

# Estimating the social rate of return of university education in Hong Kong

## Major findings

- *Reflecting the transformation of Hong Kong towards a knowledge-based economy, the social rate of return of university education in Hong Kong increased from 7% in 1990 to over 11% in 2004. The increase in the rate of return for female was more substantial than that for male, amidst the continued narrowing in the earnings gap between male and female degree-holders.*
- *The social rate of return of university education in Hong Kong was 4 percentage points higher than the average in several OECD countries. Also, the gender differential in the social rate of return in Hong Kong was less distinct.*

## Background

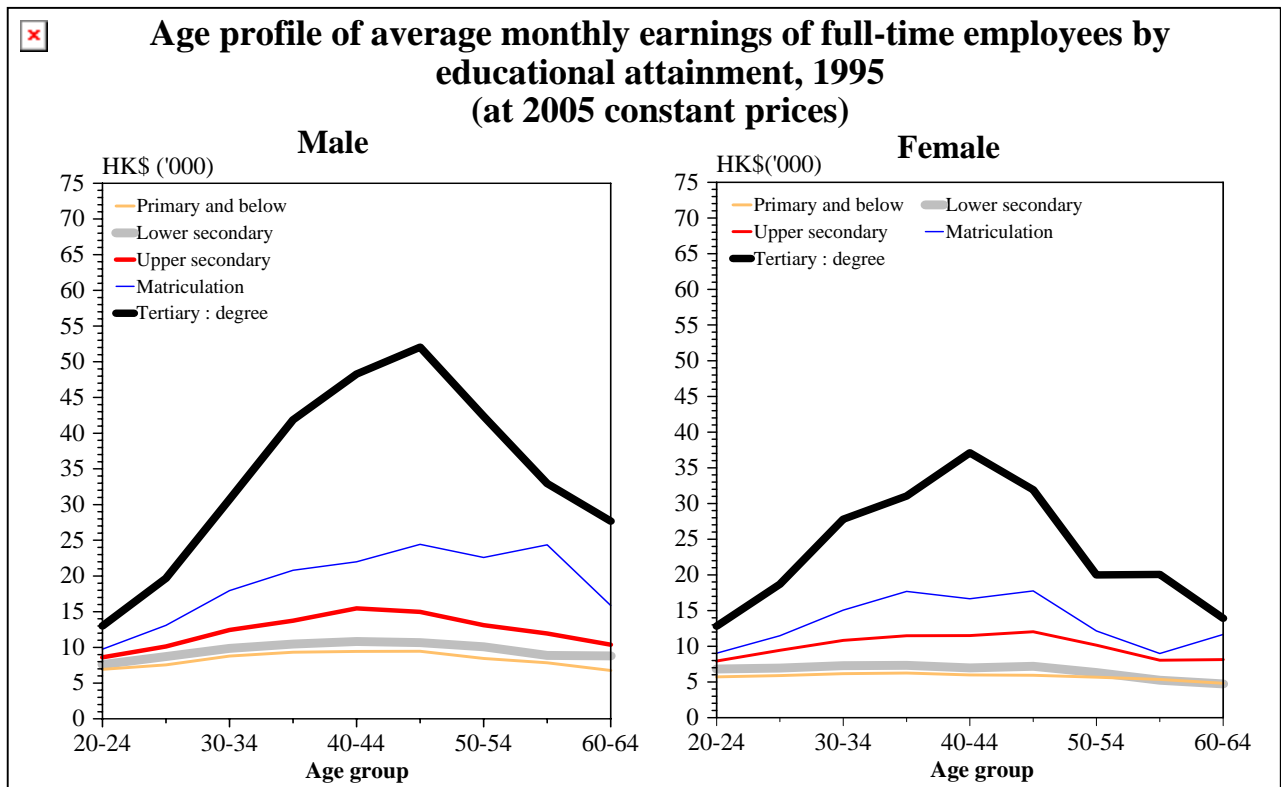
Given the development of Hong Kong towards a knowledge-based economy, a quality workforce is the fundamental for enhancing its competitiveness in a globalised world. Seen in this light, Government has placed great emphasis on education, with more than one-fifth of our public expenditure committed to education. To ascertain the importance of university education to our economy, this study provides a systematic and practical framework for estimating the social rate of return of university education in Hong Kong. Such estimations are based on human capital models that have been developed and used extensively worldwide in the past few decades.

