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GROWTH, EQUITY, AND INCOME DISTRIBUTION POLICIES IN HONG KONG

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I. INTRODUCTION

THE successful industrialization of the Hong Kong economy has received much attention from development economists lately. In a period of little more than thirty years, the economy has been transformed from an entrepôt trade to a highly commercialized, industrialized one, and Hong Kong has become an important manufacturing, trading, banking, shipping, and tourist center in the world. In terms of per capita income, it has increased from H.K.$1,500 in 1950 to the present level of H.K.$50,000 (the current exchange rate is U.S.$1 = H.K.$7.80), representing an increase of no less than thirty times. Other economic indicators, as can be seen in Appendix Table I, are equally impressive. As the growth story of the economy has been very well documented in the existing literature, this paper will refrain from repeating it yet again. Appendix Table I shall serve as a convenient reference when the problem of economic growth is touched upon.

In the long epoch of the three decades' almost uninterrupted high growth (with a few exceptions such as 1967, 1974/75, and 1982, average annual growth rate of GDP was around 10 per cent), the economic benefits have also trickled down to people in the low income brackets. This has taken place despite the fact that the Hong Kong economy is a laissez-faire system and the tax rate has been one of the lowest in the world, the standard rate being only 15 per cent up to 1983. The objectives of this paper are therefore twofold: (a) to measure the inequality of income distribution and its pattern of change over time and (b) to examine the government's income redistribution policies, both on the revenue side and the expenditure side. However, at the outset, some space will be devoted to a discussion of the special methodology which we have developed to be used in this study to measure income inequality.

II. MEASURES OF INEQUALITY

There are many kinds of formulae which may be used to measure the inequality of income distribution. The range, the relative mean deviation, variance, standard deviation of logarithms, etc. are only a few familiar examples. Pigou and Dalton

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argued that any measure of inequality must satisfy the minimum property that any transfer from a poorer person to a richer one, other things remaining equal, will always increase the variance.[1] In this respect, variance is of course an attractive measure. However, there are methodological deficiencies inherent in this measure (and in turn in the coefficient of variation) as well as in the standard deviation of logarithms.[2] One of them is that they take differences only from a central point, namely, the mean only, thereby ignoring the pair-wise differences.

A. *Gini Coefficient*

By far, the most popular measure of inequality is the Gini coefficient. Ever since its invention by Gini in 1912 [7], its mathematical properties have been much analyzed.[3] The Gini coefficient is most closely related to the Lorenz curve, which was independently developed by M. O. Lorenz in 1905.[4] The Gini coefficient is defined as the ratio of the area formed by the forty-five-degree straight line and the Lorenz curve to the lower triangle region. The Gini coefficient varies between 0 (absolute equality) and 1 (absolute inequality).

Depending on whether or not the Lorenz curve is a discrete for a continuous one, the Gini coefficient has different forms of expressions. In the discrete case, it may be shown that the Gini coefficient is identical to one-half of the relative mean difference, which is defined as the arithmatic mean of the absolute values of differences between all pairs of incomes:[5]

$$G=\left(\frac{1}{2}n^2\mu\right)\sum_{i=1}^{n}\sum_{j=1}^{n}|Y_i-Y_j|$$

$$=1+\left(\frac{1}{n}\right)-\left(\frac{2}{n^2\mu}\right)(Y_1+2Y_2+\cdots+nY_n),$$

$$\text{for}\quad Y_1\geq Y_2\geq\cdots\geq Y_n,$$

where G denotes the Gini coefficient.

Thus, by taking the difference over all pairs of incomes, the Gini coefficient overcomes the demerit which the variance has in taking the deviation from a central point (the mean) only, as in the cases of other measures mentioned above.

If the Lorenz curve forms a continuous function, then there is an interesting property. That is, the slope at any point of the Lorenz curve is equal to the ratio of the corresponding income level to the average income level [2, p. 48].

In a recent paper by the present author,[6] the following Lorenz curve was suggested,

$$Y=aX+bX^2+cX^3,$$

where $a+b+c=1$, and the very property of the curve requires that all the

[1] See [24, p. 351] [6, p. 24].

[2] For a detailed discussion on the desirable properties of an inequality measure, see [28, pp. 27–28].

[3] See [1] [2] [4] [6] [8] [17] [20] [21] [25] [26] [28] [29] [30] [32].

[4] See [19].

[5] See [28, p. 31].

[6] See [18].

parameters are nonnegative. This function has two extreme situations:
(1) $a=1$ and $b=c=0$: in this situation, $Y=X$; this is the absolute equality case.
(2) $c=1$ and $a=b=0$: in this situation, $Y=X^3$.
It is obvious that the Gini coefficient for the former case is zero while for the latter extreme it was found to be equal to 0.5.[7] In view of the fact that the empirical results available so far[8] indicate that the Gini coefficient is concentrated between 0.3 and 0.4, the above Lorenz curve can be used to examine income distribution problems of practically all the important nations in the world.

B. *Maximum Equalization Percentage*

The Gini coefficient is most closely related to another measure called the maximum equalization percentage (*MEP*), which is equal to one-half of the familiar Kuznets ratio, which is defined as the sum of the absolute differences between the income share and the population share in each income class [16]. In the author's paper mentioned above, the mathematical relationship was established between the Gini coefficient and the maximum equalization percentage. It may be noted that the economic meaning of the maximum equalization percentage is that it is the percentage of the total income of a given nation which is required to be transferred from richer (in relative sense) people to poorer (in relative sense) people so that the distribution of income reaches the state of absolute equality.

To see the relationship between the Gini coefficient and the maximum equalization percentage, we examine, inter alia, the case where the Lorenz curve is represented by the following function:

$$Y=aX+bX^2+cX^3,$$

where the parameters are subject to $a+b+c=1$. Suppose the population or households as a whole are equally divided into n classes, with the population share in each class being equal to $1/n$ of the total population, then two cases should be distinguished:
(1) n is an even number: in this case,

$$MEP=\frac{1}{2}\left\{\frac{b}{n^2}\left[(n^2)-2\left(\frac{n}{2}\right)^2\right]+\frac{c}{n^3}\left[n^3-2\left(\frac{n}{2}\right)^3\right]\right\}$$
$$=\frac{1}{2}\left(\frac{b}{2}+\frac{3c}{4}\right).$$

MEP is, in this case, independent of n. It depends on b and c only. From this formula, it is apparent that in the extreme situation of $a=b=0$ and $c=1$, $MEP=3/8$, which is less than its corresponding Gini coefficient of 0.5.
(2) n is an odd number: the *MEP* becomes

$$MEP=\frac{b}{4}\left(1-\frac{1}{n^2}\right)+\frac{c}{8}\left(3+\frac{n^2-3n-1}{n^3}\right).$$

[7] See [18].
[8] See, inter alia, [2] [3] [15] [22].

