2. Clothing	87	86	86	95	100	77	90	81	100	.0307
3. Housing	127	119	128	143	100	116	128	130	154	.1915
4. Health & Personal care	81	75	94	84	100	82	97	67	88	.0719
5. Transportation	104	91	98	109	100	105	94	105	124	.0606
6. Recreation, Reading and Education	79	80	83	93	100	82	79	76	88	.0556
7. Tobacco & Alcohol	100	101	101	102	100	100	101	100	104	.0490
Total Price Index	101	96	107	110	100	101	99	104	116	1.0000
February	101	96	107	111	100	101	98	105	118	
May	101	97	106	109	100	103	97	104	116	
August	100	96	107	111	100	100	99	104	114	
November	101	96	108	110	100	101	100	103	115	

Bangkok-Thonburi, having indices of 101 and 96 for urban areas and 101 and 99 for rural areas respectively when Bangkok-Thonburi is taken as 100. Northeastern prices are 7% higher in urban areas and 4% higher in rural areas than Bangkok-Thonburi. The Southern region has the highest prices, as much as 10% higher than Bangkok-Thonburi in urban areas and 16% higher in rural areas. The differences in price levels can be attributed in part to food prices which roughly set the pattern for the overall price level since their expenditure weight is 48% of the total.

Compared with Bangkok-Thonburi, the nonfood price indices are sometimes higher and sometimes lower for the other regions. Housing is more expensive in the provinces and since this has an expenditure weight of 19%, it tends to raise the overall indices, especially in the South. Clothing, health and personal care, recreation, reading and education are, however, cheaper outside Bangkok-Thonburi. Tobacco and alcohol have roughly the same price level everywhere.

Thirdly, contrary to expectation, the urban/rural price differential is very small. That is, even though there are significant regional variations, within each region urban and rural price indices are very similar. In the North they are exactly the same, the higher food prices in rural areas being compensated for by cheaper nonfood items. In the Northeast rural prices are a little lower than urban prices because of cheaper nonfood as well as food prices, whereas in the Centre & East they are somewhat higher on account of higher prices for nonfood items. The only

major urban/rural price differential is found in the South where the urban index is 110 while the rural index is as high as 116, which is due to higher prices for both food and nonfood commodities in the rural areas.

Summary and Conclusion

Table 3 gives regional price indices for food, nonfood and all items. Our work indicates that seasonal variations in the pattern of relative prices are very small, and the price indices presented here can be taken as applicable generally.

Table 3

Regional Consumer Price Indices for Thailand, 1970

	Urban					Rural				Expenditure Weight
	N	C&E	NE	S	B-T	N	C&E	NE	S	
Food	98	95	109	107	100	105	92	107	111	.4805
Nonfood	103	98	105	113	100	98	105	101	120	.5195
Total	101	96	107	110	100	101	99	104	116	1.0000

The consumer price indices obtained show that there are significant differences in the consumer price levels across region, but that these are minor compared with the experience of other less developed countries. Within any one region, the urban/rural differential in prices is small.

Appendix A

Locations Where Prices were Collected

	Municipal		Nonmunicipal	
Region	Amphur	Changwad	Amphur	Changwad
North:	Muang	Nakhon Sawan	Ko Kha	Lampang
	Muang	Phetchaboon		
	Phayao	Chiang Rai		
	Muang	Chiang Mai		
Centre & East:	Muang	Lopburi	Bang Pa-in	Phra Nakhon Si Ayutthaya
	Muang	Samutsakhon	Klaeng	Rayong
	Muang	Kanchanaburi		
	Muang	Chonburi		
Northeast:	Muang	Nakhon Ratchasima	Mukdahan	Nakhon Phanom
	Muang	Khon Kaen	Chom Phra	Surin
	Muang	Udon Thani		
	Warin Chamsap	Ubon Ratchathani		
South:	Hat Yai	Songkhla	Ra-ngae	Narathiwat
	Muang	Krabi		
	Muang	Ranong		

