CHAPTER 8

THE TIME VALUE OF MONEY

***Summary**: The `discount rate of interest' is preferably described as the `discount rate of return'. A nominal rate (I) comprises a real rate of return (R) and an offset to inflation (F). For compensation calculations R is the most important measure. Historical analysis suggests that for South Africa R has a value of about 2,5% per year compound. The net capitalization rate will be different from R if the cash flow to be valued does not escalate in line with inflation. The allowance for the risk aspect of general contingencies is best achieved by an increase to the discount rate of return.*

[8.1] BASIC CONCEPTS

[8.1.1] Disutility of delayed payment: A payment of R10000 immediately has greater present value than an equal payment of R10000 due in ten years' time.[1] The proposition is true whether the R10000 is subsequently adjusted for inflation or not. The difference is the disutility of delay, that is to say that people will prefer to receive R10000 now rather than later.[2] Typical of all personal utilities some people are less concerned about delayed payment than others. The discount for delayed payment is commonly ascertained by consideration of what amount invested now will yield R10000 in ten years' time. This procedural definition objectivizes the discount.

It needs to be borne in mind, however, that in most instances of damages assessment the period of investment is uncertain because the claimant may die soon or live a very long life. There will also be the general contingencies that attach to earnings or support or future expenses. There is usually no question of the claimant using his award by consuming interest and capital to reproduce the required payments. For this reason the discount rate of return has an abstract quality when used in damages assessments. Bearing in mind that the lump sum awarded by way of damages is compensation, that is to say a price reflecting the present utility of what has been lost, **it is preferable to view the discount rate of return as a pure time-money preference. In other words the disutility of delay** rather than the actual return which the claimant will achieve on his compensation money.

[8.1.2] Estimated market value: Consider the sale of a business or block of flats or offices by a willing seller to a willing buyer. Payment of the agreed purchase price acquires not only ownership of the asset **but also entitlement to all incomes and profits generated by that asset,** and other benefits from the use thereof.[3] In other

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[1] `*Onzeecker ende toekomend goed niet soo veel waerd en is, als het zekere ende tegenwoordige*' Grotius `*Inleiding*' 3.32.16.

[2] Pearce `Cost-Benefit Analysis' 2ed 37-40.

[3] See footnotes 22 at 8, 170 at 30, 55 at 221.

words **the market value of the asset includes the present value of all income and profits expected from that asset**. If by reason of a wrongful act there is a prospective loss of income or profits the market value of the asset will decrease. **The present value of the future loss of profits or income is the reduction in the market value.** Alternatively one might assess the present value of the loss by discounting at interest using a net capitalization rate of about 2,5% per year, say, and then making a deduction for general contingencies to allow for the risks and uncertainties. This is the method generally used when assessing damages for personal injury or loss of support. A third approach is to build the general contingencies into the discount rate of interest and then discount to present value using a very high net capitalization rate of 5% to 30% or more per year compound.[4] These are all different ways of arriving at the reduction in present value of the future losses of income or profits that have been caused by the wrongful act. Each of these approaches is valid and whenever possible more than one approach should be used, the one being used as a check on the other.[5] The ultimate purpose of the inquiry is to identify a fair present value for what has been lost. With damages for personal injury and death there is no commercial market where earning capacities, or rights to support, are traded for lump-sum prices. For this reason it is not possible to check the validity of the discounting process by reference to actual lump-sum market values, as can be done with a business or a block of flats. Nonetheless it is useful to bear in mind that the result of a calculation discounting future losses for interest and general contingencies is merely an estimate of the notional lump-sum price that would be agreed if there was a commercial market.[6]

[8.1.3] Duty to mitigate: The assessment of damages, I have previously noted,[7] is characterized by a tension between concretization, meticulous regard for the personal circumstances of the victim, and abstraction, the use of generalized rules which ease the burden of proof and speed up the assessment process. In theory a court should not deny a claimant or defendant the right to concretize. In practice exceptions to this guideline are to be found in the victim's duty to mitigate his damages and in the rules which require that certain collateral benefits be disregarded in the assessment process.[8] The disutility of delay in the payment of past debts has been held to be zero,[9] an example of legal abstraction. Future payments, however, when compensated by a present lump sum, will be reduced for the advantage of being received earlier.[10] In theory a claimant could testify that for him payment in advance has no advantage, no positive utility.[11] It is conceivable that a court would then

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[4]See table 11 at 161.

[5]See paragraph 3.3.9.

[6]See paragraph 12.1.4 for discussion of similarity between pricing earning capacity and pricing a block of flats.

[7]See 31.

[8]See, for instance: Assessment of Damages Act 9 of 1969; *Santam Versekeringsmpy v Byleveldt* 1973 2 SA 146 (A) 153; *Dippenaar v Shield Insurance* 1979 2 SA 904 (A) 920-1.

[9]*SA Eagle Insurance v Hartley* 1990 4 SA 833 (A).

[10]*General Accident Insurance v Summers* 1987 3 SA 577 (A).

[11]This is probably true of many poorly educated persons living in subsistence economies where money plays only a minor role. Such persons may well keep cash savings under the

award compensation without making a discount for the advantage of early receipt. It is more likely, however, that a court apprised with such evidence would objectivize the disutility of delay by observing that the claimant should mitigate his damages by profitably investing the compensation money.[12] The expected return on the investment of the award would then be the measure, for compensation purposes, of the utility of the time value of money.

[8.1.4] Objective investment standard: That objectivization is the general rule is evident from the total absence in court records of any mention of an actuary having consulted with the claimant as regards the claimant's investment abilities. This is consistent with the principle enunciated in *Radebe v Hough*[13] that the utility of money awarded to a claimant should be the same for all claimants. In *Boonzaier v Provincial Insurance*[14] the court used as a discount rate the lower returns available from the Guardian's Fund. The modern tendency is, however, to create a trust[15] thereby avoiding the relatively low rates of interest paid by the Guardian's Fund.[16] Exceptional costs associated with the management of the money will lead to an increased award.[17] As a general rule the rate of return assumed for discounting purposes would be net of investment management charges.[18]

[8.1.5] Internal rate of return: The expected return on an investment is generally expressed as a yearly proportionate rate of increase to the monetary value of the investment, typically 20% per year compound.[19] Compounding implies that the increase in year two builds on both the original capital and the capitalized return from

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mattress or in a box buried in the garden.

[12]Usually on the basis of actuarial testimony (for example, *Shield Insurance v Hall* 1976 4 SA 431 (A) 443; *AA Mutual Insurance v Maqula* 1978 1 SA 805 (A) 812F; *Ngubane v SATS* 1991 1 SA 756 (A) 781E). There are recorded instances, however, when courts have taken judicial notice of the expected advantage from investment (*Protea Assurance v Matinise* 1978 1 SA 963 (A) 975E-F; *Shield Insurance v Booysen* 1979 3 SA 953 (A) 963C-D). In *Kotwane v UNSBIC* 1982 4 SA 458 (O) 466 the court refused a request to lead actuarial evidence and did its own actuarial calculation using a discount rate of its own choice.

