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LESSONS FROM THE EAST ASIAN  
NICs: A CONTRARIAN VIEW

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ABSTRACT

The unusually rapid and prolonged growth of both output and exports in the Newly Industrializing Countries of East Asia has led many economists to believe that productivity growth in these economies, particularly in their manufacturing sectors, has been extraordinarily high. This view has, in turn, led to a growing belief in the "dynamic" (i.e. total factor productivity) gains from an outward orientation. This view fails to take into account the equally unusual rapid growth of both capital and labour input in these economies. Using the Summers & Heston and OECD data sets, this paper uses simple back of the envelope calculations to show that, as regards productivity growth in the aggregate economy and in manufacturing in particular, the East Asian NICs are not, in general, substantial outliers. The principal lessons to be drawn from the NICs are likely to be those concerning the potential gains from factor accumulation and the sectoral reallocation of resources, i.e. "static" neoclassical gains which have fueled the dynamic growth of these economies for more than 20 years.

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The post-war growth of the Newly Industrializing Countries of East Asia, i.e. Hong Kong, Singapore, South Korea and Taiwan, has profoundly influenced economists' evaluation of the potential gains from outward-oriented policies. The extraordinarily rapid and sustained nature of growth in these economies, along with its apparent association with the growth of exports, has led many economists to argue that there are enormous dynamic (i.e. total factor productivity) gains from an outward orientation. Thus, the World Bank's 1987 World Development Report notes that the gains from outward orientation "go far beyond the ones which are revealed by conventional analyses of the costs of protection..the scale and persistence of the growth rate differentials between the strongly outward-oriented economies and the others suggest that more subtle economic forces might also have been at work" (World Bank 1987, pp. 90-91).<sup>1</sup> This paper maintains that the wrong inference is being drawn from the East Asian growth experience. While it is true that the East Asian NICs have had a strong outward orientation, it is also true that they have experienced extraordinary rates of crude factor accumulation. Once factor accumulation is taken into account, productivity growth in the economies of the NICs, and in particular in their tradeable manufacturing sectors, does not appear to be extraordinarily high. Consequently, while outward orientation may or may not be associated with more rapid productivity growth, the rapid growth of the East Asian NICs should not be viewed as evidence of the potential dynamic gains from outward oriented policies.

In order to place the growth experience of the East Asian NICs in a proper international perspective, I turn to the popular Summers and Heston (1990) purchasing power parity data set. As can be seen from table 1, the growth of output per capita in the NICs during the 1960-1985

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<sup>1</sup>Even comparatively neo-classical economists have felt compelled to argue that "the lack of discrimination...against exports has led to rapid export growth in the Far Eastern NICs that, in turn, has contributed to high rates of economic growth" (Balassa 1988, p. S288) and that the "empirical evidence strongly suggests that dynamic factors may be associated with export-led growth" (Krueger 1990, p. 53).

period was truly remarkable.<sup>2</sup> Not only do these economies constitute four of the five fastest growing economies in the world during this period, but, perhaps more significantly, their growth rates were substantially higher than those of other economies in the sample. Using the sample standard deviation (2%) as a measure of dispersion, it is interesting to note that only 15 economies (not counting the NICs) are within one standard deviation of the slowest growing NIC (Korea), whereas only 9 are within one standard deviation of the fastest growing (Taiwan). Between 1960 and 1985 standards of living in the NICs increased more than four-fold, earning these economies, most appropriately, the designation: "miracles."

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<sup>2</sup> All growth rates reported in this paper are log, rather than geometric, growth rates.

Table 1: Annual Growth of Output per Capita  
(Summers & Heston Mk5: 1960-1985)

