

Capital Deepening Along the Asian Pacific Rim

Jeffrey G. Williamson

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Jeffrey G. Williamson
Professor
Department of Economics
Harvard University

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A B S T R A C T

This paper suggests a research strategy for exploring the sources of growth along the Asian Pacific Rim over the past and the next quarter century.

The paper stresses the human resource and capital-deepening connection along the following lines: the positive impact of relatively egalitarian distributions on accumulation; the impact of dependency rates on conventional accumulation and the quality of human capital (especially schooling); the impact of the rise in life expectancy on attitudes towards investment in human capital; and the role of relatively efficient labor markets on resource allocation and accumulation.

This is a product of the research undertaken as a part of the Nihon University President's Commissioned Project entitled, "Sources of Economic Dynamism in the Asian and Pacific Region: A Human Resource Approach." The paper was presented at the Project's first meeting held on January 8-10, 1988, at Nihon University Population Research Institute, Tokyo, Japan.

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I. Sources of Growth Accounting: Japan and Others Along the Asian Pacific Rim

About a decade ago, Edward Denison and William Chung (1976) used sources of growth accounting to show us How Japan's Economy Grew So Fast. We all know the limitations to this kind of analysis, but one of their chapters might be particularly useful to help organize our thinking on "the sources of economic dynamism along the Asian Pacific Rim." Denison and Chung (1976, Chp. 12) posed this question: Could Japan's growth rate up to 1973/74 be sustained in the long run? They searched for the answer by decomposing the fast growth of the 1960s into that part of the performance which was sustainable and that part which was only transitional. The transitional part was attributed to her latecomer status, to special transitory demographic features, or to economic inefficiencies which had been mostly eliminated by the early 1970s. The result is reproduced in Table 1 while Figure 1 uses that information to trace out Denison and Chung's projections into the future. Figure 1 also plots Japan's actual growth performance since 1971, and, apart from the macro-economic shocks 1973-74, those projections were remarkably close to the mark. Furthermore, the slowdown also confirms a prediction made by Kazushi Ohkawa and Henry Rosovsky in the early 1970s (Ohkawa and Rosovsky, 1973, pp. 232-250).

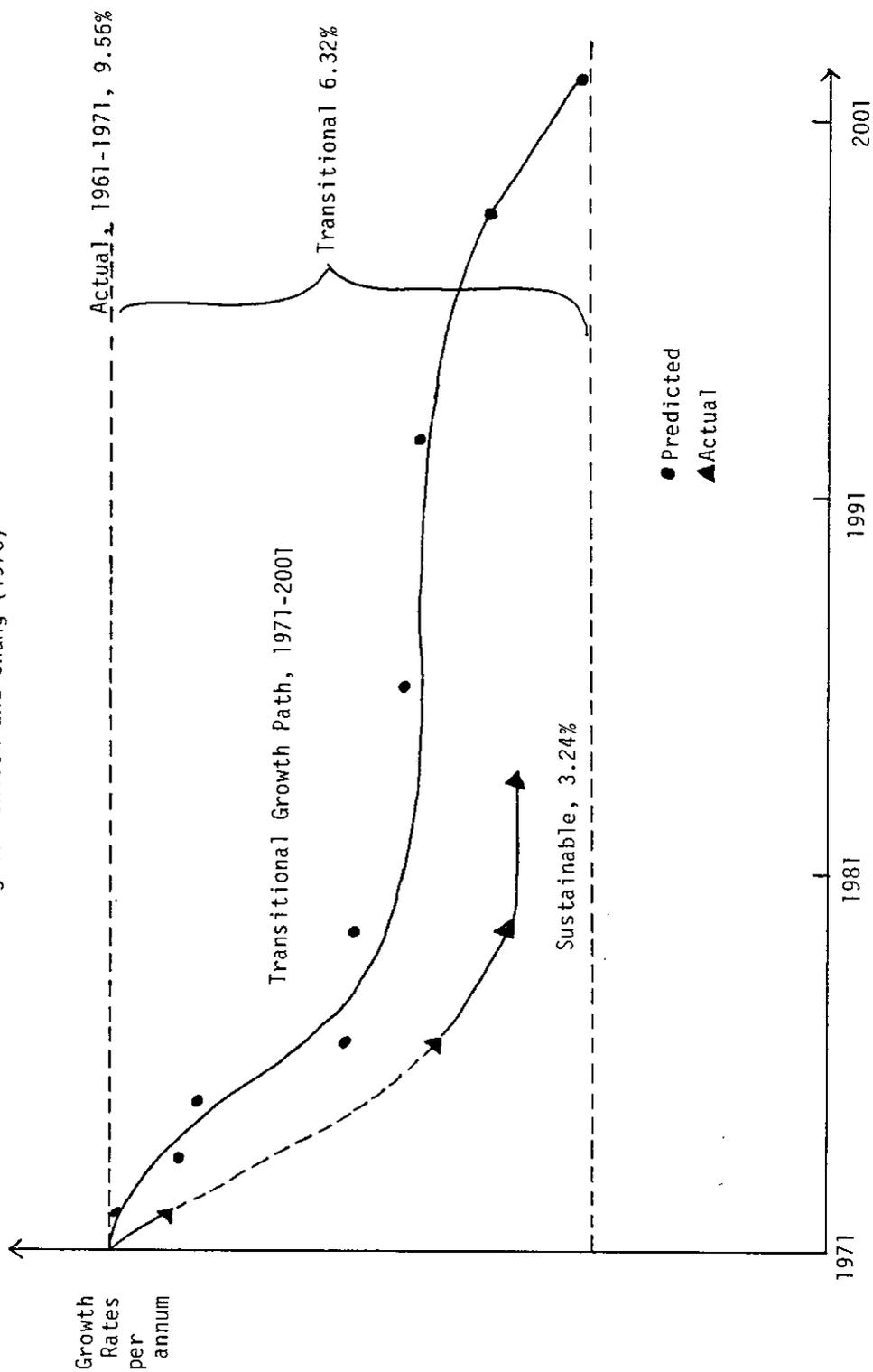
Not all of the Denison-Chung projected growth retardation into the 21st century can be attributable to demographic, labor market, and human capital accumulation factors, but a good share of it can. Of the 6.32 percentage point decline in the growth rate, they attributed 1.10 percentage points to labor force effects, 0.81 percentage points to the exhaustion of inefficiencies associated with the demise of self-employment and the farm sector, and 1.71 percentage points to the slowdown in conventional accumulation. If the decline in conventional accumulation can be shown to be related largely to demographic and

Table 1. Sustainable and Transitional Components of Japan's Growth According to Denison and Chung (percent per annum)

Rate or source	Contribution in percentage points 1961-71			Year transitional contribution expires (4)
	Total (1)	Sustainable (2)	Transitional (3)	
Growth Rate	9.56	3.24	6.32	...
Labor	1.78	0.68	1.10	...
Employment	1.09	0.33	0.76	1973
Hours	0.11	-0.15	0.26	1974
Age-sex composition	0.19	0.11	0.08	1977
Education	0.35	0.35	0.00	...
Unallocated	0.04	0.04	0.00	...
Capital	2.57	0.86	1.71	...
Inventories	0.86	0.21	0.65	1976
Nonresidential structure and equipment	1.44	0.38	1.06	1976
Dwellings	0.27	0.27	0.00	...
International assets	0.00	0.00	0.00	...
Land	0.00	0.00	0.00	...
Advances in knowledge	2.43	1.28	1.15	2002
Contraction of agricultural inputs	0.62	0.00	0.62	1982
Contraction of nonagricultural self-employment	0.19	0.00	0.19	1990
Reduction in trade barriers	0.01	0.00	0.01	2002
Economies of scale				
Measured in U.S. prices	1.14	0.42	0.72	...
Income elasticities	0.82	0.00	0.82	1995

Source: Denison and Chung (1976), Table 12-1, p. 115.

