Structural Transformation and Economic Growth in Hong Kong:
Another Look at Young's "A Tale of Two Cities"

by

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Abstract

Young (1992 and 1995) demonstrated, based on the data from the 1960s to
the 1980s, that the total factor productivity (TFP) growth rate in Hong
Kong was markedly high. Hong Kong's output growth since the mid-1980s owed
much to the establishment of the cross-border division of labor in which
Hong Kong relocated manufacturing to the Mainland and provided support
and entrepôt trade services in the form of service exports. Nevertheless,
growth accounting at the sectoral level indicates that Hong Kong's TFP
growth since the 1980s came largely from the declining manufacturing sector.
The expanding services sector's TFP growth, whether tradable or not, has
been low. Hong Kong's annual TFP growth rate dropped below one percent
during the 1991 to 1997 period. As a result of the decelerating demand
growth for Hong Kong's service exports since the mid-1990s as well as the
greatly reduced manufacturing sector's size, a fall of Hong Kong's long-term
output growth rate appears to be unavoidable.

1. INTRODUCTION

Earlier in this decade, Young (1992 and 1995) pointed out a striking difference in long-term economic growth patterns between Hong Kong and Singapore. With growth accounting based on the data from the 1960s to the early 1990s, Young demonstrated that the total factor productivity (TFP) growth rate in Hong Kong (1966-1991, 2.3% annually) was markedly high compared with that of near zero in Singapore (1966-1990, 0.2%).[1] A corollary is that, depending less on fast input increases, Hong Kong's high growth is more sustainable than is Singapore's.[2] Despite respectable output growth of the Hong Kong economy through the 1990s until the regional economic slump from late 1997, Hong Kong's long-term growth rate appears to have been falling. The annual GDP growth rate dropped from 9.0% in the 1970s to 6.5% in the 1980s and to 5.2% during the first seven years of the 1990s.[3] The objective of this study is to clarify the consequences of Hong Kong's structural transformation since the mid-1980s on its long-term economic growth, which Young's work did not consider fully, and reassess the growth potential of the Hong Kong economy with updated macroeconomic data. In extending Young's growth accounting, I have performed growth accounting on a sectoral basis for the 1981 to 1997 period.

2. STRUCTURAL TRANSFORMATION SINCE THE 1980S

Young's main arguments (1992) for Hong Kong's favorable TFP growth record are (i) Hong Kong's relatively educated work force at the early stage of its postwar industrialization and (ii) its industrial transition was largely free from government's discretionary policy. Guided by profits and market competition, Hong Kong entrepreneurs displayed remarkable

adaptability to new business opportunities, from textiles in the 1950s, to clothing and plastics (toys) in the 1960s, to electronics (watches) and banking in the 1970s, and to entrepôt trade in the 1980s (Young, 1992, Table 3, p. 25). Although industrial structure evolved over time, capital invested in light manufacturing and service trades yielded relatively high continuous returns.

Accompanying dramatic deindustrialization, the last industrial transition in the 1980s towards entrepôt trade had a far-reaching impact on Hong Kong's growth pattern. China's historic policy decision to launch economic reforms in the late 1970s offered a unique opportunity for Hong Kong to sustain its growth momentum by establishing a cross-regional division of labor. As a growing number of Hong Kong's manufacturing enterprises began relocating their operations through direct foreign investment to close-by Chinese provinces from the first half of the 1980s, Hong Kong has become the operations center and transshipping port of the rapidly industrializing southern China region.[4] Hong Kong's manufacturing investment in the mainland was turning out large volume exports by the second half of the 1980s, and Hong Kong's entrepôt trade was reinvigorated in the process. The real value of Hong Kong's re-exports increased by an astonishing 21.1% annually during the 1985 to 1997 period (Table 1, fifth column). Thanks to the rapidly growing demand for Hong Kong's service exports (such as shipping, storage, insurance, marketing, trade, financial, and managerial services) in supporting the industrial base in southern China and expanding re-exports through Hong Kong ports, Hong Kong's tradable services sector replaced manufacturing as its leading growth industry.

