

Present Value Assessment of Lost Future Earnings: An Empirical Experience from Hong Kong

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ABSTRACT

In Hong Kong, the assessment of future loss of earnings is perhaps the most complicated and contentious aspect of personal injury compensation. Conventionally, the Hong Kong Courts follow English authorities in selecting multipliers in personal injury litigation. Most judges select the multiplier by reference to a spread of multipliers in comparable cases from England and Hong Kong. The House of Lords in England deviated from this approach in *Wells v Wells* [1999] AC 345. It approved actuarial evidence as the primary method of assessing future pecuniary loss. This research paper empirically surveys the recent trends (from 2005 to 2009) of personal injury compensation in Hong Kong by applying a set of relevant actuarial tables.

In addition, the discount rate is essential to the actuarial calculation of the award – it is the rate of interest the claimant can be expected to achieve on the lump sum before it is used up. This paper also explores the proper discount rate in the context of Hong Kong's economic conditions and local circumstances.

Key words: use of economic data in courtroom; discount rate; interest rate parity; Fisher equation; multipliers; personal injury compensation in tort law.

INTRODUCTION

In Hong Kong, anyone who has been a victim of personal injury has various alternative routes open to them in order to claim damages for their injuries. In addition to general damages for pain, suffering and loss of amenity, injured plaintiffs are entitled to ask the court to look into the future, and project what pecuniary losses they will suffer as a direct consequence of the injury. The main heads of such loss include the cost of future care, future lost earnings and profits in the years remaining and after retirement. The basic principle is that injured individuals are entitled to recover the sums that would have earned but for the injury. In *British Transport Commission v. Gourley*¹, Lord Jowitt of the UK House of Lords said:

The broad general principle which should govern the assessment of damages in cases such as this is that the tribunal should award the injured party such a sum of money as will put him in the same position as he would have been in if he had not sustained the injuries...The principle is sometimes referred to as the principle of *restitutio in integrum*; but it is manifest that no award of money can possibly compensate a man for such grievous injuries as the respondent in this case has suffered.

Lord Reid supported the view expressed by Lord Jowitt and stated:

The general principle on which damages are assessed is not in doubt. A successful plaintiff is entitled to have awarded to him such a sum as will, so far as possible, make good to him the financial loss which he has suffered and will probably suffer as a result of the wrong done to him for which the defendant is responsible. It is sometimes said that he is entitled to *restitutio in integrum*, but I do not think that that is a very accurate or helpful way of stating his right. He cannot in any real sense be restored, even financially, to his position before the accident. If he had not been injured he would have had the prospect of earning a continuing income, it may be, for many years, but there can be no certainty as to what would have happened. In many cases the amount of that income may be doubtful even if he had remained in good health, and there is always the possibility that he might have died or suffered from some incapacity at any time. The loss which he has suffered between the date of the accident and the date of the trial may be certain, but his prospective loss is not. Yet damages must be assessed as a lump sum once and for all, not only in respect of loss accrued before the trial, but also in respect of prospective loss.

When assessing future pecuniary loss in personal injury litigation, courts often use the multiplicand/multiplier approach. The objective is to calculate a lump sum amount to compensate the plaintiff for future loss of earnings and to cover future expenses. The lump sum is computed as the product of a multiplicand and a multiplier.

The multiplicand is the annual figure that represents each head of loss, such as the future annual cost of care and the future annual loss of income. The multiplier is used to discount the future pecuniary values into a present lump sum amount. The compensation is assessed on the basis that the total amount awarded by the court will be used up completely at the end of the period foreseen, and that during that period the plaintiff will be expected to draw upon both the compensation itself *and* the income generated from the investment of the amount awarded by the court². The factors that are taken into account include the inflation rate, the general mortality pattern of the population at large, investment returns, taxation and additional factors reflecting contingencies other than

mortality. This principle is illustrated in *Ong Ah Long v. Dr. Underwood*³, where Justice Barakbah averred:

This amount is calculated by taking the figure of the plaintiff's annual earnings at the time of the injury less the amount, if any, which he can now earn annually, and multiplying this by the number of years during which the loss of earning power will last, which, if the injury is for the plaintiff's life, will require a calculation of the period of his expectation of working life. This latter figure is generally referred to as the multiplier and the former figure is now coming to be referred to as the multiplicand

ACTUARIAL TABLES

With the generous support of a research grant from the Hong Kong Research Grants Council, the authors of this paper collaborated with a leading barrister who specializes in personal injury compensation⁴ and published a set of actuarial tables for use in personal injury and fatal accident cases in Hong Kong⁵. The following actuarial formulae were adopted:

Tables 1, 2, 19 and 20	\bar{a}_x
Tables 3, 4, 21 and 22	$\bar{a}_{x:55-x }$
Tables 5, 6, 23 and 24	$\bar{a}_{x:60-x }$
Tables 7, 8, 25 and 26	$\bar{a}_{x:65-x }$
Tables 9, 10, 27 and 28	$\bar{a}_{x:70-x }$
Tables 11, 12, 29 and 30	${}_{55-x }\bar{a}_x$
Tables 13, 14, 31 and 32	${}_{60-x }\bar{a}_x$
Tables 15, 16, 33 and 34	${}_{65-x }\bar{a}_x$
Tables 17, 18, 35 and 36	${}_{55-x }\bar{a}_x$
Table 37	$1/(1+i)^n$
Table 38	$\bar{a}_{n }$

Definitions and computational formulae⁶ for the above actuarial functions can be found in standard textbooks for actuarial mathematics (For instance, *Actuarial Mathematics* by NL Bowers, HU Gerber, JC Hickman, DA Jones, and CJ Nesbitt; published by the Society of Actuaries, USA, 1997). The actuarial formulae were applied in the context of the statistical data and information released by the Hong Kong government in June 2004, *inter alia*:

- *Hong Kong Life Tables 1998-2033*, Demographic Statistics Section, Census and Statistics Department, Hong Kong SAR Government; and
- *The Hong Kong Population Projections 2004-2033*, Demographic Statistics Section, Census and Statistics, Hong Kong SAR Government.