In this case, the value of the *MEP* depends not only on b and c, but also on n. In the extreme case of $a=b=0$ and $c=1$, *MEP* fluctuates between 3/8 (when $n=\infty$) and 132/343, which is the *MEP*'s value for $n=7$.

Recall that the maximum value of the Gini coefficient for the Lorenz curve $Y=aX+bX^2+cX^3$ is 0.5, the corresponding maximum equalization percentage with a range of 3/8 and 132/343 is thus less than the Gini coefficient. This general conclusion is indeed born out by all the empirical studies.[9]

In the following sections, we will use the Lorenz curve and its corresponding Gini coefficient as well as maximum equalization percentage as defined above to measure the inequality of income distribution in Hong Kong.

III. THE GINI COEFFICIENT AND THE MAXIMUM EQUALIZATION PERCENTAGE IN HONG KONG

As mentioned previously, through this study the following third degree polynominal will be used as the Lorenz curve:

$$Y=aX+bX^2+cX^3+u,$$

where

Y = cumulative percentage of the total income,
X = cumulative percentage of the households,
u = stochastic terms; both X and Y range between zero and unity.

In order to satisfy the restriction: $a+b+c=1$, the constrained least-square estimation method was employed to obtain the estimates of the parameters. As there are two kinds of household data, namely the household-income data and the quintile distribution data, both data were utilized so that a check of the data for their consistency and reliability may be made.

The results as shown in Tables I and II indicate clearly that the inequality index increased from the 1950s to the early 1960s. It started to decline from the mid-1960s, but increased significantly again in the late 1970s and early 1980s. It is worthwhile noting that the maximum equalization percentage is always lower than its corresponding Gini coefficient. This is not an accidental phenomenon but a mathematical necessity as discussed in the preceding section.

IV. STAGE OF DEVELOPMENT IN TERMS OF INCOME DISTRIBUTION

Any study of income distribution in Hong Kong is bound to be handicapped by data inadequacy. This is true especially before 1966, when the first population and household by-census was conducted. From 1971 onward, every decade a census was taken, always in the first year of the new decade and in between

[9] This conclusion holds only in the case that all the parameters are nonnegative, which is indeed required by the very nature of the Lorenz curve. This point was detailed in my methodological paper of 1985. I am grateful to Professor Ezaki for pointing this out again in his comments.

TABLE I

GINI COEFFICIENT AND MAXIMUM EQUALIZATION PERCENTAGE
(HOUSEHOLD SURVEY DATA)

Year	Parameters of the Lorenz Curve			F	Gini Coefficient	*MEP*
	$\hat{a}$	$\hat{b}$*	$\hat{c}$			
1966	0.133	0.555	0.312	99,999.9	0.341	0.250
1971	0.887	−2.171	2.285	544.29	0.419	0.311
					(0.43)	
1976	0.588	−1.225	1.637	1,688.25	0.410	0.297
					(0.43)	
1981	0.621	−1.548	1.927	1,198.71	0.448	0.316
					(0.45)	

Sources: Computed from [9] [10] [11] [12].
Note: Figures in parentheses were estimated by the government.
* No restriction was imposed on the sign of the parameters in the process of estimation. Therefore, some values for b are negative. This however will not seriously affect the value of the Gini coefficient and *MEP* (see [17]).

TABLE II

GINI COEFFICIENT AND MAXIMUM EQUALIZATION PERCENTAGE
(QUINTILE DISTRIBUTION DATA)

	1957	1963/64	1966	1971	1973/74	1976	1979/80	1981
Quintile share:								
Bottom 20%	5.7	4.4	4.7	5.7	4.1	5.3	6.2	3.7
Second 20%	9.7	8.9	8.4	10.1	10.9	10.0	10.9	8.5
Third 20%	11.7	12.2	12.3	13.7	15.9	14.2	15.1	14.1
Fourth 20%	16.7	17.8	16.6	19.4	22.1	20.4	21.3	20.9
Top 20%	56.2	56.7	58.0	51.1	47.0	50.1	46.5	52.9
MEP	0.462	0.367	0.381	0.311	0.291	0.305	0.278	0.337
Gini coefficient	0.470	0.462	0.467	0.409	0.398	0.409	0.373	0.453
	(0.48)	(0.50)	(0.487)	(0.439)	(0.24)	(0.435)	(0.4)	(0.481)
Mean monthly household income (H.K.$)	365	683	709	1,031	1,930	2,026	4,574	4,208

Sources: For 1957, 1963/64, 1973/74, [15, p. 472]; the rest from [3, p. 27] and computed from census data and various household expenditure surveys conducted by the Census and Statistics Department. *MEP* and Gini coefficient were computed by the present author according to the method discussed.
Note: Figures in parentheses are the Gini coefficients obtained by L. Chau [3, p. 27]. They are included here for comparison purpose because the method used in his study was different from the present one. Chau's figures are biased upward.

a by-census has been conducted; the first one was taken in 1966. Before this year data in Hong Kong were highly piecemeal and incomplete. For this reason, the results obtained for the period in the 1950s and early 1960s are not so reliable and caution must be taken in drawing implications from them. Nevertheless, they will be discussed in this study as well because they are still useful in indicating the direction of changes during that period. As Tables I and II show,

both the Gini coefficient and the maximum equalization percentage clearly reveal the following phenomenon that since 1957, the income distribution in Hong Kong has gone through three distinctive stages:

Stage 1: The period 1957–66—growth with increased inequality.

During this period both indicators increased slightly, implying that the inequality of income distribution has somewhat deteriorated.

Stage 2: 1966–79—growth with equality.

During this period, income distribution improved considerably as evidenced by the declining Gini coefficient (from 0.47 in 1966 to 0.37 in 1979) as well as the maximum equalization percentage.

Stage 3: This period started with the late 1970s and lasts until the present date —deterioration of distribution.

In this period, income distribution strangely worsened again, as both measures of inequality have significantly increased during this period. The Gini coefficient shot up again from 0.373 in 1979 to 0.453 in 1981.

The early development pattern of income distribution conforms to the renowned "inverted U-shape" proposition of Simon Kuznets, while the deterioration of the distribution since the late 1970s is an unexpected twist in view of the excellent economic performance achieved in Hong Kong during this period.[10] An explanation of this rather strange development is therefore called for.