1	Botswana	0.067	41	Turkey	0.026	81	Kenya	0.011
2	Taiwan	0.062	42	Algeria	0.026	82	Guatemala	0.011
3	Hong Kong	0.059	43	Sweden	0.026	83	Jamaica	0.011
4	Singapore	0.059	44	Ecuador	0.026	84	Peru	0.010
5	S. Korea	0.057	45	Ireland	0.025	85	Saudi Arabia	0.009
6	Japan	0.055	46	Mexico	0.025	86	Nepal	0.009
7	Malta	0.053	47	Suriname	0.024	87	Ethiopia	0.009
8	Lesotho	0.051	48	Iran	0.023	88	Chile	0.008
9	Egypt	0.050	49	Swaziland	0.023	89	Argentina	0.007
10	Cyprus	0.049	50	Barbados	0.023	90	Sierra Leone	0.006
11	Gabon	0.045	51	Mauritius	0.023	91	Uganda	0.006
12	Greece	0.044	52	Luxembourg	0.023	92	Burundi	0.005
13	Brazil	0.042	53	Pakistan	0.023	93	Guinea	0.005
14	Syria	0.041	54	Tanzania	0.023	94	India	0.005
15	Portugal	0.041	55	Gambia	0.023	95	Bangladesh	0.005
16	Malaysia	0.039	56	Colombia	0.023	96	Nicaragua	0.003
17	Yugoslavia	0.039	57	Australia	0.022	97	Niger	0.001
18	China	0.038	58	Dom. Rep.	0.022	98	Uruguay	0.001
19	Thailand	0.038	59	U.S.A.	0.021	99	Benin	0.001
20	Norway	0.036	60	U.K.	0.021	100	Senegal	0.001
21	Cameroon	0.036	61	Costa Rica	0.021	101	Haiti	0.000
22	Congo	0.035	62	Togo	0.019	102	Mauritania	-0.000
23	Italy	0.035	63	Cape Verde	0.019	103	Liberia	-0.001
24	Panama	0.035	64	Trin. & Tob.	0.018	104	Sudan	-0.001
25	Spain	0.035	65	Switzerland	0.017	105	Somalia	-0.002
26	Finland	0.035	66	Zimbabwe	0.017	106	Zaire	-0.002
27	Morocco	0.034	67	Fiji	0.016	107	Nigeria	-0.002
28	Israel	0.034	68	Philippines	0.016	108	Afghanistan	-0.003
29	Austria	0.033	69	South Africa	0.016	109	Mali	-0.004
30	Tunisia	0.032	70	PNG	0.015	110	CAR	-0.006
31	Iceland	0.032	71	Venezuela	0.015	111	Ghana	-0.008
32	France	0.030	72	Ivory Coast	0.014	112	Guyana	-0.010
33	Jordan	0.029	73	Sri Lanka	0.014	113	Madagascar	-0.016
34	Denmark	0.028	74	N. Zealand	0.014	114	Chad	-0.017
35	Belgium	0.028	75	Honduras	0.013	115	Zambia	-0.017
36	Netherlands	0.027	76	Bolivia	0.013	116	Angola	-0.018
37	Paraguay	0.027	77	Malawi	0.012	117	Mozambique	-0.020
38	Canada	0.026	78	Rwanda	0.012	118	Kuwait	-0.080
39	Burma	0.026	79	Iraq	0.012			
40	W. Germany	0.026	80	El Salvador	0.012			

To arrive at an understanding of the factors behind the growth of output in the NICs it is necessary, as a first step, to move away from measures of output per capita (which reflect standards of living) to measures of output per worker (which are more closely linked to productivity). Table 2 below presents such data, drawn from the same Summers and Heston data set.<sup>3</sup> As is immediately apparent, in terms of labour productivity the growth performance of the NICs is both less spectacular and less differentiated from the rest of the sample. A movement from output per capita to output per worker knocks about 1% per annum off of the growth rates of three of the NICs, and about 1.6% per annum (for 25 years!) off of the growth rate of Singapore. Once again using the sample standard deviation (2%) as a benchmark, we now find that 18 non-NIC economies are within one standard deviation of the fastest growing NIC (Taiwan), whereas 42 (!) are within one standard deviation of the slowest growing (Singapore). Unexpectedly, LDCs such as Egypt, Greece, Syria and Cameroon are now seen to have performed as well as the fastest growing NICs, whereas OECD economies such as Spain, Italy and Austria are now nearly the equal of Singapore.

The surprising gap between the performance of the NICs in tables 1 and 2 is due, obviously, to rising aggregate participation rates in all four economies. Following a post-war baby boom, with rates of natural increase approaching 4% (e.g., in Singapore), all four economies experienced a rapid decline in fertility and, consequently, population growth. As the post-war baby boom aged and as female labour force participation increased, the aggregate participation rate in all four economies rose rapidly (e.g. from 39% in 1960 to 53% in 1985 in Hong Kong).<sup>4</sup> As figure 1 shows, within the Summers & Heston data set rising participation