Appendix B

Number of Items Used and the Corresponding Weights in the Consumer Price Index

Item	Number of items used	Number of items omitted	Total Number of items	Weight of items used	Weight of items omitted	Total Weight
I. Food and Beverages	84	9	93	.931	.069	1.000
1.1 Rice cereals and flour products	7	-	7	1.000	-	1.000
1.2 Meats, poultry and fish						
1.2.1 Meat	11	-	11	1.000	-	1.000
1.2.2 Poultry	3	-	3	1.000	-	1.000
1.2.3 Fish and sea food	16	-	16	1.000	-	1.000
1.3 Vegetables and fruits						
1.3.1 Vegetables	20	-	20	1.000	-	1.000
1.3.2 Fruits and berries	6	4	10	.533	.467	1.000
1.4 Eggs and milk products	5	-	5	1.000	-	1.000
1.5 Other food bought in market	8	2	10	.940	.060	1.000
1.6 Nonalcoholic beverages	6	3	9	.526	.474	1.000
1.7 Prepared food	2	-	2	1.000	-	1.000
II. Clothing	46	6	52	.906	.094	1.000
2.1 Men's and boy's clothing	17	2	19	.939	.061	1.000
2.2 Women's and girl's clothing	16	3	19	.847	.153	1.000
2.3 Cloth and sewing services	13	1	14	.910	.090	1.000
III. Housing	35	6	41	.901	.099	1.000
3.1 Shelter	5	1	6	.858	.142	1.000
3.2 Furniture and equipment	13	2	15	.715	.285	1.000

Appendix B

(Continued)

Item	Number of items used	Number of items omitted	Total Number of items	Weight of items used	Weight of items omitted	Total Weight
3.3 Paper and cleaning supplies	6	1	7	.869	.131	1.000
3.4 Household textiles	5	1	6	.619	.381	1.000
3.5 Household operation	6	1	7	.948	.052	1.000
IV. Health & Personal care	19	3	22	.953	.047	1.000
4.1 Medical care	7	3	10	.905	.095	1.000
4.2 Personal care	12	-	12	1.000	-	1.000
V. Transportation	4	6	10	.268	.732	1.000
5.1 Vehicles	4	2	6	.728	.272	1.000
5.2 Public transportation	-	4	4	-	1.000	1.000
VI. Recreation, Reading and Education	11	-	11	1.000	-	1.000
6.1 Recreation	4	-	4	1.000	-	1.000
6.2 Reading and education	7	-	7	1.000	-	1.000
VII. Tobacco & Alcohol	3	-	3	1.000	-	1.000
Total	202	30	232	.888	.112	1.000

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Regional Consumer Price Indices for Thailand

by

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Introduction

The purpose of this brief note is to report the results obtained in the construction of consumer price indices by region and location for Thailand, as well as some of the problems encountered, thereby making explicit the limitations of the indices presented here.

In our work on income distribution in Thailand the need for consumer price indices by region and location became very apparent. Without adjusting for prices, the income differentials between regions would be distorted, the actual direction of the distortion being unknown. Even more serious is the fact that the disparity in incomes between rural and urban areas would be exaggerated, if it should turn out as commonly expected that the cost of living in rural areas is substantially lower than that in urban areas. Short of constructing consumer price indices by region and location it is impossible to say how serious the problem is, and this seems to be a rationale in itself for the whole exercise.

Once the regional consumer price indices have been obtained, they can be used in a number of ways. In general, regional comparisons of income stand to benefit from some adjustment for the price level. For our own purposes the indices are essential for a study on income distribution for at least two reasons. First, regardless of the method used, in any decomposition of total income inequality the contributions of region and location are distorted without the adjustment, since the total inequality index necessarily depends on the average income levels

by region and location. Second, in terms of making a comparison of the standard of living by region or location, for instance by making use of such a measure as family income per capita, the comparison is necessarily invalid without price adjustments, the problem being more serious the larger is the price differential between two regions or locations in relation to the income disparity under consideration. In addition, some cost-of-living adjustment is desirable in any work on migration, to the extent that otherwise the attraction of a higher money income in the city or in some other region does not correctly reflect the real income gain facing a potential migrant.

