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ABSTRACT

To American and European economists in 1945, the countries of Asia were unpromising candidates for high economic growth. In 1950 even the most prosperous of these countries had a per capita income less than 25 percent of that of the United States. Between the mid-1960s and the end of the twentieth century, however, many of the countries of South and Southeast Asia experienced vigorous economic growth, some with growth rates far exceeding the previous growth rates of the industrialized countries. Forecasts that the region's population growth would outstrip its capacity to feed itself, and that its economic growth would falter, proved to be incorrect. Growth rates will probably continue at high levels in Southeast Asia for at least another generation. This forecast is based on 4 factors: the trend toward rising labor force participation rates, the shift from low to high productivity sectors, continued increases in the educational level of the labor force, and other improvements in the quality of output that are at present not accurately measured in national income accounts.

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High Performing Asian Economies: Retrospect and Prospect

In 1945, the idea of high performing Asian economies was not in the mind of American or European economists. In the United States economists worried about the problems created by the demobilization of 20 million people (half from military ranks and half from war industries) and their integration into the civilian labor force. There were widespread fears that America might slide into a severe new depression. In Europe the central issues turned around the Allied occupation of German and Italy and the restoration of the war-devastated economies. In Asia the central issues were the demilitarization of Japan and the restoration of the nations that had been occupied by Japan. On the horizon were problems related to the dismantling of the colonial empires of Britain, France, and other European powers.

Several events between 1945 and 1950 set the stage for the political economy of the remainder of the twentieth century. One was the outbreak of the cold war and the strategy of containing the expansionist ambitions of the Soviet Union. Another was the rapid recovery of Western Europe and the transformation of West Germany into an ally in the anti-communist coalition. A third was the communist victory in the Chinese civil war that followed the defeat of Japan. Still another important event was the partition of India into independent Hindu and Muslim nations. There was also the emergence of newly independent governments throughout South and Southeast Asia* that were each struggling to find its road to rapid economic growth.

As Table 1 shows, the countries of South and Southeast Asia were at different economic levels in 1950, at the beginning of this quest. Japan, an occupied nation, had

*As used in this paper, the term "Southeast Asia" applies to the first group of eight nations in Table 2.

suffered severe reversals in fortune and had slipped to a level of per capita income characteristic of a low-middle-income economy. Even the more prosperous Asian nations shown in Table 1 had a per capita income that was less than a quarter of that in the United States. In contrast, the war-ravaged economies of Europe were by 1950 already on their way to a quarter century of unprecedented economic growth that would raise standards of living, health, and life expectancy for ordinary people to levels that few would have predicted (Crafts and Toniolo 1996). Thus, the stage was set for intense debates among economists and policymakers about the way to deal with global disparities. Among the points at issue were the virtues of centralized and decentralized planning and whether international trade was a handmaiden of domestic economic growth or an obstacle to it.

It is also worth noting that by current standards the United States of 1950 was not a rich country, although it would have been classified at the top of the World Bank's category of "upper-middle-income" nations. France and the United Kingdom would also have fallen into the upper-middle-income category, but Germany and Italy would have been in the lower-middle income category, much closer to the more prosperous Asian nations than to the United States.

During the 1950s and 1960s economists were particularly interested in the relative progress of India and China. The political leadership of both countries was heavily influenced by the Soviet model of centralized planning. Both countries developed successive 5-year plans for economic growth of their countries. These plans sought rapid economic growth by placing special emphasis on the rapid development of heavy industry. Both taxed rural areas to subsidize cities and urban industries.

However, India sought to achieve its objectives under a political democracy, in which some industries would have government backing but the bulk of economic production and distribution would be left to the private sector. It also embarked on a protectionist policy aimed at promoting infant industries. New financial institutions were set up that placed the supply of capital largely under the control of the government, which directed investment into sectors given prominence by the plan. The first 5-year plan, which ran from 1951–1956, was successful in meeting its goals and private enterprise expanded. As indicated by Table 2, the annual rate of growth in per capita income during the plan was in the neighborhood of 2 percent. However, annual net investment was in the neighborhood of just 6 or 7 percent (Pepelases, Mears, and Adelman 1961; Malenbaum 1959, 1982).