[13]1949 1 SA 380 (A).

[14]1954 1 C&B 87 (C).

[15]See, for instance, *Dyssel v Shield Insurance* 1982 3 SA 1084 (C).

[16]Over the 32 years from 1960 to 1992 average rates for the Guardian's Fund were 8,1% per year compared to an inflation rate of 9,5% per year and average returns on participation mortgage bonds of 11,6% per year (see table 10B at 123).

[17]*Marine & Trade Insurance v Katz* 1979 4 SA 961 (A) 985; *Carstens v Southern Insurance* 1985 3 SA 1010 (C) 1029D-G; *Arnold v Teno* (1978) 83 DLR (3d) 609 (SCC) 635-6. These cases are concerned with the administrative costs of a *curator bonis* rather than the cost of skilled investment advice.

[18]Fama `Foundations of Finance' 141-2 observes that the additional returns provided by skilled investment advice roughly match the cost of acquiring that advice. A survey by my office of the pricing of immediate annuity contracts issued by five life offices in March 1987 (unchanged at November 1991) revealed yields of 16,6% to 17,4% per year net after management expenses compared to a long-term Escom stock yield of 15% per year (16% per year in 1991; see table 10B at 123). The life office would in this instance serve as the skilled investment manager.

[19]Table 10A at 122 shows an average return over 30 years of 9,3% per year on share-market equities above the rate of inflation. If future inflation is expected to be 13% per year this implies a nominal rate of return of 23,5% per year (1,235=1,093x1,130).

year one. The traditional analysis of investment returns uses fixed-interest investments as its paradigm. The annual rate of return is then referred to as the `discount rate of interest'. This terminology focuses exclusively on fixed-interest investments when regard really needs to be had to the entire range of possible investments, particularly immovable property and share market equities. For this reason it is preferable to use the expression `discount rate of return'. Financial analysts prefer the expression `internal rate of return' (IRR)[20] being the yearly rate of accrual needed to roll up the initial investment to its final value, including allowance for all capital growth, or depreciation, and payments of interest,[21] dividends or rents. In this sense the rate of return is an abstract ratio that is derived from the investment model,[22] that is say from the formula relating input rands to output rands.

[8.1.6] Historical returns: The figures in table 10A[23] are derived from the JSE Actuaries All-Share Index for December each year. The average return is based on a geometric average (also known as logarithmic). The figures reflect the returns available to persons who invest in a portfolio comprising the same assets as the index. In practice private individuals must be satisfied with a smaller spread of investments such is can be obtained by purchasing units in a mutual fund.[24]

[8.1.7] The nominal rate and its components: The expected rate of return on an investment will include what the investor requires to offset inflation and also to offset the risks attaching to the investment. For fixed-interest investments this rate is known as the **nominal rate of return** (I)[25] and needs to be distinguished from the **real rate of return** (R) which is the nominal rate of return less the rate of inflation (R=I-

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[20]McCutcheon & Scott `Mathematics of Finance' 38 88; Weston & Brigham `Managerial Finance' 216-17; Mishan `Cost-Benefit Analysis' 1ed 118-24. The concept of an internal rate of return goes hand-in-hand with a financial model reflecting expected payments (Brigham `Financial Management' 437).

[21]On long-dated fixed-interest investments which are traded the internal rate of return does not equal the rate of interest (the so-called `running yield'), unless the price paid for the investment was equal to the maturity value. Government stocks, for instance, are not like building society fixed deposits. They are bought and sold at prices which reflect a premium or discount on the maturity value. The capital differential on maturity gives rise to an internal rate of return different from the running yield. Fixed-interest stocks are often traded by reference to the internal rate of return rather than the price per R100 of stock. This practice implies that the interest payments can be re-invested at the same rate as the yield. For the longer dated stocks this is probably a reasonable assumption for purposes of choosing between different investments.

[22]Brigham `Financial management' 3ed 80n2 `In finance the term *model* refers to an equation or set of equations designed to show how one or more variables affect some other variables. Thus, a bond valuation model shows the mathematical relationship between a bond's price and the set of variables that determines this price'. Conversely the price may be known and the formula is then used to give the associated internal rate of return.

[23]See 122.

[24]My office has analyzed the performance of three general mutual funds (UAL, Guardbank, Old Mutual) using the same method as in table 10A at 122. This analysis suggested that mutual funds, even the better ones, do not perform as well as the index for all shares (used in table 10).

[25]Grove 1990 *THRHR* 28-42 discusses the difference between what he calls a `nominal' and an `effective' rate. I use the term `nominal rate' in this thesis in the sense of what Grove terms the `effective annual rate'.

F).[26] Thus for example a nominal rate of return of 20% per year compound with an inflation rate of 15% per year would be associated with a real rate of return of 4,3% per year.[27] The real rate of return includes a basic real rate of return on a minimum risk investment,[28] typically 2% to 3% per year, plus a premium for the effects of risk.[29] An increase to the discount rate of return reduces the associated present value. It follows that the deductions for general contingencies and the risk of death could be introduced by way of an increase to the discount rate of return.[30] In practice when assessing damages for personal injury and death it is usual to allow for risk, other than investment risk, by way of explicit percentage deductions separate from the discount rate.[31] Thus the risk of death is introduced actuarially by percentage deductions on a sliding scale applied on a year-by-year basis.[32] Other categories of risk are allowed for by way of a deduction for general contingencies.[33] The allowance by the courts for risk separately from the discount rate of return, has its origin in the early damages cases where the cost of purchasing a life annuity was used as the basis for the damages calculation[34].

[8.1.8] Risk of mortality: There is no reason why allowance for a risk such as mortality should not be included simply by using a higher discount rate of return.[7] Instances of such an adjustment are to be found: The MMF has, for instance, recommended that its agents use a net capitalization rate of 4% per year. This may seem to be excessive in relation to actuarial rates of 2% to 3% per year. However, the calculations done by fund agents often do not make explicit separate allowance for mortality in the same way as is done by an actuary. The higher 4% rate used by

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[26]The formula I-R is a rough approximation of the correct ratio formula (1+R)=(1+I)/(1+F) where F is the rate of inflation (see 99). This complication arises because the functions 1+I, 1+R and 1+F are ratios. For more detail see Koch `Damages' 74-6.

[27]If one uses the correct formula 1,20/1,15=1.043=1+R/100, ie R=4,3%.

[28]No investment is wholly free from risk, but some have lower risk profiles than others (see *Wright v British Railways Board* [1983] 2 All ER 698 (HL) 703c).