Reflecting the upward shift of the demand curve, Hong Kong's service

exports prices rose by 6.0% and their real value by 7.2% annually during the 1985 to 1997 period (eighth and sixth columns). Economic transformation towards a services-sector based economy reached the point that the goods producing sector of the economy began to contract by the end of the 1980s. The real value of domestic exports stagnated around 1989, then decreased from 1993, falling behind service exports in 1996 (third column). While the tradable services sector continued fast expansion (annual output growth rate: 1985-1997, 9.4%, Table 2, fourth column), the tradable goods sector's (mainly manufacturing) output growth rate declined from annual 6.9% during the 1985 to 1990 period to - 3.7% during the 1991 to 1997 period (third column).[5] By the mid-1990s, Hong Kong had completed its transition to a services sector-based economy. Despite strong annual real output growth of 5.7% during the 1985-97 period, the nominal GDP share of manufacturing dropped sharply from 23.1% in 1984 to 6.0% in 1997 and that of tradable services rose markedly from 28.4% in 1984 to 37.9% in 1997. Deindustrialization was no less dramatic in sectoral employment than in output; the manufacturing sector's employment share fell from 40.2% in 1984 to 11.6% in 1997.

3. GROWTH DECOMPOSITION: DEMAND SIDE

Considering the demand-side of economic growth, we can decompose Hong Kong's output growth since the 1980s into four elements.[6] Equation (1) is the GDP identity where exports consist of goods (domestic exports) and services[7]:

$$Y = D + X_g + X_s - M, \tag{1}$$

Notations: Y = GDP; D = domestic demand; X_g = domestic exports, X_s = exports of services; and M = imports net of re-exports. All variables are in constant prices.

Let α denote the share of total domestic demand supplied from domestic sources, $(D - M)/D$,

$$Y = \alpha D + X_g + X_s. \tag{2}$$

The differentiation of Equation (2) with respect to time yields,

$$\hat{Y} = \alpha \hat{D} + \hat{\alpha} D + \hat{X}_g + \hat{X}_s. \tag{3}$$

A circumflex above a variable denotes the derivative with respect to time ($\hat{x} = \mathrm{d}x/\mathrm{d}t$). Note that α's rise implies economic development biased towards import substitution. Table 3 reports the percentage contribution to GDP growth of each demand-side element.

Hong Kong is a prime example of a small open economy heavily dependent on foreign trade. Because of the multiplier effect, export growth affects output substantially more than the sizes of $\hat{X}_g$ and $\hat{X}_s$ in the table might indicate.[8] The first and second rows of the lower panel suggest that the expansion of domestic exports ($\hat{X}_g$) was the main propellant of the Hong Kong economy on the demand side until the late 1980s. This pattern was broken in the 1990s when manufacturing exports of Hong Kong products stagnated. However, the high prices reflecting strong external demand associated with

the newly-formed Hong Kong-Mainland cross-regional division of labor

continued to pull services exports forward $(\hat{X}_s)$. Export demand for tradable

services along with strong domestic demand began to play the central role

in economic growth during the 1990s. The demand-side decomposition appears

to underscore the change in the growth pattern that accompanied the industrial

transition discussed above.

4. GROWTH ACCOUNTING: SUPPLY SIDE

4.1. Aggregate Estimates

Production-based sectoral GDP data are available since 1980 with

which the author has performed growth accounting of Hong Kong's three sectors,

tradable goods, tradable services, and nontradables, based on the Solow

model.[9] The aggregate-level (sum of the three sectors) growth accounting

estimates are in Table 4 along with Young's (1995).

With the Solow model (Table 4-B), we may fully attribute the decline

in the output growth rate in the 1990s (1980s, 6.6%; 1991-1997, 4.7%) to

the sharp deceleration of TFP $(\hat{A})$ growth (from 2.4% to 0.2%). Because the