Figure 1. Actual, Transitional and Sustainable Growth Rates in Japan 1971-2001, According to Denison and Chung (1976)



labor force events, then these three sources would account for half of Denison and Chung's projected slowdown in Japan's growth.

Denison and Chung, and Ohkawa and Rosovsky before them, threw down a challenge which has yet to be taken up. Namely, what would we learn if this kind of accounting were applied in a comparative way to all of the economies--fast growers and slow growers, rich and poor--along the Asian Pacific Rim? Oddly enough, very little comparative work of this or any other sort has yet been applied systematically to the recent economic history of the Asian Pacific Rim. The time certainly seems ripe to do so since a fairly well-documented history now stretches over the quarter century, 1960-1988.

Not only is there great value in doing a comparative assessment of the sources of growth along the Pacific Rim over the past quarter century, but we need to understand far more about just how these sources work. I believe one of the most important of these is the human resource and capital-deepening connection. What follows, therefore, is an effort to outline a research strategy which might help to understand that connection better.

II. The Inequality Connection

The classical economists developed their models of growth and development during the British industrial revolution when economic life was relatively simple. They could talk about three inputs--labor, land, and physical capital, and about three social classes--laborers, landlords, and capitalists. When dealing with the sources of growth, they could discuss physical capital accumulation, while ignoring human capital accumulation. When dealing with inequality, they could reduce the problem to the functional share trilogy--wages, rents, and profits, while ignoring the distribution of human capital. And when dealing with the Smithian trade-off, they could restrict their focus to the impact of redistribution on conventional savings, ignoring investment in schooling, health, housing, nutrition and migration. Twentieth century economic life is more complex. Human capital matters to a far greater extent. This simple point is central to the trade-off debate and deserves amplification.

Support for the growth and equality trade-off has always rested

on the belief that redistribution from the poor to the rich augments the supply of private saving and thus raises the rate of accumulation.^{1/} Not only was this belief central to 19th century models of growth and distribution developed by British economists to explain the industrial revolution, but it is also central to W. Arthur Lewis' (1954) labor surplus model and to recent debates over productivity slowdown in the advanced countries. In such models, the trade-off works through marginal propensities to save (mps). Any force redistributing income may raise aggregate saving and accumulation if those benefiting have higher mps's than the rest of society. Since higher income classes were always thought to have higher mps's, it would seem natural to conclude that any redistribution toward the rich would raise saving and capital accumulation. This argument should apply equally to 18th or 19th century redistributions through market forces and to 20th century redistributions through government action.

While intuitively plausible and a staple in political economy since Adam Smith, redistribution has had little quantitative impact, in fact, on the aggregate saving rate. True, even in Asia, distribution variables help explain aggregate saving rates (Williamson, 1968). But when more sophisticated tools are applied, the trade-off seems modest. So say studies on aggregate United States data (Husby, 1971; Blinder, 1975), on Latin American data (Cline, 1972), and on international cross-sections (Della Valle and Ogushi, 1976; Musgrove, 1980). Rough calculations for 19th century America (Williamson, 1979; Williamson and Lindert, 1980) and 19th century Britain (Williamson, 1985) say the same.

With the spread of national independence, literacy and suffrage in the Third World, rejection of the Smithian trade-off gained momentum under the leadership of Robert McNamara and some World Bank economists (Chenery et al., 1974; Ahluwalia, 1976, 1980). Their competing view was that the Third World overlooked a vast range of policy options that would enhance growth by raising the value of the poor's assets: investment in public health, mass education, and rural infrastructure.

Indeed, these are exactly the prescriptions which appear to be backed by so much of 20th century Asian experience. That is, the economic history of the Asian Pacific Rim appears to offer evidence

which not only rejects the trade-off, but appears to support the view that equality may foster growth. Consider the kind of evidence which encourages this revisionist view.

Table 2 augments Montek Ahluwalia's data (Ahluwalia, 1976) used to establish the so-called Kuznets Curve. Simon Kuznets (1955) hypothesized that inequality should rise with early development, falling as countries pass from NIC to advanced development stages. The upswing of the hypothesized Kuznets Curve has generated the most active debate. After all, the variance around any estimated Kuznets Curve is always greatest from low to middle levels of development. Thus, inequality does not rise systematically across a pooled cross-section of early Industrial Revolutions. Even if many countries undergo increasing inequality during early modern economic growth, such correlations are bound to be poor since history has given less developed countries very different starting points.

More to the point of this conference, however, Table 2 shows unambiguously that, after controlling for level of development, the Asian nations tend to have more egalitarian distributions. Thus, the coefficient on the dummy variable ASIA indicates that the eleven Asian countries in the sample (Hong Kong, Indonesia, Pakistan, Sri Lanka, India, Thailand, the Philippines, Korea, Taiwan, Malaysia, and Japan) are significantly more egalitarian than the rest, and the differences are big. More or less the same results are forthcoming when only the Asian Pacific Rim countries are included (dummy variable PACIFIC RIM). When only Japan, Taiwan, and Korea are included (dummy variable BIG 3), the results are even more striking: on average, the top 20 percent claimed 12 percent less of total income compared with other countries at comparable stages of development.

These differences warrant explanations. We also need to know more about what contribution, if any, the more egalitarian distributions have made to impressive growth along the Asian Pacific Rim.

Not only are Asian nations more egalitarian, but the more egalitarian among them seem to have grown fastest during the post-World War II decades. Table 3 offers some World Bank data for sixteen nations, eight Asian along the Pacific Rim and eight Latin American. While the correlation between growth and equality is hardly perfect, the evidence not only rejects the Smithian trade-off postulate but suggests that equality may contribute to fast growth. Why? There are

Table 2. The Kuznets Curve and the Virtuous Asians

Variable	Dependent Variable							
	Share of Bottom 20%				Share of Top 20%			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Constant	26.16 (4.32)	23.81 (4.30)	26.90 (4.62)	28.78 (4.95)	-51.66 (1.84)	-39.67 (1.47)	-54.64 (2.00)	-62.26 (2.23)
ln (GNP/POP)	-6.95 (-3.60)	-6.35 (3.39)	-7.26 (3.91)	-7.67 (4.21)	36.96 (4.14)	33.92 (3.96)	38.22 (4.39)	40.55 (4.89)
[ln (GNP/POP)] ²	0.54 (3.61)	0.50 (3.46)	0.57 (3.93)	0.60 (4.22)	-3.13 (4.52)	-2.93 (4.43)	-3.24 (4.79)	-3.41 (5.30)
Dummy: ASIA		1.15 (2.33)				-5.90 (2.60)		
Dummy: PACIFIC RIM			1.29 (2.35)				-5.17 (2.02)	
Dummy: BIG 3				2.45 (2.95)				-12.27 (3.24)
\bar{R}^2	.17	.23	.23	.27	.39	.45	.43	.49
DW	1.64	1.62	1.64	1.68	2.03	2.11	2.12	2.25
F-stat	6.52	6.52	6.56	7.88	18.80	16.15	14.65	18.28

Note: BIG 3 = Japan, Taiwan, and Korea; Pacific Rim = BIG 3 plus Thailand, the Philippines, Malaysia, Hong Kong, and Indonesia; Asia = Pacific Rim plus Pakistan, Sri Lanka, and India.