By the early 1960s, the Indian economy began to stumble. Not all of the problems were due to errors by policymakers. Some problems arose from border clashes with Pakistan and China. Some of the food shortages were due to droughts. But the main pressure on the food supply was due to explosive growth of population as mortality rates fell sharply. As a result of the successful public health measures undertaken during the 1950s and 1960s, such killer diseases as cholera, malaria, and smallpox were brought under control, helping life expectancy at birth to rise from 32 to 51 years between 1950 and 1968 (Chandrasekhar 1968). Moreover, growth of per capita income also raised the demand for food, putting upward pressure on food prices that pinched both the urban and rural poor. Government efforts at land reform may actually have increased rural inequality (Mellor et al. 1968; Blyn 1971). Attempts at government controlled industrialization thwarted private investment and promoted uncompetitive enterprises

(Shenoy 1968, Sklaeiwitz 1966, 5 April 1971; Healy 1972; cf. Bhagwati and Chakravarty 1969). As a result, Indian growth slipped badly during the first half of the 1960s (see Table 2).

Although India and China were the cases most frequently discussed by economists, attention was also paid to other nations in Southeast Asia. During the 1960s, there was considerable pessimism about Indonesia's future. Although there was a spurt of economic growth immediately after independence, during which the nation recovered from the setbacks associated with the Japanese occupation, the economy stagnated between 1955 and 1965, a period long enough to make economists wonder if Indonesia could overcome its problems (Mears 1961). Beginning with the mid-1960s, however, the country began vigorous growth that lasted for three decades (see Table 2). Malaysia and Singapore also stagnated during the decade of the 1950s, contributing to the sense among some Western economists that adverse institutional factors might thwart their development. But in these countries fortunes changed decisively in the 1960s.

Table 2 shows that eight Southeast Asian nations all grew vigorously from 1965 on, and that several of them (China, Hong Kong, Taiwan and Thailand) had vigorous economic growth throughout the second half of the twentieth century. Indeed, their growth rates far exceeded the previous growth rates of the industrialized countries. Few American or European economists anticipated growth rates that would double, triple or quadruple the long-term rates of the industrial leaders between 1820 and 1950.

The most startling change of fortunes was in Japan. With outbreak of the Korean War, United Nations forces placed large orders with Japan, greatly stimulating its industrial growth. Even after the end of fighting, Japan's economy benefited from large

orders for the build-up of the U.S. military establishment in the Pacific region. The Japanese export boom powered the dramatic rise in the Japanese economy. In one industry after another, including scientific instruments, cameras, sewing machines, and shipbuilding, Japanese firms displayed their command of the latest technology. During the 1960s, Japan moved from the production of under a half million cars to the world's second largest supplier, displacing Germany and France, among others. The rise of auto production helped promote the expansion of steel and moved the country toward world preeminence in that basic product (Allen 1972). As Table 2 shows, from 1950 through 1970, the growth of Japanese per capita income exceeded that of all the other high performing economies. In the space of two decades Japanese per capita income increased by more than fivefold, a feat that had required more than a century for the nations that led the industrial revolution (Kuznets 1971; Maddison 1995). Although the growth of Japanese per capita income slowed after 1970, it still increased by about 40 percent between 1970 and 1980, making it the second largest economy in the world, bigger than France and the UK combined (Maddison 1995).

During the late 1960s and early 1970s, many analysts became alarmed at what appeared to be the unchecked growth of population in Asia. It was widely predicted that such growth would not only swamp the capacity of South and Southeast Asia to feed itself, but would also smother the tenuous economic growth of the region. In the 1950s, many demographers had predicted that population growth would moderate, because a decline in fertility would soon follow the decline in the death rate, which had caused the Asian population explosion. That view was called the theory of the demographic transition. But fertility rates remained high through the end of the 1960s, causing some

demographers to declare that the theory of the demographic transition was dead (Coale 1975).

At it turned out, that gloomy forecast was incorrect. As Table 3 shows, between 1970 and 1980, total fertility rates fell sharply in all Southeast Asian nations. Today all of these nations, except for Malaysia and Indonesia have total fertility rates below reproduction. Indeed, fertility rates in most of these nations are below the fertility rates of three of the five rich nations shown in Table 3.

The forecast that Southeast Asia would be unable to feed itself because of the unbridled growth of population also turned out be erroneous. Table 4 shows the food situation throughout South and Southeast Asia in 1961. Per capita consumption of calories in China, even after the famine, was at or below the level of consumption in England and France toward the end of the eighteenth century. The same desperate situation prevailed in India, Thailand, and Korea. By 2000 the food situation had changed dramatically. Despite the erroneous agricultural policies that precipitated the famine of 1960-1961, and again slowed agriculture during the "Cultural Revolution" of 1966–1967, China's progress in agriculture between 1962 and 2000 has been remarkable (Clark 1976). China not only found a way to feed itself, but did so well enough to increase its average daily consumption of calories by 73 percent, despite the near doubling of its population (cf. Lin 1998).