A. *Early Industrialization and Its Impact on Income Distribution (Stage 1)*

Hong Kong's industrialization started in the early 1950s when its traditional lifeline—entrepôt business—was abruptly cut off due to the development of a string of geopolitical factors, which were beyond Hong Kong's control, such as the takeover of mainland China by a communist government, the trade embargo imposed on the People's Republic of China by the United Nations during the Korean War, and the ensuing influx of refugees into Hong Kong from China. Because of these new developments, the people of Hong Kong were forced to search for new channels to earn a living. With an excellent infrastructure in port facilities and telecommunications, and good commercial connections with major industrialized countries established in the long history of her entrepôt business, it was a natural and logical response for the refugee capitalists from China, many of whom were able to bring capital, equipment, as well as valuable skills and experiences to Hong Kong, to set up new factories initially to produce textiles and clothings and later other industries as well, such as metal works, wigs, toys, and plastic flower industries. As a result, a solid foundation for manufacturing industries was very quickly laid down and the manufacturing sector became the backbone of the Hong Kong economy. As the manufacturing industries were mainly labor-intensive light industries, their development rapidly absorbed the bulk of the surplus laborers. By 1961, the share of manufacturing employment went up from virtually zero in 1950 to 43 per cent.[11] Consequently the Hong Kong

[10] A similar result was also obtained in a recent study by L. Chau, see [3].

[11] See [31, p. 161].

TABLE III

REAL WAGES RATE (SELECTIVE YEARS)

	Unskilled	Semi-skilled	Skilled
1948	100	100	100
1951	89	87	85
1954	84	87	85
1957	94	90	110
1960	103	100	165

Sources: Computed from [5, p. 475] and Chinese University of Hong Kong, Economic Research Centre, *Long-term Economic and Agricultural Commodity Projections for Hong Kong, 1970, 1975, and 1980* (Hong Kong, 1969), p. 36. For detailed figures, see Commissioner of Labor, *Departmental Report*, 1952/53 and the following years editions.

economy swiftly turned from a labor surplus economy to a labor shortage one. The end result was the rise in the real wage rate.

From Table III, it can be seen that the real wage rate hit bottom in the mid-1950s and from then climbed rather steadily until by 1960 it had surpassed the level of 1948.

As a matter of fact, similar trends can also be discerned in the other sectors, such as construction, public utilities, and modern service sectors (banking, tourism, and shipping, just to mention a few). This rising real wage rate serves as powerful evidence that by the late 1960s the benefits of industrialization had started to trickle down to the people in the lower income brackets, to which industrial workers and clerical staff in the service industries belong.[12]

However, in the 1950s, especially in the early years of industrialization, the gap of income distribution between the poor and the well-off had widened. The reasons for this will be discussed below.

There are many factors at work in the increased inequality of income distribution in the 1950s and early 1960s. The more apparent one are listed as follows.

(1) The factor to be mentioned first must be upsurge in population due to massive influx of refugees from China. Between 1945 and 1954, influx of refugees boosted the population by 300 per cent.[13] In the 1950s, the stream of refugees never ceased, which resulted in a phenomenal 5 per cent growth of population per annum. On the one hand, the traditional entrepôt trade was all but cut off by the Korean War and the U.N. embargo on trade with China, and on the other, industrialization had just got started and was still rather limited in its capacity to absorb the army of refugees, so the immediate impact of the population explosion was massive unemployment. In the mid-1950s, the unemployment rate stood at the very high level of 15–17 per cent. Fortunately, thanks to the rapidity of industrialization the army of the unemployed or underemployed was gradually

[12] It should be noted however that the rates of wage increase for the skilled workers were much higher than that for the semi-skilled and unskilled workers, as can be seen from Table III. This implies that by 1960 the shortage in the supply of skilled workers was particularly serious.

[13] For detail see [27, pp. 41–43].

absorbed by the manufacturing industries, and by the late 1950s a state of virtually full employment was achieved; the rate of unemployment then was only 1.9 per cent.

(2) The improved employment situation should have contributed to the income distribution.[14] However, a distinction should be made between skilled, semi-skilled, and unskilled workers. In view of the fact that on the one hand once the economy took off, the demand for semi-skilled and skilled workers, including technicians and professionals, tended to grow faster than that for unskilled workers, and on the other, the supply of the former was more inelastic than that of the latter, the gap between the real wage rate for skilled workers and that for unskilled workers was bound to widen, as is borne out by the figures shown in Table III above. While in the early 1950s the pay for a skilled worker was only about 70 to 75 per cent higher than that for an unskilled worker, by the late 1950s, the difference had increased to three times. A similar situation can also be observed in the emolument difference between people with good educational attainment and those without.[15]

(3) During the early stage of industrialization, property, especially land, gained greatly in its market value and the owners reaped an unearned income. Except for 1958, land value jumped every year, and between 1947 and 1961, the land price for residential purposes in certain districts rose more than twenty times.[16] As land was typically owned by wealthy people, its appreciation of value constituted an important factor for higher wealth and income concentration in Hong Kong.

(4) With rapid economic growth, the profitability of enterprises had also improved. This has been manifested in the proliferation of small-scale firms whose number had risen from a few hundreds in 1950 to some 2,750 in 1961. Many such small firms were engaged in production of plastic flowers, wigs, metal products, etc. by using very simple tools and equipment, and ultimately became well-established enterprises. This phenomenon too was naturally one of the factors responsible for the increased inequality.

All these factors discussed above worked against equalization of income distribution. Although available statistics for this period are poor, it is safe to conjecture that both the Gini coefficient and the maximum equalization percentage had deteriorated.

B. *The Period of Growth with Improved Equity: The Early 1960s to the Late 1970s (Stage 2)*

This period was characterized by continuous economic expansion. The average annual growth rate of GDP was around 9 per cent in real terms (1957–76). The engine of growth was again the manufacturing industries. In addition to the traditional textiles, new industries such as clothing, plastic and toys, and electrical

[14] See [23].

[15] For instance, in 1954, a school teacher earned 4.6 times as much as an unskilled laborer, and in 1959 the difference has increased to 5.6 times. See [3, p. 7].

[16] See [14, 1957 edition, p. 183] [14, 1961 edition]. See also [3, p. 8].

and electronics had burst upon the scene in a big way. The growth rate of our domestic exports averaged 19 per cent per annum, which was indeed among the highest in the world. Parallel to the manufacturing industries, construction and property sectors, as well as modern service industries like banking, financing and insurance, shipping, and tourism, also experienced an unprecedented boom. In manufacturing sector alone, more than 620,000 jobs were created in 1970 and an acute shortage of labor supply was felt.[17] Consequently, the real wage rates for unskilled laborers had greatly increased, which in turn had attracted more women into the labor market, greatly pushing up the labor participation rate. Particularly noteworthy is the fact that the growth of real wage rates for unskilled workers was faster than that for the semi-skilled and skilled workers, which was indeed a sharp contrast to the situation prevailing in the 1950s. Similar trends can also be observed in other sectors in terms of skill level and occupational difference.