Existing Consumer Price Indices

The Department of Commercial Intelligence of the Ministry of Economic Affairs has been collecting data on prices since 1960.[1/] Using family expenditure figures collected in the Household Expenditure Survey by the National Statistical Office in 1962/3, the Department has been able to calculate consumer price indices for Bangkok-Thonburi and the five regions of Thailand, the Northeast, North, East, Centre and South. The indices are reported, for example, in the Bank of Thailand Monthly Bulletin.

The price indices constructed by the Department of Commercial Intelligence appear as indices over time, one for each of the six regions

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1/ However, the price data did not become available for the whole Kingdom until October, 1964.

and with October 1964 - September 1965 as the base year in each case.[2/] These cannot easily be converted to give a comparison of the level of prices across all regions at any point in time. On the face of it, if we could only get the relative price indices for one of the years, say the base year, then the time-series data could be converted such as to reflect price differentials across regions for every year.

The problem, however, is that the quantity weights which are appropriate for the time-series case are inappropriate for the cross-section case. From the Household Expenditure Survey, the Department of Commercial Intelligence has obtained what amounts to quantity weights corresponding to each region, and these have been used, correctly so, to get a series of consumer price indices over time by region. Thus we are able to compare the price of a 'typical' basket of commodities consumed by a household in a particular region as the prices of the individual commodities change over time. It will thus be noted that at any point in time the quantity weights used to combine the prices are different by region. This is as it should be: each of the regional indices is concerned only with one region whose weights must be used in the construction of its price index each year.

But in order for a cross-country comparison of prices to be made, we need to know the price of the same basket of commodities purchased in different regions at the same point in time. This involves selecting one

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2/ The base year (1962=100) was later shifted to October 1964-September 1965 = 100, but the 1962/3 weights are still being used.

region as the base region and using its quantity weights to construct the price indices for all the regions. It follows then that there is no painless way of going from the existing time-series price indices to the cross-section indices. The raw prices must be recombined in such a way that the weights used are identical for every region concerned.

The consumer prices collected by the Department of Commercial Intelligence are usually for urban areas alone and thus only urban price indices are calculated and published. However, between 1966 and 1970, prices were collected for both municipal and nonmunicipal areas for all regions. Since then the collection of nonmunicipal or rural prices has been suspended and apparently will only be resumed after new consumer expenditure weights become available from the Household Expenditure Survey to the conducted by the National Statistical Office in 1975. It is fortunate that for the brief period between 1966 and 1970 we have some basis for comparing prices by urban/rural location as well as by region.

Method

Our objective is merely to utilize the existing information in constructing the regional consumer price indices. Thus we accept without question price and expenditure data supplied by the Department of Commercial Intelligence.[3/] Moreover, we make no attempt to grapple with the theoretical problems encountered in index-number theory. We simply follow the usual procedure of constructing indices, also employed by the Department

3/ The Department of Commercial Intelligence staff were very helpful in supplying the data and answering questions concerning them.

of Commercial Intelligence.[4/]

The price index for any region R is given by

$$P^R = \frac{\sum_{i=1}^{n} Q_i^o P_i^R}{\sum_{i=1}^{n} Q_i^o P_i^o} \cdot 100$$

where Q_i^o is the quantity of commodity i consumed in the base region,

P_i^o is the price of commodity i in the base region,

P_i^R is the price of commodity i in region R

and n is the number of commodities in the price index.

The index P^R can be rewritten in terms of relative prices to involve expenditure weights instead of quantity weights:

$$P^R = \frac{\sum_{i=1}^{n} Q_i^o P_i^o \left(\frac{P_i^R}{P_i^o}\right)}{\sum_{i=1}^{n} Q_i^o P_i^o} \cdot 100 = \sum_{i=1}^{n} \frac{Q_i^o P_i^o}{\sum_{i=1}^{n} Q_i^o P_i^o} \cdot \left(\frac{P_i^R}{P_i^o}\right) \cdot 100$$

This formula is the more convenient one to use in actual practice. The following steps are taken in the calculation:

4/ See, for example, Consumer Price Index for Bangkok-Thonburi, Department of Commercial Intelligence, Bangkok, 1965.

1. The absolute prices of commodities appearing in the consumers' goods basket are collected for a point in time for all regions.

2. Bangkok-Thonburi is taken as the base region and the regional absolute prices are converted to relative prices with Bangkok-Thonburi taken as 100 for each of the individual commodities.

