Court Awards Of Damages For Loss Of Future Earnings: An Empirical Study And An Alternative Method Of Calculation

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This article examines the effect upon damages for personal injury of methods used in the USA to calculate loss of future earnings. The work of lawyers is examined from the perspective of labour economists. The damages calculated by using these alternative methods are compared with those actually awarded in over a hundred cases determined by courts in England and Wales. This interdisciplinary and comparative study reveals that the tort system fails to satisfy one of its main objectives in that it does not provide recipients of damages with "full" compensation.

This article reports the results of a study, funded by the Economic and Social Research Council,[1] into the calculation of damages for personal injury in respect of loss of future earnings. It contrasts the way in which the calculation is made by lawyers in this country with the approach used in the USA and Canada. The study is

not only comparative but also interdisciplinary, for it examines the work of lawyers from the perspective of labour economics. We explore the impact on damages of adopting a USA approach which uses more detailed labour market information and a more precise method of calculation. In particular, increased attention is paid, first, to the way in which earnings change over a working lifetime and, secondly, to the extent that future employment prospects are adversely affected by injury. The result is an "alternative" award of compensation which explicitly incorporates labour market information and appropriate statistical methods to predict future earnings according to the impact of injury on employment.

The alternative method of calculation is applied to a sample of adjudicated cases to identify the practical effect of the difference in approach. Obtaining access to solicitors files throughout England and Wales, we have analysed over a hundred cases involving loss of future earnings which were judicially disposed of between 1990 and 1998. Data have been collected about the factors relevant to the determination of future earnings loss for each claimant including, for example, work history, education and the impact of injury. The actual damages awarded in each of these cases has been broken down into its component parts and the award for earnings loss has been compared with that which would have been obtained if the alternative method of assessment had been used. The study is thus given an important empirical focus. This research breaks new ground by being the first to examine the effect of different methods used to calculate damages for future loss of earnings in the context of the detailed background of decided cases.

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[1] ESCR Award Reference No R000237393.

Lawyers can find some reassurance in certain findings from the survey of decided cases. In general, the courts are consistent in their calculation of damages. We find the relationships one might expect between the size of the award, the severity of the injury, the claimant's age and other earnings-related characteristics.[2] Furthermore, we find no statistical evidence of judicial bias in respect of sex, race, types of injury, or part of the country in which the case is heard. However, the comparison of adjudicated awards with those calculated on a basis similar to the labour economics approach used in the USA produces a sharp critique of the British system. According to this alternative method of calculation claimants in this country generally have been under-compensated, some substantially so, in terms of the accepted aims of the damages award. We found 88 per cent of claimants in our sample under-compensated by the court method. Over half of these would have received an award at least 50 per cent greater under the alternative calculation. For a third, the award calculated by the alternative method was at least double the court award. These findings do not necessarily mean that the article should be read as supporting a substantial rise in damages awards. Instead we emphasise only that the tort system fails to satisfy one of its main objectives in that it does not provide "full" compensation. The rhetoric of the system is not matched by its reality.

Within the aggregate findings produced by the survey, there are some important variations including a gender and age effect and an effect conditional on post-injury employment capacity. Consistently we found that younger claimants, male claimants and those with post-injury employment potential were particularly disadvantaged by the court method. The claimant who is a young man and is still

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[2] See our Working Paper No 2, "Loss of Earnings Following Personal Injury: How the Courts Determine Compensation."

capable of some work after his injury is thus especially likely to be under-compensated.

An important reason for the difference between the court and the alternative award is that courts under-estimate the growth in earnings over a claimant's working life. There are two sources of such earnings growth. The first arises from productivity growth which is related to the individual's own experience in the labour market and the second results from an economy-wide upward trend in productivity over time. It is this under-estimation of earnings growth which explains why younger claimants, who have more of their working life ahead of them, have been particularly disadvantaged by the court method. The gender variation in the differential is more complicated. Although both women and men are equally under-compensated for the expected growth in their lifetime earnings, women are over-compensated with regard to their expected future participation in the labour market. Because of childcare responsibilities, on average, women's employment over their working lifecycle is less than that of men. The court method of calculation makes insufficient allowance for this lower participation rate with the result that, for women of child-bearing age at least, the under-estimation of earnings growth is partly offset by the over-estimation of the likelihood of future employment.

A second major reason for the difference between the court and alternative awards is that courts generally under-compensate claimants if they have a residual disability arising from their injury which is not sufficient to preclude future employment. Courts consistently under-estimate the adverse effects of disability on post-injury employment, and consequently on post-injury future earnings potential. Our alternative method of calculation makes use of labour market information about

the employment histories of disabled workers and, in doing so, makes greater

allowance for the impact of disability on the likelihood of future employment.

We begin this article by providing a general background to the way in which

the courts currently assess loss of earnings in England and Wales. We then outline

the approach in the USA where the standard tools of labour economics are used to

determine the value of loss of future earnings. This approach forms the basis of our

alternative method. We provide a detailed example of the approach by applying it to

one of the cases in our sample of adjudicated decisions. Finally, we move from the

specific to the general by reporting the overall results of calculating alternative

awards for each of the cases in our sample and comparing them with the

compensation actually awarded by the courts. Although the main findings of the

study are described here, only an outline can be given, for example, of the methods

used in the USA and of the alternative constructed by the authors for use in this

country. Further details together with accompanying statistical tables are to be found

in associated publications, including the working papers submitted to the ESRC.[3]

THE METHOD USED BY THE COURTS TO ASSESS DAMAGES FOR LOSS OF FUTURE EARNINGS IN ENGLAND AND WALES

The often stated aim of an award of damages is to return the injured person,

as far as possible, to the financial position which existed before the accident took

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[3] See Working Paper No 1, "A Statistical Overview of Compensation for Personal Injury 1990-98," Working Paper No 2 *op cit*, Working Paper No 3, "Empirical Earnings Functions: UK Evidence," Working Paper No 4, "A Comparison of Two Alternative Methods for Determining Loss of Earnings Following Personal Injury," and the End of Award Report to the ESRC.

place.[4] This aim is made all the more difficult by the requirement that damages be

paid in a once-and-for-all lump sum.[5] Like is not being replaced with like because a

continuing loss of income is compensated by a capital sum.[6] In addition, the finality

of the award means that there is little possibility of obtaining more money if

circumstances change after the settlement or trial has been concluded.[7] As a result,

the forecasts made by judges of what may happen to the claimant in the future, and

about the financial world in which the claimant will have to live, are crucial

components of the damages assessment.

Judges themselves have acknowledged that traditionally they have made

these estimates and forecasts by using a combination of precedent and intuition.[8]

Past cases and previous experience have been the tools used. Until relatively recently

judges made little use of formal statistical analysis to inform their calculations,

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[4] See, for example, Lord Blackburn in *Livingstone v Rawyards Coal Co* [1880] 5 AC
25 at p 39, Lord Goddard in *British Transport Commission v Gourley* [1956] AC
185 at p 206, and Lord Griffiths in *Dews v National Coal Board* [1988] AC 1 at p
12.

[5] "… [T]he award which covers past, present and future injury and loss, must, under
our law be of a lump sum assessed at the conclusion of the legal process. The award
is final; it is not susceptible to review as the future unfolds, substituting fact for
estimate." Lord Scarman in *Lim Poh Choo v Camden and Islington Health Authority*
[1980] AC 174 at p 183.

[6] Except for the small number of cases, usually involving very serious injury, where
a structured settlement may be used to produce a continuing income. See R. Lewis,
Structured Settlements: The Law And Practice (1993) (Sweet & Maxwell, London).

[7] For a discussion of the exceptional cases where interim or provisional damages are
sought see Lewis, *op cit* chapter 3.