Source: Figures in parentheses are t-statistics. The underlying data are taken from Ahluwalia (1976), pp. 340-1, excluding the socialist-countries, augmented by Hong Kong and Indonesia in the WDR (1987), pp. 252-3.

Table 3. Inequality and Growth: Which Drives Which?

Country	GNP per capita growth, per annum (1960-81)	Income Share of: Bottom 20%	Top 20%	Ratio, Top to Bottom
VIRTUOUS ASIANS				
<u>Fast growers:</u>				
Korea (1976)	6.9	5.7	45.3	7.95
Hong Kong (1980)	6.9	5.4	47.0	8.70
Japan (1979)	6.3	8.7	37.5	4.31
Taiwan (1976)	6.6	9.5	35.0	3.68
Unweighted Average	6.7	7.3	41.2	5.64
<u>Slower growers:</u>				
Indonesia (1976)	4.1	6.6	49.4	7.48
Philippines (1985)	2.8	5.2	52.5	10.10
Thailand (1975-76)	4.6	5.6	49.8	8.89
Malaysia (1973)	4.3	3.5	56.1	16.03
Unweighted Average	4.0	5.2	52.0	10.00
BAD LATINS				
El Salvador (1976-77)	1.5	5.5	47.3	8.60
Peru (1972)	1.0	1.9	61.0	32.11
Costa Rica (1971)	3.0	3.3	54.8	16.61
Brazil (1972)	5.1	2.0	66.6	33.30
Mexico (1977)	3.8	2.9	57.7	19.90
Panama (1973)	3.1	2.0	61.8	30.90
Argentina (1970)	1.9	4.4	50.3	11.43
Venezuela (1970)	2.4	3.0	54.0	18.00
Unweighted Average	2.7	3.1	56.7	18.29

Source: Inequality: WDR(1987), Table 26, pp. 252-253, and for Taiwan, Myers (1986), p. 24. Growth rates: WDR (1983), Table 1, pp. 148-149, and for Taiwan (1960-1978), WDR (1980), Table 1, p. 111.

four connections well worth pursuing, since they may have important implications for understanding dynamic growth along the Asian Pacific Rim. First, more egalitarian societies may find it easier to pursue pro-growth government policies. Second, more egalitarian societies may find it easier to accumulate human capital. Third, demographic forces--a glut in the young age groups--may have contributed both to slow growth (via dependency rate effects and low savings, to be discussed below) and inequality (Paglin, 1975; Kuznets, 1976; Morley, 1981). Fourth, interest rate policies may have an impact on accumulation and inequality. As Tibor Scitovsky (1985) has stressed, Taiwan has pursued a high interest rate policy since the early 1950s. Not only has such a policy encouraged a labor-intensive growth path (with egalitarian implications), but it also appears to have contributed to a high domestic personal saving rate (although some might doubt the interest-elasticity optimism implied by that conclusion). Furthermore, the high interest rate policy implies a transfer from large firms' profits to small savers. Other countries along the Asian Pacific Rim have pursued more conventional low interest rate policies combined with credit rationing, as in Korea's case (Williamson, 1979).

My colleague, Jeff Sachs (1987), recently reminded me of two of these possible connections, and I think it might be useful to repeat his argument.^{2/} Sachs argues that by historical accident, Japan, Korea, and Taiwan were all forced to introduce fundamental land reforms in the late 1940s and early 1950s.^{3/} The conditions making the land reforms possible were, of course, unique, but in all three cases land reform virtually eliminated farm tenancy. In fact, it could be argued that these land reforms were among the greatest in modern history. Not only was land redistributed, raising incomes of the poor at the bottom of the distribution, but those with middle incomes did not have to pay much for the redistribution (through taxes) since the value of government bonds used to compensate the landlords at the top of the distribution were eroded away by rapid inflation. Although Sachs does not mention it, another force was at work to redistribute wealth and income in these three economies--the destruction of wealth by war and inflation. Between 1935 and 1955, the wealth-income ratio in Japan declined precipitously from 4.15 to 2.20 (Egan, 1985, p. 63). This massive decline in the wealth-income ratio had two effects: (i)

it tended to equalize incomes, since the rich held most of the physical and financial assets destroyed; and (ii), it must have contributed to the impressive rise in the savings rate which was characteristic of Japan's dynamic postwar development, as individuals tried to restore the pre-war wealth-income ratio. While I do not have similar evidence for Taiwan and Korea, the same forces may well have been at work there too. This may offer one explanation for the rapid growth in Korea, Taiwan, and Japan relative to other nations along the Asian Pacific Rim.

Sachs argues that such redistributions may have had other important effects on postwar growth experience in these three dynamic economies. First, by replacing a tiny class of contentious landlords with a large class of contented peasants, the resulting political stability meant that government policy could focus attention on growth rather than rent-seeking. Second, the egalitarian revolution served to contribute to a minimum of labor unrest in the cities. Third, a more egalitarian distribution served to foster a rapid rate of human capital accumulation as the poor--facing imperfect capital markets--were better able to finance such investments from their own resources. And fourth, a dynamic agriculture was supported by agricultural protection and investment in rural infrastructure. As a result, a nation-wide egalitarian distribution was reinforced by an egalitarian agriculture, and by small and declining income gaps between rural and urban areas. The agricultural sector is now, of course, very small in Japan, Korea, and Taiwan, but it is still very large in the developing countries in the South of the Asian Pacific Rim.

It seems to me that we need far more research on this inequality connection. How much of the economic dynamism along the Asian Pacific Rim can be attributable to egalitarian distributions? If so, what were the strongest links? The pro-growth policy path outlined by Sachs? Human capital accumulation responses at the household level as the bottom income classes were better able to finance improved nutrition, education, migration and other forms of human capital creation? A contented and stable labor force which encouraged firms to invest in firm-specific training? And how much of the inequality in the slower growing nations can be attributed to demographic forces?

III. Age Distributions, Dependency Rates and Accumulation Responses

All of us are aware of the implications of recent fertility and mortality trends for age distribution patterns and dependency rates. What may not be quite so familiar is the enormous variance in those rates across the Asian Pacific Rim, and their projected trends over the next three decades. They may have very important economic implications for the region so it might be useful to review the evidence once more.

Table 4 reports past, present, and future dependency rates. There we summarize United Nations data for the share of populations aged 14 years or less, aged 65 years or more, and the two combined. The data was readily available for nine countries along the Rim.

Although the table doesn't show it, some of these countries have undergone important declines in their dependency rates over the past three decades, but in such cases all of the decline appears to have been concentrated in the 1970s. Even so, the differences between Japan and the other eight nations are still enormous in 1980. Four of these are especially notable: the Philippines (whose dependency rate was 16.4 percent higher than Japan), Thailand (16 percent higher), Malaysia (15.6 percent higher), and Indonesia (14.2 percent higher). These differences are very large even compared with the spectacular historical fall in Japan's dependency rate since 1950. China and Korea also have higher dependency rates, though the differentials relative to Japan are not quite so high, 10.9 and 9.5 percent, respectively. The rich city states of Hong Kong and Singapore are much more like Japan.

