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USING ACTUARIAL EVIDENCE IN SINGAPORE AND HONG KONG: A SEQUEL TO “*LAI WEE LIAN REVISITED*”



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Following the English common law, successful claimants in personal injury and clinical negligence cases in Singapore and Hong Kong usually receive their compensations as a lump sum. The amount in respect of future expenses and loss of future earning is a result of discounting the future pecuniary values into a single present-day amount, considering inflation, the time value of money and the claimant's mortality. Using actuarial tables based on projections of the mortality rate of the general population may be considered as an alternative method in converting the future loss of earnings and future expenses into a lump sum reflecting its present value. For this purpose, a set of actuarial tables are constructed in this article. Various options for determining the appropriate discount rate(s) are explored in the context of the statistical and economic data of Singapore and Hong Kong.

1. Introduction

When assessing future pecuniary loss in personal injury claims, the multiplicand–multiplier approach is often applied under English common law. The goal is to calculate a lump-sum amount to compensate the plaintiff for future loss of earnings, and to cover future care and medical expenses. The multiplicand (eg, the annual loss of income or the annual costs of care) is established by evidence put before the judge, who then has to decide an appropriate multiplier. The multiplier is used to convert (capitalise) the future pecuniary values into a present lump sum.

An academic article “*Lai Wee Lian Revisited*”¹ was cited by the Singapore Court of Appeal in *Poh Huat Heng Corp Pte Ltd v Hafizul*² and

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¹ Wai Sum Chan and Felix W H Chan, “*Lai Wee Lian Revisited: Should Actuarial Tables Be Used for the Assessment of Damages in Personal Injury Litigation in Singapore?*” (2000) *Singapore Journal of Legal Studies* 364–378.

² [2012] 3 SLR 1003 (CA).

the Singapore High Court in *Lai Wai Keong Eugene v Loo Wei Yen*.³ The doctrinal analysis contained in the article invited principled debates by the lawyers from both sides. The aim of this article is to respond to the arguments and relevant points raised in both cases.

In most common law jurisdictions,⁴ multipliers play a central role in assessing the quantum of damages in personal injury claims. In “*Lai Wee Lian Revisited*”, it was noted that some judges in Singapore and Malaysia during the 1970s–1980s applied the pure arithmetical discount tables,⁵ and committed “double discounting”.⁶ The pure arithmetical discount tables only show the exact capital sum needed to generate a given annual income for a fixed number of years at an assumed interest rate. However, the pure arithmetical tables failed to consider the accelerated payment factor and mortality factor jointly and simultaneously. The Privy Council commented that the calculations performed in *Lai Wee Lian v Singapore Bus Service* were not accurately described as “actuarial”, since they involved no element of actuarial judgment, except the unexplained choice of 5% as the assumed rate of interest.⁷

Since then the Singapore courts ceased to use the pure arithmetical tables. The Singapore courts resorted to using the “conventional approach” by selecting the multiplier by reference to a spread of multipliers in comparable cases from England and Singapore. The economic conditions and mortality patterns in Singapore have changed rapidly in the past decades. It may be difficult to find any truly comparable cases which have similar factors with respect to age and gender of the victims, life expectancy of the general population, inflation and investment return rates.

In contrast, the House of Lords⁸ ruled in *Wells v Wells*⁹ that the Ogden Tables¹⁰ should be used as the primary method for assessing future pecuniary loss in personal injury claims, rather than a mere check. However, it was argued that the UK Ogden Tables should not be used in Singapore because the mortality experience and the economic conditions in Singapore and the United Kingdom are very different.

³ [2013] SGHC 123 (HC); see also [2014] SGCA 31 (CA).

⁴ Including the United Kingdom, Hong Kong, the Republic of Ireland, Australia, Canada and the United States.

⁵ See *Lai Wee Lian v Singapore Bus Service (1978) Ltd* [1984] 1 MLJ 325 (PC).

⁶ Chan and Chan (n 1 above), p 376.

⁷ *Lai Wee Lian v Singapore Bus Service (1978) Ltd* (n 5 above) 330 (Lord Fraser of Tullybelton).

⁸ Now known as the UK Supreme Court.

⁹ [1999] AC 345 (HL).

¹⁰ The *Actuarial Tables with Explanatory Notes for Use in Personal Injury and Fatal Accident Cases*, famously known as the “Ogden Tables”, were named after Sir Michael Ogden QC.

“Lai Wee Lian Revisited” made the following observation:

“... the House of Lords in England gave formal recognition to the status of the Ogden Tables and ruled that the tables should be regarded as the *primary* mechanism for assessing future pecuniary loss... Although judicial decisions in the United Kingdom are not binding in the Singapore Courts, these decisions are, even following the introduction of the Application of English Law Act in 1993, still persuasive. The implications of *Wells v Wells* in Singapore cannot yet be seen. But it is anticipated that the conventional approach to choosing multipliers in Singapore will be hotly contested and challenged”.

The conventional approach to selecting multipliers was subsequently debated in Singapore in the following cases.

2. Important Decisions

2.1. *Poh Huat Heng Corp Pte Ltd v Hafizul* [2012]

In 2008, Mr Hafizul was laying cables at a Mass Rapid Transit worksite at Woodlands Avenue, when a bag of cement fell on his back. He suffered serious spinal injuries which resulted in paraplegia. He was aged 29 years when the Assistant Registrar assessed the quantum of damages. The total amount of damages (about \$2.12 million) comprised future medical and related expenses (\$682,283) and loss of future earnings (\$127,200).

The Assistant Registrar selected 18 as the multiplier for future care and expenses (from age 29 years to age 62 years owing to a reduced life expectancy),¹¹ and 19 as the multiplier for loss of future earnings (from age 29 years to the anticipated retirement age of 65 years).¹² The Court of Appeal¹³ confirmed the findings of the Assistant Registrar.

Having explored various approaches adopted in other common law jurisdictions (Canada, Australia and New Zealand), Chao J averred:¹⁴

“The approach that should be adopted in Singapore:

In a sense, it may be more objective to use actuarial tables because they are based on projections of the mortality rate of the general population. They

¹¹ *Poh Huat Heng Corp Pte Ltd v Hafizul* (n 2 above) [71]. The medical evidence showed that the claimant's paraplegia led to a 10% reduction of his life expectancy.

¹² No account was taken of the reduced life expectancy, because of the doctrine *restitution in integrum* – the victim should be put back in the same position as he was before the accident occurred.