Three sets of actuarial tables in the present edition include multipliers for pecuniary loss for life, multipliers for loss of earnings to pension age and multipliers for loss of pension commencing from retirement age. Each set of tables comprises different tables of multipliers that are computed under different combinations of factors such as gender (male or female), mortality basis (observed or projected) and retirement age.

DISCOUNT RATES

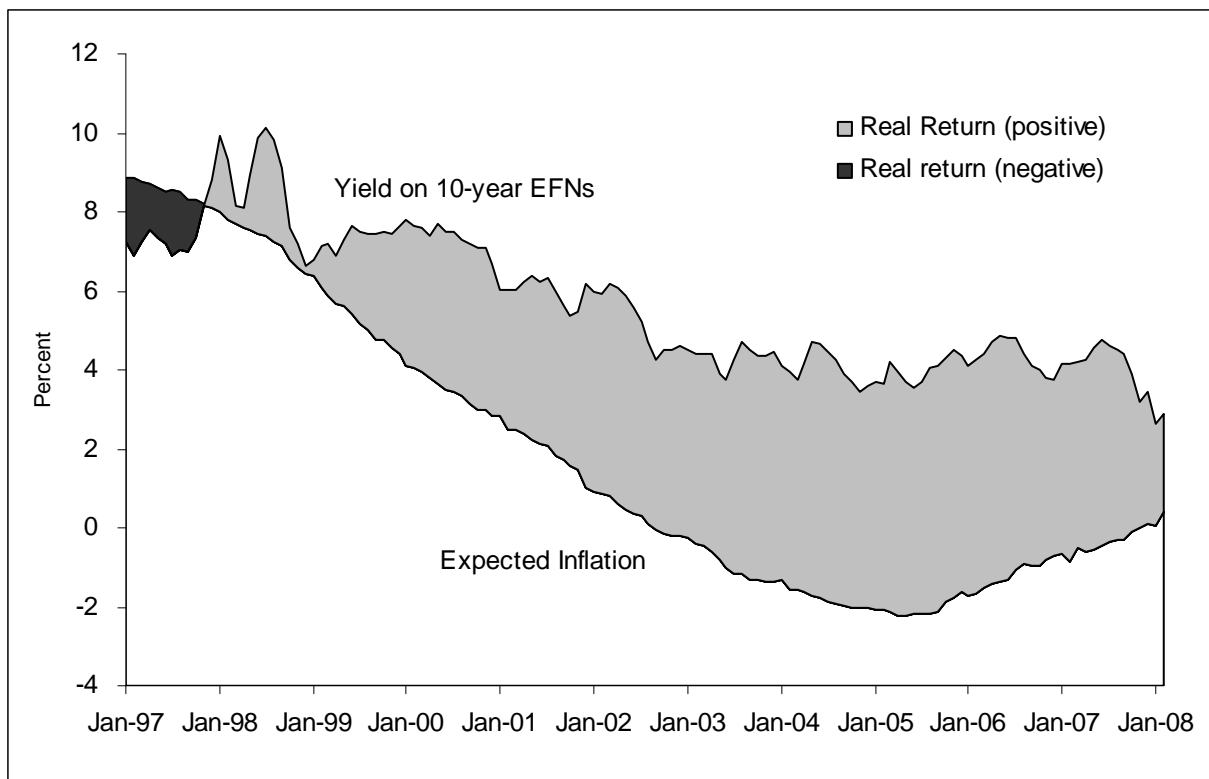
For a number of years, the Hong Kong and UK courts assumed that the injured plaintiff would invest the compensation awarded in shares and securities which, on average, generate a return of 4% to 5% every year. However, the UK House of Lords overruled this approach. In *Wells v. Wells*, Lord Lloyd of Berwick explained:

Granted that a substantial proportion of equities is the best long-term investment for the ordinary prudent investor, the question is whether the same is true for these plaintiffs. The ordinary investor may be presumed to have enough to live on. He can meet his day-to-day requirements. If the equity market suffers a catastrophic fall, as it did in 1972, he has no immediate need to sell. He can abide his time, and wait until the equity market eventually recovers... The plaintiffs are not in the same happy position. They are not “ordinary investors” in the sense that they can wait for long-term recovery, remembering that it was not until 1989 that equity prices regained their old pre-1972 level in real terms. For they need the income, and a portion of their capital, every year to meet their current cost of care.

On 25th June 2001, the UK Lord Chancellor set the discount rate at 2.5%⁷. Under the Damages Act 1996⁸, however, it is possible for the UK courts to “take a different rate of return into account if any party to the proceedings shows that is more appropriate in the case in question.” In Hong Kong, the discount rate is a controversial issue that has not yet been fully settled by judges. The Hong Kong Chief Justice has not issued any Practice Direction to legal practitioners setting out appropriate discount rate. With all due respect, the current discount rate in Hong Kong (4% to 5%) bears little, if any, relationship to reality. It should be revisited in light of the changing economic climate and economic reality.