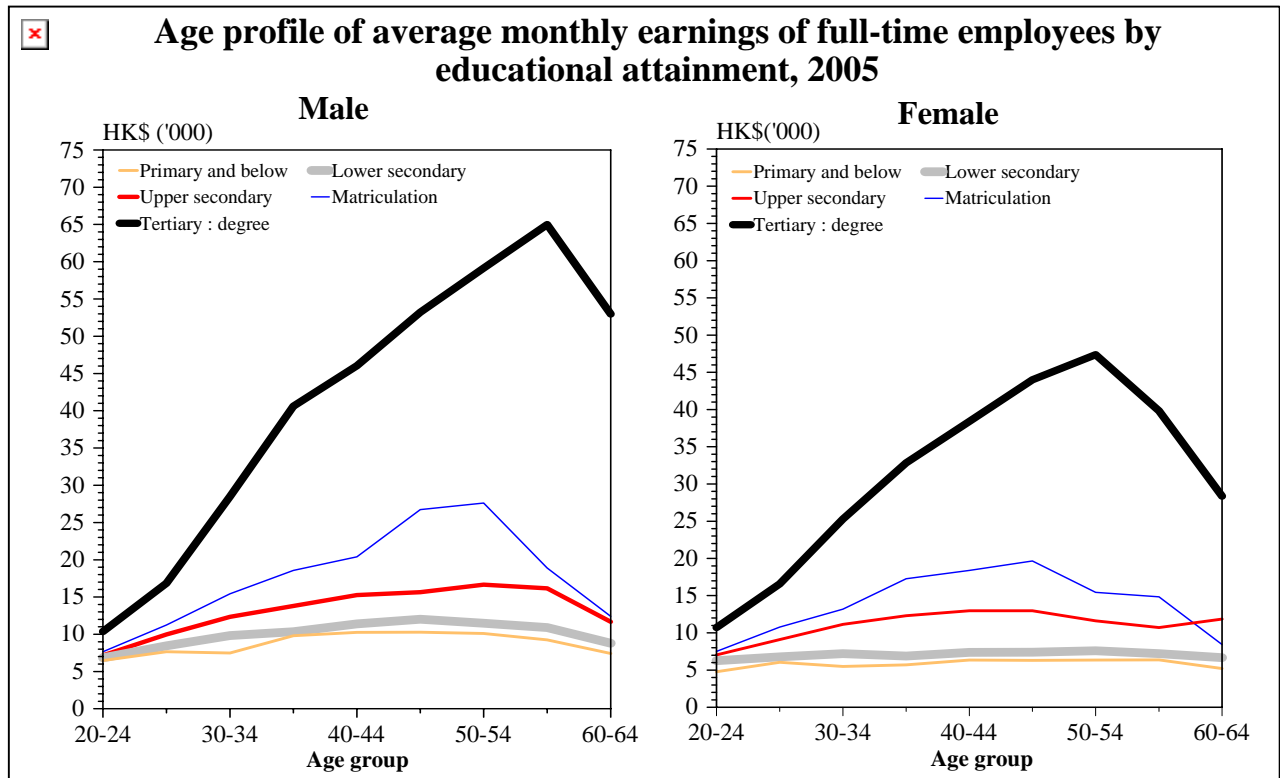
## Costs and benefits of university education

2. Generally speaking, the economic benefits of university education to society stem from enhanced productivity, which could be segregated into higher earnings for individuals, profits for businesses, and salaries tax revenue and other incomes for the Government. In a wider perspective, social benefits could also include “positive externalities” such as higher social mobility, lower unemployment risk, stronger civic consciousness and sturdier spirit of community participation in public affairs, which are more widespread to all corners of society. But these externalities are not easy to measure. Social

costs of university education, on the other hand, consist of income forgone during the course of full-time university education and resources spent on providing university education.