Thanks to such rapid economic expansion, the economic pie as a whole had been enlarged and for reasons to be discussed below the income distribution had also been improved. The Gini coefficient for this period decreased from 0.47 in 1966 to 0.37 in 1979, representing a fall of some 20 per cent. In terms of quintile share in the total GDP, the households in the lowest two quintiles gained most, while the richest 20 per cent had to be content with a reduced share in the economic pie.[18]

Factors accounting for the improved equality

From the preceding discussion, it is relatively easy to identify the factors which have contributed to the equality of income distribution during this period. They include, among others, the following factors.[19]

(a) Thanks to the increased real wage rate and a higher labor participation rate, the share of wage earners in the national income had increased vis-à-vis the non-wage earners, whose incomes were derived mainly from profit, emolument for professionals, and capital gains, etc.

(b) Among the wage earners themselves, earnings had become more equal regardless of occupation, skill level, and industry.

(c) There was a systematic shift of workers from the primary and tertiary sectors to the manufacturing industries powered by export expansion. Since real wage rates in the manufacturing industries had less variation as compared with earnings in the primary and service activities, this shift resulted in the decline of Gini coefficient.

[17] This amounted to 39.4 per cent of overall employment, compared with 44.2 per cent in 1961, when a total of 1.2 million people were engaged in economic activities. See [13] [14, 1970 edition].

[18] L. Chau has used the household expenditure data to calculate the Gini coefficient and found that the result was very consistent. Specifically, the coefficient dropped from 0.5 to 0.42 between 1963 and 1974. See [3, p. 13].

[19] For details see also [15, Chap. 5] [3, pp. 14–16]. In these publications the demographic factor was systematically enunciated.

C. *The Period of High Growth with Deteriorating Distribution: The Late 1970s to the Early 1980s (Stage 3)*

In the last decade we witnessed a variety of external shocks: the oil crunch in 1973–74, the floating of major currencies, the collapse of the stock market in 1973, China's decision to abandon her self-imposed isolationism in the mid-1970s and the launching of the four-modernization programs in the late 1970s, the big wave of illegal immigration (estimated to be some 350,000 strong) in 1979–80, the second oil shock in 1978, the protracted worldwide economic recession in 1982, the increasing protectionism, and the most far-reaching shock of China's announcement in 1982 that she would recover the sovereignty of Hong Kong after 1997, and the collapse of the property market. Mainly because of these shocks, the growth path of the Hong Kong economy was not as smooth as in the 1960s. Growth rates varied between 0.2 per cent in 1975 and 17 per cent in 1976. On the other hand, the rate of inflation was twice as high as in the preceding period. But despite all these disturbances, the average growth rate stood remarkably high at ca. 10 per cent (1976–81), which was even slightly higher than that attained in the previous period and the employment situation was generally good (except for 1982 and 1983, during which the unemployment rate was as high as 3.6–5 per cent).

The unusual developments mentioned above had an adverse impact on income distribution. In this regard, we note that income distribution between 1971 and 1979 remained rather stable as evidenced by the fact that the Gini coefficient did not change noticeably. By way of contrast, income distribution had markedly worsened in the last five years. The Gini coefficient rose from 0.373 (1979) to 0.453 (1981), which was the level recorded for the early 1960s. In the last three years, there has been no comprehensive data for analysis. However, in view of the fact that since the announcement in 1982 of China's decision to take back Hong Kong in 1997, capital formation suffered a negative growth and political uncertainty was compounded by the prolonged worldwide recession in 1982 while the real wage rates for workers in the manufacturing industries had fallen, we may assume that income distribution in the last three years since 1981 may be anything but improved. (In his 1984 study [3], L. Chau regarded the mid-1970s, say 1976, as the starting point for the deteriorating of income distribution, while our figures indicate that 1979 may be the correct year.)

Factors accounting for the deteriorating distribution

(a) The sudden influx of some 350,000 refugees in 1979–80 had weakened the supply side of the labor market, but the immediate impact was on real wage rate. Earnings of industrial workers were falling below the growth rate of GDP.

(b) Since the early 1970s, the relative importance of the manufacturing industries was on the decline.[20] In terms of employment, the share of manufacturing decreased from 38 per cent in 1971 to 35 per cent in 1984 and in terms of contribution to GDP, its share fell from 31 per cent to 21 per cent during the

[20] See [17].

same period. As the manufacturing industries absorbed the bulk of our working population, this trend of deindustrialization has been most unfavorable to the working class.

(c) Accompanying the relative decline of the manufacturing sector was the tremendous growth of modern service industries, notably banking and finance, insurance, real estate, tourism, and business services. As studied elsewhere,[21] wages and salaries in these tertiary sectors are characterized by a high degree of dispersion of income.

(d) During this period, there was an unmistakable trend that the family size in Hong Kong was shrinking. The average size of households decreased from 4.5 to 3.9 persons.

As Chau's study [3] has shown, inequality is negatively correlated with household size. Therefore, an increase in the households of small size should have implied an increase in overall deterioration of income distribution.

V. INCOME REDISTRIBUTION POLICIES

Having discussed the pattern of income distribution in the past three decades, it is in order now to examine in some detail the impact on income distribution of government fiscal policies. The policies can be conveniently distinguished between revenue-side (taxation) policies and expenditure-side policies. The former are dealt with first.

A. *Impact of Taxation*

Traditionally, government revenue from taxes and duties amount to two-thirds of the government's total revenues, with the rest coming from sales of goods and services. In the period of property boom from 1976 to 1981, the revenue from land sales alone was conspicuous, contributing about one-third of the total revenues. With the slump of the real estate sector from 1982, the revenues from land sales have drastically decreased, causing an unexpected and massive deficit in the government budget. (The deficit amounted to 10.3 per cent of the total budget in 1982/83.) It is obvious that revenues from sales of goods, land, and services have little, if any, income redistribution effect, and for this reason, no attempt will be made to evaluate their impact.

Our attention is therefore focused on the revenues from taxes and duties only. The taxation system in Hong Kong is very simple. It essentially consists of direct taxes, rates, and excise duties. The former include taxes on salaries and profits which constituted some 35 per cent of the overall revenue in 1971 and 28 per cent in 1981. The excise duties accounted for 14 per cent in 1971 and 3 per cent in 1981, while rates amounted to 11 per cent in 1971 and 3 per cent in 1981 respectively.[22]

[21] See [15].