In Hong Kong, the claimant in personal injury litigation should be assumed to invest the lump sum of the award in low-risk investment vehicles. Under the linked exchange rate system⁹, the average real rate of return from US Treasury Inflation-indexed securities is an appropriate yardstick for the determination of the discount rate in Hong Kong. Alternatively, the Hong Kong Government Exchange Fund Note programme would be another prudent choice of investment for the claimant. Using actual data from

January 1997 to January 2006, the expected real rates of return are close to 3.5%¹⁰. Hence, it is recommended that the current annual rate of return in Hong Kong ought to be 3.5% (See the figure below).



ILLUSTRATIONS

In this section, the application of the actuarial method is illustrated in the context of recent personal injury cases in Hong Kong. All of the tables involved are included in the Appendix of this paper.

Tam Hon Wing Eddy v. Hopewill Engineering Limited [2009]¹¹

The plaintiff was a 44-year-old plumber employed by the defendant when the accident happened at a construction site in February 2006. He was 47-year old at trial. His job included installation of water pipes. The accident happened inside a vertical pipe duct that ran across several floors. The plaintiff was assigned to work inside the duct on the ground level. The plaintiff stated that there was a cardboard placed by his co-worker earlier on inside the pipe duct to prevent objects from falling down and hitting the duct. Afterwards, his co-workers had to remove the cardboard in order to pass the tools around. Apparently in the course of that, the plaintiff was hit near his forehead by a block of concrete.

The plaintiff's case is that the defendant failed to provide a safe system of work. The plaintiff had asked for safety helmet after he started working at the site, but his request was ignored repeatedly. The court held that the defendant was negligent and breached its implied duty of care as the employer by failing to provide a safe system of work.

Justice Leung found that 10 was the appropriate multiplier, while \$2,205 was the appropriate multiplicand. The plaintiff's future loss of earnings was therefore:

$$\$2,205 \times 12 \times 10 = \$264,600.$$

When actuarial tables are employed to determine the appropriate multiplier, the post-trial loss of future earnings to retirement age is assessed as follows.

- Look up Table 21 (under projected mortality) for loss of earnings to pension age 60 for males.
- The appropriate discount rate is recommended to be 3.5%.
- Table 21 shows that on the basis of a 3.5% discount rate, the multiplier for a male aged 47 is 10.27.
- The loss of future earnings are assessed as $\$2,205 \times 12 \times 10.27 = \$271,744$

Imitiaz Perviz v. Senibo Development Limited & others [2007]¹²

The plaintiff Imitiaz Perviz claimed damages for personal injuries that he sustained in the course of his work at a container terminal. He was only 23 years old when the trial took place in July 2007.

On 14 September 2002 the plaintiff was engaged by the defendant to load containers on a lighter at a container terminal in Hong Kong. During the loading operation, he suffered a serious injury to his right leg. He was later found to be suffering from serious traumatic closed fracture of the right tibia and compartment syndrome. He was operated on twice. The first was undertaken in the early hours of 15 September 2002. The procedure was a fasciotomy and application of an external fixation device to stabilize the fractured tibia. His fascia was cut to relieve the pressure giving rise to compartment syndrome. The second operation was performed three days later. It lasted almost 24 hours. The procedure included removal of the external fixator, debridement and skin grafting of an open wound at the site of the fracture and close reduction and internal fixation of the fractured tibia. On 26 September 2003, there was a third operation when the implants were removed.

The plaintiff suffered serious disabilities which included lack of mobility in the knee and ankle of the right leg, and pain from time to time and particularly after extended periods of walking. He would have difficulty in returning to work as a container barge worker.

Justice Gill found that 18 was the appropriate multiplier, while \$6300 was the appropriate multiplicand. The plaintiff's future loss of earnings was therefore:

$$\$6,300 \times 12 \times 18 = \$1,360,800$$

When actuarial tables are employed to determine the appropriate multiplier, the post-trial loss of future earnings to retirement age is assessed as follows.

- Look up Table 21 (under projected mortality) for loss of earnings to pension age 55 for males.
- The appropriate discount rate is recommended to be 3.5%.
- Table 21 shows that on the basis of a 3.5% discount rate, the multiplier for a male aged 23 is 19.21.
- The loss of future earnings are assessed as $\$6,300 \times 12 \times 19.21 = \$1,452,276$

Ho Ho Ming v. Hyundai Engineering and Construction Co. Ltd. & others [2006]¹³

The plaintiff was 29 at the date of trial. He claimed damages for personal injuries against the defendants arising from an accident which occurred on 9 November 2000. The plaintiff, while working as a scaffold dismantler at a construction site, fell from a height of over 12 metres from a scaffold, sustaining head injuries as well as multiple

fractures to various parts of his body, resulting in almost complete loss of use of his left arm. Based on the evidence, Justice Suffiad decided that the multiplicand should be \$20,000 per month, and that the multiplier should be 14. Hence, the loss of future earnings (excluding pension) was:

$$\$20,000 \times 14 \times 12 = \$3,360,000$$

If the actuarial tables are applied, the post-trial loss of earnings to retirement age is assessed as follows.