[29]The add-on for risk can be substantial: In *re Bird Precision Bellows* [1984] 3 All ER 444 (ChD) 457-8 the business was valued using a real rate of return of 26,66% per year compound; in *Buckingham v Francis* [1986] 2 All ER 738 (QBD) 742 a **real rate** of 25% per year compound was used.

[30]See table 11 at 161.

[31]For the general application of this technique in business and social analysis see Weston & Brigham `Managerial Finance' 272-3; Mishan `Cost-Benefit Analysis' 2ed 298-9; Pearce `Cost-Benefit Analysis' 2ed 74-80.

[32]See paragraph 5.4.1.

[33]The deduction for general contingencies is not confined to risk but extends to other factors such as the costs of travelling to and from work and the deduction of income tax which had not originally been deducted.

[34]See, for instance, *Rowley v London and North Western Railway* [1861-73] All ER Rep 823 (Exch); *Phillips v London & South Western Rail* [1874-80] All ER Rep 1176 (CA) 1180-1; *Clair v PE Harbour Board* (1886) 5 EDC 311 316-17; *Smart v SAR&H* 1928 NPD 361 366; *Laney v Wallem* 1931 CPD 360 362 364.

[7]Grotius `*Inleiding*' 3.14.19-20 records that risk free investments are subject to a maximum rate of interest of 6,25% per year, but that higher rates are permitted on life annuities because of the attendant risk of death. *Gillbanks v Sigournay* 1959 2 SA 11 (N) 14H `Mr Warner suggested that I should use 5 per cent and not worry about contingencies'. The actuary had discounted at 4% per year compound.

fund agents then gives much the same end results as those obtained by actuaries[8] because the actuaries include an additional discount for mortality. Similar comments apply to the high rates of 3% per year to 6% per year used by the courts *mero motu* when unassisted by an actuary.[9] The main danger with such an approach to mortality is that the court when using an actuarial calculation may not appreciate that in doing so it has already made adequate allowance for the contingency of early death and may then proceed to make a further unjustified contingency deduction.[10]

[8.1.9] Residual earning capacity: Compensation money in the hands of an entrepreneur may provide opportunities to generate income far in excess of what was possible had he not been injured. Typical of such victims is the labourer who uses his money to buy a taxi. If his injuries prevent him from driving it himself he can easily hire a driver. One can also imagine the victim who buys a caravan park or an hotel. Any adjustment to the discount rate of return on this account would be an adjustment for residual earning capacity.[11] If a widow takes up employment after the death of her husband the earnings from this source are ignored when assessing her damages.[12] The same principle will undoubtedly be applied to her successful use of an award for damages for loss of support.

[8.2] THEORY OF REAL RATE OF RETURN

[8.2.1] Net capitalization rate: The vast majority of damages assessments are not concerned with the absolute values of future inflation and future nominal rates of investment return.[13] The most important parameter[14] for the courts is the real rate of return and the associated net capitalization rate. The **real rate of return** needs to be distinguished from the **net capitalization rate** because the latter includes allowance for non-investment factors such as future salary escalation above or below the rate of inflation.[15] Although the real rate of return and the net capitalization rate are often

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[8]Except when discounting over the expectation of life when the values calculated using 4% per year will usually be too low.

[9]See table in Koch `Damages' 331-3. Cases from 1966 onwards with actuarial input are recognizable by the separation of interest and inflation.

[10]See footnote 47 at 86.

[11]See paragraph 12.17.7(.

[12]*Peri-Urban Areas Health Board v Munarin* 1965 3 SA 367 (A).

[13]The use of separate allowances for future inflation and investment returns is generally confined to actuaries (see, for example, *Bailey v Southern Insurance* 1981 3 C&B 178 (C) and the subsequent approval of this practice in *Southern Insurance v Bailey* 1984 1 SA 98 (A) 115-16; see too cases listed in Koch `Damages' 332-3). In *Kotwane v UNSBIC* 1982 4 SA 458 (O) 468 one finds judicial notice being taken of the separation of the two components. A nominal rate of return is only needed when the cash flow to be valued does not increase in line with inflation. This arises most commonly with certain housing subsidies and pensions under retirement annuity plans.

[14]A parameter in applied mathematics is a linking common factor. The discount rate of return in this instance is not derived from observation of a market in earning capacities or lump-sum values for lost support, but by reference to a suitable surrogate market (see 26) such as the pricing of life annuities (see 113).

[15]In *Dusterwald v Santam Insurance* 1990 4 C&B A3-45 (C) 60 68 the court allowed for future salary increases in line with inflation only every second year with one third of the rate of inflation for intervening years, an effective net capitalization rate of 4,5% per year. In *Brunt v AA Mutual Insurance* 1990 (W) (unreported 26.2.90 case 19198/87)

numerically equal, this is not always so.

[8.2.2] Consistency between awards: The net capitalization rate is a matter of some considerable importance when assessing damages.[16] Considerations of concretization would suggest that each claim be assessed on the basis of available evidence. Available evidence in this context does not mean having regard to the personal investment idiosyncrasies of the claimant but to general investment considerations such as one might expect to be adopted by the reasonable man who is neither too cautious nor too reckless.[17] As I have observed this is an objective standard.[18] If the courts have regard to the historical record as a basis for predicting the future one might anticipate some degree of conformity between the net capitalization rates used for different awards. Some recent rulings[19] have rejected the historical record and the conventional wisdom of actuaries[20] and preferred what can best be described as a `gut-feel'[21] approach in favour of a real rate of return of 1% to 1,5% per year

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the court ordered the use of a nominal discount rate of return of 15,5% per year coupled with a rate of salary escalation of 10,96% per year, that is to say a net capitalization rate of 4,1% per year. In *Standard General Insurance v Maluleka* 1976 2 C&B 579 (A) 582-4 the court allowed, with reservations, for future increments in excess of the rate of inflation. More generally see Koch `Damages' 133-5.

[16]R10000 per year over 20 years discounted at 3% py has a present value of R148775, at 2% py this becomes R163514, at 1% py R180456, at 0% py R200000. A court that adopted 0% py would arrive at a value for the damages 34% higher than a court using 3% py. If consistency between awards were of any importance then a standard rate for all claims should be used. Considerations of what is called the `yield curve' (see 147) suggest that different discount rates should be used for different periods of loss. With damages calculations this refinement is generally ignored (see 147).

[17]*Todorovic v Waller* (1981) 37 ALR 481 (HC) 488 line 41`the rate should be that produced by reasonably safe investments - such investments as a prudent man in the position of the plaintiff, very much concerned to preserve his capital, but not overcautious, would make'; see too Fleming 1977 *AJCL* 51 64n76. Friedman & Savage 1948 *JPE* 279 284 `the probability is that the classes of investments which on the average return most to the investor are neither the very safest of all nor the very riskiest, but the intermediate classes which do not appeal either to timidity or to the gambling instinct'. *Sigournay v Gillbanks* 1960 2 SA 552 (A) 567G `He said that he himself was accustomed to use 4 per cent but that he could not speak for all actuaries ...The actuary agreed that present day rates were substantially higher and that even for Government stock the rate was now 5,5 per cent or more. His evidence convinces me that by averaging out one could obtain 4,5%, still within the limits of practicably unassailable security over a long period'.

