

# STRUCTURAL CHANGES IN THE DEMAND FOR FOOD IN ASIA

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Many Asian countries are expected to undergo transformations in their economies and rapid urbanization over the next 25 years. The changes in tastes and lifestyles engendered by urban living are likely to have significant influences on food demand—influences perhaps as strong as the well-documented effects of household incomes and food prices. Changes in marketing systems and occupations, closely linked with increasing gross national product (GNP) per capita, also may influence the demand for food.

## POSSIBLE CAUSES OF STRUCTURAL SHIFTS IN DIET

Direct per capita consumption of cereals as a staple food has declined over the past three decades in the rapidly growing economies of Japan, Korea, and Taiwan, while consumption of meat, fish, and dairy products has increased dramatically. Typically, economists have explained such changes in Asian food consumption patterns primarily as resulting from increases in disposable income and changes in food prices.

There is no question that household income and food prices strongly affect food consumption. This is well substantiated in the economics literature. Nevertheless, in projecting food demand patterns over the long run, particularly in economies undergoing rapid structural transformation and urbanization, changes in tastes, lifestyles, occupations, and marketing systems may also strongly influence food demand. Because most previous demand studies have ignored these structural shifts, the effects of income on food demand have been overestimated.

Because structural shifts are strongly correlated with increasing GNP per capita, it is difficult to separate the two effects empirically in time-series estimations. Unfortunately, methodologies for measuring the effects of structural shifts are not as well developed as those for measuring income and price effects.

As populations move from rural to urban areas, structural shifts in food demand patterns may occur for a number of reasons:

- A wider choice of foods is available in urban markets.
- People are exposed to a variety of dietary patterns from foreign cultures.
- Urban lifestyles place a premium on foods that require less time to prepare.
- Transaction costs are lower. Urban residents typically do not grow their own food and do not face the potentially high-cost alternative of selling one food at the low farm-gate price to buy another food at a high retail price, a choice faced by semi-subsistence producers.

- Urban occupations are more sedentary than rural ones, requiring fewer calories to maintain body weight.

While changes in food demand patterns that cannot be attributed to increases in household incomes and changes in food prices may first be noticed in urban areas, as structural transformation proceeds to a more advanced level, these same shifts in food demand patterns eventually will occur in rural areas as well. At some point, market availability and lifestyles in urban and rural areas become virtually indistinguishable.

## TAIWAN HOUSEHOLD EXPENDITURE SURVEYS

Average diets may change dramatically in countries experiencing rapid economic growth and structural transformation. Between 1959–61 and 1989–91, per capita rice consumption in Taiwan declined by one-half, meat consumption quadrupled, fruit consumption increased five times, and fish consumption doubled (Table 1). Consumers are substituting foods such as meat, fish, and fruit for staple foods such as rice, so that they now obtain a substantial share of their calories from nonstaple foods. To what extent are these changes in food consumption patterns explained by rising incomes and lower food prices, and to what extent by structural shifts in demand for food?

A comparison across like expenditure groups of food consumption in cities, towns, and villages in Taiwan in 1981 and 1991 indicates that rice consumption is lower in urban areas, while meat and fruit consumption is higher. These differences presumably are due to structural effects on demand after urban-rural price differentials are controlled.

For example, in cities in Taiwan in 1981, rice consumption was about the same for all expenditure quintiles, although slightly increasing (Figure 1). In villages in 1981, rice consumption for each quintile was higher than that in cities

Table 1—Per capita annual food consumption, Taiwan, 1940–92

Period	Rice	Wheat	Sweet Potato	Meat	Fish	Fruit
(kilograms per capita per year)						
1940–44	109	0	91	11	10	27
1949–51	133	7	66	13	12	16
1959–61	137	22	62	16	23	20
1969–71	136	25	24	25	33	43
1979–81	105	24	4	40	38	72
1989–91	68	29	2	62	45	108
1992	64	29	2	66	42	100

Source: Taiwan, Council for Agricultural Planning and Development, various years.

and increased with higher incomes. Despite this apparent positive relationship between incomes and rice consumption, and although income rose markedly in Taiwan between 1981 and 1991 and real prices did not change, average per capita rice consumption *declined* sharply between these years (Table 1). Figure 1 shows that rice consumption dropped substantially for each expenditure quintile in *both* cities and villages, indicating that structural shifts have occurred *within* cities and villages at the same time as rural to urban migration was occurring.