3. Within each commodity subgroup of the seven major commodity groups, expenditure weights for Bangkok-Thonburi are calculated.[5/] The relative prices belonging to each subgroup are weighted to give a price index for the subgroup applying to each of the regions.

4. Using expenditure weights within each major commodity group the subindices are combined to give indices for the seven major groups by region.

5. Finally, the weights of the major commodity groups in total expenditure are used to combine the major indices into an overall price index for each region.

Some Problems in the Construction of Consumer Price Indices

Most of the problems were encountered when absolute prices were compared by region. In general, it is desirable to include as many commodities as possible since an index is less reliable if it is based on

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5/ The weights are taken from table A-6 (Items Included in the Index Calculation and Their Weights as of January 1964) in Consumer Price Index for Bangkok-Thonburi, Department of Commercial Intelligence, Ministry of Economic Affairs, Bangkok, 1965, pp. 176-192.

fewer items, the price behaviour of which may not reflect the whole group they represent.

The Department of Commercial Intelligence has done quite a respectable job of selecting goods to represent each of the subgroups. On the whole the same items appear in both locations of all regions for the period 1966-1970. However, since the prices are collected for the purpose of constructing price indices over time, some of the commodities are not comparable across region. Such incomparability does not in any way affect the time-series results as long as within each region the data are comparable over time, which seems to be the case. Some of the problems met are discussed below.

1. Units Where identical items appear but with different units an attempt is made to adjust the prices to correspond to the same unit in order to avoid having to leave out the price series altogether. For example, soda water comes in litres in all regions except the Northeast where it comes in bottles. Using the fact that a standard bottle of soda water contains 440 c.c. or .44 litres we are able to get the litre price for the Northeast. In some cases it is not possible to make the price data comparable. For example, bus fares in different regions refer to different, but unspecified, distances so that the figures cannot be converted to the same unit.

2. Quality Where, as in the above cases, the unit problem is obvious our task is easier than when we merely suspect the problem. For example, face powder is given in grams for all regions, but the prices

for the Northeast and Centre & East are so out of line with the rest that we cannot accept the figures. Here we face the problem of apparently identical units but with the units probably meaning somewhat different things in different regions. Manufactured products suffer from this a great deal, whereas foodstuffs do not. This is to be expected since there is much more variation possible with manufactured goods which are nominally the same. This is in spite of the effort on the part of the Department of Commercial Intelligence to ensure that identical commodities enter in the price index calculation. In a large number of cases brand names have been specified: "Fab" for soap powder, "Pepsi-Cola" for soft drinks, and so on. Other items are more troublesome and the problem can be grouped under "quality differences". For instance, with a number of clothing items it is suspected that regional price variations reflect differences in the quality or type of the products.

As a general rule, we try to keep as many commodities in the index as possible, omitting only those which we think are definitely wrong. The omission may involve either some or all of the regions, the latter case occurring when the price data for the other regions seem incompatible with the Bangkok-Thonburi figure.

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In all three cases, whether a price is unavailable or has been omitted on the grounds of incomparable unit or quality, the expenditure weights are adjusted so that the remaining commodities make up the total basket, either at the subgroup or major group level. At each level of aggregation, the weights sum to unity. The advantage of weighting the prices in steps lies precisely in its treatment of missing data. Each missing price is here assumed to behave in a similar fashion to the index of the subgroup to which it belongs. If the weighting is done in just one giant step the assumption would be that the overall price index reflects accurately all the missing prices. Since the items are grouped in such a way that closely related goods appear in the same subgroup it seems more reasonable to assume that the prices of the missing commodities follow the price index of the subgroup rather than the overall regional price index. Needless to say, if the price information were complete, then whether the weighting is carried out in stages or not would have no effect whatsoever on the final results.