3. The charts below depict the size of the so-called “*education premium*” in full-time employee earnings over the past decade (excluding foreign domestic helpers). It is obvious that the “earnings and productivity boost” brought about by higher education tends to increase with age of the employee concerned, as people attaining higher levels of education generally see their earnings peaking at a later age compared with those with lesser education. Two additional observations are worth noting. *First*, the *earnings multiple* of a university degree (versus a matriculation certificate) increased from 1.86 and 1.74 to 1.98 and 1.87 for male and female respectively between 1995 and 2005. *Second*, overall average earnings grew by 27% in real terms over the same period, much higher than the corresponding increases in all individual sex-education cohorts, indicating a substantial compositional shift among local workforce, viz. a larger pool of better educated workers.





4. The social internal rate of return (IRR) of university education could be estimated with reference to the pertinent benefits and costs<sup>(1)</sup>. The higher the *social IRR* of university education is, the more economically beneficial university education is to society.

### Findings and analysis

#### (I) Social rate of return

5. The social rate of return of university education in Hong Kong are estimated using a methodology similar to an OECD study<sup>2</sup>, as shown below :

(1) The social internal rate of return measures the rate of return to society on the resources employed for university education.

Assuming an individual studying in the university during 19-21 on a full-time basis, working for a full-time job during 22-64 and retiring at the age of 65 in Hong Kong, IRR is calculated as follows :

$$-\sum_{t=19}^{21} \frac{C_t}{(1+IRR)^{t-19}} + \sum_{t=22}^{64} \frac{B_t}{(1+IRR)^{t-19}} = 0$$

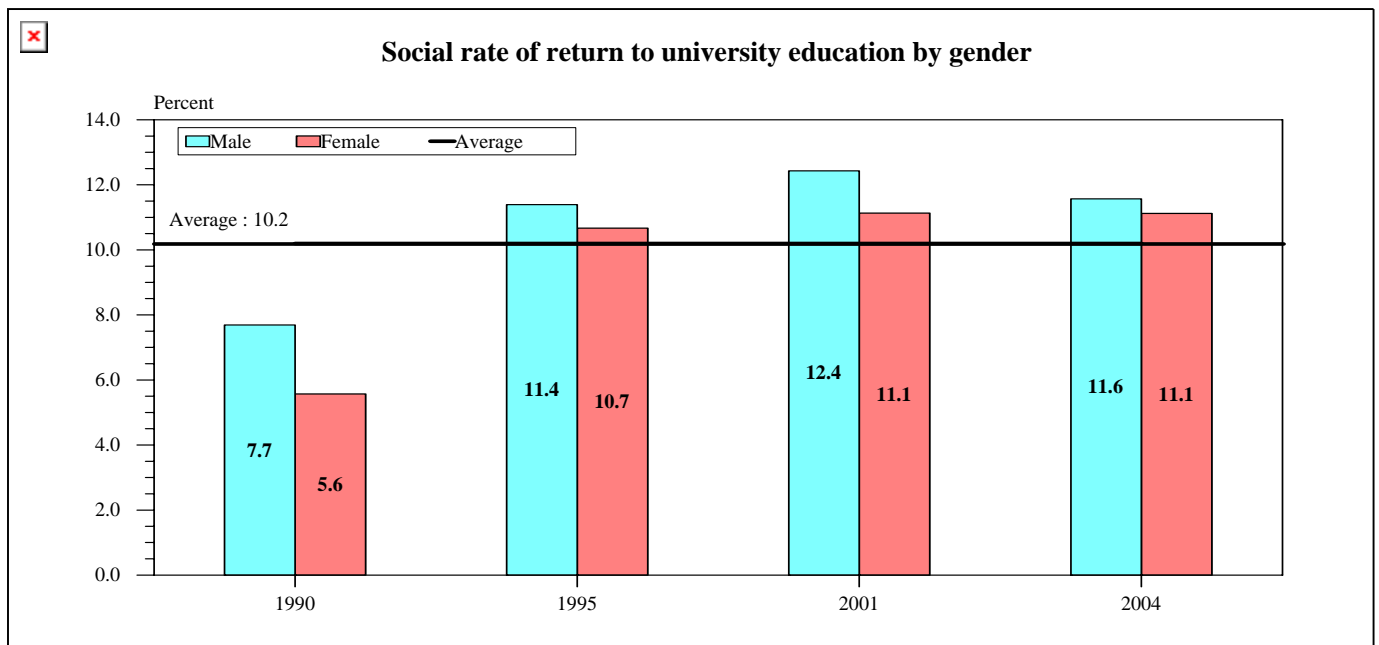
where C = Cost of university education (during the age 19-21).