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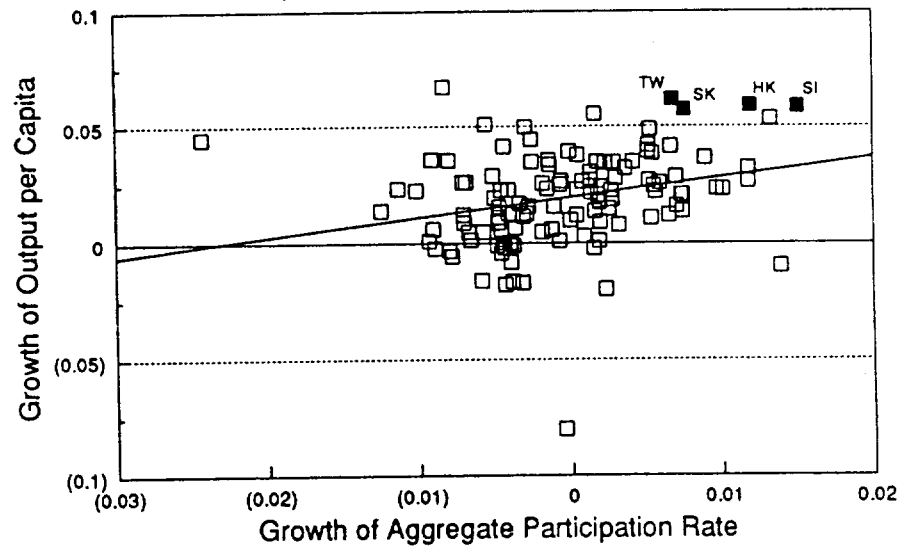
<sup>3</sup> Although the same 118 countries lie in the sample, to conserve space in this table (and in table 3) I restrict attention to the upper tail of the distribution.

<sup>4</sup> Summers & Heston (1990).

rates are associated with more rapid growth, with a 1% increase in participation leading to a .85% increase in the growth of output per capita (s.e.=.29), which is not significantly different from the 1% increase in growth predicted by a full steady state transition in the neo-classical growth model. With some of the largest increases in participation rates in the sample, the NICs experience some of the largest reductions in growth rates in moving from measures of output per capita to those based upon output per worker.

Table 2: Annual Growth of Output per Worker (Summers & Heston Mk5: 1960-1985)								
1	Botswana	0.076	16	Yugoslavia	0.039	31	Israel	0.032
2	Gabon	0.069	17	Spain	0.037	32	Morocco	0.031
3	Lesotho	0.057	18	Thailand	0.037	33	Finland	0.031
4	Taiwan	0.055	19	Italy	0.037	34	France	0.029
5	Japan	0.054	20	Brazil	0.037	35	Tunisia	0.028
6	Egypt	0.053	21	Austria	0.035	36	Ecuador	0.027
7	South Korea	0.050	22	Swaziland	0.035	37	Norway	0.027
8	Hong Kong	0.047	23	Portugal	0.035	38	Tanzania	0.027
9	Greece	0.047	24	Malaysia	0.034	39	Burma	0.027
10	Syria	0.046	25	Jordan	0.034	40	Pakistan	0.027
11	Cameroon	0.045	26	Turkey	0.033	41	Ivory Coast	0.026
12	Congo	0.043	27	Panama	0.033	42	Ireland	0.026
13	Cyprus	0.043	28	Gambia	0.033	43	Paraguay	0.025
14	Singapore	0.043	29	Algeria	0.033	44	W. Germany	0.025
15	Malta	0.040	30	China	0.033	45	Belgium	0.025