[8] "[T]he judge adopts an intuitive process buttressed by reference to previously
decided cases. These cases partly operate as reference points whose features are
compared with those of the case under consideration and partly from the basis of a
general climate of opinion on the proper multiplier in a particular class of case with
which a judge of long experience in the field will be entirely familiar." Mustill LJ in
Cunningham v. Camberwell Health Authority [1990] 2 Med LR 49 at 52.

justifying their position on the basis that they are required to determine damages on the particular facts of a case and, since averages by construction do not take account of these facts, they cannot form the basis of the award.[9] In the absence of statistical guidance, there has been potential for inaccuracy and inconsistency. In recent years the bases upon which the judicial forecasts have been made have been increasingly exposed as subjective and divorced from the realities of the financial world. Kemp describes the process as having been arbitrary, and lacking in both precision and logic.[10] In response, both the legislature and the judiciary have made important changes to the method for calculating damages. However, as we shall see, the present study reveals that important aspects of the calculation continue to be based upon assumptions which are unnecessarily arbitrary.

Based on these judicial forecasts, the lump sum award for future loss of earnings is intended to compensate exactly for the income stream that would have been available to the claimant in the future. Lawyers employ two key concepts in making the calculation: first, they assess the net annual loss of earnings, known as the multiplicand; and second, they make an allowance for the period of years during which that earnings loss is expected to continue. This second element produces the multiplier by which the multiplicand is to be increased in order to arrive at the total

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[9] "The exercise upon which the court has to embark is one which is inherently unscientific … average life expectancy can be actuarially ascertained, but to assess the probability of future political, economic and fiscal policies requires not the services of an actuary or an accountant but those of a prophet." Lord Oliver in *Hodgson v Trapp* [1989] 1 AC 833.

[10] D. Kemp, *Damages for Personal Injury And Death* (7th ed 1999) para 5.6. Haberman, "The Changing World of Multipliers" [1996] JPIL 41, Kemp, "Discounting Damages for Future Loss" (1997) 113 LQR 195.

sum to be paid for the loss of earnings. Both of these elements are examined in more detail.

The Multiplicand

The multiplicand is the annual loss of earnings assessed at the date of trial. Account is taken of the difference between future pre-injury net earnings and future post-injury net earnings. If at the time of injury the claimant is not working because of unemployment, or some other reason, the court constructs a figure for what might have been earned in the future if no injury had occurred. It does this by using the published data on average earnings such as is available annually in the *New Earnings Survey*. Where the claimant is in work at the time of injury, future pre-injury earnings are measured by the claimant's earnings at the time of injury plus any earnings growth to the date of trial. Of crucial importance to the present study is that, in general, unless there is a clear prospect of advancement, no allowance is made for potential growth in real earnings after the date of trial. The traditional reason for this is that the increase is too speculative to make allowance for it.[11]

It is even more difficult to estimate what the claimant will earn after his injury than it is to estimate what he would have earned had he not been injured. Speculative though the exercise is, an allowance must be made for these future post-injury earnings. The most straightforward cases are those where the claimant is judged to be medically incapable of future employment for then no calculation is required and full loss of pre-injury earnings can be awarded. However, if evidence indicates that the claimant is capable of employment in the future, only a partial loss

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[11] *Mitchell v Mulholland* (No 2) [1972] 1 QB 65.

can be awarded, and the court must then try to assess the value of future post-injury earnings. If the claimant is working at the time of trial, this assessment will be based upon his actual earnings. However, where the claimant is not working but is judged to be capable of doing so in the future, the court makes an estimate based upon the average earnings for an occupation which the claimant will be able to perform. For example, the average earnings for lift operators and car park attendants are often used where an injured male was formerly an unskilled manual worker but is only capable of sedentary employment after his injury.

The Multiplier and the Discounts

The multiplier converts the future stream of lost income into an immediate capital sum. Where the stream of income involves earnings rather than, for example, the proceeds of a pension or future care costs, the multiplier reflects the number of years between the date of the trial and the predicted date of retirement from work. This number of years is discounted to allow for several factors with the result that, for example, an injury to a young person causing a 40 year earnings loss produces a multiplier of, at most, only 24. There are three main reasons for making such a discount:-

(1) The first reason takes into account the fact that the claimant receives, and is able to invest, the damages long before he would have been paid the wages had he not been injured. This accelerated receipt, and the associated investment return, justifies the discount. Until recently the level of discount was based on a presumption which, to the surprise of many in the financial world, remained unchanged for over a quarter of a century. This was that a real rate of return (over and above inflation and liability to tax) could be obtained amounting to 4.5 per cent

a year. It was not until the House of Lords case of *Wells v Wells*[12] that this discount rate was reduced to 3 per cent. The Lord Chancellor has since used legislative powers to reduce the rate to 2.5 per cent.[13] The effect of these two changes has been to increase damages so that, for example, a claimant with a forty year loss now receives about a third more, and a claimant suffering a fifteen year loss receives about a seventh more.

(2) The second reason for a discount is that allowance should be made for the risk of the claimant's premature death. The courts' response to uncertainty over life expectancy has been to use population mortality statistics. The statistical information required to discount the multiplier for both the risk of mortality and for early receipt received formal recognition in 1984 with the publication by the Government Actuary of a booklet[14] which comprises tables of multipliers discounted for life expectancy[15] and by various rates of interest which could be earned on the investment of the lump sum. It represented an important step in achieving consistency and transparency in the calculation of awards for future losses. The authority of these "Ogden Tables" was not established until 1991,[16] and they were used at first only as a *post hoc* check

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[12] [1999] 1 AC 345.

[13] The Damages (Personal Injury) Order 2001 made pursuant to s. 1 of the Damages Act 1996.

[14] *Actuarial Tables with Explanatory Notes for Use in Personal Injury and Fatal Accident Cases* (4th ed 2000). The tables were compiled by a joint working party of lawyers and actuaries chaired by Sir Michael Ogden QC and the tables have come to be known as the "Ogden Tables".

[15] Judges now use the new tables (numbered 19-36) based on projected mortality rates rather than the earlier tables derived from historic mortality which almost certainly underestimate future longevity. *Worrall v Powergen* [1999] PIQR Q103.

[16] In *Docherty as Curator Burns for O'Brien v. British Steel PLC* [1991] SLT 477, later approved by the House of Lords in *Hunt v Severs* [1994] 2 AC 350.

on conventional awards. However, they are now "regarded as a starting point, rather than a check. A judge should be slow to depart from the relevant actuarial multiplier on impressionistic grounds …."[17]

(3) The third reason for making a discount is the most important for the purposes of the present study. It is that allowance must be made for labour market hazards, such as illness and unemployment, which may have prevented the claimant from working continuously until retirement even if injury had not occurred. The magnitude of this reduction used to be the subject of considerable judicial discretion. Although judges would refer to past decisions, they did not take into account any labour market information. In one study of 88 reported cases the conventional level for the deduction was found to be 17 per cent, a rate significantly higher than that recommended by actuarial analysis.[18]

Since 1994 guidance in calculating the deduction for labour market hazards has been available in the form of an additional set of tables, published as part of the Ogden Tables, which detail actuarially-calculated deductions for the risks of non-participation, unemployment and sickness. These labour market risks, or more precisely the deductions that they imply, were estimated from activity, unemployment and sickness rates observed in large scale cross sections of the labour force by Haberman and Bloomfield in an influential paper published in 1990.[19] The

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[17] Lord Lloyd in *Wells v Wells* [1999] 1 AC 345 at 379.

[18] Luckett and Craner, "Multipliers: Are the Courts Being Fair to Plaintiffs?" [1994] JPIL 139 at 143.