Although not as dramatic, there were also substantial gains in caloric consumption in the rest of South and Southeast Asia, ranging from 12 to 68 percent. Another point worth noting is the improvement in the quality of the diet, as indicated by the increase in the proportion of nutrients coming from animals. In China the rise was from under 4 to

over 19 percent of total caloric consumption. Only Indonesia and India still have levels of the consumption of animal products that hark back to eighteenth-century conditions in England and France. Still another problem is the unequal distribution of food in many of the nations of South and Southeast Asia. In these countries, the proportion of low birth weights is still high, which implies the early onset of chronic disabilities at middle and late ages, a problem that will contribute to the high cost of medical care for the elderly in future years (Barker 1998; Doblhammer and Vaupel 2001; Fogel 2003, 2004).

So far, I have focused on what has been accomplished in Southeast Asia to date, an accomplishment that has been hailed widely as an economic miracle. What about the future? Has the economic miracle run out of steam, as some analysts believe, or is there room for vigorous growth until 2030 and beyond? I believe that growth rates will continue at high levels in Southeast Asia for at least another generation. My forecast rests on three factors.

First, labor force participation rates will probably increase beyond current levels in most HPAEs. Both economic and demographic factors suggest that LFPR could rise to 60 percent or more. China is already near that level, so change in its LFPR will probably contribute little to its growth. However, given the large differences in labor productivity within sectors (see Table 5), shifts of labor from agriculture to services and industry and a small increase in the LFPR could account for 30 percent of the Chinese growth rate. In other words, labor productivity in China has to grow within sectors by about 5 percent per annum to produce a total growth rate in per capita income of 7 percent. Intersectoral shifts and increases in LFPR are also likely to account for between

a fifth and a third of the total growth of per capita income in other Southeast Asian economies.

Second, further increases in the education level of the labor force should add to labor productivity and economic growth. Table 6 shows gross enrollment ratios in 1980 and 1997 in primary, secondary, and tertiary schools. At the primary level most of the HPAEs have reached the educational levels of the rich countries. With the exception of South Korea, however, the HPAEs are still a quarter to a half below the enrollment levels in secondary schools attained by rich nations. The biggest gap is at the tertiary level where, except for South Korea, enrollment rates are generally less than a fifth of the U.S. level. Closing the educational gap will improve the quality of the labor force in the HPAEs, and will also permit them to move to the frontier of technological innovation. The growth in the number of highly trained professionals will not only speed up technological catch-up in the HPAEs, but will also increase the global pace of technological change. The greater the number of scientists trying to advance the frontier of knowledge in stem cell research, nanotechnology, genetic engineering, and information technology, the more rapid the advance in science and technology is likely to be.

Third, as HPAEs become rich, and as labor becomes concentrated in the service sector, errors in the measurement of national income become increasingly severe. Economists in the United States have identified this problem. It is now clear that many of the numbers I have presented for the United States badly underestimate U.S. economic growth because they do not take into account improvements in the quality of output, especially in such services as education and health-care. Children in secondary schools

are taught more today than post-graduate college students used to be taught a generation ago, let alone two generations ago.

Even more dramatic are the improvements in health care. A century and a half ago, people in their late thirties and early forties were more afflicted by chronic disabilities than people in their late sixties and early seventies are today. Not only has the average age of onset of disabilities been delayed by a decade or so, but once they appear, there are now numerous effective interventions. Hernias that used to be permanent and exceedingly painful conditions, afflicting one out of every four males, can now be repaired by a surgical procedure that in the U.S. requires hospitalization for only 23 hours. Other areas where medical interventions have been highly effective include genito-urinary conditions, control of hypertension and reduction in the incidence of stroke, replacement of knee and hip joints, curing of cataracts, and chemotherapies that reduce the incidence of osteoporosis and heart disease (Fogel 2004).

Yet most of these great advances in health care and education are overlooked in accounts of Gross Domestic Product (GDP), because the values of these sectors are measured by inputs instead of by output. An hour of a doctor's time is considered no more effective today than an hour of a doctor's time was half a century ago, before the age of antibiotics and modern surgery. It has recently been estimated that improvements in health care, if properly measured, are at least twice the cost of health care, but such calculations have not yet made their way into the GDP accounts (Cutler and McClellan 2001; Murphy and Topel 2003; Nordhaus 2003). In the case of the United States, my own rough estimates indicate that allowance for such factors as the increase in leisure time, the improvement in the quality of health care, and the improvements in the quality

of education would come close to doubling the U.S. annual growth rate of per capita income over the past century (from 2.0 to 3.6 percent per annum).