Equally striking are the projected trends to the year 2010, and the correlation between those trends and the size of the 1980 Japan differential appears to be perfect. That is, dependency rates will converge sharply along the Asian Pacific Rim over the next three decades. Indeed, every single country will have dependency rates below Japan in 2010, a striking reversal in demographic features along the Rim. However, with the exception of Singapore, Japan will still have the lowest dependency rates among the young since all of the projected rise in her dependency rate will be attributable to the impressive increase in those 65 and over. The distinction is likely to matter.

Table 4. Past, Present and Future Dependency Rates
Along the Asian Pacific Rim

Country		Dependency Rates, as Percent of Total Population for:				
		Age	Age	Ages 0-14 and 65+		
		0-14	65+	Country j		Year 2010
				Total: minus Japan	minus 1980	
China	1950	34.0	4.7	38.7		
	1980	33.6	5.6	39.2	10.9	-8.8
	2010		22.1	8.3	30.4	
Japan	1950	35.4	4.9	40.3		
	1980	23.4	8.9	28.3	0	+8.3
	2010	19.2	17.4	36.6		
Hong Kong	1950	30.4	2.5	32.9		
	1980	25.5	6.3	31.8	3.5	-3.0
	2010	19.5	9.3	28.8		
Korea	1950	41.7	3.0	44.7		
	1980	33.8	4.0	37.8	9.5	-7.3
	2010	22.9	7.6	30.5		
Indonesia	1950	38.2	3.0	41.2		
	1980	39.2	3.3	42.5	14.2	-10.6
	2010	26.5	5.4	31.9		
Malaysia	1950	39.2	6.6	45.8		
	1980	40.3	3.6	43.9	15.6	-11.7
	2010	27.1	5.1	32.2		
Philippines	1950	42.9	4.6	47.5		
	1980	41.9	2.8	44.7	16.4	-11.0
	2010	29.1	4.6	33.7		
Singapore	1950	40.5	2.4	42.9		
	1980	27.4	4.9	32.3	4.0	-4.1
	2010	18.7	9.5	28.2		
Thailand	1950	41.6	4.7	46.3		
	1980	41.1	3.2	44.3	16.0	-12.9
	2010	26.1	5.3	31.4		

Source: UN (1982), pp. 254-290, "medium variant".

What are the economic implications of these trends and differentials? The crudest cut at this problem is reported in Table 5. Here we first calculate GNP per worker by applying the 1980 labor participation rate (percent aged 15-64) to the 1981 GNP per capita estimates. Next we calculate GNP per capita in the year 2010 given the projected labor participation rate for that year, and assuming for the moment that GNP per worker remains unchanged. Finally, we report the implications of the drift in the labor participation rate over the next three decades on per capita GNP growth rates. Note, first, the correlation between level of development and the growth rate impact. Poor countries along the Asian Pacific Rim gain the most, while Japan, in fact, loses (confirming the Denison and Chung projections in Table 1). As it turns out, these demographic forces will also serve to help the slower growers (Indonesia, the Philippines, Thailand, and Malaysia: Table 3), and in some cases they will help a lot.

The calculation in Table 5 is, of course, much too simple. It ignores the possibility that the decline in dependency rates everywhere along the Asian Pacific Rim, with the exception of Japan, might quicken the rate of growth in labor productivity. The latter would take place if capital deepening was stimulated by the decline in the dependency rate.

Is there any reason to expect that the decline in the dependency rate will stimulate accumulation and capital deepening everywhere along the Asian Pacific Rim, outside Japan? Around 1970, the answer would have been an unambiguous affirmative. At that time, the views of Ansley Coale and Edgar Hoover (1958) dominated. Coale and Hoover focused their attention on the impact of fertility decline, rather than population growth itself. A decline in fertility, they argued, lowers the number of young dependents (augmenting saving rates), and raises female labor participation rates, thus fostering economic growth. Coale (1986) repeated the point recently by showing that while population and per capita income growth may be poorly correlated, total fertility rates and per capita income growth are negatively correlated.

Nathaniel Leff's (1969) pioneering empirical study confirmed the impact of dependency rate effects on saving. Two decades later, the profession is far less certain, but Coale, Hoover and Leff would have suggested we proceed as follows.

Table 5. Exploring the Dependency-Labor Participation Rate
Impact on Growth Along the Asian Pacific Rim

Country	1981 GNP Per Capita Index	1981 GNP Per Worker Index Using 1980 Labor Participation Rate	2010 GNP Per Capita Using 1981 GNP Per Worker Index and 2010 Labor Participation Rates	Contribution to Growth Rate Per Annum (%)
Japan	10,080 (1000)	14,059 (1000)	8,913 (1000)	-0.42
Singapore	5,240 (520)	7,740 (551)	5,557 (623)	0.20
Hong Kong	5,100 (506)	7,478 (532)	5,324 (597)	0.15
Malaysia	1,840 (183)	3,280 (233)	2,224 (250)	0.66
Korea	1,700 (169)	2,733 (194)	1,899 (213)	0.38
Philippines	790 (78)	1,429 (102)	947 (106)	0.63
Thailand	770 (76)	1,382 (98)	948 (106)	0.72
Indonesia	530 (53)	922 (66)	628 (70)	0.59
China	300 (30)	493 (35)	343 (38)	0.46

Source: The 1981 GNP per capita figures are from WDR (1983), pp. 148-9.
The labor participation rates are shares aged 15-64, from Table 4.

There have been a number of econometric studies which have estimated the impact of dependency rates on savings, and the estimated elasticity varies considerably from a high of -1.49 (Leff, 1969), to a low of -0.13 (Singh, 1975). I am unaware of similar estimates for Asia alone (see, however, Ram, 1982, Table 1), but what would the implications be of these world-wide estimates for the Asian Pacific Rim? Table 6 offers some answers. There we pose two counterfactuals. First, what would each country's savings rate have been like had they had the advantage of Japan's lower dependency rate? Second, what will each country's savings rate be like given the projected decline in dependency rates everywhere along the Rim (with the exception of Japan)? The results can be summarized most conveniently if we view the "medium" elasticity as most likely.

The implications emerging from Table 6 are striking. The slower growers would have enjoyed the most pronounced saving rate increases had they had Japan's more favorable dependency rates: Malaysia, a gain of 7.4 percentage points in her saving rate; the Philippines, a gain of 7.3; Thailand, a gain of 6.6; and Indonesia, a gain of 6.1. If these countries were really saving-constrained, then the calculation implies that the slower growers along the Asian Pacific Rim suffered

Table 6. A Dependency Rate-Savings Rate Connection
Along the Pacific Rim?