B = Benefits of university education over the entire working life (during the age 22-64).

<sup>2</sup> "Education at a Glance". OECD (2005).

	<u>1990</u> (%)	<u>1995</u> (%)	<u>2001</u> (%)	<u>2004</u> (%)	<u>Change (1990 to 2004)</u> (%)
<b>Male</b>					
Social	7.7	11.4	12.4	11.6	3.9
<b>Female</b>					
Social	5.6	10.7	11.1	11.1	5.6

6. *The social rate of return of university education rose gradually over the years before losing part of the increase in 2004.* In 2004, the social rate of return of university education was 11.6% for male and 11.1% for female. Compared with 1990, the cumulative increase in rate of return of university education for male and female was 3.9% and 5.6% respectively. The increases were mainly attributable to stronger earning ability of degree-holders over matriculation graduates. In 1990, male degree-holders working on a full-time basis had average employment earnings 72% higher than their counterparts with only matriculation education and this percentage soared to 95% in 2004. Meanwhile, the corresponding figure rose from 79% to 89% over the same period for females.



7. The relatively solid social rate of return, even after the Asian financial crisis, are likely to be underpinned by Hong Kong's gradual transformation towards a knowledge-based economy, which particularly benefits individuals with higher educational attainment and professional skills. Specifically, degree-holders working full-time on average witnessed a 26% increase in real

terms in their employment earnings between 1990 and 2004, compared with 19% for workers with matriculation education and 12% for those with primary education or below.

8. From a social perspective, university education is an open, accessible opportunity for the general public to contribute to and benefit from ongoing socio-economic progression. International experience demonstrates that university education can enhance social mobility and alleviate cross-generation income inequality. In Hong Kong, there is no lack of examples in which hard-working students from grass-root households moved up the social and economic ladder after receiving university education, especially in the 70s and 80s. Strong social-economic mobility remains a prominent characteristic of Hong Kong in recent years, with a 2006 study on earnings mobility by the University of Hong Kong showing that some 42% of the employed persons in the lowest quintile of the earnings distribution in 1996 had succeeded in moving up the earnings ladder in 2005<sup>(3)</sup>. That study also reveals that education can effectively enhance upward earnings mobility and strengthen individual's ability to break away from intergeneration poverty.

(II) *Gender differential analysis*

9. ***The social rate of return of male was substantially higher than that of female by around 2 percentage points in 1990. The discrepancy narrowed to around 0.5 percentage points in 2004 (Table 2).*** Increasingly important role of female in the labour market, especially in professional and senior management positions, should mainly account for this. Exemplified in terms of average employment earnings, the cumulative increase for full-time female workers with a university degree between 1990 and 2004, at 114%, was considerably higher than that for their male counterparts, at 101%. This has gone a long way in explaining a closer rate of return between male and female, notwithstanding the fact that males have on average higher pay than their female counterparts, especially during their prime earnings years<sup>(4)</sup>.