long-term growth rates of capital and labor barely changed, the output

growth rate must have been little affected by aggregate inputs. Note that,

because of errors and omissions in Hong Kong's national income accounts,

the production-based GDP used in growth accounting occasionally does not

match well the expenditure-based GDP. The annual GDP growth rates of the

production-based GDP are 0.1% higher during the 1981 to 1990 period and

0.5% lower during the 1991 to 1997 period than those of expenditure-based

GDP. Instead, if the expenditure-based GDP was used, the fall in the TFP growth rate computed would be about 0.6% smaller than the observed 2.2% (from 2.4% to 0.2%) and the 1991 to 1997 TFP growth rate would rise to 0.6% from the reported 0.2%. In either situation, one has to conclude that the annual TFP growth rate during the 1990s preceding the Asian Financial Crisis dropped to less than 1%. The respectable around 5% annual output growth during the 1990s was largely input-driven. Looking back on the 1970s in Young's table (Table 4-A), one can confirm that the deceleration in TFP growth began in the 1980s and was also responsible for the fall in the observed GDP growth rate in the 1980s from the 1970s level.

4.2. Sectoral TFP Growth

Growth accounting at the three sectors in the 1980s and the 1990s (Table 5, upper panel) reveals a large gap in TFP growth between the tradable goods and the two services sectors (tradable services and nontradables). While the tradable goods sector (mainly manufacturing) consistently logged high TFP growth, the other two sectors exhibited either positive but low (tradable services) or often negative (nontradables) TFP growth rates since 1981. As a matter of fact, all or very large part of TFP growth has originated from the tradable goods sector since the 1980s (lower panel). The two services sectors' contribution to Hong Kong's TFP growth has been small or negative. One must judge that the source of Hong Kong's fast TFP growth has been the favorable performance of the manufacturing sector. Although data unavailability keeps one from confirming it, the above results leave us to suspect that, during the 1960s and 1970s, the manufacturing sector also

accounted for most of the TFP growth in Young's estimates (Table 4-A). Because of the industrial transition, however, Hong Kong's manufacturing sector's output share decreased greatly through the 1990s. Given its reduced size, the manufacturing sector's contribution to TFP growth in the future is likely to be significantly smaller than in the recent past.

5. NATURE OF THE 1985 TO 1997 ECONOMIC GROWTH

We are in a position to evaluate Hong Kong's economic growth pattern since the mid-1980s. The Hong Kong government pegged the value of the Hong Kong dollar to the U.S. dollar at HK$7.8 per US$ under the "linked exchange rate system" in October 1983. This currency regime, by laying a foundation to Hong Kong's macroeconomic stability, contributed to the long economic boom from 1986, which ended abruptly in late 1997 following the currency depreciations of nearby Asian Pacific economies. During the period since the mid-1980s, the tradable services sector has become the leading growth sector of the economy, because Hong Kong's tradable services commanded high prices in export markets. Having been able to enjoy sizable terms of trade gains by switching to tradable services, Hong Kong has made the right choice.[10] Upon turning itself into a services industry-based economy within a short period, Hong Kong largely shed its manufacturing sector through relocation by the mid-1990s. Deindustrialization in this context confirms once again the time-tested high adaptability of Hong Kong entrepreneurs.

The industrial transition, however, represents a choice in favor of the price (terms of trade) effect over the quantity (productivity) effect.

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Hong Kong's tradable goods sector has exhibited fast TFP growth and slow price increases over years in contrast to the booming tradable services sector which experienced slow TFP growth and rapid price increases. For the Hong Kong population, by switching to tradable services, the purchasing power gain from real exchange rate appreciation (1991 to 1997, + 34.8%; Table 1) more than offset the observed 1%- plus annual output growth slowdown from the 1981 to 1990 (6.5%) to the 1991 to 1997 period (5.2%).[11]

6. OUTLOOK

Looking beyond the current economic cycle that began in late 1997, the finding, namely that most of Hong Kong's TFP growth originates from the tradable goods sector and the tradable services sector's TFP growth rate has been low, casts some doubt on Hong Kong's long-term growth potential.[12] Having transferred the manufacturing base to the mainland, any economic boom hereafter will be services sector-led. Given the two services sectors' past record, Hong Kong's TFP growth rate is likely to settle at a low level and its long-term output growth rate to depend largely on input mobilization.[13]

There has been a noteworthy demand-side development. The growth of service export prices decelerated markedly since 1996 (1995, 5.4%; 1996, 1.6%; 1997, 0.7%; 1998, - 3.9%; and 1999, - 2.7%) as the early phase of rapid industrialization in southern China ended. The Asian-regional recession further eased export prices in 1998 and 1999. Slowing export demand for the tradable services sector began to restrain the sector's output expansion.[14] This will inevitably curb aggregate demand growth. Also, the powerful terms of trade effect since the mid-1980s appears to have run its course. The

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relocation of manufacturing and the declining demand growth for service exports have altered the fundamentals of Hong Kong's growth by the late 1990s. Young portrayed well Hong Kong's long-term growth pattern when manufacturing was the leading industry. Once the events since the late 1980s are fully taken into consideration, Hong Kong's growth potential looks weaker than a decade ago.