[22] See [9] [11]. The shares for various tax revenues become smaller in 1981 because revenues from land sales accounted for around 30 per cent of the total revenue. This situation has changed since 1982/83.

Their impact on income redistribution was examined in great detail by Hsia and Chau [15]. Our discussion below is essentially based on their findings.

1. *Direct taxes*

The direct taxes include salaries and profit tax, interest tax, property tax, and estate duty. Progressive tax rates are applied to salary tax, the current rate being from 5 per cent to 25 per cent. But if the tax payable calculated according to the progressive scale exceeds 17 per cent[23] of gross total income, then a salaried worker is only required to pay 17 per cent of his gross income as salary tax.[24] Corporate profits are liable to an 18.5 per cent tax rate.[25] The rate is levied on the so-called rateable value of property only, which is normally considerably lower than the market value. Moreover, owner-occupier residential units are exempted from the tax. Finally, interest tax was withheld by banks and taxed at the standard rates.

In a comprehensive study, Hsia and Chau had painstakingly put household surveys and census statistics, and many other relevant data together to quantitatively evaluate this incidence for 1971. Their main results are summarized in Table IV. As it turns out, the incidence of the direct tax in Hong Kong is highly progressive. Less than 1 per cent of the burden fell on households with a monthly income of lower than H.K.$1,500, while 77 per cent was borne by households in the top income brackets. The above results were obtained for 1971. We could also have done the same exercise for 1981 by using the 1981 census data. But in view of the fact that the direct tax structure remained essentially unchanged since 1971, we may realistically assume that the incidence pattern for 1981 should be similar to that found in 1971.

2. *Indirect taxes*

The most important indirect taxes are the excise duties levied on four consumer goods, namely, hydrocarbon oils, alcohol, tobacco, and table waters.[26] Together they accounted for 7 per cent of the total tax revenue in 1981.

To determine the distribution of the tax burden, it is necessary to obtain (a) the effective tax rate, (b) the degree of shiftability, (c) the consumption propensity, (d) the price elasticity, and (e) the share of these commodities in total consumer expenditure.

In the 1970s, the average effective rate of taxes on tobacco and alcohol was around 30 per cent. Currently the effective rate must have greatly increased. But the bulk of the tax burden had been immediately passed on to the consumers,

[23] It was only 15 per cent until 1983.

[24] Incomes of husband and wife must be combined to form the tax base.

[25] Due to data problem, no distinction was made between salary tax and the tax on corporate profits. It is imaginable that their impact on income distribution is quite different. The author owes this point of clarification to Professor Ezaki.

[26] Beginning with 1985, two additional consumer goods, namely, cosmetics and soft drinks are subject to excise taxes.

TABLE IV

DISTRIBUTION OF TAXES BY INCOME CLASS IN HONG KONG, 1971

Income Class (H.K.$)	Below 200	200-399	400-599	600-799	800-999	1,000-1,199	1,200-1,499	1,500-1,999	2,000-2,499	2,500-4,499	4,500 and Over	Total
No. of land households*	40,587	88,650	203,738	167,883	96,241	80,150	61,743	39,878	27,426	26,578	13,796	846,670
Total monthly income (H.K.$1,000)	6,088	26,595	101,518	117,518	86,617	88,165	83,353	69,787	61,709	93,023	137,160	871,884
Income share (%)	0.7	3.1	11.7	13.5	9.9	10.1	9.6	8.0	7.1	10.7	15.7	100.0
Direct tax												
Tax as % of income	—	—	—	—	—	—	0.2	0.5	1.6	6.4	16.3	3.42
Excise duties, etc.												
Tax as % of income	3.70	3.69	3.04	2.82	2.46	2.64	2.27	1.87	2.04	2.15	1.53	2.37
Rates												
Tax as % of income	1.60	1.14	1.19	1.29	1.96	1.59	2.58	1.90	1.84	1.76	1.37	1.65
Aggregates												
Tax as % of income	5.30	4.83	4.24	4.11	4.43	4.28	5.05	4.22	5.45	10.27	19.21	7.43
Distribution (%)	0.50	1.98	6.66	7.45	5.92	5.74	6.50	4.54	5.19	14.75	40.66	100.00

Source: Compiled from [15, p. 154, Table 6.1].

* Meaning households on land, versus household on boats.

so it is possible to assume that the incidence of these taxes fall almost entirely on them.[27]

As to hydrocarbon oils, they consist of three categories; light oil, diesel oil, and furnace oil. Light oil tax may be allocated to various income groups according to car ownership. The tax on diesel oil can be apportioned to various income classes according to their individual shares in the total transport outlays, based on household expenditures survey (1963/64 and 1973/74). Finally, there seems no good basis for allocating the tax revenues from furnace oil to various income classes.

Entertainment tax is another relatively important indirect tax in Hong Kong. The tax revenue from this source is distributed to households in difference income classes simply according to population size in each class.

As Table IV shows, the incidence of all these taxes is regressive. In terms of income share, the indirect tax burden for the lowest income group (below H.K.$200) was 3.7 per cent. It decreased to 1.53 per cent for the highest income class (H.K.$4,500 and above). The average burden was 2.37 per cent, which is very low by international standard.

3. *Rates*

Rates are levied on the rateable value of the property. Currently it is 5.5 per cent. Revenues from rates accounted for 19 per cent of the total tax revenue in 1971 and 7 per cent in 1981. Rates are levied on landlords but are normally passed on to their tenants.

The burden of rates is determined on the basis of the rent. For owner-occupied house, an imputed rental value has to be calculated. The results are presented in Table IV. The pattern is not monotonous. The effective rate for them centered around 2 per cent, while the burden for the lower income households and the top income households was considerably lighter. The overall average effective rate was 1.65 per cent.

In sum, the overall impact of taxes are shown in the bottom line of Table IV. The effective tax rate as a percentage of household income in 1971 decreases over the two lowest income classes and levels off over the next seven income groups until the class with a monthly income of H.K.$2,500, from where it rises again. As the number of households with a monthly income of lower than H.K.$2,500 accounted for 95 per cent of the total, the overwhelming majority of households in Hong Kong paid a much lower than average tax rate. The households with a monthly income below H.K.$400 paid ca. 5 per cent of their income on all taxes (direct and indirect). Households with a monthly income below H.K.$1,000 which covered some 70 per cent of the total households contributed only 23 per cent of the overall tax revenue. These figures indicate clearly that the underprivileged and poor families in Hong Kong paid very little tax and the bulk of

[27] In 1971, the households in the expenditure class H.K.$100–400 spent 5.6 per cent of their total expenditure on them, while it was only 1.6 per cent for those households with an expenditure H.K.$2,000–4,000.