¹³ Since the claimant was an imported labour from Bangladesh, the Court of Appeal considered the following issues: there is a lack of evidence about the deposit interest rates and inflation rates in Bangladesh; the claimant may not spend his entire working life in Singapore and may return to Bangladesh with his wages earned to start his own business; he may lose his job due to changing economic conditions.

¹⁴ *Poh Huat Heng Corp Pte Ltd v Hafizul* (n 2 above) [53].

provide a more scientific basis for discounting a lump sum award to account for premature death. Adjustments may also be made for contingencies by using actuarial data. However, such actuarial tables are not generally available in Singapore”.

2.2. *Lai Wai Keong Eugene v Loo Wei Yen* [2014]

The plaintiff Mr Eugene Lai suffered catastrophic injuries in 2007 in a collision between his motorcycle and a car driven by the defendant.¹⁵ He became a paraplegic with no sensation or motor control from his upper chest downwards, due to complete spinal cord injury. He was aged 39 years when the Assistant Registrar assessed the quantum of damages. The total amount of damages (about \$2.07 million) comprised future medical expenses (\$486,000) and loss of future earnings (\$880,262).

The Assistant Registrar held that the multiplier for lifelong future medical expenses was 15 (from age 39 years towards the agreed life expectancy¹⁶ of age 69 years), while the multiplier for loss of future earnings was 13 (from age 39 years to the statutory minimum retirement age¹⁷ of 62 years).

The plaintiff’s lawyer argued that the multipliers for lifelong medical expenses¹⁸ and loss of future earnings should respectively be 22 and 21, taking into account the actuarial principles and the prevailing economic conditions of Singapore. If 22 were adopted as the multiplier for medical expenses, the plaintiff would have received \$858,000, instead of \$486,000 (based on a multiplier of 15). The Assistant Registrar’s findings were confirmed by both the High Court and the Court of Appeal.¹⁹

Coomaraswamy J made the following reflection:

“... England has developed standardised and authoritative actuarial tables known as the Ogden Tables. The Court of Appeal in *Hafizul* rejected the actuarial approach for Singapore because there are no equivalent tables for Singapore based on Singapore actuarial data. Further, the Court of Appeal was mindful that requiring bespoke actuarial evidence in every case would increase costs and delay. Finally, the Court of Appeal expressly rejected direct reliance on the Ogden Tables in Singapore, saying (at para 53): What is clear is that it would not be appropriate for our courts to adopt

¹⁵ The defendant admitted 90% liability for negligence (n 3 above) [2].

¹⁶ *Lai Wai Keong Eugene v Loo Wei Yen* [2013] SGHC 123 [89] (HC).

¹⁷ Retirement and Re-employment Act, s 4(1) (Cap 274A, 2000 rev. ed.).

¹⁸ The future medical expenses comprised three elements. The advocated multiplier applied to two of the three elements of the medical expenses. (*Lai Wai Keong Eugene v Loo Wei Yen* (n 3 above) [9]).

¹⁹ *Lai Wai Keong Eugene v Loo Wei Yen* (n 3 above).

the Ogden Tables because the latter are based on projected mortality rates in the UK".²⁰

3. Actuarial Evidence

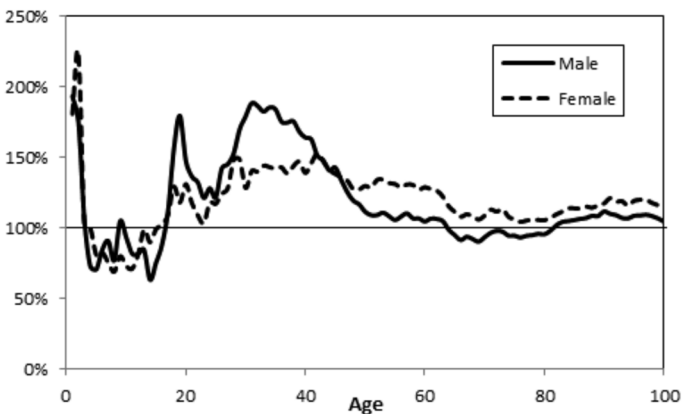
Three points were discussed by the Singapore High Court (*Lai Wai Keong Eugene v Loo Wei Yen*) and the Court of Appeal (*Poh Huat Heng Corp Pte Ltd v Hafizul*).

First, one may argue that it is more objective to use actuarial tables because they are based on projections of the mortality rate of the general population. However, Singapore-based actuarial tables are not generally available.

Second, it would not be appropriate for Singapore to apply the UK Ogden Tables, because the mortality experience and economic conditions between Singapore and the United Kingdom are very different. The present authors have compiled a graph (Figure 1) comparing the population mortality experience between Singapore and the United Kingdom. It shows that Singapore often enjoys a more favourable mortality pattern (after the age of 16) than that of the United Kingdom. Hence, in most situations, the appropriate multipliers for Singapore should be larger than those values in the UK Ogden Tables.

Third, requiring bespoke actuarial evidence in every case may lead to unnecessary costs and undue delay in resolving the disputes.

Figure 1: Rates of Mortality in the United Kingdom Expressed as Percentages of Singapore Rates, 2011



Sources:

- (1) National Life Tables, The United Kingdom, 2010–2012, Office of National Statistics.
- (2) Complete Life Tables 2007–2012 for Singapore Resident Population, Statistics Singapore.

²⁰ *Ibid.*, [7].

3.1. Actuarial Tables

To encourage discussion and comments, a full set of actuarial tables has been constructed²¹ by applying a similar methodology in producing the UK Ogden Tables:

Table 1	Multipliers for pecuniary loss for life (males)
Table 2	Multipliers for pecuniary loss for life (females)
Table 3	Multipliers for loss of earnings to pension age 50 (males)
Table 4	Multipliers for loss of earnings to pension age 50 (females)
Table 5	Multipliers for loss of earnings to pension age 55 (males)
Table 6	Multipliers for loss of earnings to pension age 55 (females)
Table 7(A)	Multipliers for loss of earnings to pension age 60 (males)
Table 7(B)	Multipliers for loss of earnings to pension age 62 (males)
Table 8(A)	Multipliers for loss of earnings to pension age 60 (females)
Table 8(B)	Multipliers for loss of earnings to pension age 62 (females)
Table 9	Multipliers for loss of earnings to pension age 65 (males)
Table 10	Multipliers for loss of earnings to pension age 65 (females)
Table 11	Multipliers for loss of earnings to pension age 70 (males)
Table 12	Multipliers for loss of earnings to pension age 70 (females)
Table 13	Multipliers for loss of earnings to pension age 75 (males)
Table 14	Multipliers for loss of earnings to pension age 75 (females)
Table 15	Multipliers for loss of pension commencing age 50 (males)
Table 16	Multipliers for loss of pension commencing age 50 (females)
Table 17	Multipliers for loss of pension commencing age 55 (males)
Table 18	Multipliers for loss of pension commencing age 55 (females)
Table 19(A)	Multipliers for loss of pension commencing age 60 (males)
Table 19(B)	Multipliers for loss of pension commencing age 62 (males)
Table 20(A)	Multipliers for loss of pension commencing age 60 (females)
Table 20(B)	Multipliers for loss of pension commencing age 62 (females)
Table 21	Multipliers for loss of pension commencing age 65 (males)
Table 22	Multipliers for loss of pension commencing age 65 (females)
Table 23	Multipliers for loss of pension commencing age 70 (males)
Table 24	Multipliers for loss of pension commencing age 70 (females)
Table 25	Multipliers for loss of pension commencing age 75 (males)
Table 26	Multipliers for loss of pension commencing age 75 (females)
Table 27	Discounting factors for term certain
Table 28	Multipliers for pecuniary loss for term certain

²¹ W S Chan, F W H Chan and J S H Li, *Personal Injury Tables Singapore 2015 - Tables for the Calculation of Damages* (Singapore: Sweet and Maxwell, 2015).

Sources of data include the various Life Tables for Singapore Resident Population, 1980–2012, published by the Singapore Department of Statistics. They are (1) Abridged Life Tables 1980–2002 for Singapore Resident Population; (2) Complete Life Tables 2003–2006 for Singapore Resident Population and (3) Complete Life Tables 2007–2012 for Singapore Resident Population.

Details of the projection method of the mortality rates in Singapore are documented in a separate research article.²² The Annexure of this article shows selected tables from the *Personal Injury Tables Singapore*.²³ They are: Table 1 (Multipliers for Pecuniary Loss for Life [Males]), Table 2 (Multipliers for Pecuniary Loss for Life [Females]) and Table 28 (Multipliers for Pecuniary Loss for Term Certain).

3.2. The Discount Rate(s)

Age, gender and the discount rate are the essential determinants for the actuarial calculation of multipliers, with the discount rate being most controversial.²⁴ The discount rate is the annual net rate of investment return in excess of inflation that the claimant is assumed to achieve on the lump-sum award. The lump sum (ie, the capital), and the income streams generated from the capital, should meet exactly the whole amount of the losses or costs (inflation-adjusted) as they arise during the entire future period. It also assumes that nothing will be left by the end of the future period. The lower the assumed discount rate, the larger are the multiplier and the resultant lump-sum award.

The discount rate depends significantly on the most appropriate investment strategy assumed by the court for the sake of protecting the claimants. The conventional discount rate in the United Kingdom before July 1998 was 4.5% per annum, premised on the assumption that the claimant would invest the lump-sum award in a mixed portfolio of government bonds and shares.²⁵

²² F W H Chan, W S Chan and J S-H Li, “An Actuarial Approach to Assessing Personal Injury Compensations in Singapore: Theory and Practice” (2010) 55 *Singapore Economic Review* 705–731, 711–716. The statistical model used is the Lee-Carter model (R Lee and L Carter, “Modeling and Forecasting U.S. Mortality” (1992) 87 *Journal of the American Statistical Association* 659–671). The model was applied to the historical data in Singapore from 1980 to 2011 and from age 0 to 99, separately for each gender. It was assumed that future mortality rates will become constant over time after year 2041 (30 years from year 2011), on grounds that there is a lack of justification for an indefinite mortality improvement.

²³ Chan, Chan and Li, *Personal Injury Tables Singapore 2015* (n 21 above).

²⁴ For example, the UK Ministry of Justice recently released two consultation papers on the discount rate: (1) “Damages Act 1996: The Discount Rate – How Should It Be Set?” CP12/2012; and (2) “Damages Act 1996: The Discount Rate – Review of the Legal Framework” CP3/2013.

²⁵ *Cookson v Knowles* [1979] AC 556 (HL)

In July 1998, the House of Lords in *Wells v Wells* ruled that the severely injured claimants (or the dependants of the deceased wage-earners), who were not in a position to take any risks, should only invest the award prudently in index-linked government stock (ILGS).²⁶ The House of Lords lowered the rate from 4.5% to 3.5%.

In 2001, the UK Lord Chancellor, pursuant his statutory power,²⁷ prescribed a discount rate of 2.5% to reflect the change in the average redemption yields of ILGS at that time. The discount rate of 2.5% has remained unchanged for more than 12 years since 2001.

The index-linked government securities are not available in Singapore. Hence, the UK approach of setting the discount rate by reference to index-linked securities is inapplicable. Based on the proposed methodology contained in the UK consultation papers,²⁸ a small-scale pilot study has been performed in the present study for illustrative purposes. The four investment portfolios used as the samples in the pilot study are as follow:

Portfolio 1	100%: 10-year Singapore Government Securities (SGS)
Portfolio 2	100%: Singapore high-quality bond fund
Portfolio 3	10%: Time-deposit, 70% Singapore high-quality bond fund and 20% Singapore equity fund
Portfolio 4	20%: Time-deposit, 30% Singapore high-quality bond fund and 50% Singapore equity fund

The 12-month time deposit rates and the SGS yield rates of return for the past 10 years are publicly available from the Monetary Authority of Singapore. The consumer price inflation rates during the past 10 years are also publicly available from Statistics Singapore. For bonds and equities, there are many high-quality bond funds and equity funds readily available in Singapore. In the present pilot study, we used the data publicly available through the website²⁹ of one of the biggest insurance companies in Singapore. The average annual rates of return,³⁰

²⁶ *Wells v Wells* (n 9 above), 367B.

²⁷ Set by the Lord Chancellor under the Damages (Personal Injury) Order 2001, pursuant to s 1 of the Damages Act 1996 (UK, Cap 48).

²⁸ (n 24 above).

²⁹ Available at <<https://www.income.com.sg/fund/ilp.asp>> (NTUC Income is a life and general insurance company based in Singapore).