[19] Haberman and Bloomfield, "Work Time Lost to Sickness, Unemployment and Stoppages: Measurement and Application"(1990) 117 *J of the Institute of Actuaries* 533. This paper reports the results of a comprehensive and well-executed study of

deductions are reported as averages for broadly defined groups of workers. These

groups are differentiated on the basis of (i) sex and age group, (ii) age group and

occupation (below average, average, and above average risk of

injury/sickness/unemployment), and (iii) age group and region (below average,

average, and above average unemployment). For example, deductions are lower "for

persons in clerical or similar jobs, e.g. civil servants, the professions and financial

services industries, and greater for those in manual jobs, e.g. construction, mining,

quarrying and shipbuilding."[20] Deductions are lower "for those living in the South

East, East Anglia, South West and the East Midlands and higher for those in the

North, North West, Wales and Scotland." These Ogden deductions for non-mortality

contingencies are significantly lower than the conventional judicial discount of

around 17 per cent. According to the Ogden Tables, such a deduction for labour

risks would only be justified in the most adverse of circumstances involving a 60

year old man in a risky occupation living in a region of high unemployment. For a

man aged 30 years outside of these categories the deduction for pre-injury labour

market risks is only 3 per cent.[21]

In terms of transparency and consistency, the application of the Ogden tables

is undoubtedly an improvement. Nevertheless, the categories are broad and therefore

the deductions are arbitrary. More importantly, as Haberman and Bloomfield

acknowledge, due to incomplete data at the time of the survey the deductions are

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employment data in an attempt to calculate working life expectancies. Although
making a major contribution, the authors are ready to acknowledge that their
estimates may be deficient because of incomplete data.

[20] Ogden Tables, *op cit* para 40.

[21] *Ibid* para 43.

calculated on the basis of a deficient methodology and unrealistic assumptions about individual career patterns.[22] They anticipate that the resulting bias will overstate claimants' expected work lives by about 5 per cent.

Handicap In The Labour Market and Smith v Manchester Awards

The effects of the accident may be such that the claimant may find it more difficult to retain his post-injury employment and, compared to others, may encounter more problems in obtaining new work in the future. Where these risks are significant, in addition to the usual multiplier-multiplicand assessment, a lump sum may be awarded for this weakening in the claimant's competitive position in the labour market. The award is known as a *Smith v Manchester* payment, being named after the case in which the principles were first established.[23] Court practice in making such an assessment is to adopt a "broad brush" approach,[24] one judge suggesting that a lump sum was plucked from the air.[25] However, subject to

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[22] Haberman and Bloomfield *op cit.* Specifically, the conventional approach to the estimation of future working life is based upon a single lifetime entry transition into the labour force and a single lifetime exit transition from the labour force, a unimodal (single peaked) curve of age-specific activity and unemployment rates, and the omission of current labour market states as a predictor of subsequent transitions. Recent Labour Force Surveys coupled with a Markov chain methodology allow for more accurate estimation of future working life on the basis of status-dependent multiple transitions.

[23] In *Smith v Manchester Corporation* [1974] 17 KIR 1.

[24] Steyn LJ in *Blamire v South Cumbria Health Authority* [1993] PIQR Q5.

[25] Stephenson LJ in *Moeliker v a Reyrolle & Co Ltd* [1977] 1 WLR 132 at 144.

exceptions, it appears that most judges make conventional awards of between 6 and 24 months' earnings.[26]

THE ASSESSMENT OF LOSS OF FUTURE EARNINGS IN THE USA

In awarding damages for loss of future earnings in the USA the courts do not use the technical terms multiplier and multiplicand but they do use some of the concepts upon which those terms are based. For example, lifetime earnings are based upon earnings at the time of trial and the future stream of earnings is discounted by the real rate of interest available on the lump sum. In these respects the basic elements of the computation process are broadly similar. However, in the USA, the courts are more ready to embrace the results of labour market analysis to predict future patterns of earnings and employment. It is not the case that there is an agreed method of incorporating this information but rather several variants on a common theme. A stylised version of the calculation is presented below which is based upon our discussions with the National Association of Forensic Economists and on their surveys of their members' practices.[27]

In the USA, the calculation comprises a four-stage procedure:

(1) Base earnings are estimated in the same way as in the UK, that is, by relying on the claimant's earnings at the time of injury plus any growth to the time of trial.

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[26] Ritchie, "Smith v Manchester Awards: How Do Courts Assess Loss of Capacity on the Labour Market?" [1994] JPIL 103 at 105 *cf* Chippendale, "An Alternative Way of Calculating Smith v Manchester Awards" [2001] JPIL 37. Where there is too much uncertainty surrounding a continuing loss the court may abandon the multiplier-multiplicand approach entirely and characterise the whole award for future earnings loss as being *Smith v Manchester*.

[27] Brookshire and Slesnick, "Survey of NAFFE Members: A Follow-up Survey of Economic Methodology" (1993) 7 (1) *J Forensic Economics* 25, Brookshire and

(2) A rate of growth is applied to these base earnings in order to account for individual productivity growth. Furthermore, a rate for economy-wide productivity growth is often also included. On this basis an earnings calculation is made for each year of potential future earnings

(3) Annual earnings are then added together for the period of claimant's "worklife expectancy." This calculation takes account of the individual's potential future unemployment or inactivity, and the possibility of premature death.

(4) Finally, the resulting lifetime sum is discounted for early receipt in order to obtain a capitalised present value.

Where the claimant has post-injury future employment capacity, this four-stage procedure is repeated to calculate the present value of post-injury future earnings. In this calculation base earnings, earnings growth and employment risks take into account the effects of residual disability. A fifth stage involves the subtraction of the present value of the lifetime sum of post-injury earnings from the present value of the sum of pre-injury earnings.

In focusing upon the differences in approach between the USA and the method currently used in this country, it is the second, third and fifth stages of these calculations which we consider: namely the measurement of wage growth and of expected working life and the impact of residual disability on both of these.

Wage Growth

There are two components to individual wage growth: the first arises as a result of individual age-related productivity growth and the second as a result of

Slesnick, "A 1996 Study of 'Prevailing Practice' in Forensic Economics" (1997) 10 (1) *J Forensic Economics* 1.

economy-wide productivity growth. The age-related element arises because earnings are positively related to human capital which is accumulated either during years of formal education and training or as a result of labour market experience. The profile of earnings over the course of an individual's working life (the "age-earnings profile") is increasing but at an ever decreasing rate as the individual gets older. Age-earnings profiles are used routinely by forensic economists in the USA, and ultimately the courts, to predict the path of future earnings in personal injury cases.[28] Age-earnings profiles are measured in one of two ways: either, more broadly, by a cross-tabulation of the average level of earnings for groups of employees at various age intervals by sex and education level; or, more accurately,[29] by estimating earnings equations which take into account precise age and a wider set of personal characteristics including race, marital status, employment history, current occupation and so on. In spite of the potential for bias associated with age-earnings profiles derived from cross-section data these continue to be commonly used to measure individual wage growth in the USA.[30]

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[28] See Bryan and Linke, "The Estimation of the Age/Earnings Profiles in Wrongful Death and Injury Cases" (1988) 55 *J Risk and Insurance* 168, Lane and Glennon, "The Estimation of Age/Earnings Profiles in Wrongful Death and Injury Cases" (1985) 52 *J Risk and Insurance* 686, and by the same authors, "The Estimation of Age/Earnings Profiles in Wrongful Death and Injury Cases: Authors' Reply" (1988) 55 *J Risk and Insurance* 174, Gilbert, "Estimates of Earnings Growth Rates Based on Earnings Profiles" (1994) 4 (2) *J Legal Economics* 1, and by the same author "Long-term and Short-term Changes in Earnings Profiles" (1997) 10 (1) *J Forensic Economics* 29, Thornton, Rodgers, and Brookshire, "On the Interpretation of Age–Earnings Profiles" (1997) 18 (2) *J Labour Research* 351.

[29] See Gilbert (1997) *op cit*.

[30] Rogers *et al* (1996) *op cit*. Lane and Glennon, "The Estimation of Age/Earnings Profiles in Wrongful Death and Injury Cases" (1985) 52 (4) *J Risk and Insurance* 686, and (1988) 55 (4) *J Risk and Insurance* 174, Gilbert (1990) and (1997) *op cit*, Nelson, Nelson, and Patton, "Measuring Earnings Growth in the U.S." (1990) 3 (3) *J*

In addition to this individual productivity effect, the path of future earnings is affected by economy-wide factors such as technological change and the general economic climate. The effect of economy-wide wage growth is to increase the individual age-earnings profiles over time. Measures of national earnings growth are typically based on historical data for movements in average economy-wide earnings and tend to be in the region of 1 - 2 per cent a year, although these may vary according to the individual's education, gender or race.[31] This is a small annual growth rate, but it is cumulative over an individual's working life and estimates of individual earnings growth that ignore this component will significantly understate an individual's loss of earnings.[32] Economy-wide earnings growth does not always feature as a part of the calculation made by USA courts. However, when it is taken into account, there appears to be considerable consistency in the actual values used.