Country	Actual 1981 Gross Domestic Savings Rate (%)	Counterfactual Gross Domestic Savings Rate (%), Calculated at:		
		Elasticity	Japan(1980) Dependency Rates	UN Projected 2010 Dependency Rate
China	28	High	39.6	37.3
		Middle	34.2	33.0
		Low	29.0	28.8
Japan	32	High	na	18.0
		Middle	na	24.5
		Low	na	30.8
Hong Kong	24	High	27.9	27.4
		Middle	26.1	25.8
		Low	24.3	24.3
Korea	22	High	30.2	28.3
		Middle	26.2	25.4
		Low	22.7	22.6
Indonesia	23	High	34.4	31.5
		Middle	29.1	27.6
		Low	24.0	23.7
Malaysia	26	High	39.8	36.3
		Middle	33.4	31.6
		Low	27.2	26.9
Philippines	25	High	38.7	34.2
		Middle	32.3	29.9
		Low	26.2	25.8
Singapore	33	High	39.1	39.2
		Middle	36.3	36.4
		Low	33.5	33.5
Thailand	23	High	35.4	33.0
		Middle	29.6	28.4
		Low	24.0	23.9

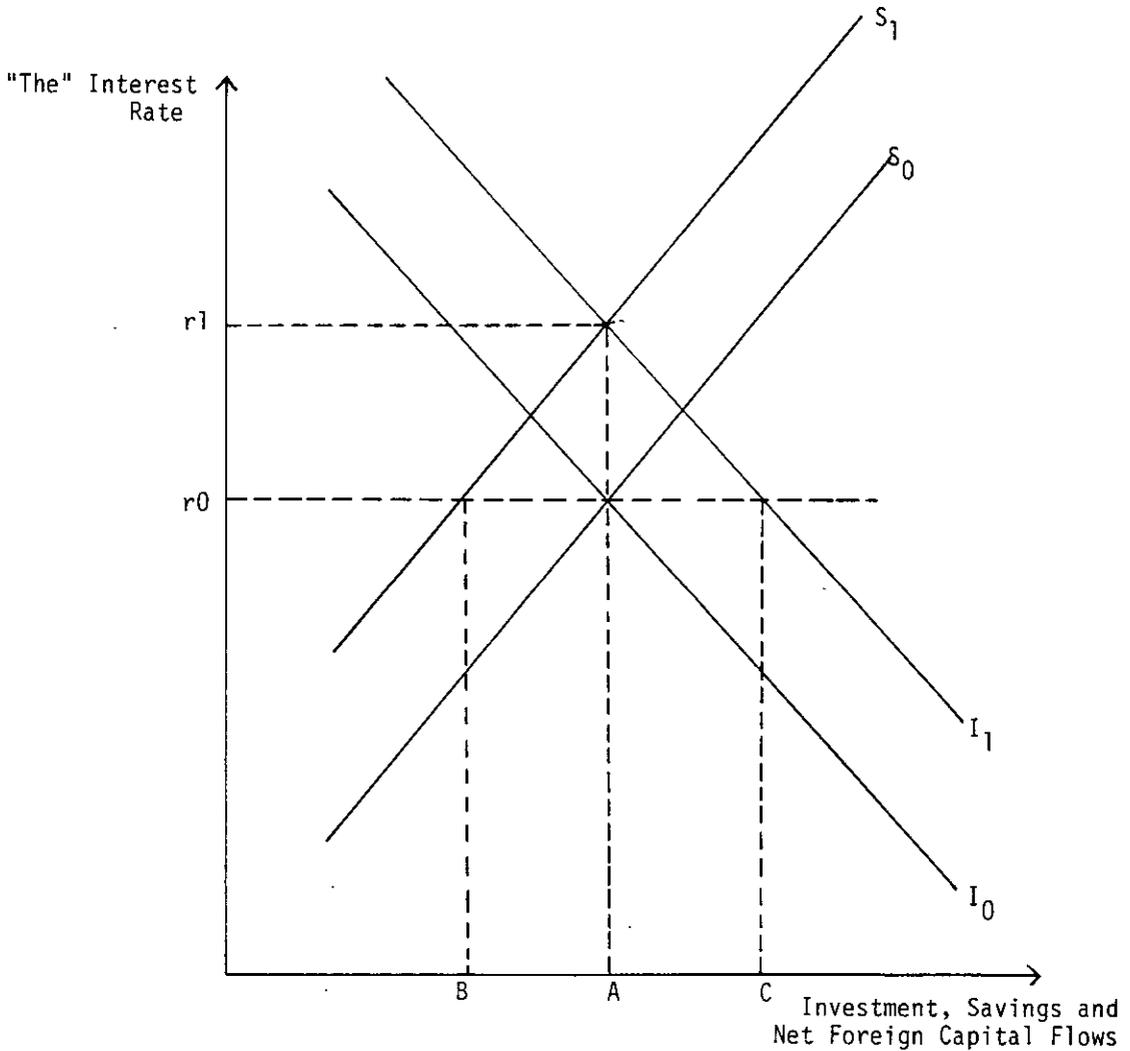
Source: The 1981 actual gross domestic savings rates are taken from WDR (1983), Table 5, pp. 156-7. The counterfactuals use the dependency rates (ages 0-14 and 65+) in Table 4, and the elasticity of savings rates with respect to dependency rates are: "high" (-1.49), Leff (1969); "middle" (-0.80), Adams (1971); and "low" (-0.13), Singh (1975) -- all reported in Hammer (1985), p. 13.

significantly from high dependency rates. Assuming an incremental capital-output ratio (ICOR) of 4:1, it implies that Malaysia had a lower growth rate of almost 2 percent because of it ($7.3 \times .25 = 1.83$). Had she not had that disadvantage, she would have nearly closed the growth gap between herself and Japan ($4.3 + 1.8 = 6.1$ versus 6.3 for Japan: see Table 3). According to UN projections, that disadvantage will have disappeared by the year 2010. If the dependency rate-savings rate connection holds, the implications are for big future increases in savings rates among the poorer nations on the Asian Pacific Rim. In contrast, Japan's savings rate will decline by 7.5 percentage points. Again assuming an ICOR of 4:1, Table 6 implies that due to the dependency rate effect alone, growth rates in the poor, slower growing countries will converge on Japan: that is, Japan's growth rate would drop to 5 percent per annum by 2010 (once again consistent with the Denison and Chung projections in Table 1), while that of the four slower growers would rise to 5.3 percent per annum.

These calculations are illustrative only, but they certainly suggest that the dependency rate-savings rate connection has great potential for the Asian Pacific Rim. Unfortunately, however, very few development economists now believe this Coale-Hoover-Leff argument. First, the life-cycle model underlying the calculations has come under attack (Hammer, 1985), especially for developing countries where the assumptions of the life-cycle model are most likely to be violated. Second, recent econometric analysis suggests that the dependency rate effect on savings and investment is weak at best (Kelley, 1987). Oddly enough, the literature has failed to appreciate the implications of that result. If saving and investment rates will be unaffected by a fall in the dependency rate expected over the next three decades along the Asian Pacific Rim, then the rate of accumulation will also be unaffected, allowing the rate of capital deepening to accelerate if labor force growth rates eventually decline following the decline in dependency rates. That the effect of the dependency rate on savings is weak does not necessarily imply that the impact on the rate of capital deepening is weak, and it is the latter that matters. We need to learn a lot more about those responses for countries along the Asian Pacific Rim.