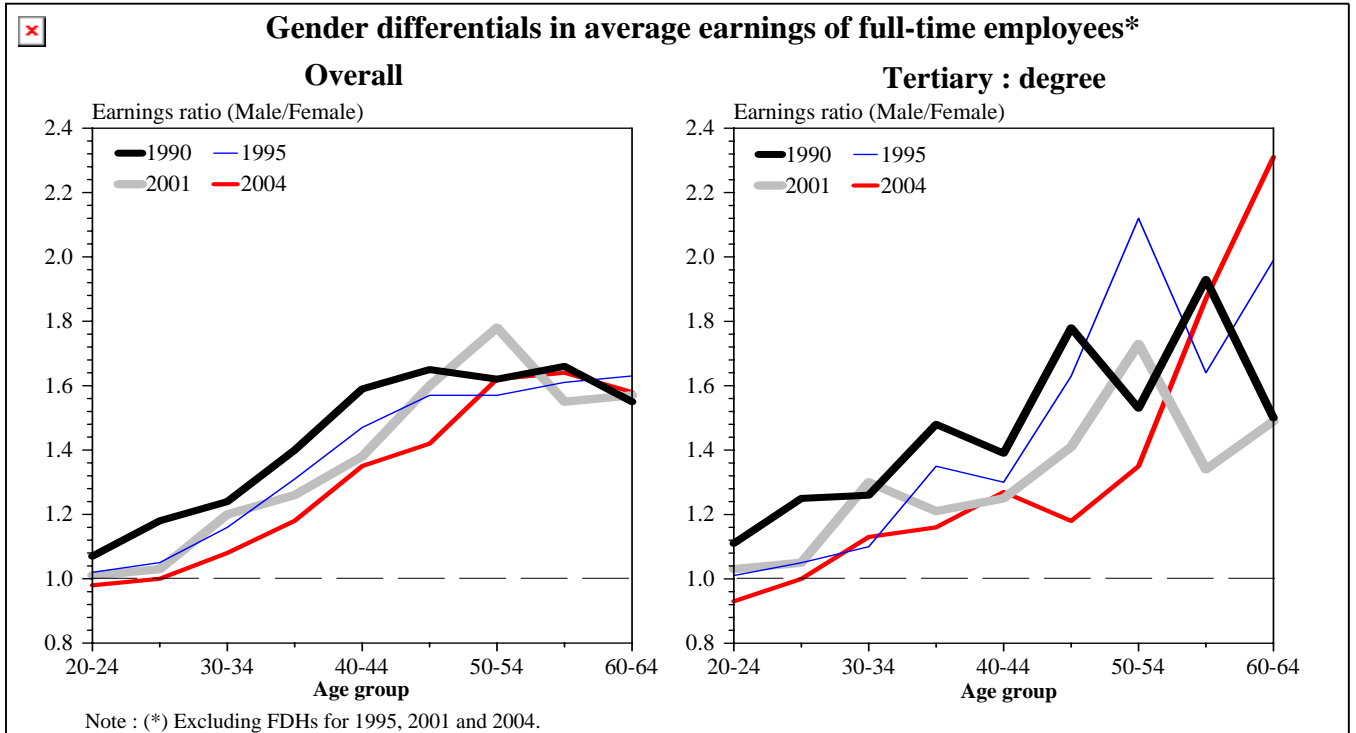
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(3) "Special Topic Enquiry on Earnings Mobility" by J. Vere (2006). The report can be downloaded in [www.cop.gov.hk/eng/meeting11.htm](http://www.cop.gov.hk/eng/meeting11.htm).

(4) The erratic age profile of earnings differentials between male and female degree-holders in different years is conceivably due in part to the distortion brought about by the very small sample counts in certain age cohorts, notably those comprising full-time employees of near-retirement age.

**Table 2 : Gender differentials in rates of return of university education**  
(male over female in percentage points)

	<u>1990</u> (%)	<u>1995</u> (%)	<u>2001</u> (%)	<u>2004</u> (%)	<u>Change (1990 to 2004)</u> (%)
<b>Social</b>	2.1	0.7	1.3	0.5	-1.7



(III) *International comparison*

10. In neighboring economies such as Singapore and Korea, similar studies have also been conducted to estimate the rate of return of education investment. In a 1998 study, the estimated social rate of return was 13.9% in Singapore. In a dated 1986 study, the corresponding rate was 15.5% in Korea<sup>(5)</sup>.