What is the implication of these statistics for the understanding of change in standards of living for the typical American? If we use the conventional measure of growth, the real income of the typical American in 2000 was seven times greater than it was in 1900. However, if the adjusted measure is used, Americans in 2000 had real incomes that are 34 times greater than in 1900. In other words, 80 percent of the goods and services that Americans enjoy today are outside of the measured economy.

I close with a final question. Suppose HPAEs are able to grow at 6 or 7 percent per capita per annum for another generation. Does that mean that technological leadership will pass from the West to Southeast Asia? My answer is, not necessarily. Since new technologies in the information, biomedical, genetic engineering, and energy production industries are driven by the level of basic scientific knowledge, the key issue is not only the speed with which the HPAEs will be able to develop a large cadre of advanced scientists. It also turns on how rapidly these scientists can discover the most promising uncharted frontiers of scientific research.

The American experience shows that scaling such heights is not an easy task. The United States began the process of rivaling Western Europe in natural science when it began establishing post-graduate research programs in the U.S., beginning about 1875. During the next quarter century it sent some of its most promising young scientists to Europe to study with the great masters in Germany, France, and Great Britain. That policy yielded some successes, as indicated by the occasional Nobel prizes awarded to Americans. Yet in such fields as physics and chemistry, the Europeans remained dominant down to the outbreak of

World War II. It was not until some of the European master-scientists emigrated to the United States, chased out of Europe by the Nazis, that the U.S. was able to gain the scientific dominance that it achieved during the second half of the twentieth century.

The conclusion I draw from that experience is that scientific training is still an artisanal craft that requires not just a few years of contact between the masters and students, but decades of patient interaction. It is not, of course, precluded that the HPAEs will do better than the U.S. did. Perhaps the old masters in the West will become too narrow in the range of issues they are willing to entertain and create new openings for younger minds. In any case, it will be interesting to see how the race for scientific excellence unfolds in the new millennium.

Table 1

A Comparison of the Per Capita Income of 15 Nations in 1950
(International Dollars of 1990)

China	439*
Hong Kong	2,218**
Indonesia	840**
Korea (South)	770**
Malaysia	1,559**
Singapore	2,219**
Taiwan	936**
Thailand	817**
India	619*
Japan	1,926**
France	5,270***
Germany	3,881**
Italy	3,502**
United Kingdom	6,907***
United States	9,561***

Source: Maddison 2001.

Rank by World Bank standards of 1990:
- * low-income
- ** lower-middle income
- *** upper-middle income

Table 2

Average Annual Percentage Rates of Growth in Per Capita Income 10 HPAEs Compared with 5 Rich Nations, by Quinquennia, 1950–2002

	1950–55	1955–60	1960–65	1965–70	1970–75	1975–80	1980–85	1985–90	1990–95	1995-2002
China	5.5	3.2	1.0	2.1	2.2	5.1	9.1	6.2	11.1	7.1
Hong Kong	3.5	3.5	9.0	3.4	4.2	8.9	4.0	6.7	3.1	1.4
Indonesia	3.3	0.7	-0.6	3.8	4.7	5.9	3.9	5.1	5.8	0.4
Korea (South)	6.5	1.0	3.2	8.6	10.1	5.4	6.5	7.8	6.4	3.9
Malaysia	-1.3	0.9	3.4	2.9	5.0	6.2	3.2	3.1	6.9	1.9
Singapore	1.2	-0.4	2.9	10.7	7.7	8.2	2.2	6.2	5.9	2.5
Taiwan*	6.0	3.7	6.6	7.7	6.0	8.3	6.7	3.9	5.6	3.9
Thailand	3.0	2.7	3.9	5.3	2.9	5.6	3.7	8.4	7.6	0.6
India	1.8	2.2	0.5	2.4	0.7	0.7	3.3	4.2	3.2	3.7
Japan	7.6	7.5	8.3	10.4	3.2	3.5	2.6	4.3	1.2	0.8
France	3.7	3.6	4.4	4.5	2.6	2.6	1.4	2.7	0.7	1.8
Germany	8.3	5.8	3.6	3.4	2.1	3.3	1.3	2.9	1.8	1.2
Italy	6.0	4.8	5.1	5.0	2.1	5.8	1.8	3.0	1.1	1.5
United Kingdom	2.5	2.0	2.4	2.0	1.9	2.1	1.8	3.1	1.3	2.1
United States	2.7	0.8	3.4	2.3	1.6	2.6	2.1	2.3	1.2	1.9

Sources: 1950–1975: Maddison 2001.
1975–2002: World Bank, World Development Indicators Online. See http://www.worldbank.org/data/wdi2004/index.htm.
*1950–1995: Maddison 2001.
*1995–2002: Asian Development Bank 2003a and 2003b.