APPENDIX: DATA DEFINITIONS AND SOURCES

H1. Constant-price GDP, domestic exports, re-exports, and exports of services: 1990-price annual expenditure-based GDP series, provided by the Census and Statistics Department, the Government of Hong Kong.

H2. GDP deflators: provided by the Census and Statistics Department and CSD-b (2000), Table 2, pp. 18-19.

H3. Hong Kong Dollar exchange rate: HK$ per one US$, annual average, International Monetary Fund (1999), pp. 334-335 and Hong Kong Monetary Authority (May 2000), p. 47.

H4. Sectoral GDP deflators. The deflator for the tradable sector is computed as the composite deflator of two GDP deflators: one for domestic exports (used as the deflator for tradable goods) and the other for exports of services (for tradable services). With this tradable sector deflator and the GDP deflator, the deflator for the nontradable sector is computed as the geometric difference of the two. Considering Hong Kong's heavy dependence on international trade, this author believes that the GDP deflators for domestic exports and exports of services serve well as the proxies of the missing sectoral output deflators. In 1996, the nominal value-added of the tradable goods and services sectors were HK$78.3 and HK$437.0 billion; domestic exports and exports of services were, respectively, HK$212.2 and HK$288.6 billion (computed from the data provided by the Census and Statistics Department and CSD-b (2000, pp. 13 and 19).

H5. Sectoral output. Value-added at current prices by economic activity (production-based GDP) was provided by the Census and Statistics

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Department. Industries are classified into three sectors. The tradable goods sector consists of manufacturing, mining, and agriculture. The tradable services sector consists of import and export trades, hotels, transport, storage, financing, insurance, and business services. The rest represents the nontradable sector. In addition, the tradable goods and services sectors jointly represent the tradable sector. Note that the tradable goods sector is almost exclusively manufacturing; Hong Kong's mining and agricultural sectors are very small. The current-price sectoral value-added are converted to sectoral output in 1990 prices with the sectoral GDP deflators (H4).

H6. Sectoral labor input. CSD-a each year lists the numbers of persons engaged in the non-agricultural private industrial sectors based on the business establishment survey (Table 2.9). The number of persons engaged in the civil service is also listed (Table 2.7). The Census and Statistics Department provided the author with the data for the persons engaged in the agricultural sector. If the numbers refer to 1996, for example, these are as of December 1996 for the private sector and as of early January 1997 for the civil service. Because the business establishment survey omits the self-employed, persons engaged from the establishment survey in all private industrial sectors' are adjusted upward proportionally so that their sum matches the persons engaged from the general household survey (CSD-a, Table 2.4), which include the self-employed. Readers are referred to the Census and Statistics Department (1997) for the methodological details of the two surveys. The computed persons engaged figures still understate the working population. To make another adjustment, the numbers of

persons engaged in the tradable goods, tradable services, and nontradable sectors are computed according to their industrial classification in H5 (A series). The civil service is included in the nontradable sector. The Census and Statistics Department also provided the author with the population census data for 1981, 1986, 1991, and 1996, which were more complete and accurate. The second series of persons engaged in the three sectors are obtained based on the census data (B series). The ratio of the A series to the B series is calculated for the four census years (A/B ratio). Because the census data is more complete, these ratios are smaller than unity. Each A/B ratio is extended by intrapolation to cover the 1980-1997 period. The A series is divided by the A/B ratio each year to obtain the adjusted sectoral labor input used in this study.