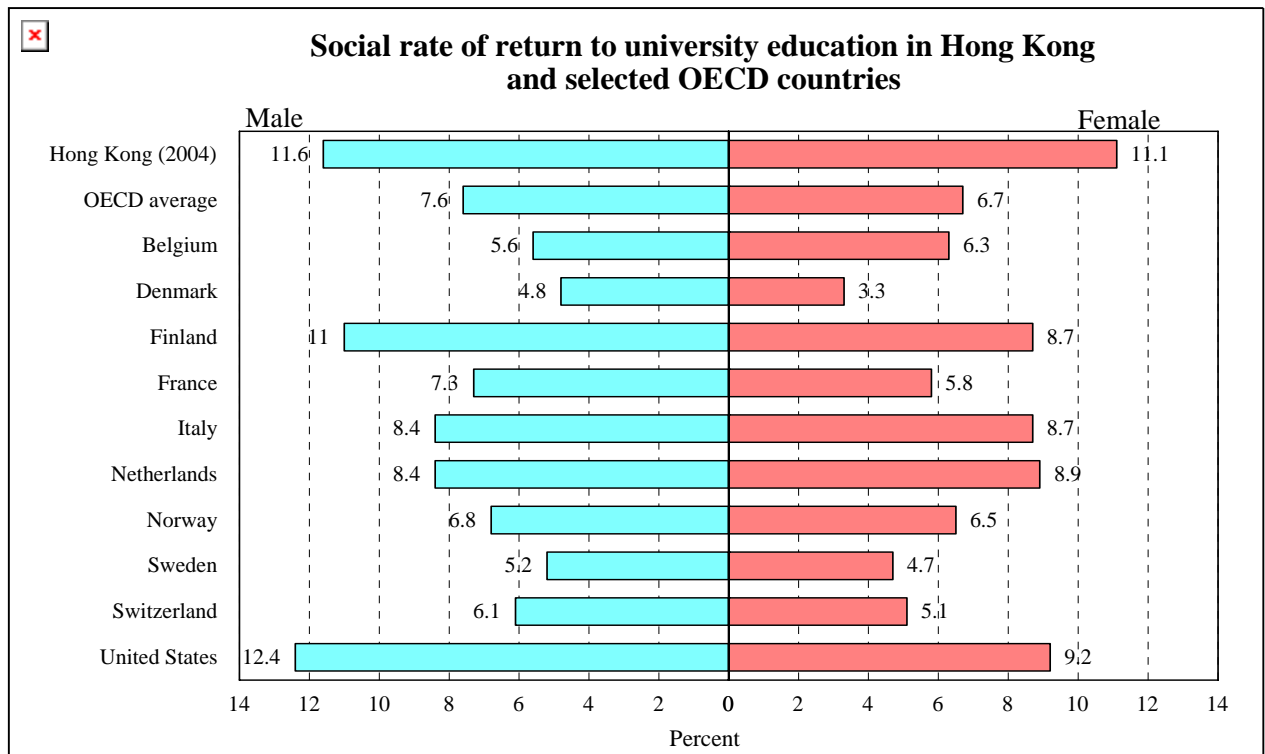
11. Also, the social rate of return of university education for several OECD countries ranged from 4.7% to 12.4% in 2002. Compared with the rates of return so estimated in Hong Kong, a number of observations are worth noting : *First*, the social rate of return of university education in Hong Kong in 2004 was higher than the average rate in these countries, by 4.0 percentage points for male and 4.4 percentage points for female. *Second*, the discrepancy in social rate of

(5) The estimations from the Singapore and Korea studies are quoted from "Returns to Investment in Education : A further update" by G. Psacharopoulos and H. Patrinos (2002).

return between male and female was less distinct in Hong Kong, while it averaged at around 1 percentage point in these OECD countries. Indeed, the social rate of return for female in Hong Kong exceeded all these countries (*Table 3*).

**Table 3 : Social rate of return in Hong Kong and selected OECD countries**

	Male (%)	Female (%)
(i) Hong Kong (2004)	11.6	11.1
(ii) Average rate of return in selected OECD countries (2002)	7.6	6.7



Note : The figures for OCED refer to the year of 2002 and are sourced from Education at a Glance (2005).