- Look up Table 21 (under projected mortality) for loss of earnings to pension age 55 for males.
- The appropriate discount rate is recommended to be 3.5%.
- Table 21 shows that on the basis of a 3.5% discount rate, the multiplier for a male aged 29 is 17.01.
- The loss of future earnings is assessed as $\$20,000 \times 17.01 \times 12 = \$4,082,400$.

Pang Ping Sum v. Enpack (Hong Kong) Limited & Others [2005]¹⁴

The plaintiff Mr Pang claimed damages for personal injuries that he sustained in the course of his work on 21 February 2002 at a construction site. He was 44 years old when the trial took place in September 2005.

On the day in question, the plaintiff was instructed to spray cement on the slope at the site. Together with another worker, he held a hose from the cement machine to spray cement on the slope. Another three workers operated the cement spraying machine by switching it on and off and shovelling dry mortar powder into it, which, by use of a compression pump, would be pumped into the hose and then sprayed onto the slope. In the afternoon, the hose of the machine became blocked, and the plaintiff's colleague went down the slope to check what was causing the blockage. The plaintiff was left alone on the slope holding the hose.

The plaintiff pleaded that suddenly, without warning, the hose violently spurted out cement and knocked against the plaintiff, causing him to fall and hit some objects. He was knocked unconscious, and was bleeding profusely. The plaintiff was suing the principal contractor of the site and some related parties.

For future loss of earnings, Justice Suffiad of the Hong Kong Court of First Instance adopted \$6,500 as the multiplicand. As for the multiplier, the plaintiff was 44 years old at trial. Had it not been for the accident, he would have been likely to continue working as a hose operator, as he was very experienced in that kind of work. Given the age of the plaintiff and that he was a manual worker on construction sites, in

normal circumstances a multiplier of 10 would be appropriate. However, in this case, Justice Suffiad considered that the work of a hose operator was very exertive and risky. This can be seen by the fact that one person is considered insufficient to operate the hose, and it is usual to engage two persons to do so at the same time.

The judge took the view that this should be reflected in the multiplier to be adopted. Hence, a multiplier of 9 would be appropriate to assess future loss of earnings. The future loss of earnings was therefore:

$$\$6,500 \times 12 \times 9 = \$702,000$$

When actuarial tables are employed to determine the appropriate multiplier, the post-trial loss of future earnings to retirement age is assessed as follows.

- Look up Table 21 (under projected mortality) for loss of earnings to pension age 55 for males.
- The appropriate discount rate is recommended to be 3.5%.
- Table 21 shows that on the basis of a 3.5% discount rate, the multiplier for a male aged 44 is 9.05.
- The loss of future earnings are assessed as $\$6,500 \times 12 \times 9.05 = \$705,900$.

Wong Ka Wa v. Hung Tin Sun & Others [2005]¹⁵

The plaintiff Mr Wong was born on 24 June 1965. He was 36 years old at the time of the accident, and was 40 years old at trial.

The plaintiff's injuries arose from an accident on the highway that was a direct result of vehicles following too closely. In the early morning of 28 December 2001, the Plaintiff was riding his motorcycle in an offside lane. Ahead of him was a tanker truck. Further ahead on the same lane was a goods vehicle. The goods vehicle in front braked suddenly, and the drivers of the other vehicles behind it were unable to stop in time. The plaintiff, following too closely behind the tanker truck, swerved to avoid it and collided with the concrete median barrier between the northbound and southbound lanes of the road. He suffered significant injuries.

The plaintiff worked in the elevator field for some 19 years, and had extensive experience as a supervisor. When he returned to work, by virtue of the physical restrictions placed upon him as a result of the accident, he was not re-employed in the same capacity, but as an elevator technician. Apparently the post of technician is a less demanding post, and one that he was able to manage. Justice Saunders considered all of the relevant evidence and decided that the multiplicand should be \$5,795.

Weighing in all matters, including the result of future surgery, Justice Saunders found that 13 was the appropriate multiplier. The plaintiff's future loss of earnings was therefore:

$$\$5,795 \times 13 \times 12 = \$904,020$$

When actuarial tables are used to ascertain the appropriate multiplier, the post-trial loss of earnings to retirement age is assessed as follows.

- Look up Table 21 (under projected mortality) for loss of earnings to pension age 55 for males.
- The appropriate discount rate is recommended to be 3.5%.
- Table 21 shows that on the basis of a 3.5% discount rate, the multiplier for a male aged 40 is 11.58.
- The loss of future earnings is assessed as $\$5,795 \times 11.58 \times 12 = \$805,273.2$.

Hang Huu Duc v. Hanbo Engineering Limited [2005]¹⁶

The plaintiff Mr Hang was born on 4 June 1972. He was 28 years old at the time of the accident, and 33 at the date of trial.

He was employed by Hanbo Engineering Limited as a carpenter. On 27 March 2001, in the course of his employment, he tried to hammer a steel cement nail through a wooden plank and into an iron tube. The nail rebounded, and hit him in the left eye. He lost sight in that eye, and could no longer work as a carpenter. He pleaded damages for negligence, breach of implied terms of employment and breach of statutory duty.

The plaintiff's left eye was ruptured and he had to undergo various operations. His vision in that eye became very poor and he could only see dark shadows. He suffered from loss of stereoptic vision, depth perception and fine visual discrimination. The medical experts on both sides agreed that he could only see hand movement with his left eye. He suffered a permanent 100% visual impairment in that eye and could not return to work as a carpenter. However, various types of work were open to him, and one such was as a security officer. He was on sick leave until 25 December 2003 and worked as a security officer from 1 November 2004.