Table 3

Secular Trends in Total Fertility Rates

	1950	1960	1970	1980	1990	2002
China	6.24	5.93	4.76	2.68*	2.10	1.88
Hong Kong	4.43	4.97#	3.49	2.06	1.27	0.96
Indonesia	5.49	5.42	5.10	4.10	3.04	2.32
Korea (South)	5.18	5.60	5.24	4.02	1.77	1.45
Malaysia	6.83	6.72	5.15	3.91	3.77	2.85
Singapore	6.41	5.43##	3.10	1.74	1.87	1.37
Taiwan	—	5.79	4.00	2.51	2.27	1.3
Thailand	6.62	6.42	5.01	3.52		1.80
India	5.97	5.81	5.43	4.75	3.80	2.92
Japan	3.30**	2.01	2.07	1.74	1.54	1.33
France	2.86**	2.80#	2.48	1.95	1.78	1.88
Germany (West)	2.10	2.41	2.01	1.46	1.45	1.35
Italy	2.40**	2.42#	2.38	1.64	1.26	1.25
United Kingdom	2.18	2.82	2.45	1.89	1.83	1.66
United States	3.08	3.65	2.47	1.84	2.08	2.10

Sources: Keyfitz and Flieger 1990; Population Reference Bureau (see http://www.prb.org/datafind/datafinder.htm; World Bank, World Development Indicators Online (see http://www.worldbank.org/data/wdi2004/index.htm).

* 1981 ** 1951
# 1961 ## 1962

Table 4

Trends in Caloric Consumption

	In calories per capita per day		Percentage increase	Percentage of calories from animals	
	1961	2000		1961	2000
China	1725*	2979	72.7	3.8	19.4
Hong Kong					
Indonesia	1727	2913	68.7	2.9	4.1
Korea (South)	2147	3093	44.1	2.7	15.0
Malaysia	2401	2917	21.5	10.5	17.8
Singapore					
Taiwan					
Thailand	1938	2459	26.8	8.8	11.7
India	2073	2489	20.1	5.5	7.9
Japan	2468	2753	11.5	9.6	20.5
France	3194	3597	12.6	31.7	37.7
Germany	2889	3505	21.3	32.7	30.0
Italy	2914	3663	25.7	15.5	25.5
United Kingdom	3240	3312	2.2	38.8	30.1
United States	2883	3814	32.3	35.1	27.4
World	2255	2805	24.4		

Source: FAOSTAT nutritional data, 2004 (http://apps.fao.org/default.jsp), using the "Food Balance Sheets" data collection.

* 1962

Table 5

Labor Productivity by Sector

	Distribution of the Labor Force in 2000			Value Added per Worker in 2000 in PPP Dollars 1995		
	A	I	S	A	I	S
China	50	22	28	448	3,205	1,534
Hong Kong	0	20	79	--	--	--
Indonesia	45	17	37	747	4,550	1,025
Korea	11	28	61	13,758	41,492	21,164
Malaysia	18	32	50	6,894	15,625	9,800
Singapore	0	34	65	--	55,852	53,307
Taiwan						
Thailand	49	19	32	847	10,241	6864

Sources: World Bank, World Development Indicators Online (see http://www.worldbank.org/data/wdi2004/index.htm); China Statistical Yearbook 2003.

A = agriculture
I = industry
S = services

Table 6

Gross Enrollment Ratios

	Primary School		Secondary School		Tertiary School		Age for Compulsory
	1980	1997	1980	1997	1980	1997	Attendance
China	113	123	46	70	2	6	7–15
Hong Kong	107	94	64	73	10	22	
Indonesia	107	113	20	56	4	11	7–15
Korea (South)	110	94	78	102	15	68	6–15
Malaysia	94	101	48	64	4	12	
Singapore							
Taiwan							
Thailand	99	87	35	58	5	21	6–14
India	83	100	30	49	5	7	6–14
Japan	101	101	93	103	31	41	6–15
France	111	105	85	111	25	51	6–16
Germany	—	104	—	104	27	47	6–18
Italy	103	101	72	95	27	47	6–14
United Kingdom	104	116	83	129	19	52	5–16
United States	99	102	91	97	56	81	6–16

Source: National Center for Education Statistics 2002.

Note: Gross enrollment ratios are equal to the total enrollment of all ages in the school level divided by the population of the specific ages that correspond to the specific age groups that correspond to the school level. Ratios may exceed 100 because of the students outside the relevant age range.

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