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1966-1970, and of these the data were incomplete except for the year 1970. We have therefore chosen to construct regional consumer price indices for this year. The relationship between regional price levels is expected to be quite stable over such a short period for which nonmunicipal prices were collected, so that it does not matter very much which year is in fact selected.[6/]

For 1970 prices are available for four regions, the Northeast, Centre & East, Northeast and South, for both municipal and nonmunicipal areas, as well as for the Bangkok-Thonburi municipality.[7/] Altogether 232 price items were collected, of which 202 were eventually used in the construction of the indices. The remaining items were eliminated because of problems involving the units used, quality differences or missing data. The combined weight of the items included is 89% of the total so that the indices obtained should be a fairly good reflection of the true indices, had there been no problems of data comparability.[8/]

Some differences might be expected in the price variations across regions for different times of the year. However, these should not be serious for nonfood items for which prices are relatively stable. In order to be sure that we are not biasing the results by picking a nonrepresentative month, while at the same time to avoid having to calculate

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6/ In preliminary calculations in which urban price indices were constructed for 1965 and 1969, only minor differences were found in the pattern of regional price differentials.

7/ Appendix A lists the districts in each region for which the prices were collected.

8/ Appendix B lists the number of items and the weight, both used and omitted, associated with each commodity subgroup.

average prices for the whole year which would be very time-consuming, we use four price series for food items but only one for nonfood items. Food prices are collected on a weekly basis and we average the weekly figures to get four monthly price series. The four months are February, May, August and November so that each of the quarters is represented. Thus we generate four food price series at all levels of weighting. There is much less variation in the prices of the other major commodity groups. This is reflected in the fact that prices are collected on a monthly basis for clothing and for the remaining commodity groups only every three months. We use the price series for nonfood commodities for May and there should be no major differences in the pattern of prices across region if some other month had been picked.

Table 1 gives price indices for subgroups making up the major commodity groups for 1970. The Central and Eastern regions have been combined into one by the Department of Commercial Intelligence.

The subindex which is most troublesome is public transportation (5.2). This is based on four individual price series and it is clear that the distances involved in different regions are not the same. The unit given is a 'stop' instead of some specified distance, in kilometres for example. Since there is not even one single series which is reliable enough to represent the whole subgroup, we have decided to leave this subindex out of the transportation index altogether. Unfortunately, public transportation expenditures form 70% of the total transportation index while vehicles (5.1) form only 30%.

Table 1

Consumer Price Indices by Commodity Subgroups, 1970*

Subgroup \ Region	URBAN					RURAL			
	North	Centre & East	North-east	South	Bangkok-Thonburi	North	Centre & East	North-east	South
1.1 Rice cereals and flour products	86	91	86	84	100	84	94	112	76
1.2 Meat, poultry and fish									
1.2.1 Meat	89	97	100	94	100	91	96	89	102
1.2.2 Poultry	88	90	93	86	100	A/	98	98	95
1.2.3 Fish and sea food	112	95	113	99	100	134	98	112	82
1.3 Vegetables and fruits									
1.3.1 Vegetables	97	94	105	113	100	107	85	117	123
1.3.2 Fruits and berries	96	84	104	67	100	88	78	109	63
1.4 Eggs and milk products	102	100	101	94	100	116	90	108	86
1.5 Other food bought in market	115	107	136	125	100	129	100	125	126
1.6 Nonalcoholic beverages	122	109	123	122	100	125	96	130	143
1.7 Prepared food	96	91	121	133	100	100	86	100	150
2.1 Men's and boy's clothing	82	74	85	98	100	72	80	80	100
2.2 Women's and girl's clothing	90	91	85	86	100	80	91	78	99
2.3 Cloth and sewing services	93	106	89	102	100	84	111	86	99

Table 1 (continued)

Subgroup \ Region	URBAN					RURAL			
	North	Centre & East	North-east	South	Bangkok-Thonburi	North	Centre & East	North-east	South
3.1 Shelter	107	72	106	118	100	109	108	114	112
3.2 Furniture and equipment	97	114	81	116	100	80	78	81	130
3.3 Paper and cleaning supplies	91	104	108	98	100	92	100	103	107
3.4 Household textiles	97	97	81	91	100	55	82	75	112
3.5 Household operation	148	154	150	170	100	128	150	149	193
4.1 Medical care	58	51	80	59	100	66	38	46	66
4.2 Personal care	104	99	109	108	100	98	106	87	111
5.1 Vehicles	104	91	98	109	100	105	94	105	124
5.2 Public transportation	-	-	-	-	100	-	-	-	-
6.1 Recreation	91	90	97	110	100	87	88	86	105
6.2 Reading and education	61	66	63	67	100	74	65	62	63
7.1 Tobacco & alcohol	100	101	101	102	100	100	101	100	104

* All the rounding was done only for the purpose of presentation here. More significant figures were used for the next steps in weighting.