TABLE V

GOVERNMENT EXPENDITURE

(H.K.$ Million)

Expenditure Item	1981/82
General administration and security	4,775
Economic services	1,992
Social services:	9,441
Public housing	2,604
Education	3,655
Health	1,928
Social welfare*	1,253
Other	8,854
Total	25,062

Source: [14, 1982 edition, p. 270].

* Including expenditures on labor.

the taxes, particularly the direct taxes, were borne by the high-income families, especially those belonging to the top 10 per cent. Therefore, any reform of the taxation system will not result in any material improvement in the equality of income distribution.[28]

The above conclusion was based on 1971 data. But in view of the fact that the taxation structure in the last fifteen years remains essentially the same, the above distribution pattern of the tax burden in Hong Kong should also be applicable to the current situation. It is therefore not necessary to repeat the exercise which was done by Hsia and Chau in their 1978 study for the year of 1981.

B. *Expenditure-Side Redistribution Policies*

In spite of the fact that Hong Kong adopts a laissez-faire economy system, the government's role in economic development has been crucial. Especially since the early 1970s the public sector's share in the whole economy has greatly increased from 14 per cent in 1971/72 to over 20 per cent in 1981/82. In absolute terms, annual expenditure rose from H.K.$2.86 billion to H.K.$25 billion during the same period. For the purpose of assessing the impact on income distribution, the following items of expenditures are most significant, namely, housing, education, health services, and social welfare. These four categories are traditionally classified under the umbrella category entitled "social services," which accounted for 56 per cent of the total budgetary expenditure in 1971/72. This share decreased to 38 per cent in 1981/82.

Table V shows the detailed figures for 1981/82. Among the four items of the social services, education ranks first, followed by public housing and health. The expenditure on social welfare is the less important one and no attempt will be made to estimate its impact on equality.

The effect of the three important expenditures on income distribution are briefly discussed below.

[28] See also [15, p. 161].

1. *Public housing*

The public housing program dates back to the early 1950s but it only really expanded from the 1970s when the government decided to launch an ambitious ten-year housing program with the aim of cleaning up all the squatter areas in Hong Kong. As a result, public housing expenditure grew by leaps and bounds. In 1971, about 40 per cent of land population were accommodated in public housing, and this percentage increased to 43 per cent in 1981.[29]

The rent for tenants living in public housing have been extremely low, as they are meant to recover the original construction costs only (land was provided free by the government). The rent charged on the government low-cost public housing is based on the same principle as that for resettlement estates, even though the quality of the former is generally higher. Finally, the Housing Society and Housing Authority initially operated under a low interest rate loan from the government and project sites were made available to them at lower than the market price. They are nonprofitmaking organizations but they are supposed to be self-financed from the rents. In summary, due to heavy subsidy people living in public housing receive in effect considerable subvention payment in kind from the government. To evaluate the amount of subsidies for the public housing, the following factors have to be taken into account:

(a) Rent differentials between public housing and private housing of comparable standards.
(b) Difference in shares of rental expenditure between households living in public housing and in private housing.

It was found that rents in resettlement estates were on the average only a quarter or less of their market value, and only a third of their market value in the other two types of public housing.

For the sake of comparison, we have followed Hsia and Chau's approach to estimate benefits for various income classes for the year 1981, which will be compared with the results for 1971 obtained by them.

2. *Education*

In terms of absolute magnitude, education is by far the most important item in social services expenditure, accounting for 20 per cent of the total budget in 1971 and 15 per cent in 1981. As primary education is compulsory (and free in all government and aided schools), secondary and tertiary education used to enjoy relatively low priority. The bulk (58 per cent) of the education expenditure was spent on primary education, with secondary and tertiary education sharing more or less equally in the remainder. Their relative importance remained basically unchanged in 1981. There were some 549,000 students attending primary

[29] There are three types of public housing. The first and most important is the resettlement estates (introduced in the early 1950s), where more than 50 per cent of the people living in public housing; second, government low-cost housing (introduced in 1971); third, those public housing projects provided by the Housing Society and the Housing Authority; finally, in the last few years, a house-owner scheme was launched, but compared with the other housing schemes it is not yet of much significance.

schools, about 14 per cent of whom attended private schools.

The distribution of educational benefits on primary education received in various income classes is given in row 6 of Table VI for 1981. The results are most impressive. For 1981, the benefits amounted to 1.8 per cent of the total income, whereas in 1971 it was 2.9 per cent.[30] Row 6 shows that the distribution of benefits is highly progressive. The four lowest income classes reaped more than 70 per cent of the total benefit. The relative benefits decline quickly with increasing household income. This situation is true for both 1971 and 1981.

There were many fewer students in secondary school. In 1971 there were some 268,000 students attending secondary schools, but only about 68,000 studied in government or aided schools. The average subsidy per student was estimated at H.K.$1,180 per year. In allocating students to different income classes, again the general observation is useful that the government or aided secondary schools were of high standard and competition for a place in these schools is very keen. Therefore it can no longer be true that they were mostly attended by students from poor families.

The distribution of benefits from the education expenditures on secondary school is shown in row 7. Again, as a proportion of income, the benefits turn out to be highly progressive.

As there are only two universities and one polytechnic in Hong Kong,[31] university education is highly exclusive. Less than 4 per cent of the secondary school leavers can find a place in these tertiary education institutions. As the overwhelming majority of the students come from low-income families, tertiary education in Hong Kong was heavily subsidized.

The results are given in row 8. The overall benefits are slightly greater than those for secondary education, but the pattern of distribution is not straight forward; it seems that the families at the higher and low ends tend to benefit most from the expenditures. For 1981 the degree of progressiveness is much more pronounced than 1971. As a ratio of their income, the five lowest income classes received about 4–5 per cent of their income from government's tertiary education expenditures. This ratio decreased sharply from the sixth class onward.

Row 9 of Table VI shows the combined distribution of benefits from expenditures on education at all levels. As it turns out, education expenditure was highly progressive. In 1971, the educational expenditure benefits were equivalent to 11.6 per cent of income for the households in the lowest income class. This percentage decreases monotonously with increasing income. However there were two exceptions, namely, households in the two income classes, H.K.$2,000–2,499 and H.K.$2,500–4,499 (the third and the second highest income class), where the benefit ratio is higher than that of the fourth highest income class.[32] For 1981, the pattern of benefit distribution is more straight forward. For the lowest income class, the benefit ratio is 18.9 per cent, which declines monotonously with increasing income and reaches its minimum of 1.31 per cent for the top income class. The overall average benefit ratio is 5.02 per cent. Compared with

[30] See [15, p. 165, Tab. 6.2].