In any case, I do not think the literature has spent enough time

Figure 2. Why the Dependency-Rate Effect Might Be Estimated as "Weak"



asking why it is that macro-estimates of the savings-dependency relationship are typically "weak" when our Coale and Hoover priors had been so strong. I offered an answer when serving as a discussant for Allen Kelley's paper on this topic presented in Nairobi a year ago. It might be useful to repeat that answer by reference to Figure 2. High dependency rates and rapid population growth go together, and it seems highly plausible to expect that the latter will serve to augment

investment demand, either by additional social overhead requirements or by encouraging firms to expand capacity given an augmented labor force. Thus, investment demand shifts outwards to the right. If Coale and Hoover are correct, the saving supply schedule shifts backwards to the left. Suppose, for sake of argument, it shifted such as to reach a new equilibrium at a higher interest rate, r_1 , but at the same level of saving and investment, A. This analysis assumes that the domestic economy is closed to foreign capital. If the assumption holds, then it would explain why savings rates and dependency rates often appear to be poorly correlated in conventional time series analysis. Suppose instead the economy is open to foreign capital flows, and in fact takes the world interest rate as given, r_0 , and can absorb as much at that rate as it wishes. In this case, domestic savings decline to B, investment expands to C, and net foreign capital inflows fill the gap, BC. Which of these two extreme assumptions about foreign capital flows is most accurate?

I believe that far more research needs to be done on the dependency rate-savings rate connection along the Asian Pacific Rim. If such research were forthcoming, one of the first tasks would be to determine whether in fact these economies are saving-constrained. If they are not, then the dependency rate effect would simply translate into changes in net foreign capital flows, not growth. But for many countries, like Korea (Williamson, 1979), a reduction in external capital dependence is an additional policy target, so even if these economies can be shown to be investment-driven, the dependency rate-savings rate connection still matters.

IV. Mortality, Life Expectancy and Human Capital Responses

The previous section focused on financial savings and conventional accumulation responses to changes in dependency rates. What about accumulation responses to the rise in life expectancy?

Table 7 should serve to remind us just how impressive these life expectancy gains have been along the Asian Pacific Rim. The most important mortality declines appear to have been experienced by the poorer countries along the Rim. That is, a rise in life expectancy from 43 to 53 in Indonesia is likely to have a bigger impact on

Table 7. Life Expectancy at Birth Along the Asian Pacific Rim, 1965-85.

Country	Male			Female		
	1965	1985	Change	1965	1985	Change
China	54	68	14	55	70	15
Japan	68	75	7	73	80	7
Hong Kong	64	73	9	71	79	8
Korea	55	65	10	58	72	14
Indonesia	43	53	10	45	57	12
Malaysia	56	66	10	60	70	10
Philippines	54	61	7	57	65	8
Singapore	64	70	6	68	75	7
Thailand	54	62	8	58	66	8

Source: WDR (1987), Table 29, pp. 258-9.

accumulation behavior than a rise from 68 to 75 in Japan, and for three reasons: it's a bigger absolute rise, 10 versus 7 years; it's an even bigger percentage rise, 23 versus 10 percent; and it's in a more critical stage of the life-cycle where the payoff to investment in human capital should matter most.

Rati Ram and Theodore Schultz have argued that longer life expectancy leads to greater incentives for human capital deepening, and human capital even in India is big enough to matter. Their estimates from India suggest that total expenditures on human capital investment are about 55 percent of conventional investment (Ram and Schultz, 1979). I suspect that the figure is higher in Korea and far higher in Japan since, based on 20th century European and American experience, the total capital stock tends to shift out of physical and into human capital as modern industrialization ensues. If Ram and Schultz are correct, then there is reason to suspect that the rise in life expectancy should have an even greater impact along the Asian Pacific Rim where human capital investments presumably loom larger in total investments than in India. On the other hand, the life expectancy gains summarized in Table 7 exaggerate the likely impact on human capital accumulation responses since it is the rise in expected life-span from age 5 to 10 that matters to human capital investments,

and they have increased much less than life expectancies at birth. From what scraps of data I was able to collect from the United Nations, it appears that improvements in life expectancy at age 10 along the Asian Pacific Rim (Hong Kong, Japan, Korea, Malaysia, Taiwan and Thailand) have been from a third to a half of those in India. Nonetheless, they are big enough to warrant our attention.

Given the enormous size of the recent rise in life expectancies along the Asian Pacific Rim, we need to know far more about the response of investments in nutrition, education, on-the-job training, and migration. This includes learning where in the life cycle changes in mortality experience are taking place, and what forms of human capital investment are most responsive to those age-specific mortality declines. As far as I know, we are in the dark on these potentially important empirical issues for most of the countries along the Asian Pacific Rim.

It could be argued, of course, that these postulated but unmeasured human capital responses are unlikely to matter in those economies where life expectancies at age 10 already stretch into retirement years. The only countries along the Asian Pacific Rim where life expectancies at age 10 fall below 65 appear to be Indonesia, most of Malaysia, and Thailand. Even so, the distribution of life expectancies and their change over time may matter more than the average life expectancy experience. Who has gained most from life expectancy improvements in Asia? Have these gains centered on the poor who begin with very low life expectancies? I am not aware of any research which has focused on this potentially important problem. We simply need to learn far more about the Ram-Schultz assertion and its likely influence on growth performance along the Asian Pacific Rim over the next few decades.

I should hasten to add that while the Ram-Schultz hypothesis focuses solely on human capital accumulation responses to the rise in life expectancy, it may also have a profound effect on financial savings since young adults need to ponder far longer the adequacy of their resources for retirement than did their parents who might well have expected brief retirement or no retirement at all.

V. Schooling, Inequality, and Dependency Rates

Using a price dual of the production of school services and an aggregate demand for school services, T. Paul Schultz (1987) has recently estimated a reduced-form equation for school expenditures per child and enrollment rates, based on a large world cross-section of countries. While Schultz includes a wide range of explanatory variables, three explain the vast majority of the variance: income, or GNP per adult; the relative price of teachers, or teacher cost relative to GNP per adult; and relative cohort size, or share of population school age.

There is an obvious omitted variable in Schultz's model. Nowhere does he include the influence of income distribution. Given GNP per adult, the country with the more equal income distribution is likely to have the stronger schooling demands, and thus the higher enrollment rates. I suspect that is why Schultz finds very high positive residuals for East Asia where, as we have seen in section II, incomes have been far more equally distributed in the postwar period. Any extension of Schultz's analysis to the Asian Pacific Rim should pursue this connection between inequality and schooling. While we are all aware of the impressive schooling commitment along the Asian Pacific Rim, we need to know why. Can it be explained by income inequality patterns, or is the explanation cultural?

Most interesting to me, however, are Schultz's findings on the relative price of teachers and cohort size effects. Expenditures on teachers are by far the biggest component of direct schooling costs, and the relative price of teachers serves to tell us how well the schooling sector is doing in keeping up with the growth in demand. When teacher prices rise, schooling costs per child rise, and the quantity of schooling may be choked off as a consequence. If the demand for schooling is price inelastic, total expenditures on schooling may, of course, rise, but enrollment rates--the critical proxy for human capital deepening--will decline. This is exactly what Schultz finds: the elasticity of enrollment rates in secondary education with respect to teacher prices is -0.96 while the elasticity of schooling expenditures is 0.24. What has been the experience with relative teacher costs along the Asian Pacific Rim since 1960? What can we expect over the next two decades?