³⁰ Different investment portfolios are expected to produce different returns. For example, investing in shares (equities) may, in the long term, produce a higher return than leaving the money on bank deposits. On the other hand, it is also known that equities are riskier than bank deposits, because

for the 10-year span from 2004 to 2013, after inflation, for the four mixed investment portfolios are:

	Average Return (per year, after inflation)
Portfolio 1	-0.31%
Portfolio 2	0.76%
Portfolio 3	2.20%
Portfolio 4	4.52%

Portfolio 3's composition is similar to the one used in Hong Kong in *Chan Pak Ting v Chan Chi Kuen (No 2)* for needs exceeding 10 years.³¹ The average real rate of return on Portfolio 3 is in the range of 2.0% to 2.5%. It is worth noting that 2.5% is also the current discount rate applied in the United Kingdom,³² Hong Kong,³³ Ireland³⁴ and Ontario.³⁵

Portfolio 4 contains a larger portion of equity fund, which generates a higher discount rate of 4.52%. The discount rate of 4–5% is the current discount rate applied in Singapore.³⁶ Chao J observed: “In cases where the damages award is meant to compensate a plaintiff for decades of lost earnings, a substantial portion of the award would not be called upon for many years, and we see no reason why that portion cannot be invested in equities or other asset classes to achieve a higher return (as compared to fixed deposits) in the meantime”.³⁷

One should not lose sight of the fact that the present research is merely a small-scale pilot study, using only the public data from one major insurance company in Singapore. It is not the authors' intention to advocate the use of any of the above sample portfolios in determining the appropriate discount rate(s) in Singapore. Instead, the objective of the present pilot study is to explore the feasibility of conducting a more

the value of shares may fall as well as rise. One commonly used measurement of investment risk is “standard deviation”, a measure of volatility of past returns. The greater the volatility, the riskier is the investment. The annual volatilities (in terms of standard deviation) of the four sample portfolios are respectively: 2.38%, 2.59%, 5.27% and 13.57%. It should be noted that Portfolio 4 has the greatest volatility per year, which is the most risky as compared to other portfolios.

³¹ [2013] 2 HKLRD 1, [134] (CFI).

³² Set by the Lord Chancellor under the Damages (Personal Injury) Order 2001, pursuant to s 1 of the Damages Act 1996 (UK).

³³ For claimants with needs exceeding 10 years (*Chan Pak Ting (No 2)* (n 31 above)).

³⁴ *McEaney v Monaghan County Council* [2001] IEHC 114 [121]. The discount rate was reduced to 1% by the Irish High Court in *Russell v Health Service Executive* [2014] IEHC 590 [2.70], but an appeal against this decision is pending.

³⁵ For claimants with needs exceeding 15 years, under the Rules of Civil Procedure, RRO 1990, Reg. 194 r 53.09(1)(b).

³⁶ *Kartina Bte Mohd Nor v Pee Tian Leng (an Infant)* [1994] SGHC 291; *Mallett v McMonagle* [1970] AC 166; *Cookson v Knowles* (n 25 above); *Lai Wai Keong Eugene v Loo Wei Yen* (n 3 above).

³⁷ *Lai Wai Keong Eugene v Loo Wei Yen* (n 3 above), [34].

thorough examination, involving more comprehensive sources of data and economic evidence which could be studied by actuaries, economists, lawyers and the relevant experts in Singapore.³⁸ Without doubt, there are other issues and areas in the present pilot study which merit further examination and elucidation. Examples include inflation,³⁹ the sample period⁴⁰ and the choice of investment vehicles.⁴¹ Once the issue of the discount rate(s) has been resolved, there should be rare occasions in the future to reopen the issue, unless a drastic change of economic conditions occurs.⁴²

4. Illustrations

4.1. *TV Media Pte Ltd v De Cruz Andrea Heidi*⁴³

The claimant underwent a liver operation and other medical treatments after taking a slimming drug which was later found to be life-threatening. She was 29 years old during the assessment of compensation. In assessing the damages she suffered, the High Court applied a multiplier of 34 to cover the annual medical costs of \$7,910 throughout her life expectancy. The amount assessed was:

$$\$7,910 \times 34 = \$268,957.00.$$

The Court of Appeal adopted a smaller multiplier of 17, reducing the amount from \$268,987.00 to \$134,470:

$$\$7,910 \times 17 = \$134,470.00$$

³⁸ Chao J averred: “We agree that the present state of the law is rather unsatisfactory and that there is scope for reform in this area. However, we do not think the courts are really in a position to undertake this reform. Any drastic change to the discount rate for accelerated receipt can only be undertaken after a careful study, with input from experts and the various stakeholders involved. This is a matter that falls within the institutional competence of the Legislature” (*Lai Wai Keong Eugene v Loo Wei Yen* (n 3 above) [37]).

³⁹ In the present pilot study, historical headline inflation rates are used to estimate the future inflation. However, the growth of future earnings and future expenses might not be totally in line with the future inflation assumption. Furthermore, there is more than one measurement of inflation in Singapore. See “A Review of the Core Inflation Measure for Singapore”, Monetary Authority of Singapore Staff Paper No. 51, August 2011, available at www.mas.gov.sg (visited 9 Mar 2015).

⁴⁰ The sample period of the present pilot study covers 2004 to 2013. Different sample periods might yield different results. It is advisable to perform sensitivity analysis with respect to different sample periods.

⁴¹ Due to limited data available and gathered by the present authors, the four sample portfolios in the present pilot study contain only a few investment vehicles. There are in fact many other investment vehicles available in Singapore. Transaction costs (such as management fees) associated with different investment funds may also vary.

⁴² *Wells v Wells* (n 9 above), p 388E (Lord Steyn).

⁴³ [2004] 3 SLR 543 (CA).

If the actuarial tables are used to determine the appropriate multiplier, the medical costs would be computed as follows:

- (1) Use Table 2: Multipliers for pecuniary loss for life (females).
- (2) A discount rate of 4.5% is adopted for illustrative purpose.
- (3) Table 2 shows that, on the basis of a 4.5% discount rate, the multiplier for a 29-year-old female is 20.50.
- (4) Using the multiplicand decided, the lump-sum award for medical costs throughout her life expectancy should be:

$$\$7910 \times 20.50 = \$162,155.00$$

- (5) The calculation takes no account of contingencies and risks other than mortality. Adjustment of the multiplier could be made by taking other contingencies and risks into account.