A/ Prices were not collected.

The indices for the seven major commodity groups are presented in Table 2. For food and beverages the indices for the four different months are given as well as their average. These monthly food indices are combined with the other indices for major commodity groups to generate four sets of consumer price indices by region, in addition to the set based on the average values for food price indices.

There are three major conclusions to be drawn from these price indices. First of all, it has been shown that seasonal variations are not of any significance. Even though food prices fluctuate over the course of the year, the pattern of relative prices across region does not change much. Food prices are the least stable of all prices, so that having examined these in detail for four different months of the year and found the same pattern emerging, we are confident that our conclusion that the total price indices bear roughly the same relationship to each other throughout the year is quite robust.

Secondly, there are some significant differences in the price level by region. For the average series of the total price index, we see that the North and Centre & East have price levels similar to Bangkok-Thonburi, having indices of 101 and 96 for urban areas and 101 and 99 for rural areas respectively when Bangkok-Thonburi is taken as 100. North-eastern prices are 7% higher in urban areas and 4% higher in rural areas than Bangkok-Thonburi. The Southern region has the highest prices, as much as 10% higher than Bangkok-Thonburi in urban areas and 16% higher in rural areas. The differences in price levels can be attributed in part to food prices which roughly set the pattern for the overall price

Table 2

Consumer Price Indices by Major Commodity Groups, 1970

Major group \ Region	URBAN					RURAL				
	North	Centre & East	North-east	South	Bangkok-Thonburi	North	Centre & East	North-east	South	Expen-diture Weignt
1. Food and Beverages	98	95	109	107	100	105	92	107	111	.4805
February	100	95	109	109	100	104	90	110	116	
May	99	95	106	104	100	109	89	108	112	
August	98	94	109	108	100	103	93	108	108	
November	98	95	111	106	100	103	95	105	110	
2. Clothing	87	86	86	95	100	77	90	81	100	.0907
3. Housing	127	119	128	143	100	116	128	130	154	.1915
4. Health & Personal care	81	75	94	84	100	82	97	67	88	.0719
5. Transportation	104	91	98	109	100	105	94	105	124	.0608
6. Recreation, Reading and Education	79	80	83	93	100	82	79	76	88	.0556
7. Tobacco & Alcohol	100	101	101	102	100	100	101	100	104	.0490
Total Price Index	101	96	107	110	100	101	99	104	116	1.0000
February	101	96	107	111	100	101	98	105	118	
May	101	97	106	109	100	103	97	104	116	
August	100	96	107	111	100	100	99	104	114	
November	101	96	108	110	100	101	100	103	115	

level since their expenditure weight is 48% of the total.

Compared with Bangkok-Thonburi, the nonfood price indices are sometimes higher and sometimes lower for the other regions. Housing is more expensive in the provinces and since this has an expenditure weight of 19%, it tends to raise the overall indices, especially in the South. Clothing, health and personal care, recreation, reading and education are, however, cheaper outside Bangkok-Thonburi. Tobacco and alcohol have roughly the same price level everywhere.

Thirdly, contrary to expectation, the urban/rural price differential is very small. That is, even though there are significant regional variations, within each region urban and rural price indices are very similar. In the North they are exactly the same, the higher food prices in rural areas being compensated for by cheaper nonfood items. In the Northeast rural prices are a little lower than urban prices because of cheaper nonfood as well as food prices, whereas in the Centre & East they are somewhat higher on account of higher prices for nonfood items. The only major urban/rural price differential is found in the South where the urban index is 110 while the rural index is as high as 116, which is due to higher prices for both food and nonfood commodities in the rural areas.

Summary and Conclusion

Table 3 gives regional price indices for food, nonfood and all items. Our work indicates that seasonal variations in the pattern of relative prices are very small, and the price indices presented here can be taken as applicable generally.