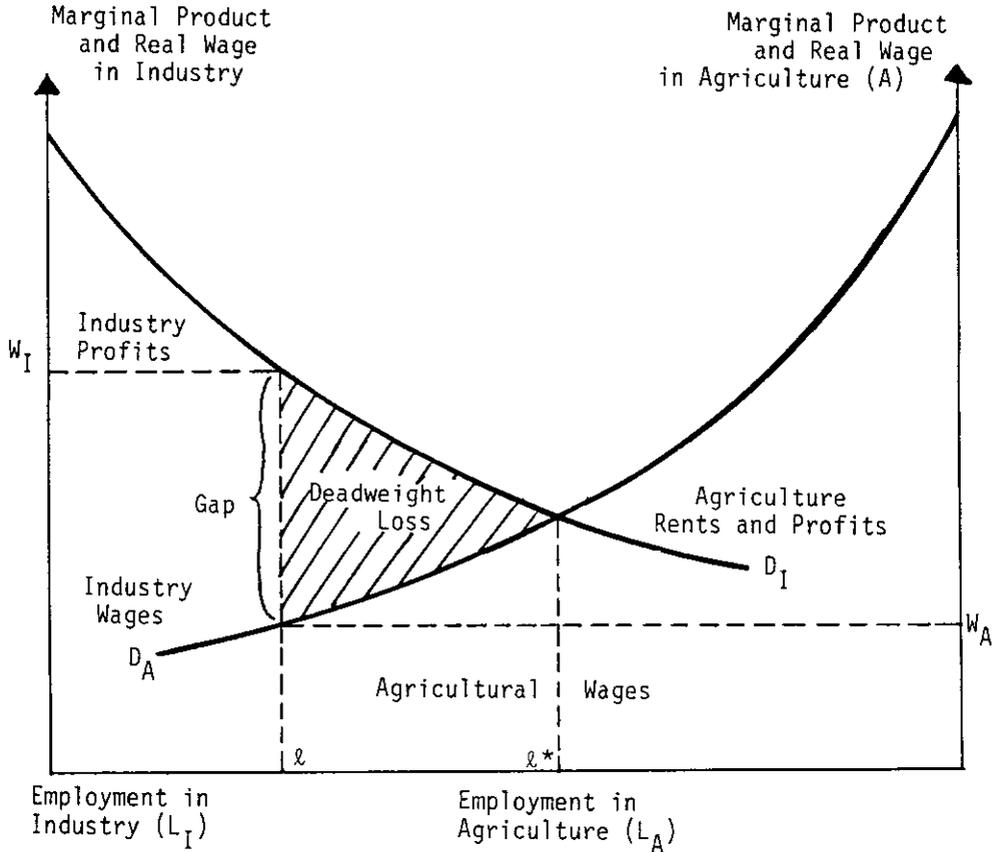
Cohort size effects are, of course, tied in closely with the dependency rate effects discussed at length in section III. Any increase in the relative size of the school-aged population will put pressure on the educational system, the latter accommodating the pressure by spreading resources more thinly across the school population and lowering schooling quality. Once again, this is exactly what Schultz finds: the elasticity of expenditures per child with respect to school-aged cohort size is -1.12 at the primary level and -1.68 at the secondary level. If we are looking for Coale and Hoover dependency rate effects, here they are! Since the UN projects such massive declines in the dependency rates along the Asian Pacific Rim over the next two decades, can we therefore expect the quality of education per child to rise, augmenting the rate of human capital deepening?

VI. Inefficient Factor Markets

The simplest multi-sectoral models assume long run wage equalization. But even in such simple models, unbalanced output growth and derived labor demand can imply labor market disequilibrium and wage gaps in the short run. Migration, after all, responds only with a lag to wage differentials. Furthermore, when such models are consistently shocked by disequilibrating economic and demographic events, wage gaps can persist and even increase. Since such shocks are precisely the ingredients of industrial revolutions--like those taking place along the Asian Pacific Rim, development economists have come to expect the appearance of wage gaps, especially between small-scale rural agriculture and large-scale urban manufacturing.

Figure 3 describes the familiar two-sector example of labor market failure with wage gaps between agriculture (A) and industry (I), although the real world counterpart could be expanded to include urban informal services and small-scale manufacturing. The derived labor demand functions intersect at Z where the distribution of labor is optimal, and the prevailing wage is w^* . In the presence of a wage gap like XY, however, the distribution of labor is sub-optimal: here there are too many farm laborers and not enough manufacturing operatives. I have also shaded in the Harberger Triangle XYZ,

Figure 3. "Partial" General Equilibrium Analysis of Wage Gaps in Two Sectors



representing the allocative losses associated with this labor market failure. The economic significance of the market failure is conditioned by two forces, the size of the wage gap and the share of the labor force misallocated, $\bar{l} - l$.

How big are the rural-urban wage gaps? Lewis (1954) thought the gap was about 30 percent when he was writing in the early 1950s, but a recent review by Lyn Squire (1981, Table 30, p. 102) suggests they were somewhat bigger in the 1960s and 1970s, 41.1 percent.^{4/} They were even bigger in England at the end of the First Industrial Revolution, about 73 percent (Williamson, 1987).

Are nominal wage gaps good proxies for real wage differentials? Based on evidence from Brazil (Fishlow, 1972), from Peru (Thomas, 1980), from the American South (Bellante, 1979), and from 19th century England (Williamson, 1987), I suspect not. Not only do rural areas have the lower living costs, but it appears to be the non-food component of cost of living that explains most of the differentials (Thomas, 1980, p. 89; Williamson, 1987). On the other hand, urban amenities associated with government services may well serve as a partial offset to high cost of living in the cities (that is, these amenities may be capitalized into rents). Even if real wages were equalized, however, the real cost of labor facing firms need not be. The ratio of output price to cost of living may vary considerably across industry.

Are wage gaps necessarily evidence of labor market failure? Perhaps not. First, they may reflect real costs of moving. Second, they may reflect our inability to fully control for differences in the quality of labor (even after controlling for age, sex and skill), immigration to the city having selected individuals with attributes which have real economic value to city employers. Third, they may reflect urban employers' attempts to minimize turnover, in which case the cost of an efficiency unit of labor may in fact be equalized between sectors even though the measured wage gaps persist. This, after all, is the essence of the labor hoarding and permanent employment models which have been applied so extensively to contemporary Japan (Maddison, 1987, pp. 673-4), or to efficiency-wage models which emphasize differences in labor intensity. Finally, higher wages in urban employment may reflect greater job uncertainty or the cost of job search. Some time ago, Michael Todaro (1969) stressed the role of "casual" employment in the informal urban service sector as a holding area for the reserve army of immigrants who have come to the city in the anticipation of getting the more attractive jobs in formal, large-scale industry. Since there may be greater uncertainty attached to unskilled casual work in services and small-scale industry, the measured wage gap may reflect some compensation for such uncertainty. If so, we have another argument for the view that measured wage gaps may not reflect labor market disequilibrium at all. We need to learn a lot more about the sources of measured wage gaps and the operation of labor markets before we can assess the

extent to which labor market disequilibrium has constrained growth along the Asian Pacific Rim.