H7. Sectoral capital stock. The 1990-price expenditure-based GDP series (H1), which includes gross domestic fixed capital formation and change in inventory, date back to 1961. Gross domestic fixed capital formation in the private sector in 1990 prices is available from 1986 onwards (CSD-b, pp. 38-39). This series was extended back to 1966 with the 1990-price volume index (pp. 36-37). In 1966, the private sector share of gross domestic fixed investment was 85.2%. Assuming this ratio was constant, the series is further extended to 1961. The sum of this series and inventory change in 1990 prices represents gross investment in 1990 prices. Upon reconstructing the capital stock series with annual gross investment and the rate of depreciation, two assumptions are made; (i) capital stock at the end of 1960 was twice as large as GDP in 1961 in 1990 prices and (ii) the annual

rate of depreciation was constant at 5.0%. Table I in Hulten and
Wykoff (1995, p. 17) lists the estimated rates of economic depreciation
in the U.S. The rate for non-residential structures is 3%. A similar
rate may apply to residential structures. Because the share of
construction in gross fixed capital formation has been high in Hong
Kong and capital stock in this paper includes inventory investment,
a low rate of depreciation (5.0%) is adopted. In the absence of sectoral
investment data, the reconstructed total capital stock value is
distributed to the three sectors according to the sectoral shares
of capital income. This computational method assumes the rental of
capital to be identical across the sectors. Considering high factor
mobility in Hong Kong, this assumption may be a good approximation
over a relatively long period of time.

H8. Sectoral labor and capital income and their value-added shares.
Value-added at current prices by economic activity (see H5) consists
of compensation of employees and gross operating surplus. Because
labor income of the self-employed is included in gross operating
surplus, the share of compensation of employees in value-added
understates the output share elasticity of labor. The share of employees
in persons engaged can be computed with the census data (see H6)
for the three sectors in 1981, 1986, 1991, and 1996. This share in
these four census years is extended by intrapolation to cover the
1980 to 1997 period. Assuming that the unobserved average labor income
of self-employed is the same as the employees, the value added share
of compensation of employees is adjusted upward. The unadjusted share
is divided by the share of employees in persons engaged to compute

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the adjusted share. By deducting this labor share from unity, the output share elasticity of capital is obtained. Sectoral labor and capital income is computed by distributing sectoral value-added according to these output share elasticities.

H9. Sectoral total factor productivity indexes: Based on the Cobb-Douglas production function ($Y = AL^{\alpha}K^{(1-\alpha)}$) with an output ($Y$) and labor ($L$) and capital inputs ($K$), the Solow residual is computed as A's log difference for each sector. α and $(1-\alpha)$ are assumed to be constant at the mean of the observed output share elasticity of each factor during the 1984-97 period.

U1. U.S. GDP deflator (1992 prices): Council of Economic Advisors (1999, p. 330) and the International Monetary Fund (May 2000, p. 802).

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1. The TFP growth rates cited are from Tables V (p. 657) and VI (p. 658), Young, 1995. Young's growth accounting is based on the translog production function with a single output and disaggregated labor and capital inputs. Under this method, the qualitative improvement of capital and labor is accounted (rightfully) as part of input growth. Young's finding on Singapore's low productivity growth rates has become the standard view (similar findings: Kim and Lau, 1994, and Collins and Bosworth, 1996). Nevertheless, Hsieh (1999) offers a notable opposing view. Having chosen Young's work as a starting point to evaluate Hong Kong's growth pattern, we do not dispute Young's TFP estimates of Singapore in this paper.

2. Krugman (1994) used Young's growth accounting results to apply the familiar logic to East Asian economies, (i) resource constraints and the law of diminishing marginal returns sooner or later put an end to fast output growth that relies on resource mobilization and (ii) part of output growth originating from TFP growth is sustainable.

3. Unless otherwise stated, the sources and definitions of statistical data cited in this paper are listed in the Appendix.