[18]See paragraph 8.1.3(.

[19]*Oberholzer v NEG Insurance* 1988 4 C&B A3-1 (C) (1% per year); *Gallie NO v NEG Insurance* 1992 2 SA 731 (C) (1,5% per year) `I do not, however, consider myself bound by the conventional wisdom prevailing in the actuaries profession at the present time' (2,5% per year); *Dusterwald v Santam Insurance* 1990 4 C&B A3-45 (C) 60-4 (1% per year). Contra *Brink v The MVA Fund* 1991 (C) (unreported 2.8.91 case 6038/89) 2,5% per year; *Ngubane v SATS* 1991 1 SA 756 (A) 781E `the actuary, having regard to inflation and capitalization of the award, used a nett capitalization rate of 3% per annum compound'.

[20]Martens (1987) surveyed discount rates being used by actuaries active in compensation work in South Africa. This revealed net capitalization rates with 7 replies falling between 2% and 3% per year, 3 above this range and 2 below this range. A survey by my office at March 1987 of rates used by 5 major life offices to price increasing annuities certain revealed nominal rates ranging from 16,6% per year to 17,4% per year. The 20-year bond index for 1987 averaged 15,4% per year, 1,4% per year below what life offices were prepared to guarantee. If a real rate of return of 2,5% per year was implicit to the 20-year bond index then the life office rates implied a real rate of return of 3,9% per year. See footnote 66.

[21]*Southern Insurance v Bailey* 1984 1 SA 98 (A) 114D.

compound. These `gut-feel' assessments are nonetheless objective in that they have no regard for the claimant's personal opinions on the matter. The use of 1% per year would seem to have its origin in the practice of a prominent life office[22] which had taken to valuing its pension fund liabilities using this rate. The rate has been described as a conservative one and, in the life-office context, includes allowance for future increases in salaries at rates above the rate of inflation.[23] The use by some courts of low rates of 1% to 1,5% per year is sporadic and higher rates are also in use[24] depending on which actuaries give evidence. There is certainly no general rule in this regard. Actuaries favouring the lower rates would seem to be very much in the minority.[25] There are substantial difficulties with fixing a real rate of return by reference to evidence. Even-handed justice and forensic efficiency would be best achieved by laying down a fixed standard real rate of return in the rules of court.[26]

[8.2.3] Good times and bad times: Considerations of hypothetically consuming interest and capital over a stated period of time casts the calculation into the contingency-fund mould[27] and can give rise to inappropriate margin building when pricing compensation for a single claimant.[28] Thus, for example, the failure of the defendant to offer compensation by instalments was held to cast onto the claimant the risk that inflation may exceed investment returns over an extended period of time.[29] It is of note in this regard that no life insurer in South Africa is prepared to issue a life policy which guarantees that benefits will increase in line with inflation. The reason for this lies in the contractual nature of a life office's obligations. A claimant who is faced with poor investment conditions can lower his standard of living or defer certain expenditure, as he would have done had he not been injured and had difficulties with his job. A life office does not have the same flexibility, it cannot reduce policy benefits which are contractually guaranteed.[30] The *quid-pro-quo* for the claimant who is faced with adverse investment returns is the prospect that if investment returns are far better than expected he can increase his standard of living. The real rate of return

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[22]Old Mutual. See next footnote.

[23]*Brink v The MVA Fund* 1991 (C) (unreported 2.8.91 case 6038/89) `Mr Cartwright was of the opinion that a discount rate of 1% ought to be used, but this was based on what he readily conceded to be the "cautious" and "prudent" approach adopted by insurance companies (by one which he was employed)'. This 1% per year rate is used by the pensions department at Old Mutual to value pension-fund liabilities and includes allowance for future real increases in the salaries. With compensation calculations it is usual to make explicit allowance for real increases, if any. The use of a 1% per year rate can thus lead to double compensation.

[24]*Brink v The MVA Fund* 1991 (C) (unreported 2.8.91 case 6038/89) 2,5% per year; *Ngubane v SATS* 1991 1 SA 756 (A) 781E 3% per year based on actuarial evidence.

[25]See footnote 20.

[26]See 144.

[27]See 106.

[28]See footnote 23.

[29]*Dusterwald v Santam Insurance* 1990 4 C&B A3-45 (C) 64; the court elsewhere (at 66) noted the contingency that investment returns might substantially exceed the rate of inflation. See too *Smith v SA Eagle Insurance* 1986 2 SA 314 (C) 318-19 `I must also *inter alia* weigh the possibility that the investment of the award might achieve a return greater than the inflation rate against the possibility that the converse might occur'. The court then made a deduction of 20% for all contingencies including the investment issue.

[30]Most life offices offer benefits which increase in line with investment returns.

used for discounting the award, if fair to both claimant and defendant, would balance the down-side chances against the upside chances.

[8.3] INVESTMENT INDICES

Personal expectations of the real rate of return are not readily measured. Prevailing financial indicators in South Africa provide us with a few rough guides: The consumer price index, the yield index and the dividend yield. These are now discussed in greater detail:

[8.3.1] The consumer price index: The consumer price index as published by the Department of Statistics, despite its many weaknesses,[31] is generally accepted as a fair reflection of the rate of inflation.[32] Because of its high credibility it gives rise to a degree of self-fulfilment.[33] Personal beliefs as to the rate of inflation will find expression in price and salary increases which will in turn determine the level of the index. There are a number of other indices such as the GDP deflator and the retail price index. In an active economy these indicators, along with the consumer price index, are all expected to give the same average values over an extended period of time.[34] There are a number of papers on inflation in relation to damages awards[35] but these will not be discussed further here because they proceed from the unsound premise that the award can be used by consuming interest and capital to replace the lost income.

[8.3.2] The dividend yield: The closest we can come to a direct measure of the real rate of return is to observe the dividend yield on the FT-Actuaries index for stock exchange prices.[36] This averages the yields on numerous different shares and reflects the dividend return obtainable if a portfolio was held which matched the shares making up the index. The historical analysis in table 10A[37] suggests that over periods of 15 to 20 years the overall return, capital growth and dividends combined, will exceed the dividend yield at the beginning of the period by about 2% per year.[38] If one accepts this observation as a predictor for future share-market returns in South Africa then a current dividend yield of 3% per year indicates an average real rate of

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[31]The popular financial press includes numerous tilts at this all-too-conspicuous and potentially fallible index. The fact remains that it is the best general price index that can be achieved within the practical limitations of economic and demographic research. For a recent well balanced discussion see *Farmer's Weekly* April 16 1993 11 (Havinga). The Department of Statistics provides numerous subindices focusing upon select areas of expenditure. The building trade has developed its own special index (the Haylett formula).