4.2. *Ng Song Leng v Soh Kim Seng Engineering and Trading Pte Ltd*⁴⁴

The claimant suffered serious injuries while working as a mechanic at a warehouse. He was 32 years old during the assessment of compensation. A multiplier of 17 was adopted to cover the annual medical and nursing costs at \$16,800, for a fixed term of 35 years after trial. The amount calculated was:

$$\$16,800 \times 17 = \$285,600.00$$

If the actuarial tables are used to determine the appropriate multiplier, the medical costs would be computed as follows:

- (1) Use Table 28: Multipliers for pecuniary loss for term certain.
- (2) A discount rate of 4.5% is adopted for illustrative purpose.
- (3) Table 28 shows that, on the basis of a 4.5% discount rate, the multiplier covering a certain term of 35 years is 17.85.
- (4) Using the multiplicand decided, the lump-sum award for medical costs should be:

$$\$16,800 \times 17.85 = \$299,880.00$$

The following table demonstrates the impact of applying the actuarial tables at the discount rate of 4.5% in Singapore.⁴⁵

⁴⁴ [1997] SGHC 289.

⁴⁵ Set by the Lord Chancellor under the Damages (Personal Injury) Order 2001, pursuant to s 1 of the Damages Act 1996 (UK).

Multipliers for Future Care and Expenses throughout Life Expectancy

Plaintiff	Gender	Age at the date of trial	Duration of future care required	Multiplier adopted	Actuarial multiplier (discount rate of 4.5%)
(a) Lee Wai Kong	M	22	Throughout life expectancy	20	21.20 [Table 1]
(b) De Cruz Andrea	F	29	Throughout life expectancy	17	20.50 [Table 2]
(c) Chin Swey Min	M	42	Throughout life expectancy	16	18.79 [Table 1]

(a) *Lee Wai Kong v Ng Siok Tong* [2012] 2 SLR 85 (CA)

(b) *TV Media Ptd Ltd v De Cruz Andrea Heidi* [2004] 3 SLR 543 (CA)

(c) *Chin Swey Min v Nor Nizar Bin Mohamed* [2004] SGHC 27

Multipliers for Future Care and Expenses for a Fixed Term

Plaintiffs	Duration of future care required	Multiplier adopted	Actuarial multiplier (discount rate of 4.5%)
(d) Lai Eugene (Male aged 39)	30 years	15	16.65 [Table 28]
(e) Hafizul Uddin (Male aged 29)	34 years	18	17.63 [Table 28]
(f) Ng Song Leng (Male aged 32)	35 years	17	17.85 [Table 28]

(d) *Lai Wai Keong Eugene v Loo Wei Yen* [2013] SGHC 123

(e) *Poh Huat Heng Corp Pte Ltd v Hafizul Uddin* [2012] 3 SLR 1003 (CA)

(f) *Ng Song Leng v Soh Kim Seng Engineering and Trading Pte Ltd* [1997] SGHC 289

5. Comparative Analysis: The Recent Developments in Hong Kong

Recently in Hong Kong, two significant decisions were made in *Chan Pak Ting (No 1)*⁴⁶ and *Chan Pak Ting (No 2)*⁴⁷ by Bharwaney J. Chan Pak Ting, 31 years old at the date of trial, suffered catastrophic injuries after a car

⁴⁶ [2013] 1 HKLRD 634.

⁴⁷ [2013] 2 HKLRD 1.

crash. Two clinical negligence cases were consolidated together with *Chan Pak Ting* on the same issues related to actuarial tables and discount rates. The plaintiffs are: 12-year-old Li Ka Wai who suffered from deprivation of oxygen at birth and became paraplegic, and 12-year-old Yuen Hiu Tung who suffered a cardiorespiratory seizure and became mentally retarded and paralysed.

As discussed above, the “Ogden Tables” were approved by the House of Lords as the primary method of assessing future pecuniary loss in personal injury claims, rather than a mere check in (*Wells v Wells*).⁴⁸ The *Personal Injury Tables Hong Kong 2013: Tables for the Calculation of Damages*⁴⁹ gained judicial recognition in *Chan Pak Ting (No 1)*. Bharwaney J stated:

“[32] ... I agree that the [Actuarial] Tables should be accepted as the starting point in Hong Kong, just as the Ogden Tables are accepted as the starting point in the UK. In future, there should be less need to refer to previous case law of multiplier precedents, particularly if those cases were decided without reference to actuarial tables by way of a cross-check”.

In *Chan Pak Ting (No 2)*, Bharwaney J departed from the conventional discount rate of 4.5% per annum (set by the House of Lords in *Cookson v Knowles*;⁵⁰ endorsed by the Hong Kong Court of Appeal in *Chan Pui Ki v Leung On*).⁵¹ Having examined Hong Kong’s economic evidence, he set three different discount rates, reflecting the investment choices of each class of investors as driven by their specific needs and goals.

For needs exceeding 10 years, he set a discount rate of 2.5% per annum by taking an “average” portfolio of (1) 10% in time deposits; (2) 70% in high-quality bonds and (3) 20% in high-quality blue-chips which qualify as “widows and orphans” stock. It should be noted that 2.5% is also the current discount rate in the UK.⁵²

For needs extending beyond 5 years but not exceeding 10 years, the court set a discount rate of 1% per annum.⁵³ For needs not exceeding five years, a negative discount rate of -0.5% per annum⁵⁴ was set, following the Privy Council’s decision in *Simon v Helmot*⁵⁵ that there was nothing wrong in principle to set a negative discount rate. Lord Hope of

⁴⁸ *Wells v Wells* (n 9 above, 379F).

⁴⁹ (Hong Kong: Sweet and Maxwell, 2012).

⁵⁰ [1979] AC 556, 577A (HL).

⁵¹ [1996] 2 HKC 565, 582D (CA).

⁵² Set by the Lord Chancellor under the Damages (Personal Injury) Order 2001, pursuant to s 1 of the Damages Act 1996 (UK).

⁵³ About 15% in time deposits and 85% in HK Government Exchange Fund Notes and high-quality bonds.

⁵⁴ About 20% in time deposits and 80% in HK Government Exchange Fund Notes.