The theoretical underpinnings and empirical results of the wage determination process clearly demonstrate the need to measure both the individual wage growth associated with age and the growth in economy-wide wage levels in determining future loss of earnings. Nevertheless, in the UK claimants do not

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Legal Economics 11, and Mullet, Nelson and Patton, "Alternative Measures of Earnings Growth" (1990) 3 (1) *J Forensic Economics* 29.

[31] Little attention has been paid to the statistical properties of the historical average earnings data, and projections relying of this data may, in effect, be employing little more than crude rules of thumb. Gohmann, McCrickard, and Slesnick *op cit*, Gilbert (1997) *op cit.*

[32] Gohmann, McCrickard, and Slesnick, "Age-Earnings Profiles Estimates: Do They Change Over Time?" (1998) 11(3) *J Forensic Economics* 173 show that the present value of an earnings stream for a 20 year old man would be 24 per cent less if no adjustment is made for the growth in real average earnings. Similarly, Gilbert (1997) *op cit* reports that total life-time earnings of a 25 year old college graduate would be 7 per cent higher when adjusted for the long term growth in earnings of college graduates.

receive compensation in respect of either age-related or economy-wide earnings growth.

Expected Working Life

To calculate future loss of earnings, the number of years the individual would have been in employment if the injury had not occurred must be measured. This is not simply the number of years until the claimant would have reached statutory retirement age because some people leave and re-enter the labour market, some people leave before, or work beyond, the statutory retirement age and some people die before their retirement. The most common solution to this problem in personal injury trials in the USA is to use statistics published in the worklife tables. These tables are published by the Bureau of Labor Statistics (BLS)[33] and provide an estimate of the number of years an individual of a stated age is expected to remain in the workforce until "final separation" either because of retirement or death. The BLS tables are calculated using the probabilities of movement into and out of the labour force for people of a particular age.

While the use of these tables has the benefit of being simple to apply, it has been the subject of criticism at the theoretical level. The objections concern the uneven spread of periods of inactivity over an individual's working life and the fact that future labour market activity is conditional on past and current labour market status. These criticisms have led to a number of modifications being made.[34] The

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[33] Smith, "New Worklife Estimates Reflect Changing Profile of Labor Force" (1982) 105 (3) *Monthly Labor Review* 15.

[34] Nelson, "The Use of Worklife Tables in Estimates of Lost Earning Capacity" (1983) 106 (4) *Monthly Labor Review* 30, Boudreaux, "A Further Adjustment Needed to Estimate Last Earnings Capacity" (1983) 106 (10) *Monthly Labor Review*

most comprehensive refinements have been made by Alter and Becker who use age-
and employment-specific employment transition probabilities as the basis for
estimating future employment prospects.[35] Although theoretically superior, their
method is computationally more costly compared with the use of worklife
expectancy tables and the mathematical complexity makes it less accessible to the
courts. This is particularly important in the USA because, unlike the UK, juries are
still used in personal injury trials. In practice Alter and Becker's approach, based on
transition probabilities, produces estimates of loss of earnings that are similar to
those which are estimated from BLS working life tables, thereby justifying the
courts' preference for the simpler method.[36] However, as we shall see, Alter and
Becker's approach is of particular value when constructing a model for use in the
UK.

AN ALTERNATIVE METHOD OF CALCULATION

We set out an alternative method for determining loss of future earnings in
this country which draws heavily on the USA practices described above. We use
labour market data drawn from UK sources to construct age-earnings profiles and, in
the absence of official calculations of work life expectancies, to estimate
employment probabilities. From these two variables, measured over the individual's
future working life, we calculate loss of future earnings. It is in the measurement of

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30, Alter and Becker, "Estimating Lost Future Earnings Using the New Worklife
Tables" (1985) 108 (2) *Monthly Labor Review* 39.

[35] Alter and Becker (1985) *op cit*.

[36] Schieren has provided numerical examples of the sorts of differences one might
expect using the different methods discussed above. Schieren, "Median Worklife,
Mean Age at Final Separation, or Transition Probabilities to Calculate Expected Lost
Earnings?" (1993) 7 (1) *J Forensic Economics* 103.

these two variables that our alternative method represents a significant departure from that presently used by the courts. In other respects we use the methods currently endorsed by the courts of England and Wales. In particular, we use the present method for measuring base earnings, that is, the actual earnings at the time of trial of the claimant in the job that he or she was doing when injured. In order to obtain the present value of the future earnings stream we apply the same discount rate as used by the courts. It therefore makes no difference to our comparison of the loss of future earnings assessed by our alternative method and that produced by the existing system if the courts vary this discount rate, as they did following *Wells v Wells*.[37] The discount rate is not a distinguishing feature. Similarly, it makes no difference to the measurement of the differential between the court and the alternative award whether population mortality rates used are historic or projected. What matters is that like is compared with like.[38]

The alternative method of calculation works in the following way. For a claimant whose injury precludes future employment, loss of earnings in year 1 is simply pre-injury wages at the time of trial, base wages, ($Wages^a$) multiplied by the probability that the claimant would have been in employment at the time of trial ($Employment^a$). (The suffix "a" denotes pre-injury estimates where the claimant is normally able-bodied). The risk of non-employment, however small, is positive and therefore the likelihood of employment is always less than 1. The likelihood of employment is estimated using transition probabilities based upon the claimant's age

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[37] [1999] 1 AC 345. See the text accompanying note 13 above.

[38] We use the historic population mortality statistics which were available at the time that our sample of cases were tried. Judges now use projected mortality rates. See note 15 above.

and labour market status (employed, unemployed or inactive) at the time of injury. Formally the calculation is as follows:

$$Earnings\ Loss_1 = (Wages^a\ x\ Employment_1{}^a)$$

In year 2 the wages component of the equation must be uplifted for individual and economy-wide productivity growth (G^a) and a new employment probability ($Employment_2{}^a$) estimated.

$$Earnings\ Loss_2 = (Wages_1{}^a\ (1+G_2{}^a)\ x\ Employment_2{}^a)$$

The total loss over a working lifetime is the sum of annual losses in each year until retirement. To achieve a capitalised sum this total is discounted by a real rate of interest.[39]

There is an additional element to the calculation where the claimant has post-injury employment potential. Post-injury earnings, adjusted for the likelihood of employment, are calculated in the same way as pre-injury earnings and are then subtracted from the pre-injury earnings. For year 1 the calculation is as follows:

$$Earnings\ loss_1 = (Wages^a\ x\ Employment_1{}^a) - (Wages^d\ x\ Employment_1{}^d)$$

In this case, base earnings, where the individual is now disabled, are represented by $Wages^d$. (The suffix "d" denotes post injury estimates where the claimant is disabled).

In subsequent years, base wages are increased by the average rate of earnings growth for disabled workers (G^d). The probability of employment for a disabled

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[39] $LFE = \Sigma_i{}^T[(Wages_{i-1}{}^a(1 + G_i{}^a)\ x\ Employment_i{}^a\ x\ Life_i)/(1+r)^i\ ]$
where *LFE* is loss of future earnings and each remaining year *i* runs from the year of trial to the year in which claimant retires, $Wages^a$ are the pre-injury net earnings at trial, $G^a{}_i$ is the average rate of growth of pre-injury real earnings from the time of trial in each year *i*, $Employment_i{}^a$ is the conditional pre-injury employment rate in each year *i*, $Life_i$ is the probability of survival in each remaining year of working life, and *r* is the rate of discount.

individual is based upon the claimant's age and labour market status at the time of

trial (*Employment$_1^d$*). Again the total of post-injury earnings over a work life-time is

the total of the annual earnings in each year until retirement. Loss of future earnings

is the difference between the pre- and post-injury earnings when measured over the

working lifetime of the claimant. To achieve a capitalised sum this lifetime

difference is discounted by a real rate of interest.[40]

　　In what follows, we provide a brief explanation of the empirical methods

used to calculate wage growth (*G^a* and *G^d*) and employment probabilities

(*Employment^a* and *Employment^d*). Subsequently we illustrate our alternative method

with reference to a decided case.