More rigorous regression analysis, not reported in detail here, indicates that *within villages* (this analysis does not take into account the effect of rural to urban migration), structural factors accounted for 73 percent of the decline in rice consumption between 1981 and 1991, and 82 percent of the increase in fish consumption, 65 percent in fruit consumption, and 17 percent in meat consumption.

## PROVINCIAL DATA FROM CHINA

Analysis of provincial data from China shows similar results: consumption of grain, edible oil, vegetables, and beverages and tobacco is higher in rural areas, after differences in income and food prices are controlled. Meat, fish, dairy, and fruit consumption is higher in urban areas.

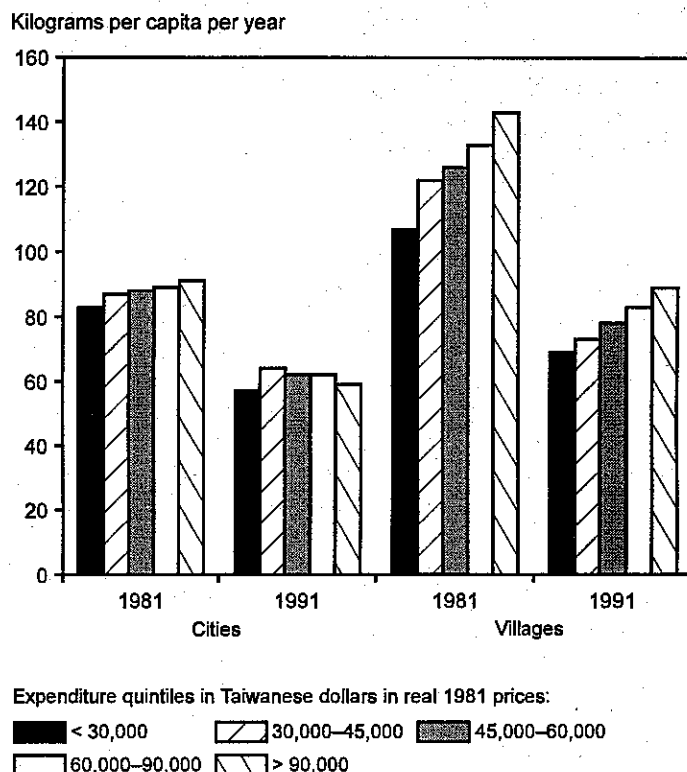
A rough calculation indicates that a one-time increase in the urban population from one-quarter to two-thirds of the national population of China would result in a 10 percent increase in per capita demand for meat, fish, and dairy products as a result of current structural differences in food demand patterns *between* rural and urban areas. While 10 percent may not seem like a large increase (in addition to the effects of rising incomes and perhaps falling prices), as Figure 1 for Taiwan demonstrates, structural shifts in food demand are probably occurring *within* rural and urban populations as well. The total additional demand, taking these concurrent shifts into account, would be much larger than 10 percent.

## POLICY IMPLICATIONS FOR 2020

Because urbanization is expected to proceed rapidly in a number of developing countries over the next several decades, projections of food demand need to take such structural changes into account. It is particularly important, from a global perspective, to understand these phenomena for countries with large populations such as China and India.

Existing income elasticity estimates from time-series data may be substantially biased for higher-income countries in Asia, such as Japan and Taiwan, because they measure both the effects of increased disposable income and structural shifts in demand for various foods. The crucial question for demand projections in these countries is at what point will these structural shifts slow down, and at what

**Figure 1—Per capita annual rice consumption by expenditure group, cities and villages, Taiwan, 1981 and 1991**



Source: Taiwan household expenditure surveys, 1981 and 1991.

Note: Boundaries for defining expenditure groups are kept constant in real terms between 1981 and 1991. Real rice prices remained constant between 1981 and 1991.

point will the upwardly biased estimates of income elasticities for meat, fish, and dairy products begin to overestimate future demand, while the downwardly biased estimates for rice begin to underestimate future demand?

Perhaps more important, in lower-income countries such as India and Indonesia, where meat consumption is presently quite low and structural transformation is in an early stage, time-series data for meat consumption will not reflect a possible impending upward structural shift in demand. Thus existing income elasticities will underestimate the demand for animal products if these structural changes in food demand do indeed materialize.

Relatively little is known about the specific reasons for these structural shifts. When, in the process of economy-wide structural adjustment, will they begin, accelerate, slow down, and perhaps stop? There is a need for further research to understand these underlying factors in order to assess accurately the future global demand for food. Such information in turn helps to guide long-term investments in production among various foods.

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