⁵⁵ [2012] Med LR 394, [14] and [118] an appeal from the Guernsey Court of Appeal.

the Privy Council in *Simon v Helmut* noted that in Guernsey, there was a significant difference (2%) between the price inflation (concerning future expenses) and wage inflation (for loss of earnings until the retirement age).⁵⁶ To reflect the differentiation, he adopted 0.5% as the discount rate for non-earnings-related losses and applied -1.5% for earnings-related losses, for the reason that wage inflation was substantially higher than price inflation.⁵⁷ In *Chan Pak Ting (No 2)*,⁵⁸ the economic data of Hong Kong show that the difference between price inflation and wage inflation (from 2001 to 2012) was only 0.4%, which was not substantial enough to justify separate discount rates for earnings-related and non-earnings-related losses.

The *Personal Injury Tables Hong Kong* have been cited a number of times in the Hong Kong courts after *Chan Pak Ting (No 2)*.⁵⁹ Choosing multipliers “intuitively” on impressionistic grounds (by reference to a spread of multipliers in comparable cases) has been eschewed. The breadth of factors which actuaries took into account when producing the actuarial tables is now fully appreciated.

6. Conclusion

The move to a standard method of assessing future loss by means of actuarial tables that reflect the realities of life in Singapore and Hong Kong may enable disputes to be resolved more efficiently. Regarding the discount rates, they should be certain enough so that they can prevail for a reasonably long duration. On the other hand, the rates should not be too prescriptive. In the event of a drastic change in the economic conditions, evidence should be admissible for reviewing the discount rates. Striking a fair balance between accuracy and certainty is essential to allow for the ready use of the actuarial tables through which lawyers resolve the personal injury disputes.

⁵⁶ See *ibid.*, [30]–[36], regarding the actuarial evidence.

⁵⁷ The gap of 2% represents the difference between +0.5% and -1.5%.

⁵⁸ (n 31 above).

⁵⁹ The most recent citation is *Chan Wai Ming v Leung Shing Wah* [2014] 4 HKLRD 669. Cheung JA of the Court of Appeal averred (at [8.5]): “In my view to hold on to the conventional multiplier approach which is based on the discount rate of 4.5–5% fails to provide full compensation to the victim because this notional return does not accord with the economic reality of present day Hong Kong. For my part, I would respectfully ... adopt the new approach” (n 31 above).

ANNEX

Table 1: Multipliers for pecuniary loss for life (males)

Age at date of trial	Multiplier calculated with allowance for projected mortality and rate of return of													
	-1.0%	-0.5%	0.0%	0.5%	1.0%	1.5%	2.0%	2.5%	3.0%	3.5%	4.0%	4.5%	5.0%	
16	104.61	85.38	70.63	59.20	50.26	43.18	37.52	32.95	29.22	26.14	23.58	21.43	19.61	
17	102.57	83.95	69.63	58.50	49.75	42.82	37.26	32.76	29.08	26.04	23.51	21.38	19.57	
18	100.54	82.53	68.63	57.79	49.25	42.45	37.00	32.57	28.94	25.94	23.43	21.32	19.53	
19	98.54	81.12	67.63	57.07	48.74	42.08	36.73	32.37	28.79	25.83	23.35	21.26	19.48	
20	96.56	79.72	66.63	56.36	48.22	41.71	36.46	32.17	28.65	25.72	23.27	21.20	19.43	
21	94.61	78.33	65.64	55.64	47.70	41.34	36.18	31.97	28.50	25.61	23.18	21.13	19.38	
22	92.68	76.95	64.65	54.93	47.18	40.96	35.90	31.76	28.34	25.49	23.10	21.07	19.33	
23	90.76	75.58	63.65	54.21	46.66	40.57	35.62	31.55	28.18	25.37	23.01	21.00	19.28	
24	88.87	74.21	62.66	53.48	46.13	40.18	35.33	31.33	28.02	25.25	22.91	20.93	19.23	
25	86.99	72.84	61.66	52.75	45.59	39.78	35.03	31.11	27.85	25.12	22.81	20.85	19.17	
26	85.12	71.48	60.66	52.02	45.04	39.37	34.72	30.88	27.68	24.99	22.71	20.77	19.10	
27	83.26	70.12	59.66	51.27	44.49	38.95	34.41	30.64	27.49	24.85	22.60	20.69	19.04	
28	81.42	68.76	58.65	50.52	43.92	38.53	34.08	30.39	27.30	24.70	22.49	20.60	18.97	
29	79.59	67.40	57.64	49.76	43.35	38.10	33.75	30.14	27.11	24.55	22.37	20.50	18.89	
30	77.78	66.05	56.63	49.00	42.77	37.66	33.42	29.88	26.91	24.39	22.25	20.41	18.82	
31	75.98	64.70	55.61	48.23	42.19	37.21	33.07	29.61	26.70	24.23	22.12	20.30	18.73	
32	74.19	63.36	54.60	47.46	41.60	36.75	32.72	29.34	26.48	24.06	21.98	20.19	18.65	
33	72.42	62.02	53.58	46.67	40.99	36.29	32.36	29.05	26.26	23.88	21.84	20.08	18.55	
34	70.66	60.68	52.55	45.89	40.38	35.81	31.98	28.76	26.03	23.69	21.69	19.96	18.46	
35	68.92	59.35	51.53	45.09	39.77	35.33	31.61	28.46	25.79	23.50	21.54	19.84	18.36	
36	67.19	58.02	50.50	44.30	39.14	34.84	31.22	28.15	25.54	23.31	21.38	19.71	18.25	
37	65.47	56.69	49.47	43.49	38.51	34.34	30.82	27.84	25.29	23.10	21.21	19.57	18.14	
38	63.77	55.37	48.43	42.68	37.87	33.83	30.42	27.51	25.03	22.89	21.04	19.43	18.02	
39	62.08	54.05	47.40	41.86	37.22	33.32	30.00	27.18	24.76	22.67	20.86	19.28	17.90	
40	60.40	52.73	46.36	41.04	36.57	32.79	29.58	26.83	24.48	22.44	20.67	19.12	17.77	
41	58.74	51.42	45.32	40.21	35.90	32.26	29.15	26.48	24.19	22.20	20.47	18.96	17.63	
42	57.09	50.11	44.28	39.38	35.23	31.71	28.70	26.12	23.89	21.96	20.27	18.79	17.49	
43	55.45	48.81	43.23	38.53	34.55	31.16	28.25	25.75	23.58	21.70	20.06	18.61	17.34	
44	53.83	47.50	42.18	37.69	33.86	30.59	27.79	25.37	23.27	21.44	19.83	18.42	17.18	
45	52.21	46.20	41.13	36.83	33.16	30.02	27.32	24.97	22.94	21.16	19.60	18.23	17.01	
46	50.61	44.91	40.08	35.97	32.46	29.44	26.83	24.57	22.60	20.88	19.36	18.02	16.84	
47	49.03	43.62	39.02	35.10	31.74	28.84	26.34	24.16	22.25	20.58	19.11	17.81	16.65	
48	47.45	42.33	37.97	34.23	31.02	28.24	25.83	23.73	21.89	20.28	18.85	17.59	16.46	
49	45.89	41.05	36.91	33.35	30.28	27.63	25.32	23.30	21.52	19.96	18.58	17.35	16.26	
50	44.35	39.77	35.85	32.47	29.55	27.01	24.79	22.85	21.14	19.64	18.30	17.11	16.05	
51	42.83	38.51	34.80	31.59	28.81	26.38	24.26	22.40	20.76	19.31	18.01	16.86	15.83	
52	41.33	37.26	33.75	30.71	28.07	25.75	23.73	21.94	20.36	18.96	17.72	16.61	15.61	
53	39.85	36.02	32.71	29.83	27.31	25.11	23.18	21.47	19.96	18.61	17.41	16.34	15.37	
54	38.38	34.78	31.66	28.94	26.56	24.47	22.62	20.99	19.54	18.25	17.10	16.06	15.13	
55	36.94	33.56	30.63	28.06	25.80	23.82	22.06	20.50	19.12	17.88	16.77	15.77	14.88	