**Figure 1: Participation Rates and Growth**  
(Annual: S&H 1960-1985)



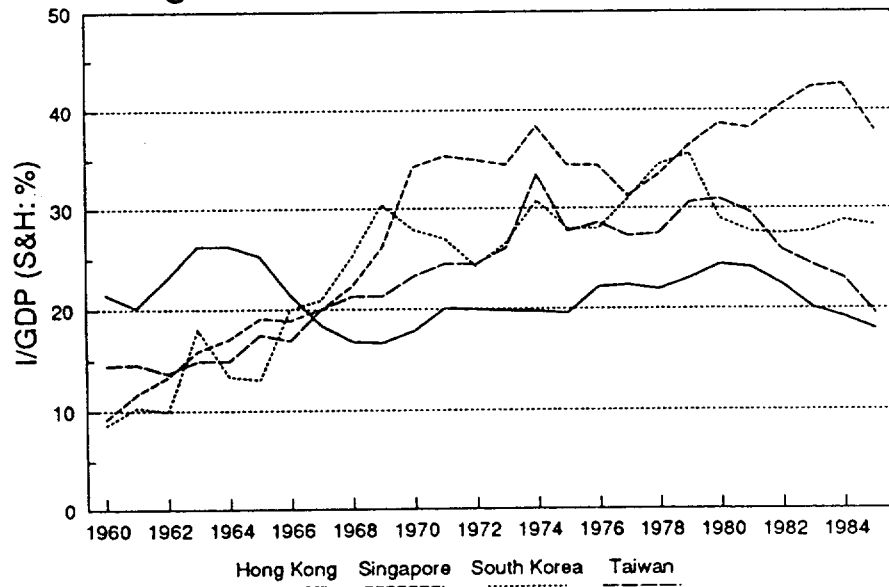


Clearly, even allowing for rising participation rates, with growth rates of output per worker in the top 14 of 118 economies, the performance of the NICs remains extraordinary. Measures of output per worker, however, do not properly control for rising capital input. As figure 2, again using Summers and Heston data, shows, with the exception of Hong Kong, during the 1960-1985 period each of the NICs experienced an extraordinary rise in its investment to GDP ratio. Between 1960 and 1980 the I/GDP ratio doubled in Taiwan, tripled in Korea and quadrupled in Singapore. As figure 3 shows, this increase is not typical of the world economy where, with the exception of high-performing Asia, I/GDP ratios were constant or declining.<sup>5</sup>

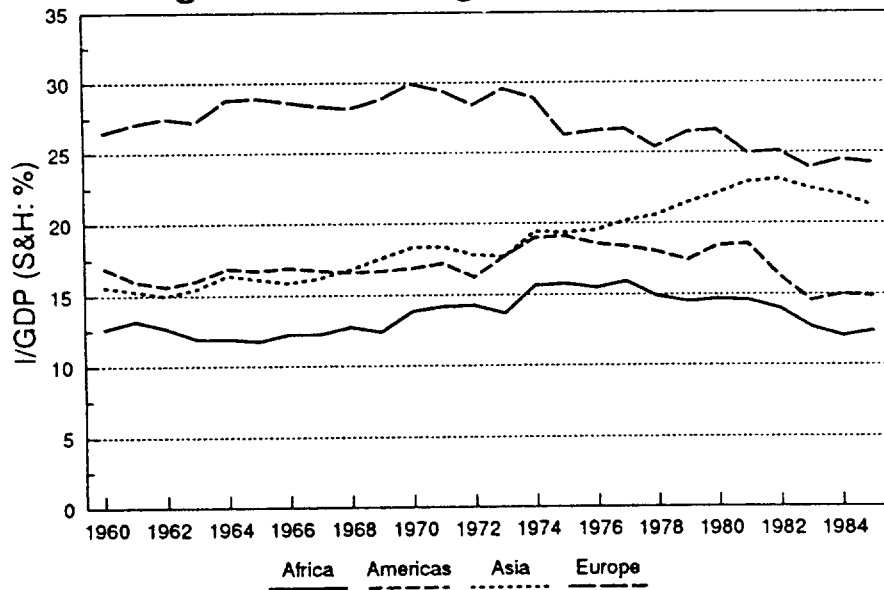
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<sup>5</sup>The numbers reported in figure 3 represent the unweighted average of the economies in each geographical region. The figures for Asia include the Middle East, Oceania, and South Asia, but exclude the NICs.

**Figure 2: Investment in the NICs**



**Figure 3: Average I/GDP Ratios**



One can use the Summers and Heston data to arrive at a fairly crude measure of total factor productivity growth in these 118 economies. Cumulating investment flows for 10 years (1960-1969) using a 6% depreciation rate provides a benchmark capital stock for each economy in 1970; which can then be extended to 1985 using the investment data for 1970-1985. Using the Summers and Heston data on output and number of workers then allows for a cross-sectional regression of the growth of output per worker (1970-1985) on a constant and the growth of capital per worker (1970-1985):

$$\hat{Q}_i - \hat{L}_i = -.21 + .45(\hat{K}_i - \hat{L}_i) + E_i$$

where  $E_i$ , the residual for each economy, represents a measure of the growth of total factor productivity (over and above the world average) in that economy.<sup>6</sup> Clearly, this procedure is fraught with error. In particular, since technical change induces capital accumulation the coefficient on capital per worker will tend to capture the average rate of technical change in the world economy, overstating the elasticity of output with respect to capital input. Nevertheless, the results of this simple, back-of-the-envelope, computation are worth examining.