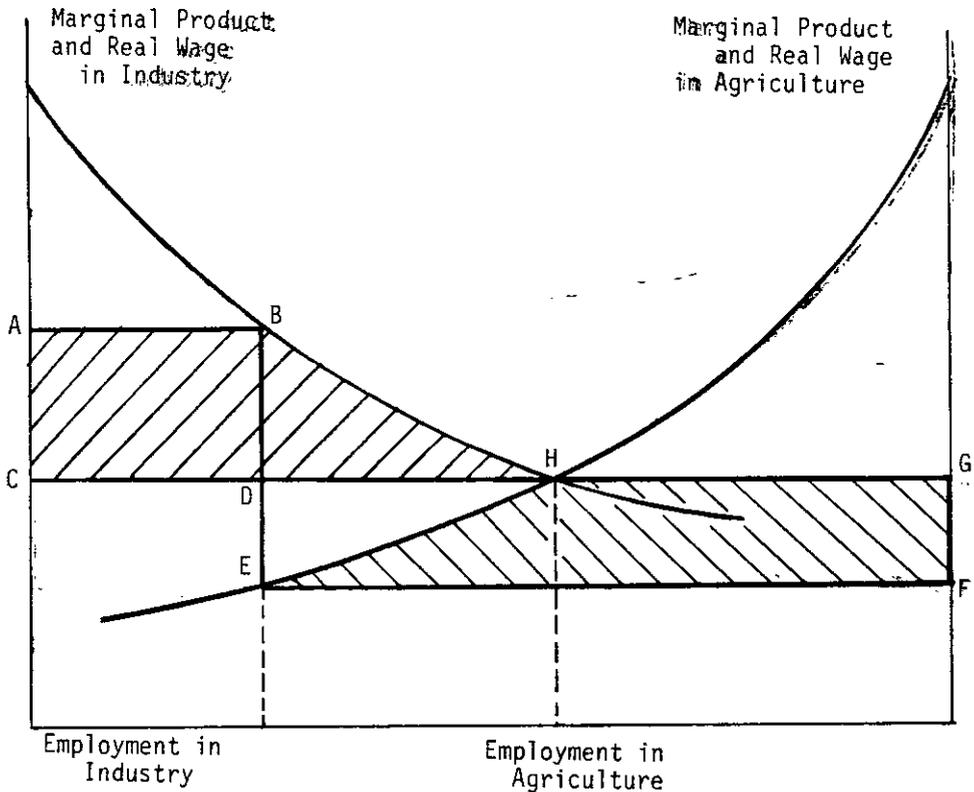
If we had good evidence on the size of these wage gaps along the Asian Pacific Rim (we do not), and if we were sure that they reflected disequilibrium (we are not), we could then ask what the national income gains would be if migration drove the wage gaps to zero. We could also ask what contribution changes in wage gaps have made to growth performance in the recent past. This, in fact, is precisely the kind of calculation that Denison and Chung (1976) offered for Japan. They found that such labor reallocations comprised about 10 percent of labor productivity growth. Moshe Syrquin (1986, Table 8-9, p. 255) found the same for Japan, and, surprisingly, smaller figures for Taiwan and Korea, 5 to 7 percent. Alternatively, Denison and Chung found that about a fifth of the US-Japan differential in income per worker in 1970 was attributable to the over-allocation of labor to agriculture and non-agricultural self-employment. What would we find if similar calculations were performed on the less-developed countries to the South of the Asian Pacific Rim? Presumably the wage gaps are bigger in Indonesia and the Philippines, for example, but we need the data to confirm that assertion. Certainly low productivity activities employ a far larger share of the labor force there, suggesting that the gains from more efficient labor allocations would be greater.

If we had wage gap and labor distribution evidence in hand, how would we go about estimating the impact of the elimination of those Harberger Triangles? I hope to show in a moment that the only way the assessment can be properly made is with general equilibrium models. Once again, however, I am unaware of any such attempt for Third World economies, let alone for economies along the Asian Pacific Rim.^{5/}

Allow me to use an historical example from the distant past which has been so calculated, Britain in the middle of the First Industrial Revolution, to illustrate the point (Williamson, 1986; 1987). In this case, the real wage gap was about 33 percent, and the deadweight loss embodied in that Harberger Triangle was only 0.5 percent of GNP. The figure is surprisingly small, as is so often the case in such calculations (Leibenstein, 1957; Dougherty and Selowsky, 1973; Shoven and Whalley, 1984)

The 0.5 percent estimate for Britain in the 1830s is likely to be a gross understatement, however, and for two reasons, both of which

Figure 4. "Partial" General Equilibrium Analysis of Wage Gaps:
Who Gains, and Who Loses?



having to do with capital markets. First, this "partial" general equilibrium calculation (like those offered by Denison and Chung) does not allow capital to chase after labor. As labor migrates to exploit the wage gaps, rates of return to capital begin to diverge, rising in the labor-absorbing sectors, so that capital should migrate as well. When a full general equilibrium assessment is made for the British case, the deadweight loss is considerably larger, some 3.3 percent of GNP, or six times larger. If such results can be generalized, they imply that labor market imperfections (and their removal) may have had a far bigger impact on postwar growth performance than we have thought. The size of the impact hinges on capital market responses. Second, what about the distributional incidence of labor market failure and its removal? Figure 4 tells us exactly who gains and who loses. With the disappearance of wage gaps, and with the emigration

of labor from agriculture, wages would have to rise in agriculture and fall in industry. Given no change in capital, land, or technology in either of the two sectors, it follows that rents in agriculture would decline and profits in industry would increase. Profits in industry would rise by $ABHC$, an increase in their producers' surplus. Rents (or farmers' profits) in agriculture would fall by $EHGF$, a decrease in their producers' surplus. It is not clear, however, how labor would fare. Laborers gain in agriculture but lose in industry for an ambiguous net change of $DGFE$ minus $ABDC$. The net change in the wage bill will be influenced by relative labor demand elasticities: if they are lower in agriculture, workers gain; if they are lower in industry, workers lose. In any case, to the extent that the classical saving postulate holds, then industrial capital accumulation is choked off by labor market failure. That is, if the reinvestment rate out of industrial profits is far higher than out of rents and farmers' profits, then aggregate savings are lower in the presence of labor market failure, and so too is the rate of accumulation economy-wide. Even if the classical saving postulate does not hold, imperfect capital markets ensure that the rate of accumulation in industry is lower given the lower profits in the presence of labor market failure. This, after all, is the central premise of the classical labor surplus model.

All of this reasoning suggests that we need to know far more about the role of labor market failure along the Asian Pacific Rim, especially in the presence of capital market distortions.

VII. A Concluding Remark

There is certainly no shortage of research tasks suggested by any effort to explore the human resource-economic growth connection along the Asian Pacific Rim. Furthermore, since this short paper has made no effort to be comprehensive, there are still a whole host of important topics left untouched. I am convinced, however, that we shall learn much from a systematic comparative assessment of recent economic histories along the Asian Pacific Rim. I hope this conference will help launch that effort.

Notes

1. The next four paragraphs draw heavily on Lindert and Williamson (1985), pp. 342-359.
2. I have drawn liberally on Professor Sachs' paper for the remainder of this section (Sachs, 1987, pp. 12-15).
3. Sachs overdraws the case in three ways. First, he ignores the fact that Japan underwent important land reforms early in the Meiji Restoration. Second, he ignores the fact that the poor in all three countries had relatively high levels of literacy and access to public health long before the late 1940s. Third, he ignores the fact that, compared with Latin America, land was also more equally distributed in much of South East Asia (the Philippines being an obvious exception).
4. Squire surveys 23 Third World countries in the 1960s and early 1970s. While three of these are in the South Asia region (Pakistan, Sri Lanka, and India), none of them are from the Asian Pacific Rim!
5. One such model that might be used for the labor market disequilibrium assessment is that by Allen Kelley and myself (1984) which was constructed to explore the determinants of rural-urban migration and city growth in the Third World.

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