4. Ho states, by 1996 "on top of some four-fifths of Hong Kong manufacturers having transferred production to the Mainland, around 30,000 factories in the Pearl River Delta region of Guangdong alone are engaged in outward processing for Hong Kong companies, while between three and four million

people there are directly or indirectly employed by these Hong Kong outward processing firms" (1996, pp. 79-81). Note that less than 0.4 million workers were engaged in the manufacturing sector in Hong Kong in 1997 (source, Appendix B, H6). Outward processing represents a common business arrangement in which Hong Kong companies typically provide factories in Guangdong with raw materials and intermediate inputs for processing. Hong Kong companies often make direct investment so that mainland parties secure production equipment and physical plants. Finished products are shipped to Hong Kong for re-export.

5. See Appendix A, H5 for Hong Kong's industrial classification adopted in this paper.

6. See Syrquin (1988, pp. 250-251) for a formal presentation of the decomposition method for gross output. The author has used a modified version to apply to net output (GDP) growth.

7. Re-exports are omitted in the equation because the direct relationship between the real value of re-exports and output is unclear. Imports in the equation represent total imports net of re-exports. The equation, however, captures the indirect effect of re-exports through service and domestic exports.

8. Part of domestic demand's contribution to GDP growth reported in Table 3 represents the secondary effect of export growth.

9. Because disaggregated labor and capital input data are available at the Hong Kong regional level but unavailable at the industrial level, the

Solow model (Cobb-Douglas production function) is used for growth accounting. Unlike growth accounting based on the translog production function such as the one by Young, TFP growth computed from the Solow residual cannot exclude the qualitative improvement of capital and labor, leading to overstatement of TFP growth. This partly explains why this author's TFP growth estimates at the aggregate level (Table 4-B) are larger than those by Young (4-A) for the 1980s.

10. For example the import prices of goods and services (GDP deflators) grew by, respectively, 1.7 and 4.4% annually compared with 6.0% in the export prices of services during the 1985 to 1997 period. The Hong Kong dollar real exchange rate against the U.S. dollar based on the GDP deflators of the two economies appreciated by 73.1% during the same period (Table 1, second column).

11. Hong Kong's economic boom since the mid-1980s, characterized by the growth of service exports, real exchange rate appreciation, and the contraction of the manufacturing sector, can be interpreted as the Dutch disease (see Imai, 1999). A puzzling finding is that the nontradable sector's output grew strongly despite its observed negative TFP growth (Tables 2 and 5). This is consistent with the Dutch disease. Rapid economic growth led by expanding service exports in Hong Kong should have brought about a consumption boom through real income increases. High demand for nontradables resulted in output expansion at high prices.

12. One may wonder whether advances in information technology will significantly lift the total factor productivity growth rate of Hong Kong's

services sectors in the future. Recent developments in the U.S. may serve as a guide. Gordon (2000) claims that, if the cyclical factors are adjusted, labor productivity growth acceleration in the U.S. during the second half of the 1990s has been largely limited to the durable manufacturing sector.

13. Note that the relatively high labor input growth during the 1990s reflects the relaxation of the Hong Kong government's immigration policy towards the mainland applicants. The daily one-way immigration permit quota for mainland residents was raised from 75 to 105 in 1994 and then to 150 in 1995. Consequently, the number of one-way permit holders entering Hong Kong rose from 27,976 in 1990 to 61,179 in 1996 (Siu, pp. 202-203). In the absence of the policy change, the growth of the labor force should have slowed significantly because of the steady fall in the rate of natural increase and demographic transition.

14. The tradable services sector's output grew by 4.4% in 1995, the slowest since 1989. The growth rate picked up in 1996 (10.4%) and 1997 (6.2%), the last year in which sectoral output data are available. Because Hong Kong's real GDP growth rate was negative (- 5.1%) in 1998, the sector must have experienced a slump that year.