Estimating the Age-Earnings Profile

　　The path of future earnings growth (*G*) depends upon how earnings increase

with age (the age-earnings profile) and on the general growth in the level of average

earnings over time. Both the base earnings at the time of trial and the earnings

growth from the time of trial to retirement can be expected to be adversely affected

by residual disability. This means that wages before injury are greater than those

received afterwards (*Wages^a > Wages^d*), and earnings growth achieved before injury

is greater than that achieved afterwards (*$G^a > G^d$*). Within standard labour market

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[40] $LFE = \Sigma_i^T \{[(Wages_{i-1}{}^a(1 + G_i^a) \; x \; Employment_i^a \; x \; Life_i)$

　　　$- \; \Sigma_i^T \; (Wages_{i-1}{}^d(1 + g_i^d) \; x \; Employment_i^d \; x \; Life_i)]/ \; (1+r)^i\}$

where each remaining year i runs from the year of trial to the year in which claimant
retires, *Wages^d* are the post-injury net earnings at trial, *G^d_i* is the average rate of
growth of post-injury real earnings over the working life measured in each year i,
Employment$_i^a$ is the conditional post-injury employment rate in each year i, *Life$_i$* is
the probability of survival in each remaining year of working life and *r* is the rate of
discount.

theory, having a disability is thought to reduce a worker's marginal product and thus earnings. Where the injured individual is still capable of work, but may be limited in the amount or type of work that can be done, this lower post-injury earnings potential must be reflected in the age-earnings profile.

We estimate age-earnings profiles using data for a representative sample of 60,000 households contained in the *Labour Force Survey* (LFS). These data are the most comprehensive source of labour market information currently available in the UK. The survey is undertaken four times in any one year and we pool the four quarters of the 1996 LFS and the first quarter of the 1997 LFS. This gives us a total sample of around 22,000 men and 23,000 women for whom we have information on earnings, age, sex, disability, current and past employment statuses and, for those in employment, their occupation. The information about earnings is derived from questions relating to the last usual pay received and the relevant payment period from which we calculate real weekly earnings. The information about disability is based upon a question which asks whether the respondent has a disability or suffers from poor health which limits the kind of paid work that can be undertaken. We use this information to estimate age-earnings profiles separately for men and women by six occupational groups and by disability (24 profiles in all). It is interesting to note at this stage that our results are consistent with those of a previous study on the labour market effects of disability and indicate a rather small effect on earnings growth.[41] This is not to say that disability has little effect on a lifetime's earnings. On the contrary, lifetime earnings are substantially reduced by disability but the

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[41] D. Blackaby, K Clark, S. Drinkwater, D. Leslie, P, Murphy, and N. O'Leary *Earnings and Employment Opportunities for People with Disabilities* (1998, Department of Employment).

impact of disability is through lower starting wages and reduced employment

prospects rather than through earnings growth. Of particular importance in the

present context is the scarring effects of disability.[42] That is, even when a worker has

recovered from a temporary disability, there is evidence of its history in future

labour market outcomes.[43]

Estimating Employment Probabilities

In our above equations, annual wages are weighted by the probability that an

individual will be in employment in the particular year in question. As noted earlier,

the most widely used approach employed by forensic economists in the USA is to

rely upon BLS worklife expectancy tables compiled by the USA Government. Since

equivalent worklife expectancy tables are not available for England and Wales, our

alternative method adopts the approach proposed by Alter and Becker.[44] This is the

method favoured, but not used, by Haberman and Bloomfield in calculating the

deductions for worktime lost to unemployment and sickness which were

subsequently adopted in the Ogden Tables.[45] In our calculation, we use a Markov

Chain model in which transition probabilities between different activity states

(employment, unemployment and inactivity) at each age are derived empirically

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[42] I. Walker and A. Thompson, *Disability, Wages and Labour Force Participation: Evidence from UK Panel Data* (1996) mimeo Keele.

[43] Ruhm, "Are Workers Permanently Scarred by Job Displacements?" (1991) 81 (1) *American Economic Review* 19 finds a scarring effect for displaced able-bodied workers four years after displacement.

[44] Alter and Becker (1985) *op cit.*

[45] Haberman and Bloomfield *op cit.*

from the LFS.[46] The likelihood of transition between these different states is used to calculate the likelihood of being in employment at each age, conditional on initial activity status and the age at which the individual entered the labour market. The result is a lifetime of projected employment probabilities which are unique according to the claimant's age and employment status at the time of injury. Using a Markov Chain we are able to capture the dynamic nature of the labour force, in particular the fact that workers often change activity status during their working lives.

We begin by explaining the data upon which we have based our estimates of employment probabilities. The LFS provides information for each person on current activity status and the individual's activity status 12 months earlier. To estimate transition probabilities for someone initially in employment we calculate the likelihood that an individual of a stated age who was in employment 12 months ago is still in employment, the likelihood that this individual has become unemployed and the likelihood that this individual has become inactive. This process can be continued until the expected age of retirement from the workforce. These transition probabilities are used to estimate employment probabilities at each age which are conditional on activity status and age at the time of injury. We call these conditional employment probabilities.

Conditional employment probabilities are calculated separately for males and females, able-bodied and disabled and by initial activity status for all starting ages from 16 to 65 years. The volume of material documenting the estimated employment

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[46] A Markov Chain model is a useful conceptual device for describing, analysing and forecasting stochastic processes such as lifetime employment where the probability of transition to a future labour market state is dependent on the current state.

probabilities is considerable (12 tables each containing 50 columns) and precludes useful commentary.

In the following section we apply our alternative method of calculation of loss of future earnings to an adjudicated case. The purpose is twofold: first to provide a worked example using the alternative method and, secondly, to illustrate the key points of difference with the current method of calculation.

A CASE STUDY APPLICATION OF THE ALTERNATIVE METHODOLOGY

The case involved a 23 year old carpenter earning £7,800 a year net who suffered an injury to his non-dominant hand in 1991. He previously had suffered from no ill-health or disability, and during the seven years of his pre-injury working life had been out of work for only four months. However, his accident resulted in a residual disability which restricted his ability to manipulate objects and lift heavy items. He was forced to give up his job, and for the three years between his injury and trial he was continuously unemployed. Although the court found that he had future earning potential, it was thought that he would never be able to resume work as a carpenter. For his future earnings loss alone he received damages of £62,216. This was calculated using a multiplier of 16, representing the period of his earnings loss until he reached retirement age in 39 years time. This overall multiplier was apportioned to three separate multiplicands representing three distinct periods with different annual losses. Typical of cases tried before *Wells v Wells*, the court applied a discount rate of 4.5 per cent, and used its discretion to assess pre-injury labour market risks rather than adhere precisely to the Ogden Tables deductions for non-mortality risks. In addition, a sum of £20,000 was awarded as a *Smith v Manchester*

payment. This was the equivalent of four years' post-injury earnings. In effect, the award for loss of future earnings assumed that the claimant would experience 5½ further years out of work as a result of his injuries and that his annual earnings would be around 75 per cent of his pre-injury earnings.[47]

The court's findings in respect of future earnings were as follows.

Multiplicand x multiplier

£8,169 x 1½ years	=	£12,253.50
£3,120 x 4 years	=	£12,480.00
£1,665 x 10½ years	=	£17,482.50
Smith v Manchester payment	=	£20,000.00
Total		£62,216.00

The court considered that if the claimant had not been injured he would have been in employment at the time of trial and his net annual earnings would then have been £8,169.[48] Because of his injury he was thought capable of only light work with likely net earnings of £5,049 a year, although this would eventually rise to £6,504 a year with his greater experience of such work.