[32]1985 *Finance Week* 31.1.85-6.2.85 152 `While noting their reservations, economists generally seem fairly satisfied by the cpi's reliability. "It's the best indicator that's available and I have no hangups about using it," concludes Falkena'; see too Corbett & Buchanan vol 4 at lxiv.

[33]`The prices of *existing* assets will always adjust themselves to changes in expectation concerning the prospective value of money' Keynes `The General Theory' 142 .

[34]For the same reason, the index is not very sensitive to the weightings used for the different classes of expense (Osborn *Business Day* 10.9.91 8).

[35]See, for instance, Spandau 1975 *SALJ* 31; Fleming 1977 (26) *AJCL* 51.

[36]3,3% per year at April 1992.

[37]At 122.

[38]See analysis in table 10A at 122.

return over the next 15 to 20 years of 5% per year compound above the rate of inflation. A small reduction may need to be applied to allow for taxation.

[8.3.3] The yield index: An index is published daily in the South African financial press showing the average yields on an aggregated portfolio of fixed-interest stocks[39] issued by government[40] and other corporations. Yields are published for terms to redemption of 1 to 25 years. The index record commences at 1960. Prior to the introduction of this index the heavily traded stocks issued by Escom served as a substitute for a formal index. The significance of the index is that it gives some guidance as to prevailing investor expectations on long-term investment returns. If the South African investment market was efficient[41] then the long-term yield would be in equilibrium with other forms of investment, such as the stock exchange and the property market, and would give an accurate guide to expected minimum-risk returns for all classes of investment. One suspects that the South African market is by no means as efficient as the markets in London and Tokyo.[42] We may safely assume, however, that a reasonable degree of investor choice is reflected in the pricing of fixed-interest stocks[43] and that the yield index, although not accurate to the second decimal place, does provide a fair indication of minimum[44] long-term yield expectations by the market. It is certainly sufficiently accurate for the very approximate calculations required by the courts for assessing damages. The main problem is that the index gives a nominal rate of return and not a real rate of return. The expected level of future inflation implicit to the index is thus not immediately apparent. For tax reasons the purchasers of fixed-interest stocks are largely investors

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[39]A stock is a negotiable security which, in its most common form, promises to pay a fixed amount, the face value, at the end of the investment term, perhaps 20 years, with fixed interest payments every six months calculated on the face value. As market interest rates go up and down the price at which these securities are traded will fall below or rise above the face value. The yield to redemption, the internal rate of return, includes the value of the difference between price paid and redemption value. .

[40]Spandau 1975 *SALJ* 31 46 records that the prices of government stocks are artificially increased by reason of prescribed asset requirements, that is to say the yields are artificially reduced. This restriction on the investments of life insurers and pension funds was removed early in 1989. The yields on long-dated stocks then moved upwards by about ½% per year but ended the year on the same level as they began.

[41]That is to say that if all investors were well informed as to a wide variety of alternative investment opportunities and were able to switch their investments to take advantage of that information **then** the market prices for different investments would relate to one another in a rational manner. In practice all markets are inefficient to a greater of lesser degree and thus exhibit a certain degree of irrationality. It should be borne in mind, however, that even a fairly inefficient market will be substantially more efficient than a court of law.

[42]A market with poor information transfer, and associated pricing anomalies, provides numerous opportunities for bargains for perceptive investors. For a highly critical discussion of conventional views on market efficiency see Clarkson & Plymen `Improving the performance of equity portfolios' 1988 *JIA* 631 634-6 660-3.

[43]Kantor reproduced in Koch `Damages' 244-5 `All participants in financial markets have much to gain from estimating the inflation rate correctly. Therefore, the current market long-term interest rates implicitly reflect the consensus of financial opinion about the average rate of inflation expected over the next 20 years'. Keynes `The General Theory' 142 `The prices of *existing* assets will always adjust themselves to changes in expectation concerning the prospective value of money'.

[44]See paragraph 8.3.12.

who are not liable for tax on the interest receipts.[45] Thus for practical purposes the yield may be viewed as gross of taxation,[46] that is to say investors can be expected to arrange their affairs to minimise liability for taxation.

[8.3.4] Consumption of capital: The ballooning of investment funds[47] will for many years, if not indefinitely, ensure sufficient funds for living off dividends and rentals alone. After prolonged periods of time (20 to 40 years) it may become necessary to sell some investments. This may well be achieved by the opportune switching to investments which provide more income and less capital growth, such as property trusts and syndication schemes.[48] Immovable property cannot be sold in small quantities and will usually be retained either for rental income[49] or as owner accommodation. The notion that a plaintiff should consume interest and capital over his lifetime suggests that even the immovable properties must be sold in order to ensure total consumption of assets at the date expected for death at the time of the trial. This is unsound as an investment strategy. In the absence of injury or death many families will accumulate savings, usually in the form of a family home, but also through endowment policies, pension funds and other planned savings. The award of a capital lump sum has the result that these savings plans are fulfilled many years ahead of schedule. By paying cash for the home the family is relieved of bond repayments. The family car can be purchased for cash instead of on lease. Freedom from the burden of interest or lease charges are investment advantages which do not attract taxation.

[8.3.5] Expectations and outcomes: Reliance on the yield index does not imply that investment should be made in the assets measured by the index. Investment in fixed-interest stocks should, as a general rule, be avoided by compensated victims and dependants. Thus, for instance, a 25-year investment bought in 1975 would have guaranteed a yield of 9,5% per year compound.[50] A fair rate of return at the time of purchase but, with hindsight, hopelessly inadequate in relation to the average inflation rate of 13,9% per year which has prevailed since 1975.[51] This example

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[45]Pension funds are major investors who are not liable for tax on interest. Life offices do not pay tax on interest receipts associated with retirement annuity and immediate annuity business. Until recently non-residents were substantial investors in government stock. They paid a flat 15% withholding tax on the interest payments with the balance being remittable overseas, an attractive opportunity to withdraw substantial funds from South Africa.

[46]If all investors experience the same tax liability in relation to an investment then that liability will be reflected in the market value at which such investments are exchanged.

[47]See 101.

[48]Such schemes usually involve holding shares and loan accounts in a company which owns a substantial commercial or industrial property. These schemes give the small investor access to large-scale property investments.

[49]Property neglect in later years will have the short-term effect of increasing cash income whilst depreciating the underlying asset.

[50]Assuming consumption of income receipts or reinvestment at the original guaranteed rate.