Justice Muttrie found that the multiplicand was \$22,167 per month and that the multiplier should be 15. Accordingly, the loss of future earnings was:

$$\$22,167 \times 15 \times 12 = \$3,990,060$$

If the actuarial tables are applied, the post-trial loss of earnings to retirement age is assessed as follows.

- Look up Table 21 (under projected mortality) for loss of earnings to pension age 55 for males.
- The appropriate discount rate is recommended to be 3.5%.
- Table 21 shows that on the basis of a 3.5% discount rate, the multiplier for a male aged 33 is 15.26.
- The loss of future earnings is assessed as $\$22,167 \times 15.26 \times 12 = \$4,059,221$.

Chan Pui Ki v. Leung On [1996]¹⁷

Chan Pui Ki is a milestone in personal injury litigation in Hong Kong. Prior to this, no Hong Kong cases admitted expert evidence given by actuaries or economists to challenge the appropriateness of conventional discount rates and conventional multipliers.

Miss Chan was knocked down by a double-decker bus in 1989 at the age of 10, and suffered severe head injuries. The plaintiff invited the Court of First Instance not to adopt the conventional multiplier (which would only have been 20), but to receive actuarial evidence of what was an appropriate multiplier. The plaintiff argued that the fundamental principle of law was that compensation should, as nearly as possible, put the party who had suffered loss in the same position that she would have been in if she had not sustained the wrong (*Lim Poh Choo v. Camden Health Authority*¹⁸). The conventional multipliers were only appropriate to discount rates of 4% to 5% (per Lord Diplock in *Cookson v. Knowles Coal*¹⁹). The discount rate is the differential between the rate of investment return and the wage inflation for the period of the plaintiff's probable working life. The discount rate is an essential element in the actuarial formula as regards the calculation of multipliers. The plaintiff introduced evidence which showed that in present-day Hong Kong, the rate of real return on investment over wage increase falls below the rate of 4% to 5%. Thus, the conventional multiplier which was based on that range of return was not capable of giving the plaintiff fair compensation by covering her loss of earnings measured at the date of the trial and the amount by which future annual earnings would increase above the normal inflationary increase. Hence, it was argued that the multiplier had to be increased to give the plaintiff fair compensation.

The trial judge, Justice Cheung, did not adopt the conventional upper limit of the multiplier based on previous case law, namely 20. He boldly admitted the actuarial evidence introduced by the plaintiff. He chose 30 as the multiplier, based on a discount rate of 2.7%. In other words, the court assumed that the plaintiff would invest her money and obtain a return of 2.7% over inflation. The multiplier of 30 also reflected consideration of the various 'vicissitudes of life', chiefly mortality, illness and redundancy. The award for future loss of earnings by the Court of First Instance was:

$$\$120,900 \text{ (multiplicand)} \times 30 \text{ (multiplier)} = \$3,627,000.$$

In respect of the multiplier, Justice Cheung observed:

Short of picking a figure from the air, the only possible way of calculating the appropriate multiplier is by the assistance of expert evidence. It should be noted that the use of actuarial evidence has been accepted by the court in the past. Lord Denning MR in *Hodges v Harland & Woolf Ltd* [1965] 1 WLR 523 at 526D-E held that: "...loss of future earnings...is, of course, a proper head of compensation. The evidence receivable depends on the circumstances. The judges do take actuarial considerations into account...If the evidence of an actuary would be helpful in any case, I know of no rule of law which prevents it from being entertained and considered.

The case went before the Court of Appeal in 1996. The appeal was regarded by the Hong Kong legal profession as a test case for challenging the conventional approach to the assessment of damages for future loss of earnings. The Chief Justice at that time specially convened a five-person court to hear the case. The Court of Appeal ruled that the conventional approach for selecting multipliers should be restored. It also discouraged any further use of expert evidence given by economists and actuaries in personal injury litigation in Hong Kong. The conventional discount rate of 4% to 5% was restored. Consequently, the level of award for loss of future earnings in the *Chan Pui Ki* case was substantially reduced to \$108,000 (multiplicand) x 15 (multiplier) = \$1,620,000. (The multiplicand was reduced because the Court of Appeal took the view, *inter alia*, that the trial judge failed to take into account the amount that the plaintiff would have earned in a sheltered workshop after recovery.)

The difference between the Court of First Instance's award and the Court of Appeal's award for loss of future earnings was around \$2 million. Of this difference, more than \$1.8 million was due to the reduction of the multiplier from 30 to 15. The Court of Appeal took the view that for many years the conventional method of assessing an appropriate lump sum to compensate for loss of future earnings had been to use the multiplier/multiplicand approach. Crude though that method might be, it was nevertheless a realistic acknowledgment of the inherent limitations of the whole exercise. It was based upon the applied wisdom of the courts over many years. Justice Litton was rather conservative in his response:

In the course of the hearing we were told by counsel that recently practitioners have been at a loss as to the right approach in cases involving future loss of earnings and have increasingly relied on "experts" for assistance in advancing their respective cases. This is a trend which must stop, for it proceeds upon a fundamental misconception. Experts, be they economists, accountants or other professional persons, can of course testify in a court of law as to past events, and their views and opinions can sometimes be helpful in assisting the court in interpreting data...But the opinion evidence in the court below was allowed to stray far beyond proper realms. For example, the judge said..."[The expert] was of the view that the period from 1962 to 1995 is probably fairly representative of the economic conditions that one might expect to see in 20, 30 or 40 years' time". This, with respect to the judge, was of no evidential weight in a court of law and ought never to have been entertained...[The expert] who testified before the judge was an economist. He was no prophet.