For reference purposes, and in view of the requirement since *Wells v Wells* that the courts follow more closely the guidance in the Ogden Tables in respect of the multiplier and the associated deduction for pre-injury labour market risks, we calculated the award for future loss of earnings for this case based upon a strict Ogden calculation.[49] Discounting the pre-injury remaining 39 years of potential working life for early receipt (at a discount rate of 4.5 per cent) and for the risk of

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[47] $[(£5,049 \times 4) + (£6,504 \times 10½)/14½]/£8,169 = 0.75$

[48] This figure includes a nominal rate of growth in earnings over a three year period from the date of injury to the date of trial of around 5 per cent.

premature death, yields a multiplier of 18. This is reduced to 17.6 to take account of pre-injury labour market risks,[50] and results in compensation for future loss of earnings being £66,519. This is only £3,303 more than the court award based upon a multiplier of 16. The difference between the two awards arises from a difference in the calculation of pre-injury labour market risks. According to the court's calculation, in the absence of injury, the claimant would have faced an 11 per cent chance of unemployment whereas the deduction specified in the Ogden Tables for pre-injury labour market risks is, in effect, only 2 per cent.

We now come to our alternative calculation based upon the equation we previously established.[51] It calculates the difference between the claimant's predicted pre- and post-injury earnings by measuring the earnings in each year of the claimant's future working life, taking into account both individual and economy-wide real earnings growth, and making a downward adjustment to account for an estimated probability of employment in each year. Discounts are then made for early receipt and for premature death[52] on the same bases as employed by the court.

Pre-injury net earnings at trial were valued by the court as £8,169. For each later year these earnings are increased by:-

1) the average rate of growth of real earnings over the working life (age-earnings profile) of an able-bodied male craftsman estimated from LFS earnings data, and

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[49] We use the Ogden Tables (2nd ed, 1993) *op cit* which were available to the court at the time of the trial in 1994.

[50] *Ibid*. See tables in section C of the Explanatory Notes.

[51] See above note 39.

[52] We use the mortality rates used by the court and contained in the Ogden Tables (2nd ed 1993) *op cit* Life Tables B1.

2) a 2 per cent economy-wide growth.

In each year this potential earnings figure is reduced by the conditional employment probability estimated from LFS transition rates into employment, unemployment or inactivity for an able-bodied man who was in employment at the age of 23 years (age at accident).

Post-injury net earnings at trial are valued by the court at £5,049. Using the same method of calculation a s for pre-injury future earnings, post-injury earnings at trial are increased in subsequent years by the rate of growth of real earnings over the working life but this time for a male unskilled employee who is disabled, and a 2 per cent economy-wide growth. In each year the potential earnings figure is reduced by the conditional employment probability which is estimated from transition rates into employment, unemployment or inactivity for a disabled man who is unemployed at the age of 26 years (time of trial).

The diagram below shows the graph of employment-adjusted earnings in each remaining year both before and after injury. The upper graph represents the claimant's predicted pre-injury earnings, inclusive of earnings growth and adjusted to account for the likelihood of employment, in each year until retirement. The lower graph represents the claimant's predicted post-injury earnings where the level of earnings and the rate of earnings growth is lower than in the pre-injury job and, critically, where the likelihood of employment in each remaining year is also lower. In fact the average rate of employment over the claimant's remaining working life is 50 per cent.

Employment-adjusted Earnings Pre- and Post-injury

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Pre- and post-injury earnings are measured before adjustment for early receipt and the possibility of premature death.

An approximate estimate of the financial loss for the claimant is measured by the vertical distance between the two graphs. The lifetime of post-injury earnings are substantially lower than the lifetime of pre-injury earnings and damages are much increased. Pre-injury earnings over the remaining 39 years of the claimant's working life discounted for early receipt and the likelihood of pre-retirement non-employment and premature death amount to £219,305. Post-injury earnings over the same period start from a lower base, grow at a slower rate and are discounted more heavily by the increased risk of pre-retirement non-employment and amount to £98,845. Future loss of earnings is estimated by the difference between the two sums at £120,460. This alternative award is almost double that awarded by the court. Economy-wide earnings growth is not always included in the USA and, excluding this component from the calculation, reduces the alternative award to £91,924, but this is still 1½ times the actual award made by the court.[53]

The differences between the court and the alternative awards are substantial and represent the cumulative effect of ignoring earnings growth and of understating the difficulties faced by a job seeker disabled through injury. Wage growth is particularly important in this case because the earnings of an able-bodied craftsman at the beginning of his career grow at a faster rate than those of a disabled unskilled employee in light work. Furthermore, the court is too optimistic about the post-injury employment prospects for this unemployed disabled former carpenter. In effect, the court has estimated that he will be out of work for 5½ years of the discounted 16 years, an average unemployment rate of 34 per cent. In fact, using conditional employment probabilities in each year from the age of 26 to 65 years, we

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[53] Pre-injury earnings are £166,200, post-injury earnings are £74,276 and the difference is £91,924.

find that the claimant is likely to be unemployed for 50 per cent of his remaining working life.

In many ways the alternative award is a conservative estimate of this claimant's loss of future earnings. The court's figure for base earnings is based upon a growth rate between the date of injury and trial of 5 per cent in nominal terms. Earnings data reported in the *New Earnings Survey* indicate that. In fact, nominal earnings grew by 38 per cent for the claimant's occupation group over this three year period.[54] In addition, the post-injury estimates of earnings growth and conditional employment rates are based upon averages for all disabled employees. Those recently disabled, as in the case of personal injury claimants, may experience greater difficulties in securing alternative employment than those whose disabilities are long-standing.

This case study illustrates both the application of the alternative method and the potential for variation in the levels of compensation between the two methods. The result here is that the alternative method based on the same base earnings, the same discount rate and the same adjustment for premature death doubles the award made by the court. Of itself, this difference does not necessarily imply that substantial under-compensation in the existing system is a generalised phenomenon. However, in the next section we take a broader approach by examining the damages awarded in 108 adjudicated cases and comparing them with our alternative calculations.

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[54] An alternative estimate using a base earnings figure of £10,790 is £190,824, three times the court award.

EMPIRICAL COMPARISON OF AWARDS

The Cases In The Survey

To examine the differences between awards calculated under the alternative method and those calculated by the courts, we examined in detail a sample of 108 cases tried between 1990 and 1998 in which an award for future loss of earnings was adjudicated.[55] Our sample of cases was compiled from two sources. First, just under half of the cases were taken from reported judgements. However, relatively few reports deal with the computation of future loss of earnings, and often they do not provide sufficient detail about the relevant economic variables. We therefore also sought, by appeal to practitioners, transcripts of judgements of unreported cases. Full case papers relating to these unreported trials were made available to us by a wide range of solicitors from law firms throughout England and Wales. We recognise the potential difficulties involved in accepting cases from this self-reporting system. Solicitors may refer cases which may reflect well upon them or in which they think their client may have been dealt with unfairly. However, we were not directly aware of our sample being affected in this way.

We must emphasise that our sample of cases is not representative of tort cases in general. This is because the vast majority of personal injury claims involve minor injuries and damages of less than £5,000.[56] Our focus is exclusively upon

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[55] Full details are contained in Working Paper No 2 *op cit*.

[56] In 1995 the Department of Social Security estimated that half of the cases reported to it under the compensation recovery scheme were being settled for £2,500 or less. DSS *Memorandum of Evidence to the Social Security Select Committee* (1995) HC 196, para 40. *Cf* the figure of 37 per cent given 5 years earlier in H.C. Deb. vol 166, col. 942 (February 7, 1990). £2,500 was the median figure in the survey of 81,000 cases receiving legal aid and closed in 1996 - 97 in P. Pleasence, *Report Of The*

damages for loss of future earnings and these are only likely to be awarded in the minority of cases involving serious injury. According to one estimate, this head of damages is only present in 5.5 per cent of all tort cases.[57] A second major difference between our sample and tort cases in general is that 99 per cent of the latter are settled out of court,[58] whereas all of our cases involve court determined awards. We cannot examine directly settlements out of court because they rarely involve complete agreement about the factors which determine the acceptance of the money on offer, and it is impossible to identify the actual process involved in reaching a particular outcome. Therefore the only way to examine the effect of applying the alternative method to the calculation of loss of future earnings is to look at court judgements recognising, of course, that judicial practice has a much wider effect in that it is of fundamental importance in disposing of cases which do not come to court.