[31] Since 1984, a second polytechnic has also started to operate.

[32] See [15, p. 165, Tab. 6.2].

TABLE

DISTRIBUTION OF BENEFITS FROM GOVERNMENT EXPENDITURES

Income Class (H. K. $)	Below 600	600–999	1,000–1,499	1,500–1,999	2,000–2,499
1. No. of land households	66,959	50,763	112,683	123,231	156,481
2. Total monthly income	33,480	40,610	140,854	215,654	352,082
3. Income share (%)	0.6	0.8	2.7	4.2	6.8
Public housing:					
4. Benefits	3,050	3,446	9,256	12,868	19,437
5. Benefits-income ratio (%)	9.11	8.49	6.57	5.97	5.52
Education:					
6. Benefits from primary education	2,504	2,395	6,204	8,382	12,627
7. Benefits from secondary education	2,165	2,070	5,364	7,246	10,917
8. Benefits from university education	1,675	1,602	4,148	5,604	8,444
9. Total benefits	6,344	6,067	15,716	21,232	31,988
10. Benefits-income ratio (%)	18.95	14.94	11.16	9.85	9.09
Health:					
11. Benefits from health & medical services	3,254	3,066	7,931	10,774	16,150
12. Benefits-income ratio (%)	9.72	7.55	5.63	5.00	4.59
Total:					
13. Benefits	12,648	12,579	32,903	44,874	67,575
14. Share (%)	2.34	2.33	6.09	8.31	12.51
15. Benefits-income ratio (%)	37.78	30.98	23.36	20.81	19.19
16. Income distribution (after adjustment)	46,135	53,191	173,757	260,532	419,647
17. Percentage distribution	0.8	0.93	3	4.5	7.3

Sources: [11] [14, 1981 and 1982 editions]; Director of Education, *Annual Summary*, 1980–81 and 1981–82 editions; Hong Kong Government, *The 1983–84 Budget: Speech by the Financial Secretary, Moving the Second Reading of the Appropriation*

1971, the ratio has increased by 0.5 per cent on the one hand and on the other, the degree of progressiveness has also greatly improved.

3. *Health*

Under the influence of British tradition, the Hong Kong government provides extensive health services to the public virtually free. In terms of absolute amount of expenditure it is second only to education expenditure. In 1971, the average amount of health expenditure was H.K.$76, rising to H.K.$410 in 1981. There are two divisions in the Medical and Health Department—the Health Division and the Medical Division. For the purpose of allocating the benefits of such expenditures to different income classes, a plausible and realistic assumption is that low-income people made more use of the public medical services than the well-to-do residents, who mostly went to private medical doctors for treatment due to time and other considerations. By way of contrast, there is good reason to

VI

AMONG LAND HOUSEHOLDS BY INCOME CLASS IN HONG KONG, 1981

(H.K.$1,000)

2,500–2,999	3,000–3,999	4,000–4,999	5,000–5,999	6,000–7,999	8,000–9,999	10,000 and Over	Total
119,935	199,242	123,889	84,157	90,992	42,439	66,872	1,237,643
329,821	697,347	557,501	462,864	636,944	381,951	1,337,440	5,186,548
6.4	13.4	10.7	8.9	12.3	7.4	25.8	100
16,826	27,711	17,204	11,917	12,050	4,074	2,453	140,292
5.10	3.97	3.09	2.57	1.89	1.7	0.18	2.70
10,667	14,509	10,092	7,422	8,672	4,086	5,837	93,395
9,223	16,375	11,382	8,376	9,787	4,611	6,588	94,109
7,134	12,666	8,807	6,478	7,571	3,568	5,096	72,793
27,024	43,550	30,284	22,276	26,030	12,165	17,521	260,297
8.19	6.25	5.43	4.81	4.09	3.21	1.31	5.02
13,626	24,317	16,880	12,425	14,588	6,890	9,722	139,623
4.13	3.49	3.03	2.68	2.29	1.80	0.73	2.69
57,476	95,578	64,368	46,618	52,668	23,229	29,696	540,212
10.64	17.69	11.91	8.68	9.75	4.30	5.50	100
17.43	13.71	11.55	10.07	8.27	6.08	2.22	10.42
387,309	792,953	621,892	509,474	689,619	405,171	1,367,131	5,726,700
6.8	13.8	10.9	8.9	12	7.1	23.9	100

Bill, 1983 (Hong Kong, 1983); University of Polytechnic Grant Committee of Hong Kong, *Report, 1980–82* (Hong Kong, 1983).

assume that everyone in the community will benefit more or less equally from the public health expenditures. On the basis of these assumptions, the benefits of the health and medical expenditures have been allocated. The results are displayed in row 12. The impact of government medical and health expenditure was clearly progressive. For the lowest income class the benefit amounted to 10.3 per cent and 9.7 per cent of their income in 1971 and 1981 respectively, while that for the highest income class was only 0.12 per cent for 1971 and 0.73 per cent for 1981. The average benefit was 2.96 per cent for 1971 and 2.69 per cent for 1981.

Summing up, the total benefits, which combine the benefits from government's public housing, education, and health and medical expenditure, are listed in row 15 of Table VI. For 1971, the average total benefit was equivalent to 11.07 per cent of income, while in 1981 it was 10.42 per cent, representing a slight drop in percentage. The pattern of benefits distribution shows a high degree of progressiveness in both years. In 1971, more than 70 per cent of the total benefits

went to those households with a monthly income of less than H.K.$999, and in 1981, about 60 per cent of the total benefits were enjoyed by those households whose monthly income was less than H.K.$4,000. The pattern of distribution was clearcut in both cases. In 1971, the total benefit ratio declines monotonously from 31.8 per cent for the lowest income class to 0.83 per cent for the top income class. Similarly, in 1981 the ratio falls from 37.78 per cent for the lowest income class to 2.22 per cent for the top income class (monthly income of H.K.$10,000 and above).

In terms of Gini coefficient, in 1971 the combined impact of the three types of government expenditure (education, medical and health, and housing) has resulted in a 10 per cent improvement in income distribution. (Gini coefficient fell from 0.44 before the adjustments to 0.40 after the adjustments).[33] Similarly, for 1981, using the income distribution data as shown in Table VI, the Gini coefficient was brought down from 0.44 to 0.41 (a reduction of some 9 per cent) by the impact of the government's expenditure policies.[34] Compared with the advanced industrialized nations, where progressive tax rates are constrictively high, the above findings are certainly a far cry from being spectacular. But considering the fact that Hong Kong has a laissez-faire government, a 10 per cent redistribution effect of government expenditure is indeed very significant.