If the Hong Kong Court of Appeal had applied the actuarial tables, then the post-trial loss of earnings to retirement age would have been assessed as follows.

- Look up Table 24 (under projected mortality) for loss of earnings to pension age 60 for females.
- The appropriate discount rate is recommended to be 3.5%.
- Table 24 shows that on the basis of a 3.5% discount rate, the multiplier for a female aged 16.5 is 22.45.
- The loss of future earnings is assessed as $\$9,000 \times 22.45 \times 12 = \$2,424,600$.

CONCLUSION

The following table summarises the common law multipliers and actuarial multipliers in relation to the recent cases in Hong Kong.

Case name	Plaintiff's age at trial	Common law multiplier	Actuarial multiplier
<i>Tam Hon Wing Eddy</i> [2009] HK District Court	47	10	10.27
<i>Wong Kwok Wa</i> [2005] HK Court of First Instance ("CFI")	40	13	11.58
<i>Wong Lai Chuen</i> [2006] CFI	36	14	13.79
<i>Ngai Lung Hing</i> [2006] CFI	34	14	14.79
<i>Hang Hui Duc</i> [2005] CFI	33	15	15.26
<i>Ho Ho Ming</i> [2006] CFI	29	14	17.01
<i>Mung Yee Ki</i> [2005] CFI	26	15	19.78
<i>Tse Hon Wai</i> [2007] CFI	24	17	20.38
<i>Imtiaz Perviz</i> [2007] CFI	23	18	20.66
<i>Chan Pui Ki</i> [1996] Hong Kong Court of Appeal	16	15	22.45

For plaintiffs aged above 30 years old, the common law multipliers are in line with the corresponding actuarial multipliers. Unfortunately, for plaintiffs who are in their twenties or younger, the common law multipliers are obviously lower than their corresponding actuarial multipliers. In other words, younger victims in Hong Kong are being under-compensated. The use of inappropriate common law multipliers has led to a deflation in the size of awards to younger plaintiffs. In *Dall v. Choy Wing Wai*²⁰, Justice

Cheung correctly observed that “the multipliers for persons of young age have been over-discounted”. As shown in the above table, it is illogical that the common law multiplier of 15 would apply equally to three different victims aged 33, 26 and 16 at trial. It should be obvious that the younger the victim, the greater the multiplier.

The present research paper advocates that the Hong Kong court practice in personal injury cases be reformed by invoking established actuarial methodology in the specific context of Hong Kong. Historically focused on the insurance and pensions industries, actuarial skills are now being applied to an array of areas related to finance and business. Actuaries are trained to “analyse past events, assess present risk involved, and model what could happen in the future²¹”. If more interdisciplinary scholarship and research are pursued in the future, then an appropriate rebalance between the legal profession and the actuarial profession is likely to be achieved soon. After all, justice under the doctrine of the rule of law can only be achieved when the rights of the most disadvantaged (including those who are prematurely disabled from earning) are appropriately addressed. Hence, legal reform is needed urgently in order to arrive at a fair and equitable assessment of personal injury compensation in Hong Kong²².

Appendix: Table 21- Multipliers for loss of earnings to pension age 55 (males)