Before we report the results of the comparative exercise, we provide a brief description of the claimants in the sample and the levels of compensation they were

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Case Profiling Study, Personal Injury Litigation In Practice, Research Paper 3 (1998) Legal Aid Board Research Unit, p 40 fig 3.17. Similarly in evidence to the Law Commission in March 1993 the Trades Union Council noted that the average sum obtained in the 150,000 union-backed cases in 1991 was under £2,000. See also the figures for various years in D. R. Harris et al, *Compensation For Illness And Injury* (1984) (Clarendon Press, Oxford) 87.

[57] As reported as the result of a British Insurance Association survey in the *Report Of The Royal Commission On Civil Liability And Compensation For Personal Injury* (1978, cmnd 7054), chairman Lord Pearson, vol 2 para 44 (the Pearson Report). Future pecuniary loss comprises only 8.3 per cent of the total damages paid in tort. *Ibid* vol 2 table 107.

[58] Pearson Report vol 2 table 12. Similarly P. Pleasence, *Personal Injury Litigation In Practice* (1998) p 12 reveals that only 5 out of the 762 cases studied went to trial. Even in cases involving substantial awards of damages - £150,000 or more paid by insurers in 1987 and 1988 - only ten per cent of payments were the result of formal court orders. See P. Cornes, *Coping With Catastrophic Injury* (1993) p 20.

awarded by the courts. All the regions of England and Wales were represented. Appellate and first instance courts were included with decisions drawn from County Courts, the High Court, Court of Appeal, House of Lords and the Criminal Injuries Compensation Board.[59] As for the type of accidents involved, just over half of the injuries were work-related: 52 involved an accident at work and 9 others arose from industrial diseases.[60] Road traffic accidents accounted for 26[61] and clinical negligence a further 12. The remaining 9 cases arose as a result of product liability, occupiers liability or a criminal injury. Three-quarters of claimants were men and 90 per cent were ethnically white. All age groups were represented although only four claimants had yet to reach school-leaving age. The majority of claimants (87 per cent) had no pre-injury disability. Over half of the injured (58 per cent) were thought to be capable of work in the future. There are some interesting patterns in the sample data. Work-related injuries were more common amongst older claimants whereas road traffic accidents and injuries arising through clinical negligence are more common amongst those under the age of 30 years. Men were over-represented amongst those injured at work and on the road. On average women in the sample were more severely injured than men.

Nearly all claimants who had completed their education were employed prior to injury (96 per cent). Three claimants were unemployed and one was inactive. Thirteen claimants had yet to begin their labour market careers. Employment rates

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[59] At the relevant period the Board assessed loss of future earnings using common law principles.

[60] This figure is in line with that given in the Pearson Report *op cit* vol 2 table 11 which estimated work accidents as being 46 per cent of all tort claims in 1973.

were substantially lower after injury (35 per cent) and are a first indication of the difficulties faced by the recently disabled in securing alternative work. Of the 63 claimants judged to have future earnings potential, only 33 had actually secured employment at some time between injury and trial and 5 of these were unemployed again at the time of trial.

The total of awards under all heads of damage ranged from £15,000 to £1.6 million. The lowest involved a payment, described as a *Smith v Manchester* award to cover the "loss of any future opportunity to earn" for a mother who was inactive at the time of trial. The highest award involved severe mental and physical disability where future care costs alone accounted for over £1 million. The average total award for all heads of damage was around £323,000. Compensation for future loss of earnings (including *Smith v Manchester* awards) ranged from £0 to £561,488,[62] and averaged £95,565. This award for loss of future earnings comprised a very important part of the overall award, and accounted for 44 per cent of the total. This is not surprising given that cases were selected specifically to include this a head of damage.

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[61] This is some what less than the figure that might be expected given that the Pearson Report *op cit* vol 2 table 11 reported that road accidents comprised about 40 per cent of all tort claims. Similar figures are noted by P. Pleasence, *op cit* p 48.

[62] The zero is not a "missing value", there is a specific adjudication that the claimant is capable of securing employment at his previous wage for his remaining working life, and therefore suffers no loss. The case is that of a 48 year old fireman where an injury to his leg prevented him continuing his employment in the fire service. He had worked for the fire-service for 24 years, he had no transferable skills, he lived in a high unemployment locality and he had been unemployed during the four years between injury and trial. The highest award of compensation for losses in the labour market is a conventional multiplier–multipicand award made to a Managing Director. The multiplicand was just under £60,000 and was based upon the average earnings of a business executive.

As a test of whether the courts apply the multiplier-multiplicand method in a uniform and consistent way, we used base earnings, the number of potential remaining years to retirement, and future earnings potential as predictors of the award for loss of future earnings. These variables proved to be accurate predictors of the level of compensation. Furthermore, when details of the case (accident type, location of trial etc) and characteristics of the claimant (sex, ethnicity, occupation and education) were included, they had no additional predictive value. In other words, we found that courts were consistent in their award of damages for loss of future earnings and were not biased in any systematic way associated either with the case or with the claimant.

Comparison With Awards Calculated Using The Alternative Method

We now turn to the comparison of awards calculated using different methods. The table below reports a summary of the statistics which compare the court awards with damages calculated using two versions of our alternative method. The focus is upon the differentials between the court awards and the alternatives. The court award in column (i) is compared, first, in column (ii) with an alternative which includes age-related individual productivity growth and, secondly, in column (iii) with an award which includes both age-related and economy-wide productivity growth. The figures also distinguish men from women claimants, and separate those who were judged to have post-injury earnings potential from those who were not expected to return to work.

The differential between the alternative awards and those of the courts is a measure of the extent to which the current method of calculation under-compensates the claimant. A major finding of the survey is that, for the sample as a whole, the

award calculated under the alternative method in column (iii), which includes both individual and economy-wide productivity growth, is nearly 2½ times that of the court award in column (i). If future national productivity growth is discounted, the alternative method in column (ii) still generates an award which is over 1½ times greater than that awarded by the court.

Our sample of 108 cases includes 8 where the court award is very substantially below the alternative award. All these cases involve *Smith v Manchester* awards. While their inclusion is justified on the basis of eligibility to be in the sample, they bias the average differential upwards. If these 8 cases were to be excluded, alternative award A would be on average 20 per cent higher, and alternative award B 60 per cent higher, than the adjudicated awards.

Loss of Future Earnings: A Comparison of Court and Alternative Awards

	(i) **Actual Court Award Mean £**	(ii) **Alternative Award A*** **Differential**	(iii) **Alternative Award B** **Differential**
Total Sample (108 cases)	97,396	1.68	2.43
With post-injury potential earnings (63)	69,764	2.17	3.21
Without post-injury potential earnings (45)	136,081	1.01	1.36
Males (81)	101,898	1.76	2.44
Males with post-injury potential earnings (52)	70,476	2.19	3.09
Males without post-injury potential earnings (29)	158,239	1.02	1.29
Females (27)	83,890	1.45	2.39
Females with post-injury potential earnings (11)	64,394	2.12	3.74
Females without post-injury potential earnings (16)	95,919	0.99	1.46

* Award A includes compensation for age-related productivity growth
** Award B includes compensation for age-related and economy-wide productivity growth
Differential = alternative award divided by the court award

Post-injury earnings potential

As expected, awards are lower where there is post-injury earnings potential. More important for our purposes is the finding that in such cases the differential between the alternative and court award is particularly large. This reflects the failure of courts to compensate adequately for reduced chances of employment, especially if the claimant is inactive or unemployed at the time of trial. The conventional method for compensating a claimant when residual disability makes future labour market outcomes uncertain is to award a *Smith v Manchester* payment. This lump sum is unnecessarily arbitrary and generally leads to under-compensation. It is a major reason for the difference between the alternative award and that calculated using the

court's method. Under the alternative method, post-injury labour market risks, together with any adverse impact of disability on the claimant's age earnings profile, are much more precisely calculated.