[51]If income receipts had been invested at the higher returns that have since been obtainable this would have increased the overall yield above that notionally obtainable when the investment was purchased.

emphasises the risks attaching to seemingly safe fixed-interest investments. Only investments such as share market equities and immovable property have provided returns since 1975 in excess of the rate of inflation. 9,5% per year compound nonetheless was a fair nominal rate in 1975 **for discounting future losses**. This is what Pepper has in mind when he states that:

> `Economists tend to focus on the rate of interest at the start of a transaction, more precisely on the *expected* real rate of interest, ie on a nominal rate of interest less the expectation of inflation over the relevant term. The expected real rate of interest influences decisions to invest, eg to build a factory, and decisions to save. Actuaries are more interested in the *realised* rate of interest at the end of a transaction, ie the nominal rate of interest less actual inflation over the relevant period.'[52]

This passage states that the returns **expected** at present are one thing, but that the actual returns that will be achieved are something quite different. It also states that decisions to invest are based on present expectations and not eventual outcomes. In the next paragraph I discuss Keynes' concept of a `barometer' of investment levels.

[8.3.6] `Barometer' of prevailing investment conditions: A claimant who was compensated in 1975 was able to invest the money into a market where business was conducted on the basis that future long-term yields would be 9,5% per year. Hindsight tells us that there were ample opportunities to profit from the low level of yields in 1975. For instance had the claimant used the award to pay off the mortgage bond on his house he would have been spared the cost of subsequent increases in bond rates. The prices of share market equities and property were all very much lower in 1975 than they are today. The long-term yield of 9,5% per year in 1975 was not a prediction of what interest rates would be but a measure, **a `barometer'[53] of investment opportunities at the time that the award was made**. It was a fair and proper basis for comparing investments in 1975. The victim who claims damages is required to accept a single lump sum in lieu of contingent future earnings and expenses. He then has cash which he can invest into a market where investment opportunities are being traded in anticipation of future investment returns of 9,5% per year. It is submitted that if fairness is to be achieved the award that is made for damages should have regard to the state of the market at the time that the award is made. That lump-sum award, I have argued,[54] is the **price** that the wrongdoer pays as financial equivalent for what has been lost. The point I here seek to make is that it is a price of the same nature as the price that would be paid to purchase shares on the share market or immovable property or, if one wanted it, a long-term fixed-

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[52]1984 *TFA* 145 146. Collings 1982/83 *TASSA* 119 128-9 makes the same point when he states that `Sometimes it is hard to understand why we spend so much time trying to devise plausible alternatives to market value. After all it is as far as is possible objective (ie independent of the opinions and methods of the valuator) ... Personally I would hate to be accused of pretending to be wiser than the market'. See too Brown (presidential address) 1985/86 *TASSA* 604 605 `We have often observed the dangers resting in our mystique. Many clients see the financial importance of their pension fund. They are puzzled by the underlying actuarial valuation assumptions, which seem to have little bearing on the assumptions they would make in their business activities'. In *Brink v The MVA Fund* 1991 (C) (unreported 2.8.91 case 6038/89) the court rejected a 1% per year net capitalization rate on the grounds that it reflected life office conservatism.

[53]**Keynes `The General Theory' 151.**

[54]See chapters 2 to 6.

interest investment.[55]

[8.3.7] Dispute resolution amongst actuaries: In their normal activities life-office and pensions actuaries[56] are seldom concerned with the pricing of financial instruments with a view to immediate re-investment in the wider market. One notable exception in this regard is the pricing of immediate annuities,[57] and then only when the life office wishes to be competitive.[58] Having regard to the tendency of some actuaries to use artificial discount rates for financial management purposes,[59] it is notable that the professional guidelines for actuaries emphasise the need to have regard to market rates of interest when calculating the value to be placed upon transfer values[60] for the transfer of the savings[61] of a pension-fund member to another pension fund. This directive ensures that a common standard of value is applied when calculating the transfer values, despite different actuarial bases for the normal financial management of the various funds involved.[62] Pension funds generally invest part of their funds in growth investments such as share-market equities and immovable property. The yield to redemption on fixed interest investments thus also serves as a benchmark for the yields expected on other investments. The directive permits an actuary to deviate from the market rate if a future reinvestment risk[63] is perceived as being of material

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[55]`The considerations upon which expectations of prospective yields are based are partly existing facts which we can assume to be known more or less for certain, and partly future events which can only be forecasted with more or less confidence... our usual practice (is) to take the existing situation and to project it into the future, modified only to the extent that we have more or less definite reasons for expecting a change... The actual results of an investment over a long term of years very seldom agree with the initial expectation' Keynes `The General Theory' 147-52 (emphasis supplied).

[56]There are some actuaries who specialise in trading investments rather than the setting of insurance premiums and ensuring the solvency of the fund.

[57]See discussion of this topic at 117.

[58]For various reasons a number of life offices do not wish to compete for immediate annuity business.

[59]That is to say when setting premiums and testing the solvency of a fund. For this purpose the artificial rates are quite satisfactory.

[60]Faculty of Actuaries Members' Handbook paras 3.1 3.2 `One of the ways in which a market value assessment may be made is on the basis of market redemption yields on British Government Stocks of appropriate duration and type at the time of transfer with allowance for investment of future interest receipts as the actuary considers reasonable'. The point made by Pepper (see quotation at 135 above) is that here-and-now economic decisions assume that future interest receipts will be at the yield rate. The award of damages is a once-and-for-all here-and-now decision. The victim cannot come back later and ask for more money; the defendant cannot claim back surplus funds (see chapter on Contingency Funds at 106).

[61]I use the word `savings' here for the benefit of legally trained persons. Actuaries would not view these amounts as savings but rather the present value of the member's prospective rights to a pension and future lump sum payment.

[62]Dissolution of a pension fund on the insolvency of an employer may result in transfer values going to several different funds as the employees find employment at different places. In South Africa the law does not prohibit the payment of a transfer value directly to the member.

[63]Re-investment of interest receipts.

proportions. One suspects that such a discretion would only be exercised when discounting is being done over fairly short periods up to 10 years.

[8.3.8] Surrogate markets: If the damages assessment process were perceived as setting a fair price in exchange for what has been lost then we could describe the pricing of fixed-interest stocks, and the associated yields, as a `surrogate market'[64] which enables the court to establish a market related value, that is to say a fair value, for what has been lost. The yield index[65] commends itself for this purpose for a number of reasons: First and foremost it is readily ascertainable. Secondly it offers more than adequate accuracy for the fairly rough and ready requirements of a court.[66] Thirdly actuaries have close regard to this index when setting the prices at which they will issue immediate annuities.[67] The long-term yield in the surrogate fixed-interest market provides a common valuation parameter just as for business premises the rental per square meter is commonly used to compare the rents of premises of different sizes.