Table 3 presents estimates of "total factor productivity" in the sample economies, using the procedure outlined above. Although Hong Kong remains one of the top performers in the world economy, the ranks of Taiwan and South Korea are now reduced to 21st and 24th, respectively. While this remains a strong performance, it is no longer dramatically differentiated from that of the rest of the world economy. Fully 81 of the 118 sample economies lie within one standard deviation (again 2%) of Taiwan and South Korea. Surprisingly, economies such as Bangladesh,

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<sup>6</sup> Since only ten years of investment data are used to establish the benchmark capital stock, it is likely to be underestimated in each of the sample economies. The constant term adjusts for this problem. Specifically, if the true initial capital stock is  $\lambda$  times the estimated benchmark capital stock then, assuming the final capital stock is measured without error, the constant, aside from incorporating that component of the average rate of productivity growth in the world economy which is uncorrelated with capital accumulation, will also contain an element  $-B \ln(\lambda)$ , where B is the elasticity of output with respect to capital.

Uganda, Iceland and Norway are now seen to have outperformed Korea and Taiwan, whose productivity growth is only .5% greater than that of a renowned laggard, the United Kingdom. Singapore, where participation and investment rates have risen faster than in any of the other NICs, is reduced to a rank of 63rd in the world economy, just ahead of Sri Lanka and just behind India.

Table 3: Annual Growth of "Total Factor Productivity"  
(1970-1985)

1	Egypt	0.035	23	Guinea	0.014	45	Turkey	0.008
2	Pakistan	0.030	24	South Korea	0.014	46	Netherlands	0.008
3	Botswana	0.029	25	Iran	0.014	47	Ethiopia	0.007
4	Congo	0.028	26	Burma	0.014	48	Austria	0.007
5	Malta	0.026	27	Mauritius	0.013	49	Australia	0.007
6	Hong Kong	0.025	28	China	0.013	50	Spain	0.006
7	Syria	0.025	29	Denmark	0.013	51	Kenya	0.006
8	Zimbabwe	0.024	30	Israel	0.012	52	France	0.005
9	Gabon	0.024	31	Greece	0.012	53	Liberia	0.004
10	Tunisia	0.024	32	Japan	0.012	54	Paraguay	0.004
11	Cameroon	0.024	33	Luxembourg	0.012	55	Honduras	0.004
12	Lesotho	0.022	34	Yugoslavia	0.011	56	Portugal	0.004
13	Uganda	0.021	35	Tanzania	0.011	57	U.S.A.	0.004
14	Cyprus	0.021	36	Colombia	0.011	58	Belgium	0.004
15	Thailand	0.019	37	Sweden	0.010	59	Canada	0.003
16	Bangladesh	0.019	38	Malaysia	0.010	60	Algeria	0.003
17	Iceland	0.018	39	Malawi	0.010	61	CAR	0.002
18	Italy	0.018	40	Brazil	0.010	62	India	0.001
19	Norway	0.017	41	Panama	0.009	63	Singapore	0.001
20	Finland	0.015	42	U.K.	0.009	64	Sri Lanka	0.001
21	Taiwan	0.015	43	W. Germany	0.009	65	Fiji	0.001
22	Ecuador	0.014	44	Mali	0.008	66	Switzerland	0.000

The conclusions derived from table 3 are surprisingly insensitive to substantial modifications in the analysis. Thus, for example, use of a 10% depreciation rate to estimate the capital stock changes the regression coefficient on capital to .42, lowering Hong Kong to a position of 9th in the table, while raising Taiwan to 20th, Korea to 22nd, and Singapore to 62nd. Avoiding the regression analysis altogether and simply imposing a (lower) .35 capital share (with a 10% depreciation rate) ranks Hong Kong 10th in the sample, Taiwan 15th, South Korea 16th and Singapore 51st. In each case, one is forced to conclude that (i) Hong Kong, South Korea and Taiwan lie somewhere around the 15th percentile mark of the sample, with a performance that (with the exception of Hong Kong) is not substantially differentiated from the majority of the sample economies; (ii) Singapore lies at about the 50th percentile mark, with a performance that is not substantially differentiated from the slow growing economies of South Asia. The NICs have experienced an unusually rapid growth of output per worker. This output growth, however, is not substantially greater than what one would have predicted, given the doubling, tripling and quadrupling of the investment to GDP ratios in these economies.<sup>7</sup>