Table 2: Multipliers for pecuniary loss for life (females)

Age at date of trial	Multiplier calculated with allowance for projected mortality and rate of return of												
	-1.0%	-0.5%	0.0%	0.5%	1.0%	1.5%	2.0%	2.5%	3.0%	3.5%	4.0%	4.5%	5.0%
16	110.41	89.54	73.63	61.38	51.84	44.34	38.38	33.59	29.70	26.51	23.86	21.65	19.78
17	108.31	88.09	72.63	60.68	51.36	44.00	38.14	33.42	29.58	26.42	23.80	21.60	19.75
18	106.24	86.65	71.63	59.98	50.87	43.66	37.89	33.24	29.45	26.33	23.73	21.55	19.71
19	104.18	85.22	70.63	59.28	50.37	43.30	37.64	33.06	29.32	26.23	23.66	21.50	19.67
20	102.14	83.80	69.63	58.58	49.87	42.95	37.39	32.88	29.19	26.14	23.59	21.45	19.63
21	100.12	82.38	68.63	57.87	49.36	42.58	37.13	32.69	29.05	26.03	23.52	21.39	19.59
22	98.12	80.97	67.63	57.15	48.85	42.22	36.86	32.50	28.91	25.93	23.44	21.34	19.55
23	96.14	79.56	66.62	56.43	48.34	41.84	36.59	32.30	28.76	25.82	23.36	21.28	19.50
24	94.18	78.16	65.62	55.71	47.81	41.46	36.31	32.09	28.61	25.71	23.27	21.21	19.45
25	92.23	76.77	64.62	54.99	47.29	41.08	36.02	31.88	28.45	25.59	23.19	21.15	19.40
26	90.30	75.38	63.61	54.25	46.75	40.68	35.73	31.67	28.29	25.47	23.09	21.08	19.35
27	88.39	73.99	62.60	53.52	46.21	40.28	35.44	31.44	28.12	25.34	23.00	21.00	19.29
28	86.50	72.61	61.59	52.77	45.66	39.88	35.13	31.21	27.95	25.21	22.90	20.93	19.23
29	84.62	71.24	60.58	52.03	45.11	39.46	34.82	30.98	27.77	25.08	22.79	20.84	19.17
30	82.76	69.87	59.57	51.28	44.55	39.04	34.51	30.74	27.59	24.94	22.68	20.76	19.10
31	80.91	68.51	58.56	50.52	43.98	38.61	34.18	30.49	27.40	24.79	22.57	20.67	19.03
32	79.09	67.15	57.55	49.76	43.41	38.18	33.85	30.24	27.21	24.64	22.45	20.58	18.96
33	77.28	65.80	56.53	49.00	42.83	37.74	33.51	29.98	27.01	24.48	22.33	20.48	18.89
34	75.48	64.45	55.52	48.23	42.24	37.29	33.17	29.71	26.80	24.32	22.20	20.38	18.80
35	73.70	63.11	54.50	47.45	41.65	36.83	32.81	29.44	26.58	24.15	22.07	20.28	18.72
36	71.94	61.77	53.48	46.67	41.05	36.37	32.45	29.16	26.36	23.98	21.93	20.16	18.63
37	70.19	60.44	52.46	45.89	40.44	35.90	32.09	28.87	26.13	23.80	21.79	20.05	18.54
38	68.46	59.11	51.43	45.09	39.82	35.42	31.71	28.57	25.90	23.61	21.64	19.93	18.44
39	66.74	57.78	50.41	44.30	39.20	34.93	31.32	28.27	25.65	23.41	21.48	19.80	18.33
40	65.03	56.46	49.38	43.49	38.57	34.43	30.93	27.95	25.40	23.21	21.32	19.67	18.23
41	63.35	55.15	48.36	42.69	37.94	33.93	30.53	27.63	25.15	23.00	21.15	19.53	18.11
42	61.67	53.84	47.33	41.88	37.29	33.42	30.12	27.30	24.88	22.79	20.97	19.38	17.99
43	60.01	52.53	46.29	41.06	36.64	32.89	29.70	26.96	24.60	22.56	20.78	19.23	17.87
44	58.36	51.23	45.26	40.23	35.98	32.36	29.27	26.61	24.32	22.33	20.59	19.07	17.73
45	56.72	49.93	44.22	39.40	35.31	31.82	28.83	26.25	24.03	22.09	20.39	18.91	17.59
46	55.11	48.64	43.19	38.57	34.64	31.27	28.38	25.89	23.72	21.84	20.18	18.73	17.45
47	53.50	47.35	42.15	37.73	33.95	30.72	27.93	25.51	23.41	21.58	19.97	18.55	17.30
48	51.90	46.06	41.10	36.88	33.26	30.15	27.46	25.13	23.09	21.31	19.74	18.36	17.14
49	50.32	44.78	40.06	36.02	32.56	29.57	26.98	24.73	22.76	21.03	19.51	18.16	16.97
50	48.76	43.50	39.02	35.17	31.85	28.99	26.49	24.32	22.42	20.74	19.27	17.96	16.79
51	47.21	42.24	37.98	34.31	31.14	28.39	26.00	23.91	22.07	20.45	19.02	17.74	16.61
52	45.68	40.98	36.94	33.45	30.42	27.79	25.50	23.48	21.71	20.14	18.76	17.52	16.42
53	44.16	39.72	35.89	32.58	29.70	27.18	24.98	23.05	21.34	19.83	18.49	17.29	16.22
54	42.65	38.47	34.85	31.70	28.96	26.56	24.46	22.60	20.96	19.50	18.21	17.05	16.01
55	41.17	37.23	33.81	30.83	28.22	25.94	23.93	22.15	20.57	19.17	17.92	16.79	15.79