[8.3.9] Compensating errors: The long-term yield will include full allowance for prevailing investor perceptions of future fluctuations in interest rates. This allowance is by way of an add-on to the yield, the so-called liquidity premium.[68] The higher the yield the lower the market value. The risk of fluctuations thus gives rise to a reduction in market value. Judicial reasoning has been quite the reverse. Thus in one instance one finds a **reduction** in the discount rate of return to allow for the disutility of anticipated fluctuations.[69] This is an example of the general theorem that the present utility of an expected value subject to uncertainty is always less than or equal to the expected value as a certainty.[70] Similar considerations explain why the

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[64]Pearce `Cost-Benefit Analysis' 2ed 9-13 discusses the problem of estimating consumer willingness to pay when there is no market in the commodity whose value needs to be determined. A notional market price is then estimated by reference to a `surrogate market' with suitable parallel characteristics. See *Todd v Administrator, Transvaal* 1972 2 SA 874 (A) 885D for an example of judicial pricing by reference to a surrogate market.

[65]See 133.

[66]In practice the expected real rate of return is far more financially important. The survey of actuarial bases by Martens (1987 - see footnote 20) revealed gross discount rates ranging from 8,5% per year to 15,5% per year at a time when the long-term stock yield was ranging between 15% to 16% per year. With such wide divergences of actuarial opinion it is clear that errors in the yield index of ¼% to ½% are insignificant by comparison. A survey by my office at March 1987 of yields on increasing immediate annuities certain issued by 5 life offices revealed gross discount rates ranging from 16,6% per year to 17,4% per year (a repeat survey in 1991 revealed similar rates). This very much narrower range suggests that the life office actuaries had seriously applied their minds to the problem whereas the consulting actuaries had not. The annuities were to be contractually increased by 13,2% per year compound.

[67]See, for instance, Gratton `Immediate Annuity Business in Australia' 1985 (unpublished - at page 43 of the discussion paper)

[68]Pepper 1984 *TFA* 145 147.

[69]The minority judgment in *Sigournay v Gillbanks* 1960 2 SA 552 (A) 587F `It seems clear that the current rate of interest is not the proper rate for calculating the capital value of a future income over a long period. As was pointed out in the evidence, interest rates fluctuate'.

[70]'... the utility from a benefit that occurs with certainty is greater than the utility that comes from the expected value of a benefit... this is the same as inserting the expected value of the

allowance for general contingencies is almost always a deduction.[71] The reduction in the discount rate of return leads to an overstatement of the capital value. This is then, it seems, compensated by an over-deduction for general contingencies. An extreme example of this process is to be found in *Kotwane v UNSBIC*[72] where the court applied a contingency deduction of 60% to a capital value obtained by discounting at the very low rate of 5% per year against wage escalations of 12% per year.[73]

[8.3.10] Importance of nominal rate of return: In practice the expected real rate of return is of far greater financial importance than the yield on long-dated fixed-interest stocks. The expected long-term yield is nonetheless relevant: Firstly it provides a bench mark from which to measure the real rate of return. Secondly the expected long-term yield provides a paradigm which gives a clearer insight into how we discount future losses. Thirdly the expected long-term yield is the relevant net capitalization rate when the future cash flows do not increase to offset inflation, as with some home loan subsidies and some pension benefits. The expected long-term yield is also relevant in the determination of the net capitalization rate when increases in future payments will only partly offset the effects of inflation as with most pensions, particularly those provided by the Workmen's Compensation Commissioner.[74] An actuary who adopts a nominal discount rate below the market rate will usually[75] place too high a present value[76] on future payments which are expected to escalate at rates below the rate of inflation.

[8.3.11] Reliability of long-term fixed-interest yield index: Despite its rejection in *Sigournay v Gillbanks*[77] the current long-term yield has not been entirely disregarded.[78] The main objection to using a current rate is that a court might fall into the trap of using a nominal rate without a compensating adjustment for future inflation.[79] This would lead to too high a net capitalization rate with a consequent understatement of the capital value. That such fears are well founded is documented

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benefit and deducting the "cost of risk bearing"'Pearce `Cost-Benefit Analysis' 2ed 79. See 157 below.

[71]See 157.

[72]1982 4 SA 458 (O).

[73]The court had refused to allow actuarial evidence to be led.

[74]These are increased at about 40% of the rate of inflation (Koch 1987 *THRHR* 475 479).

[75]I say `usually' because some actuaries make special adjustments to compensate for their use of an unduly low nominal discount rate of return.

[76]Compared to other investments available at the time.

[77]1960 2 SA 552 (A) 567 587.

[78]Fabian has stated that: `The most important area is that of interest and inflation. The author fixes the interest rate as the long-term rate on Escom stock and he chooses the CPI for inflation. I have no argument with either of those' Koch 1982/83 *TASSA* 78 104.

[79]*Andrews v Grand & Toy Alta Ltd* (1978) 83 DLR (3d) 452 (SCC) 471-2 `One thing is abundantly clear: present rates should not be used with no allowance for future inflation. To do so would be patently unfair to the plaintiff. It is not, however, the level of inflation in the short term for which allowance must be made but that predicted over the long term. It is this expectation which is built into present interest rates for long-term investments'.

by the Australian experience.[80] An objection which has been raised against using the current long-term yield is the observation that future interest rates will fluctuate.[81] This objection is, however, without foundation because the market rate includes the market's allowance for the prospect of fluctuations. The tendency of the courts is to reduce the discount rate of return for the prospect of fluctuations. The market's allowance for fluctuations will be to add a margin for risk, that is to say to increase the rate of return. The overall effect is that the one adjustment tends to cancel out the other.

[8.3.12] Mixed investment portfolio: Having thus far concentrated on the long-term stock yield it is as well to recall that what is really required is a guide to the general level of expected future returns on a mixed portfolio comprising a variety of investments (including immovable property and stock exchange equities). Fixed-interest stocks are perceived[82] to have a low risk profile. For this reason the associated yields will generally be lower than for other forms of investment. It follows that the yield index may be viewed as a guide to a **minimum** expected level of return for a mixed portfolio. Tax liability depends on the mix of investments selected for the portfolio. Fixed-interest investments are generally heavily taxed and will thus be avoided by most portfolio managers except for the temporary harbouring of surplus funds. Small amounts of interest are tax free.[83] The capital growth on equities is tax free provided one does not buy and sell so actively as to qualify as a `trader' for tax purposes. Immovable property is subject to tax only on net rental after deduction of expenses, and provides tax-free accommodation for an owner-occupier.[84] The value of immovable property, can be expected to increase more or less in line with inflation.[85] Rentals on residential property are expected to be about 6% to 8% on value before deduction of property taxes and maintenance costs.[86] Such rental statistics as are available indicate increases about 1,5% per year below the rate

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[80]Luntz `Damages' 2ed 319 `Murphy J drew attention to the injustice to plaintiffs that was being perpetrated by ignoring future wage increases while discounting at comparatively high rates of interest'. The problem was subsequently removed by the ruling in *Todorovic v Waller* (1981) 37 ALR 481 (HC) that a rate of 3% per year compound be used in all instances.