Age at date of trial	Multiplier calculated with allowance for population mortality from the population projections and rate of return										
	0.0%	0.5%	1.0%	1.5%	2.0%	2.5%	3.0%	3.5%	4.0%	4.5%	5.0%
16	38.55	35.05	31.98	29.29	26.91	24.81	22.95	21.29	19.82	18.50	17.31
17	37.55	34.22	31.30	28.72	26.44	24.42	22.62	21.02	19.59	18.31	17.16
18	36.55	33.39	30.61	28.14	25.96	24.02	22.29	20.74	19.36	18.11	16.99
19	35.56	32.56	29.91	27.56	25.47	23.61	21.94	20.45	19.11	17.91	16.82
20	34.56	31.73	29.21	26.97	24.98	23.19	21.59	20.15	18.86	17.69	16.64
21	33.57	30.89	28.51	26.38	24.47	22.76	21.23	19.85	18.60	17.47	16.45
22	32.58	30.05	27.80	25.77	23.96	22.33	20.86	19.53	18.33	17.24	16.25
23	31.59	29.21	27.08	25.16	23.44	21.88	20.48	19.21	18.05	17.00	16.05
24	30.60	28.37	26.36	24.54	22.91	21.43	20.09	18.87	17.76	16.75	15.83
25	29.62	27.52	25.63	23.92	22.37	20.96	19.68	18.52	17.46	16.50	15.61
26	28.63	26.67	24.89	23.28	21.82	20.48	19.27	18.16	17.15	16.22	15.37
27	27.65	25.81	24.15	22.63	21.25	19.99	18.84	17.79	16.83	15.94	15.13
28	26.66	24.95	23.40	21.98	20.68	19.49	18.40	17.41	16.49	15.64	14.87
29	25.67	24.09	22.64	21.31	20.09	18.98	17.95	17.01	16.14	15.33	14.59
30	24.68	23.22	21.87	20.63	19.49	18.45	17.48	16.59	15.77	15.01	14.31
31	23.70	22.34	21.09	19.94	18.88	17.91	17.00	16.17	15.39	14.67	14.00
32	22.71	21.46	20.31	19.25	18.26	17.35	16.51	15.72	14.99	14.32	13.69
33	21.72	20.57	19.52	18.54	17.63	16.78	16.00	15.26	14.58	13.95	13.35
34	20.73	19.69	18.72	17.82	16.98	16.20	15.47	14.79	14.15	13.56	13.00
35	19.74	18.79	17.91	17.09	16.32	15.60	14.93	14.30	13.71	13.16	12.64
36	18.75	17.90	17.09	16.35	15.64	14.99	14.37	13.79	13.25	12.73	12.25
37	17.76	16.99	16.27	15.59	14.96	14.36	13.80	13.27	12.77	12.29	11.85
38	16.78	16.09	15.44	14.83	14.26	13.72	13.20	12.72	12.27	11.83	11.43
39	15.79	15.18	14.60	14.06	13.54	13.06	12.60	12.16	11.75	11.35	10.98
40	14.80	14.26	13.76	13.27	12.82	12.38	11.97	11.58	11.21	10.85	10.52
41	13.82	13.35	12.90	12.48	12.07	11.69	11.33	10.98	10.65	10.33	10.03
42	12.83	12.42	12.04	11.67	11.32	10.98	10.66	10.36	10.06	9.78	9.52
43	11.84	11.50	11.17	10.85	10.55	10.26	9.98	9.71	9.46	9.21	8.98
44	10.86	10.57	10.29	10.02	9.76	9.51	9.28	9.05	8.83	8.62	8.41
45	9.87	9.63	9.40	9.18	8.96	8.75	8.55	8.36	8.17	8.00	7.82
46	8.89	8.69	8.50	8.32	8.15	7.97	7.81	7.65	7.50	7.35	7.20
47	7.91	7.75	7.60	7.46	7.31	7.18	7.04	6.92	6.79	6.67	6.55
48	6.92	6.80	6.69	6.58	6.47	6.36	6.26	6.16	6.06	5.96	5.87
49	5.94	5.85	5.77	5.68	5.60	5.52	5.44	5.37	5.29	5.22	5.15
50	4.95	4.89	4.83	4.78	4.72	4.66	4.61	4.55	4.50	4.45	4.40
51	3.97	3.93	3.89	3.85	3.82	3.78	3.74	3.71	3.67	3.64	3.61
52	2.98	2.96	2.94	2.92	2.89	2.87	2.85	2.83	2.81	2.79	2.77

53	1.99	1.98	1.97	1.96	1.95	1.94	1.93	1.92	1.92	1.91	1.90
54	1.00	1.00	0.99	0.99	0.99	0.99	0.98	0.98	0.98	0.98	0.97

Table 23 - Multipliers for loss of earnings to pension age 60 (males)

Age at date of trial	0.0%	0.5%	1.0%	1.5%	2.0%	2.5%	3.0%	3.5%	4.0%	4.5%	5.0%
16	43.32	38.93	35.14	31.86	29.01	26.52	24.35	22.44	20.75	19.27	17.95
17	42.32	38.12	34.49	31.33	28.58	26.17	24.06	22.21	20.57	19.11	17.82
18	41.33	37.31	33.83	30.80	28.14	25.82	23.77	21.97	20.37	18.95	17.69
19	40.33	36.50	33.17	30.25	27.70	25.45	23.47	21.72	20.17	18.78	17.55
20	39.33	35.69	32.50	29.70	27.25	25.08	23.17	21.47	19.96	18.61	17.41
21	38.34	34.87	31.83	29.15	26.79	24.70	22.85	21.21	19.74	18.43	17.26
22	37.35	34.05	31.15	28.59	26.32	24.32	22.53	20.94	19.52	18.25	17.10
23	36.36	33.23	30.47	28.02	25.85	23.92	22.20	20.66	19.29	18.05	16.94
24	35.38	32.41	29.78	27.44	25.37	23.52	21.86	20.38	19.05	17.85	16.77
25	34.39	31.58	29.08	26.86	24.88	23.10	21.51	20.09	18.80	17.64	16.59
26	33.41	30.75	28.38	26.27	24.38	22.68	21.15	19.78	18.54	17.42	16.40
27	32.42	29.91	27.67	25.67	23.86	22.24	20.78	19.47	18.27	17.19	16.21
28	31.44	29.07	26.96	25.06	23.34	21.80	20.40	19.14	17.99	16.95	16.00
29	30.45	28.23	26.23	24.43	22.81	21.34	20.01	18.80	17.70	16.70	15.79
30	29.46	27.38	25.50	23.80	22.27	20.87	19.60	18.45	17.40	16.44	15.56
31	28.47	26.52	24.76	23.16	21.71	20.39	19.19	18.09	17.08	16.16	15.32
32	27.48	25.67	24.01	22.51	21.15	19.90	18.76	17.71	16.75	15.88	15.07
33	26.49	24.80	23.26	21.85	20.57	19.39	18.31	17.32	16.41	15.58	14.80
34	25.50	23.93	22.50	21.18	19.98	18.87	17.86	16.92	16.06	15.26	14.53
35	24.52	23.06	21.73	20.50	19.38	18.34	17.39	16.50	15.69	14.93	14.24
36	23.53	22.19	20.95	19.81	18.77	17.80	16.90	16.07	15.31	14.59	13.93
37	22.54	21.31	20.17	19.12	18.14	17.24	16.40	15.63	14.91	14.24	13.61
38	21.56	20.42	19.38	18.41	17.51	16.67	15.89	15.17	14.49	13.87	13.28
39	20.57	19.54	18.58	17.69	16.86	16.09	15.37	14.69	14.07	13.48	12.93
40	19.58	18.65	17.77	16.96	16.20	15.49	14.82	14.20	13.62	13.07	12.56
41	18.60	17.75	16.96	16.22	15.53	14.88	14.27	13.69	13.16	12.65	12.17
42	17.61	16.85	16.14	15.47	14.84	14.25	13.69	13.17	12.67	12.21	11.77
43	16.63	15.95	15.31	14.71	14.14	13.61	13.10	12.63	12.17	11.75	11.34
44	15.65	15.05	14.48	13.94	13.43	12.95	12.50	12.06	11.66	11.27	10.90
45	14.67	14.14	13.64	13.16	12.71	12.28	11.87	11.49	11.12	10.77	10.44
46	13.69	13.23	12.79	12.37	11.97	11.59	11.23	10.89	10.56	10.25	9.95
47	12.71	12.31	11.93	11.57	11.22	10.89	10.57	10.27	9.98	9.71	9.44
48	11.74	11.40	11.07	10.76	10.46	10.17	9.90	9.64	9.38	9.14	8.91
49	10.77	10.48	10.20	9.94	9.68	9.44	9.20	8.98	8.76	8.55	8.35
50	9.79	9.56	9.33	9.10	8.89	8.69	8.49	8.30	8.11	7.94	7.76
51	8.82	8.63	8.44	8.26	8.09	7.92	7.75	7.60	7.44	7.29	7.15
52	7.85	7.70	7.55	7.40	7.26	7.13	7.00	6.87	6.74	6.62	6.51
53	6.88	6.76	6.64	6.53	6.42	6.32	6.22	6.12	6.02	5.92	5.83