TABLE 1

Hong Kong's GDP, Real Exchange Rate, and Exports

Year	Real GDP (Growth Rate)	$HK Real Exchange Rate	Domestic Exports		Re-exports	Exports of Services			
			Value (1990 Prices)	Prices (GDP Deflator)	Value (1990 Prices)	Value (1990 Prices)	(Growth Rate)	Prices (GDP Deflator)	(Growth Rate)
	%	1984=100	HK$billion	1984=100	HK$billion	%		1984=100	%
1980	10.1	142.5	108.9	-	53.4	65.6	(0.9)	-	-
1981	9.2	127.9	117.7	-	68.3	72.3	(10.2)	-	-
1982	2.7	121.6	114.7	-	66.2	75.0	(3.7)	-	-
1983	5.7	101.8	131.2	-	76.6	79.1	(5.5)	-	-
1984	10.0	100.0	153.8	100.0	99.8	88.0	(11.2)	100.0	-
1985	0.4	102.2	145.5	99.6	124.2	92.5	(5.2)	103.0	(3.0)
1986	10.8	103.3	168.9	101.6	141.5	105.0	(13.5)	106.7	(3.6)
1987	13.0	109.3	208.0	104.7	206.5	122.2	(16.3)	117.8	(10.4)
1988	8.0	115.3	226.8	107.0	301.0	134.3	(9.9)	129.0	(9.5)
1989	2.6	124.4	227.0	110.0	356.9	137.4	(2.3)	144.5	(12.0)
1990	3.4	128.4	225.9	111.5	414.0	142.3	(3.6)	156.0	(8.0)
1991	5.1	135.2	227.0	113.5	523.7	148.9	(4.7)	168.8	(8.2)
1992	6.3	144.9	227.4	114.7	672.0	164.8	(10.6)	179.3	(6.2)
1993	6.1	153.3	217.1	114.5	803.9	178.0	(8.0)	188.9	(5.4)
1994	5.4	160.2	212.2	116.7	915.1	189.6	(6.5)	198.0	(4.8)
1995	3.9	160.4	216.4	119.4	1,046.2	198.8	(4.8)	208.6	(5.4)
1996	4.5	166.8	198.1	119.4	1,124.8	218.0	(9.7)	212.0	(1.6)
1997	5.0	173.1	202.4	116.5	1,201.8	217.8	(- 0.1)	213.6	(0.7)
1998	- 5.1	172.8	186.4	112.7	1,157.3	203.4	(- 6.6)	205.1	(- 3.9)
1999	2.9	160.5	172.9	110.0	1,219.9	214.6	(5.5)	199.6	(- 2.7)
					Growth rate, %				
1981-90	6.5	- 1.0	7.6	-	22.7	8.1	-	-	-
1985-90	6.3	4.3	6.6	1.8	26.8	8.4	-	7.7	-
1991-97	5.2	4.4	- 1.6	1.2	16.4	6.3	-	4.6	-
1985-97	5.7	4.3	2.1	1.5	21.1	7.2	-	6.0	-

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Note.- The real GDP is based on the series in 1990 prices for Hong Kong. The Hong Kong dollar real exchange rate is computed as $(P)/(EP*)$ indexed to the 1984 level, where P, $P*$, and E are, respectively, the GDP deflator in Hong Kong, the GDP deflator in the U.S., and the Hong Kong dollar exchange rate against the U.S. dollar. Pre-1994 export prices are omitted, because Hong Kong had a flexible exchange rate system before the introduction of the U.S. dollar peg in October 1983.

TABLE 2

Sectoral Output

Year	All Sectors Value-added	Tradables Total	Goods	Services	Non-tradables
		HK$billion, 1990 prices			
1980	294.2	127.7	50.2	77.4	166.5
1981	326.8	139.7	53.6	86.0	187.1
1982	331.3	139.2	51.5	87.7	192.1
1983	348.6	149.4	56.7	92.7	199.2
1984	378.2	169.8	63.6	106.2	208.4
1985	380.0	170.4	61.8	108.6	209.6
1986	426.5	198.1	72.0	126.1	228.4
1987	485.2	237.2	83.6	153.6	248.0
1988	529.3	263.8	91.1	172.7	265.5
1989	536.5	266.8	94.6	172.2	269.7
1990	559.4	277.9	94.8	183.1	281.5
1991	578.3	296.4	90.6	205.9	281.9
1992	611.1	323.7	91.7	232.0	287.4
1993	638.6	345.3	85.4	259.9	293.3
1994	683.6	358.7	79.3	279.3	324.9
1995	713.1	366.4	74.9	291.5	346.7
1996	749.0	395.0	73.1	321.8	354.0
1997	772.3	414.6	72.9	341.7	357.7
		Growth rate, %			
1981-90	6.6	8.1	6.6	9.0	5.4
1985-90	6.7	8.6	6.9	9.5	5.1
1991-97	4.7	5.9	- 3.7	9.3	3.5
1985-97	5.6	7.1	1.1	9.4	4.2