Table 3

Regional Consumer Price Indices for Thailand, 1970

	Urban					Rural				Expenditure Weight
	N	C&E	NE	S	B-T	N	C&E	NE	S	
Food	98	95	109	107	100	105	92	107	111	.4805
Nonfood	103	98	105	113	100	98	105	101	120	.5195
Total	101	96	107	110	100	101	99	104	116	1.0000

The consumer price indices obtained show that there are significant differences in the consumer price levels across region, but that these are minor compared with the experience of other less developed countries. Within any one region, the urban/rural differential in prices is small.

Appendix A

Locations Where Prices were Collected

	Municipal		Nonmunicipal	
Region	Amphur	Changwad	Amphur	Changwad
North:	Muang	Nakhon Sawan	Ko Kha	Lampang
	Muang	Phetchaboon		
	Phayao	Chiang Rai		
	Muang	Chiang Mai		
Centre & East:	Muang	Lopburi	Bang Pa-in	Phra Nakhon Si Ayutthaya
	Muang	Samutsakhon	Klaeng	Rayong
	Muang	Kanchanaburi		
	Muang	Chonburi		
Northeast:	Muang	Nakhon Ratchasima	Mukdahan	Nakhon Phanom
	Muang	Khon Kaen	Chom Phra	Surin
	Muang	Udon Thani		
	Warin Chamsap	Ubon Ratchathani		
South:	Hat Yai	Songkhla	Ra-ngae	Narathiwat
	Muang	Krabi		
	Muang	Ranong		

Appendix 3

Number of Items Used and the Corresponding Weights in the Consumer Price Index

Item	Number of items used	Number of items omitted	Total Number of items	Weight of items used	Weight of items omitted	Total Weight
I. Food and Beverages	84	9	93	.931	.069	1.000
1.1 Rice cereals and flour products	7	-	7	1.000	-	1.000
1.2 Meats, poultry and fish						
1.2.1 Meat	11	-	11	1.000	-	1.000
1.2.2 Poultry	3	-	3	1.000	-	1.000
1.2.3 Fish and sea food	16	-	16	1.000	-	1.000
1.3 Vegetables and fruits						
1.3.1 Vegetables	20	-	20	1.000	-	1.000
1.3.2 Fruits and berries	6	4	10	.533	.467	1.000
1.4 Eggs and milk products	5	-	5	1.000	-	1.000
1.5 Other food bought in market	8	2	10	.940	.060	1.000
1.6 Nonalcoholic beverages	6	3	9	.526	.474	1.000
1.7 Prepared food	2	-	2	1.000	-	1.000
II. Clothing	46	6	52	.906	.094	1.000
2.1 Men's and boy's clothing	17	2	19	.939	.061	1.000
2.2 Women's and girl's clothing	16	3	19	.847	.153	1.000
2.3 Cloth and sewing services	13	1	14	.910	.090	1.000
III. Housing	35	6	41	.901	.099	1.000
3.1 Shelter	5	1	6	.858	.142	1.000
3.2 Furniture and equipment	13	2	15	.715	.285	1.000

Appendix B

(Continued)

Item	Number of items used	Number of items omitted	Total Number of items	Weight of items used	Weight of items omitted	Total Weight
3.3 Paper and cleaning supplies	6	1	7	.869	.131	1.000
3.4 Household textiles	5	1	6	.619	.381	1.000
3.5 Household operation	6	1	7	.948	.052	1.000
IV. Health & Personal care	19	3	22	.953	.047	1.000
4.1 Medical care	7	3	10	.905	.095	1.000
4.2 Personal care	12	-	12	1.000	-	1.000
V. Transportation	4	6	10	.268	.732	1.000
5.1 Vehicles	4	2	6	.728	.272	1.000
5.2 Public transportation	-	4	4	-	1.000	1.000
VI. Recreation, Reading and Education	11	-	11	1.000	-	1.000
6.1 Recreation	4	-	4	1.000	-	1.000
6.2 Reading and education	7	-	7	1.000	-	1.000
VII. Tobacco & Alcohol	3	-	3	1.000	-	1.000
Total	202	30	232	.888	.112	1.000