Given the allowance for possible errors due to data deficiency and the approach adopted, the results are nonetheless unequivocal and convincing. Unlike the effects of government taxation measures on the equality of income distribution, which was found to be quite weak, the impact of the government expenditure policy is most effective and strong. Therefore it may be concluded that given the present low tax rate and the simple structure of the taxation system in Hong Kong, government expenditure measures have played the central role in redistributing income. Among the social services, which are provided by the government, the expenditure on public housing and education have the most powerful income redistribution effect due to their high progressiveness. Expenditure on medical and health care also greatly benefited the low-income residents; the pattern of benefit distribution resembles that of public housing expenditure. A comparative study of intertemporal change shows that the progressiveness and effectiveness of such government expenditure remain essentially the same. This in turns signifies the fact that Hong Kong government's general fiscal policy and fundamental philosophy remain more or less unchanged during the ten years under investigation despite the fact that the public sector's share in the GDP has enlarged during this period.

[33] See [15, p. 177].

[34] The corresponding maximum equalization percentage is from 0.32 to 0.29.

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APPENDIX

GROWTH RATES IN REAL TERMS OF COMPONENTS OF

	1967	1968	1969	1970	1971	1972	1973
Private consumption expenditure	1.1	10.2	8.5	10.2	13.1	7.0	13.4
Government consumption expenditure	8.6	5.0	8.9	6.4	1.8	8.0	9.7
Gross domestic fixed capital formation	−16.9	−9.0	3.8	14.2	27.5	8.7	11.5
Transfer costs of land and buildings	−11.2	14.8	14.5	2.6	10.2	52.8	19.2
Building and construction	−19.8	−12.9	−6.7	6.9	30.1	7.7	12.1
Private	−24.3	−16.9	−3.0	20.7	29.5	8.5	4.3
Public	−9.3	−5.1	−12.9	−19.0	31.8	5.6	33.9
Government	−9.3	−5.1	−12.9	−19.0	31.8	5.6	33.9
M.T.R.C.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Real estate developers' margin	−24.2	−16.9	−3.3	21.0	29.4	8.5	4.3
Plant, machinery, and equipment	4.2	6.2	26.1	17.6	14.3	4.3	17.3
Private	5.3	6.6	27.0	17.7	14.6	3.7	16.6
Public	−23.1	−8.4	−9.2	14.5	0.0	41.8	50.9
Total exports of goods	13.5	14.6	17.6	8.8	6.9	7.6	13.3
Domestic exports	13.8	19.7	18.3	9.8	4.6	5.5	9.2
Reexports	12.3	−2.2	14.6	4.5	16.5	15.9	27.8
Imports of goods	2.5	15.8	11.6	12.6	13.0	4.1	9.9
Exports of services	8.1	11.9	13.9	16.0	−3.2	12.3	2.8
Imports of services	0.9	13.1	10.4	11.1	11.2	10.5	15.6
Gross domestic product (GDP)	1.9	3.2	11.8	9.4	7.3	11.0	12.7
Per capita GDP	−0.6	1.0	10.0	6.8	5.0	9.1	10.1
Total final demand	2.1	8.1	11.7	10.7	9.7	8.0	11.5
Total final demand excluding reexports	1.3	9.0	11.5	11.2	9.2	7.4	10.1
Retained imports	0.2	20.5	10.9	14.4	12.3	1.6	5.6
Domestic demand	−4.7	3.8	7.3	10.9	15.0	7.6	12.6
Private	−5.5	4.2	8.0	12.4	15.8	7.5	12.1
Public	1.2	1.4	1.8	−0.4	8.4	7.8	16.8

Source: Hong Kong Government, *Economic Prospects,* various issues.

* Based on revised provisional estimates.

† Based on revised preliminary estimates.

TABLE I

EXPENDITURE ON THE GROSS DOMESTIC PRODUCT, 1967–83

(%)

1974	1975	1976	1977	1978	1979	1980	1981	1982*	1983†
−1.9	3.1	7.2	17.8	19.2	9.3	12.8	7.6	5.0	7.1
8.9	6.3	6.5	10.1	10.9	9.4	7.7	20.8	4.9	5.3
−1.5	2.0	13.9	25.8	9.9	15.1	19.7	8.9	1.5	−8.7
−44.8	14.4	14.2	15.5	21.6	−12.7	4.1	41.3	−3.3	−10.9
12.6	4.9	12.9	33.8	9.9	4.4	15.1	7.6	14.2	−8.9
1.5	3.8	12.4	28.6	0.2	12.8	26.0	9.1	3.6	−18.2
36.8	6.7	13.6	41.8	23.6	−5.3	0.1	4.8	33.2	4.0
36.8	−9.3	−13.7	12.7	44.0	4.3	13.8	21.2	18.8	0.7
n.a.	n.a.	168.0	95.1	2.1	−19.7	−26.5	−44.3	126.9	15.5
1.6	3.8	12.6	28.5	−1.4	13.5	24.3	8.6	3.6	−16.9
−11.9	−5.8	17.3	12.0	23.9	37.9	22.8	8.1	−14.3	1.0
−12.5	−4.8	18.0	11.8	21.4	35.7	24.3	6.2	−15.1	1.7
10.7	−33.7	−13.7	27.1	150.0	91.5	−3.8	51.0	−1.8	−8.8
−4.1	0.5	28.8	4.3	12.7	20.2	18.7	14.3	−2.7	14.6
−3.0	0.4	29.1	4.7	10.3	17.9	12.0	8.1	−2.5	14.3
−7.7	0.7	27.9	3.3	20.6	27.0	37.4	28.4	−3.0	15.3
−8.6	3.5	25.1	7.0	21.6	16.0	19.3	12.1	−2.2	9.6
−4.3	0.5	25.9	2.1	13.5	10.4	−0.1	11.8	1.8	9.4
0.8	5.6	16.8	12.6	16.9	32.8	12.7	17.9	0.8	11.8
2.2	0.2	17.1	12.5	9.5	11.7	11.0	9.4	2.2	5.2
−0.3	−1.5	15.8	10.9	7.4	5.2	7.4	7.0	0.7	3.6
−2.3	1.5	20.1	10.4	14.4	14.5	14.5	11.0	0.2	7.4
−1.7	1.6	19.4	11.0	13.9	13.3	12.1	8.8	0.7	6.3
−8.9	4.4	24.3	8.1	21.8	13.0	13.8	6.1	−1.8	7.1
−0.4	2.7	13.6	16.3	15.6	11.7	14.2	8.7	2.1	2.1
−2.4	2.3	14.3	15.5	15.3	12.7	15.6	7.8	0.4	1.8
17.3	5.6	8.7	22.0	18.0	4.7	4.1	15.8	14.6	4.1