TABLE 3

GDP Growth Decomposition

Period	$\hat{Y}$	αD	$\alpha \dot{D}$	$\hat{D}$	$\hat{X}_g$	$\hat{X}_s$
		Annual growth rate, %				
1981-90	6.5	4.5	5.7	- 1.2	7.6	8.1
1985-90	6.3	4.9	6.2	- 1.3	6.6	8.4
1991-97	5.2	9.7	7.4	2.1	- 1.6	6.3
1985-97	5.7	7.4	6.8	0.6	2.1	7.2
		Contribution to GDP growth, %				
1981-90	(100.0)	27.8	35.6	- 5.7	43.0	28.2
1985-90	(100.0)	30.0	38.0	- 8.0	40.6	30.6
1991-97	(100.0)	78.9	60.7	18.2	- 9.5	30.6
1985-97	(100.0)	58.4	53.7	4.7	11.4	30.6

Note.- Because of errors and omissions in Hong Kong's 1990-price GDE series, the right-hand side does not add up to 100.0 when the period includes pre-1990 years.

TABLE 4

Growth Accounting-Aggregate Level

A: Young (1995, Table V, p. 657)

	$\hat{Y}$	$\hat{K}$ (I)	$\hat{K}$ (II)	$\hat{L}$ (I)	$\hat{L}$ (II)	$\hat{A}$	W_L
1961-66	10.9	16.9	16.2	3.2	2.5	3.5	.643
1966-71	6.5	7.5	7.8	2.5	2.4	2.3	.660
1971-76	8.1	7.5	8.0	3.3	2.4	3.9	.662
1976-81	9.9	9.3	9.8	5.1	6.4	2.2	.617
1981-86	5.8	7.8	7.9	1.9	2.7	.9	.593
1986-91	6.3	6.2	6.6	.5	2.2	2.4	.609
1966-91	7.3	7.7	8.0	2.6	3.2	2.3	.628

Note.- Annual growth rates (%) except W_L. Y is real GDP. $\hat{K}$ (I) and $\hat{L}$ (I) are the growth rates of quantity. $\hat{K}$ (II) and $\hat{L}$ (II) include qualitative improvement. Growth accounting is based on a single output translog production function.

Notations: Y = aggregate output; K = capital; L = labor; A, total factor productivity; and W_L = labor share of Y.

B: Solow model

	$\hat{Y}$	$\hat{K}$ (I)	$\hat{L}$ (I)	$\hat{A}$	Contribution to $\hat{Y}$	
					$(1 - W_L)\hat{K}$	$W_L\hat{L}$
		Annual rate, %				
1981-90	6.6	7.4	1.9	2.4	3.1	1.1
1985-90	6.7	7.1	1.3	3.0	2.9	0.8
1991-97	4.7	7.9	2.1	0.2	3.2	1.3
1985-97	5.6	7.4	1.7	1.5	3.1	1.0

Note.- $\hat{Y}$ is based on the GDP at factor cost (value-added, production-based GDP). There are small differences between the production- and expenditure-based GDP because of errors and omissions in Hong Kong's national income accounts. Growth accounting is based on the Cobb-Douglas production function. The mean of the 1984 to 1997 period (.583) was used as the fixed value of W_L.

TABLE 5

Sectoral TFP Growth

| Period | All Sectors | Tradables | | | Nontradables |
		Total	Goods	Services	
		Annual growth rate, %			
1981-90	2.4	4.1	5.6	0.8	0.7
1985-90	3.0	6.2	9.7	1.6	- 0.0
1991-97	0.2	3.0	6.0	0.9	- 2.5
1985-97	1.5	4.5	7.7	1.2	- 1.4
		Contribution to annual TFP growth, %			
1981-90	(2.4)	2.0	1.8	0.2	0.4
1985-90	(3.0)	3.0	2.5	0.5	- 0.0
1991-97	(0.2)	2.9	1.6	1.3	- 2.7
1985-97	(1.5)	2.9	2.0	0.9	- 1.4