Where there is no post-injury earning potential, the court and alternative awards are much closer. In fact, where the alternative award is based upon individual but not economy-wide earnings growth (column (ii)), there is no difference between the court and the alternative award. The explanation for this lies in the different approaches to the calculation of pre-injury labour market risks. Even before the decision in *Wells v Wells* the courts were beginning to calculate multipliers with closer reference to the Ogden deductions for non-mortality contingencies. These deductions are significantly lower than those we have calculated using transition probabilities of the likelihood of being in employment. Consequently claimants' average lifetime employment rates calculated on the basis of the Ogden deductions are significantly higher than the employment rates used in our alternative calculation.[63] It just so happens that the lower pre-injury employment rates used in the alternative calculation almost exactly offset the extra compensation for individual age-related lifetime earnings growth. However, if compensation for future earnings growth arising from economy-wide productivity growth is included in the alternative calculation (column (iii)), claimants with no post-injury earnings capacity are once again under-compensated by the court method.

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[63] This was demonstrated in the case study where pre-injury average lifetime employment rate implied by the Ogden deduction is 98 per cent compared to that of 89 per cent using the alternative calculation.

Sex

If the differential between the court and the alternative awards in respect of men and women claimants are compared it might be thought that, on average, they are equally under-compensated by the court method. However, this is a misleading result which arises because the women claimants in our sample are younger than the men, and the differential is greater for those who are younger. Controlling for age reveals a particularly marked differential for men which reflects the courts' failure to make sufficient allowance for earnings growth over an individual's working life. Although this under-compensation applies to both men and women, there is an offsetting effect which benefits women because courts generally do not make sufficient allowance for periods of inactivity on future employment rates. Women's disproportionate responsibilities in respect of childcare are reflected in the labour market in the form of reduced participation. In much the same way that inactivity due to ill health or unemployment have scarring effects on future labour market outcomes so the effects of career breaks and part-time work continue following re-employment after a period of childcare. The court method, even when based on the Ogden approach, does not fully account for these periods of inactivity or their after-effects. The result is that, in this respect, women are over-compensated and this offsets the under-compensation from failing to make sufficient allowance for earnings growth.

Age

The differential between the court award and the alternative award increases with the number of potential years remaining in the labour market. In other words, the court method of calculation particularly under-compensates younger claimants. This is clear from the correlation between the differential and the claimant's age.

The correlation coefficient measures the extent to which two variables vary together. We calculate the correlation coefficient separately for those with and without future earnings prospects and find that for both groups the relationship between age and the differential is strongly negative.[64] This pattern reflects the absence of any uplift in earnings in line with productivity growth over an individual's working life in the court approach where younger claimants have a greater proportion of their working lives ahead of them. The calculation of earnings growth over a working lifetime is a central component of the alternative methodology.

The comparison of two variables in isolation can produce misleading results. The apparent equality in the differential for men and women is an example of this. This was in fact the result of the negative relationship between age and the differential, and that women in the sample tended to be younger than the men. When we systematically test for each of the above results using multivariate methods, each differential is significant after controlling for the effects of other correlates.

CONCLUSION

We have set out an alternative method for the calculation of loss of future earnings following personal injury. The method is founded upon labour market analysis and mirrors the most widely used practices of forensic economists in the USA. Its theoretical basis is easier to defend than that presently used by courts in the UK because it avoids subjective or arbitrary assumptions about labour market outcomes. The basis of this approach is that the path of future earnings can be approximated empirically using age-earnings profiles and trends in national earnings

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[64] Correlation coefficients are -0.71 and -0.46 respectively and are significant at the 1 per cent level.

growth, both of which show how earnings increase over a working lifetime. This stream of earnings is adjusted according to the changing probability of employment over the claimant's working life. The data for the alternative model are derived empirically from the *Labour Force Survey*. While fairly technical at the theoretical level, this approach is nevertheless amenable to the routine application of standard statistical tables, and therefore offers a viable alternative to the existing court method of calculation.

To measure the extent that the alternative method would make a difference in practice we compared its results with those produced in a sample of court adjudicated cases. We kept other variables, including base earnings, the discount rate and mortality rates, the same as those used by the courts. This enabled us to identify the impact on future earnings compensation of using the central apparatus of the alternative approach, namely age-earnings profiles and employment probabilities. We found that, by comparison with our alternative method, the courts under-compensated future earnings loss in 88 per cent of the cases in our survey. Over half of the claimants adversely affected would have received at least 50 per cent more if our alternative calculation had been used, and a third of them would have more than doubled their court award.

There are two main reasons for this under-compensation. First, the multiplier-multiplicand method fails to account for earnings growth over the claimant's working life. Secondly, *Smith v Manchester* awards, which are founded upon arbitrary assumptions about post-injury employment prospects, fail to compensate sufficiently for the greatly reduced likelihood of future employment where injury has resulted in a period of unemployment and/or residual disability. By

contrast, post-injury labour risks and the adverse effect of disability on earnings are integral parts of our alternative calculation.

The differential between the court awards and those calculated using our alternative method is not uniformly distributed across our sample of claimants. It is most significant for men, younger claimants, and those with post-injury earnings potential. It is the young who have more years of potential employment, and thus earnings growth, ahead of them. For women the absence of compensation for earnings growth is offset by the failure to allow for the effects of periods of inactivity on future employment rates.

In the last ten years or so a clear trend has been identified towards a more "scientific" approach in the assessment of damages.[65] Both the legislature and the judiciary have responded to calls for greater precision. The increasing ability of personal injury practitioners to understand and use the information provided to them by forensic accountants, actuaries and a panoply of other specialist advisors has fuelled important developments in tort law.[66] As a result spread sheets, inflation factors, discount and interest rates are not the mysteries they once were. One of the most notable developments has been the increased acceptance of the Ogden Tables by courts. Their routine use may make it appear that actuarial science has produced an accurate system for compensating, in particular, loss of future earnings. Certainly the Tables encourage a more systematic and consistent approach, and make the calculations involved more transparent. However, they merely support the existing multiplier and multiplicand method and thus do not address the absence of

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[65] International Underwriting Association, *The Second UK Bodily Injury Awards Study* (1999) para 7.1.4.

compensation for earnings growth or the misuse of *Smith v Manchester* awards in compensating claimants for future disadvantage in the labour market. Both earnings growth and the significantly reduced employment prospects associated with disability are established empirical features of the labour market. The failure of the courts to make sufficient allowance for these factors within the context of the accepted aims of the damages award in tort results in substantial under-compensation of claimants.

However, whether the damages award *should* therefore be increased to take account of this under-compensation is a policy matter which goes beyond the scope of the present article. Our research findings do not have to be interpreted as necessarily supporting a substantial rise in damages awards.[67] We recognise that in some quarters there is considerable concern about present damages levels, and in particular, about their effects upon the NHS. Indeed the tort system has been seen as compensating only the fortunate few, and disabled organisations in the past have opposed increasing damages awards because this would only make "an

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[66] Lewis, "Increasing the Price of Pain: Damages, the Law Commission and Heil v Rankin" (2001) 64 MLR 100.

[67] Although the findings may prompt claimants' representatives to campaign for further increases in damages, there are alternative perspectives upon the tort system which would not support such a campaign. For example, the limited importance and inefficiency of tort could be emphasised in that it compensates but few people and at a very high administrative cost. The great majority of accident victims are unable to claim and must be content with receiving limited social security benefits. Successful tort claimants are distinguished on the basis of haphazard and inconsistent principles of liability which, in practice, achieve capricious results. If a decision were to be made to increase the resources to be made available to disabled people, many would not target the money at a group already receiving the highest benefits. The tort system may be seen as impeding the development of a more coherent compensation regime based upon the extent of disability rather than its cause. It is in such wider contexts that the present under-compensation of tort claimants is not seen as justifying an increase in damages awards.

elite even more elite." Our research should instead be interpreted only as revealing that the tort system fails to satisfy one of its main objectives in that it does not provide "full" compensation. The claimant is not returned as closely as possible to the pre-accident position. The rhetoric of the system with regard to damages, as is so often also the case when wrongdoing and "fault" are considered, is not matched by its reality.