54	5.90	5.82	5.73	5.65	5.57	5.49	5.41	5.34	5.26	5.19	5.12
55	4.93	4.87	4.81	4.75	4.69	4.64	4.58	4.53	4.48	4.42	4.37
56	3.95	3.91	3.87	3.83	3.80	3.76	3.73	3.69	3.66	3.62	3.59
57	2.97	2.95	2.93	2.90	2.88	2.86	2.84	2.82	2.80	2.78	2.76
58	1.98	1.98	1.97	1.96	1.95	1.94	1.93	1.92	1.91	1.90	1.89
59	1.00	0.99	0.99	0.99	0.99	0.98	0.98	0.98	0.98	0.97	0.97

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¹ [1956] AC 185.

² *Wells v Wells* [1999] 1 AC 345; See also Markesinis, Coester, Alpa and Ullstein (2005). *Compensation for Personal Injury in English, German and Italian Law*. Cambridge University Press, UK, p. 116-138.

³ [1983] 2 MLJ 324 at 335.

⁴ The research team comprises Mr Neville Sarony, one of Her Majesty's Counsels, Dr Felix W.H. Chan, Associate Professor in Law at The University of Hong Kong, and Dr Wai-sum Chan, Professor in Actuarial Science at the Department of Finance of The Chinese University of Hong Kong.

⁵ N. Sarony, W.S. Chan and F.W.H. Chan (2004). *Personal Injury Tables Hong Kong 2005*, Sweet & Maxwell Asia. The methodology that was used in constructing the English Actuarial Tables (commonly known as the Ogden Tables) has been applied in the context of Hong Kong. A full set of the English Actuarial Tables can be found in Robin de Wilde QC (2004). *Facts and Figures: Tables for the Calculation of Damages*, Sweet & Maxwell UK.

⁶ Loadings: none. The relevant rate of return is stated in the tables.

⁷ Damages (Personal Injury) Order 2001, SI2001/2301.

⁸ Section 1(2).

⁹ The Hong Kong dollar is officially linked to the US dollar at the rate of 7.8 Hong Kong dollar to one US dollar. This linked exchange rate system has been in existence since October 1983.

¹⁰ Readers interested in the technical aspects of the actuarial mathematics involved may consult W.S. Chan and F.W.H. Chan, "On selection of the discount rate for actuarial assessment of damages in personal injury litigation in Hong Kong", *Law, Probability and Risk* (2003) Vol.2, 15-24 (UK: Oxford University Press).

¹¹ [2009] HKCU 208

¹² [2007] HKCU 1441.

¹³ [2006] HKEC 1790.

¹⁴ [2005] HKEC 1657.

¹⁵ [2005] HKEC 1705.

¹⁶ [2005] HKEC 1882.

¹⁷ [1996] 2 HKC 565.

¹⁸ [1980] AC 174 at 187 per Lord Scarman.

¹⁹ [1979] AC 556 at 571.

²⁰ [1997] 2 HKC 558E.

²¹ www.actuaries.org.uk.

²² Parts of this paper draw on the authors' earlier research on the subject matter: "How well do judges understand money? The reform of personal injury litigation in Hong Kong", *Tort Law Review* (2004) Vol.12, 1-6; and "Just and Equitable Assessment of Personal Injury Compensation in Hong Kong", an in-progress working paper presented at the Fourth Asian Law Institute (ASLI) Annual Conference (24-25 May 2007, Jakarta)