Table 28: Multipliers for pecuniary loss for term certain

Term	Multiplier calculated with allowance for projected mortality and rate of return of												
	-1.0%	-0.5%	0.0%	0.5%	1.0%	1.5%	2.0%	2.5%	3.0%	3.5%	4.0%	4.5%	5.0%
1	1.01	1.00	1.00	1.00	1.00	0.99	0.99	0.99	0.99	0.98	0.98	0.98	0.98
2	2.02	2.01	2.00	1.99	1.98	1.97	1.96	1.95	1.94	1.93	1.92	1.91	1.91
3	3.05	3.02	3.00	2.98	2.96	2.93	2.91	2.89	2.87	2.85	2.83	2.81	2.79
4	4.08	4.04	4.00	3.96	3.92	3.88	3.85	3.81	3.77	3.74	3.70	3.67	3.63
5	5.13	5.06	5.00	4.94	4.88	4.82	4.76	4.70	4.65	4.59	4.54	4.49	4.44
6	6.18	6.09	6.00	5.91	5.82	5.74	5.66	5.58	5.50	5.42	5.35	5.27	5.20
7	7.25	7.12	7.00	6.88	6.76	6.65	6.54	6.43	6.32	6.22	6.12	6.02	5.93
8	8.33	8.16	8.00	7.84	7.69	7.54	7.40	7.26	7.12	6.99	6.87	6.74	6.62
9	9.42	9.21	9.00	8.80	8.61	8.42	8.24	8.07	7.90	7.74	7.58	7.43	7.28
10	10.52	10.25	10.00	9.75	9.52	9.29	9.07	8.86	8.66	8.46	8.27	8.09	7.91
11	11.63	11.31	11.00	10.70	10.42	10.15	9.88	9.63	9.39	9.16	8.93	8.72	8.51
12	12.75	12.37	12.00	11.65	11.31	10.99	10.68	10.39	10.10	9.83	9.57	9.32	9.08
13	13.89	13.43	13.00	12.59	12.19	11.82	11.46	11.12	10.79	10.48	10.18	9.90	9.63
14	15.03	14.50	14.00	13.52	13.07	12.64	12.23	11.84	11.46	11.11	10.77	10.45	10.14
15	16.19	15.58	15.00	14.45	13.93	13.44	12.98	12.54	12.12	11.72	11.34	10.98	10.64
16	17.36	16.66	16.00	15.38	14.79	14.24	13.71	13.22	12.75	12.30	11.88	11.48	11.11
17	18.54	17.75	17.00	16.30	15.64	15.02	14.43	13.88	13.36	12.87	12.41	11.97	11.55
18	19.73	18.84	18.00	17.22	16.48	15.79	15.14	14.53	13.96	13.42	12.91	12.43	11.98
19	20.94	19.93	19.00	18.13	17.31	16.55	15.83	15.17	14.54	13.95	13.39	12.87	12.38
20	22.15	21.04	20.00	19.03	18.14	17.30	16.51	15.78	15.10	14.46	13.86	13.30	12.77
21	23.38	22.15	21.00	19.94	18.95	18.03	17.18	16.39	15.65	14.95	14.31	13.70	13.14
22	24.62	23.26	22.00	20.84	19.76	18.76	17.83	16.97	16.17	15.43	14.74	14.09	13.49
23	25.88	24.38	23.00	21.73	20.56	19.48	18.47	17.55	16.69	15.89	15.15	14.46	13.82
24	27.14	25.50	24.00	22.62	21.35	20.18	19.10	18.11	17.19	16.34	15.55	14.82	14.14
25	28.42	26.63	25.00	23.50	22.13	20.87	19.72	18.65	17.67	16.77	15.93	15.16	14.44
26	29.71	27.77	26.00	24.38	22.91	21.56	20.32	19.19	18.14	17.18	16.30	15.48	14.73
27	31.02	28.91	27.00	25.26	23.68	22.23	20.91	19.71	18.60	17.59	16.65	15.80	15.01
28	32.34	30.06	28.00	26.13	24.44	22.90	21.49	20.21	19.04	17.97	16.99	16.09	15.27
29	33.67	31.21	29.00	27.00	25.19	23.55	22.06	20.71	19.47	18.35	17.32	16.38	15.52
30	35.01	32.37	30.00	27.86	25.94	24.20	22.62	21.19	19.89	18.71	17.64	16.65	15.75
31	36.37	33.54	31.00	28.72	26.67	24.83	23.17	21.66	20.30	19.06	17.94	16.91	15.98
32	37.74	34.71	32.00	29.58	27.41	25.46	23.70	22.12	20.69	19.40	18.23	17.16	16.19
33	39.13	35.89	33.00	30.43	28.13	26.07	24.23	22.57	21.08	19.73	18.51	17.40	16.40
34	40.53	37.07	34.00	31.27	28.85	26.68	24.74	23.01	21.45	20.04	18.78	17.63	16.59
35	41.95	38.26	35.00	32.12	29.56	27.28	25.25	23.43	21.81	20.35	19.04	17.85	16.78
36	43.37	39.45	36.00	32.95	30.26	27.87	25.74	23.85	22.16	20.64	19.28	18.06	16.96
37	44.82	40.65	37.00	33.79	30.95	28.45	26.23	24.26	22.50	20.93	19.52	18.26	17.13
38	46.28	41.86	38.00	34.62	31.64	29.02	26.70	24.65	22.83	21.20	19.75	18.45	17.29
39	47.75	43.07	39.00	35.44	32.32	29.58	27.17	25.04	23.15	21.47	19.97	18.64	17.44
40	49.24	44.29	40.00	36.26	33.00	30.14	27.63	25.42	23.46	21.73	20.19	18.81	17.58