Before concluding, it is worth narrowing our focus to growth in the leading tradeable goods sector, manufacturing. Table 4 below presents data on the growth of output and employment in the aggregate economy and in manufacturing for the OECD, the NICs and a

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<sup>7</sup> I should note that Lau and Kim (1992), using a more sophisticated econometric analysis, found that productivity growth in the East Asian NICs was not significantly different from zero. For my part, I have developed detailed estimates of total factor productivity growth in the NICs, decomposing capital input into its component parts (e.g. residential, non-residential, machinery, etc.), adjusting for hours of work and the changing sex, age, and educational characteristics of the working population, and using actual data on compensation to estimate the output elasticities (Young 1993). Following two years of concentrated work, I estimated total factor productivity growth rates of 2.4% (71-91) for Hong Kong, -1.1% (70-90) for Singapore, 1.8% (70-90) for South Korea, and 2.1% (70-90) for Taiwan, i.e. numbers which, with the exception of Singapore, are not substantially different from those derived in a leisurely afternoon with the Summers and Heston data set.

small sample of LDCs.<sup>8</sup> Whereas there is clearly a large disparity between the growth of aggregate output per worker in the NICs and in the other sample economies, the performance gap in manufacturing is noticeably smaller. In fact, with growth rates of output per worker of 2.8% and 4.1%, the performance of Singaporean and Taiwanese manufacturing is well within the range recorded by the other economies, whose mean growth rate is 3.2%. South Korea emerges, however, as a substantial outlier. The final column of the table reconciles these surprising statistics with the well-known rapid growth of East Asian manufacturing output and exports. With the exception of Hong Kong, manufacturing employment in the East Asian NICs has been growing almost 6% per annum. The crucial characteristic of the Newly Industrializing Countries of East Asia is not that they have had unusually rapid productivity growth in manufactures, but, rather, that they have successfully expanded investment and employment in manufactures, hence the title: "industrializing."

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<sup>8</sup> I have, to the degree possible, tried to focus the comparison on the 1970s and 1980s, for which period the data on the NICS is more reliable. The data for the OECD were provided to me by the OECD Statistics Directorate. For the NICs and the other LDCs I use national accounts and census sources. The Hong Kong government has never estimated the constant price growth of manufacturing output, hence the NA in the table. Young (1993) explains the sensitivity of the other estimates for the NICs to the selection of period of analysis and sources.

Table 4: Growth of Output and Employment (Annual)				
Country	Time Period	Aggregate Output per Worker	Manufacturing Output per Worker	Manufacturing Employment
Hong Kong	71-91	4.8%	NA	0.6%
Singapore	70-90	3.4%	2.8%	5.7%
South Korea	70-90	6.1%	7.3%	5.5%
Taiwan	70-90	5.9%	4.1%	5.6%
India	61-81	2.6%	3.3%	1.2%
Philippines	70-90	1.1%	2.8%	1.5%
Thailand	60-80	4.5%	4.9%	5.1%
Turkey	65-85	3.3%	3.2%	3.8%
Australia	74-89	1.3%	2.9%	-0.8%
Austria	76-90	1.8%	3.6%	-0.7%
Denmark	70-90	1.8%	2.5%	-0.5%
Finland	76-90	3.0%	4.8%	-1.3%
France	77-90	2.2%	2.6%	-1.7%
Germany	70-89	2.2%	2.3%	-0.8%
Greece	71-85	3.0%	2.1%	1.5%
Iceland	73-89	1.7%	1.5%	1.1%
Luxembourg	75-90	1.8%	4.7%	-1.8%
USA	70-87	0.9%	3.1%	-0.1%



In sum, with the possible exception of Hong Kong, aggregate productivity growth in the East Asian NICs is not extraordinarily high, while, with the exception of South Korea, productivity growth in NICs manufacturing is well within the experience of other, less open, economies. In general, rapid factor accumulation, of both capital and labour, explains the lion's share of the East Asian growth miracle, both in the aggregate economy and in the manufacturing sector. Consequently, it would be a mistake to conclude that the East Asian NICs are a prime example of the potential dynamic gains from outward oriented policies. This is not to say, however, that an outward orientation has not played an important role in the development of these economies, allowing them to expand manufacturing employment and output and, in the case of Korea, borrow extensively from international capital markets. There are many beneficial lessons to be drawn from the NICs. Most of these, however, have to do with the gains from factor accumulation and the sectoral reallocation of resources, "static" neo-classical gains which have sustained the growth of these economies for more than 20 years.

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