[81]*Sigournay v Gillbanks* 1960 2 SA 552 (A) 587F; Cooper-Stephenson & Saunders `Damages in Canada' 264.

[82]The risk of default is very low but the risk of fluctuations in value is high. Many investors perceive risk in terms of preservation of nominal capital rather than preservation of real capital. This leads to overrating the security of fixed-interest investments. For long dated fixed-interest stocks the risk of fluctuations will often lead to a reduction in the market price of the stock, and thus in a higher yield, ie internal rate of return.

[83]R2000 for 1992/93 tax year per ss10(1)(i)(xv) and (xvi) of Income Tax Act 58 of 1962 (as amended).

[84]This reflects the consideration that persons with capital, unlike wage earners, are in a good position to take advantage of tax shelters (*Beach v Reed Corrugated Cases* [1956] 1 WLR 807; McGregor `Damages' 14ed 322).

[85]*TRENDS* 3 1991 30 gives an index for house prices which indicates that over a 10-year period to 1990 prices have kept pace with the rate of inflation. Houses bought 15 years ago have fallen behind inflation by 1% per year.

[86]Squire `SA property & the valuer' 29-33.

of inflation.[87] Considering the low level of the rentals revealed by the survey[88] the low rate of increase may well reflect subsidised housing for persons of low income. One suspects that a survey of the rentals paid for higher priced residential properties, and business premises, would reveal rentals that increase, with leads and lags, in line with inflation. Social-welfare housing is not a recommended avenue for private investment.

[8.3.13] Fixed-interest investment involves high risks: Under conditions of high inflation fixed-interest deposits of short to medium term assume a very high risk profile indeed. This will in many cases be higher than that attaching to good immovable property and share market equities. The explanation for this is as follows: When interest rates are low, say 4% per year, the ratio of total interest receipts over 25 years to capital invested is roughly 1 to 1. When interest rates are at 16% per year the ratio rises to 4 to 1.[89] Although the original nominal capital may be guaranteed, the rate of interest, the major portion of the investment, is not guaranteed. If the interest rate is guaranteed, as with long-dated stocks, then the interest risk is replaced with fluctuating values for the original capital invested.[90] As has been discussed above large fixed-interest deposits are subject to the additional risk of heavy taxation compared to share market equities and immovable property.

[8.4] QUANTIFYING THE REAL RATE OF RETURN

[8.4.1] Estimates: If the yield index shows 16% per year for 25 year stocks and the dividend yield is 3,2% this suggests[91] that inflation is expected to average roughly 12,4% per year in the long term.[92] Traditionally fixed-interest investments have been viewed as having a lower risk profile than equities and immovable property. This conventional wisdom would give rise to a lower expected real rate of return for fixed-interest investments. One might guess this real return for this class of investments to be somewhere between 1% per year and 2,5% per year implying expected future inflation of between 13% and 15% per year. This expectation was appropriate in 1992. In 1993 the long-term yield index for fixed-interest stocks had dropped to 15% per year. Expected future inflation is thus 12% to 14% per year. There is an undemonstrable suspicion that in South Africa the pricing of long-term fixed-interest stocks is based on investor expectations of a real rate of return of about 2,5% per year.

[8.4.2] Anomalous investor preferences: During times of high inflation real long-term

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[87]CSS News Release of 10.4.90 indicates that flat rentals have increased over the 10 years 1979 to 1989 by 1,5% per year below the rate of inflation.

[88]CSS News Release of 10.4.90 indicates, for example, R358 per month in 1989 for a 3-bedroom unfurnished flat, that is about R540 per month in 1992 if escalated in line with inflation.

[89]And would be higher still if allowance were made for compounding.

[90]See 136 for a discussion of the effect of inflation persistently exceeding the guaranteed rate of interest.

[91]This is no more than a superficial impression. The analysis of share equity returns in table 10A at 122 suggests that expected returns on this type of investment are about 2% per year higher than the dividend yield, ie 5,2% per year (3,2%+2%).

[92]Using the ratio formula (see 99).

rates of interest are generally lower than during times of low inflation.[93] This is an odd phenomenon because inflation increases the risk attaching to the investment, and one would expect investors to demand a higher real rate of interest during times of high inflation. The explanation is probably that with the higher interest rates, and associated greater volatility, there is less demand, relative to the money supply, for borrowings with a consequent weakening of the lender's negotiating strength. The fact that many investors in fixed deposits continue to accept the lower real rate of return suggest substantial investor conservatism, a preference to stay with poor returns on a familiar form of investment.[94] It has been noted that investors tend to be either too conservative or too reckless.[95] The middle-path investments which offer the best returns relative to the risks involved are generally considered too risky by risk-averse people and too dull for entrepreneurs.

At a technical level one may note that there is a difference between the apparent real rate of return and the true effective real rate of return, and that the true real rate of return reduces as the rate of inflation increases. Suppose, for example, that an investor seeks an apparent real rate of return of 2,5% per year above the rate of inflation. If inflation is 5% per year then he will ask for a return of 7,5% per year. His true effective real rate of return is then 2,4% per year.[96] If, however, inflation rises to 15% per year then he will look for a return of 17,5% per year. His true effective real rate of return will then have dropped to 2,2% per year[97] by reason of the increased rate of inflation. The observed fact that the real rate of return reduces with increasing rates of inflation may be cited as evidence that the market focuses on the apparent real rate of return and not on the true effective rate.

[8.4.3] Measurement of liquidity premium: Analysis of historical real rates of return has generally been by way of a comparison between the long-term yield and the current rate of inflation.[98] This seems *prima facie* to be unsound procedure in that it involves a comparison between `apples and pears'. The procedure is sound, however, because it involves two stages rolled into one: Firstly a comparison between the current rate of inflation and short-term interest rates, usually 3 months or less; secondly, an analysis of the interest premium for long terms, that is the additional yield required by investors for the greater risks attaching to the extended period of

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[93]Kantor as published in Koch `Damages' 244 245. See too the graphs in Pepper 1984 *TFA* 145 148 151. Pepper 146-50 qualifies his forecast of real rates of 3,25% to 3,5% per year with the assumption that `there will not be a continuing rise in the rate of inflation, ie that the UK will not become a banana republic'.

[94]Newdigate & Honey `MVA Handbook' 168 maintain that `the plaintiff could only be asked to place his capital in a safe and steady investment, which would normally produce a lower rate of interest than would an investment with more risk attached to it'. This echoes the now dated criterion of `unassailable security over a long period'; *Sigournay v Gillbanks* 1960 2 SA 552 (A) 567G. Anderson `Actuarial Evidence' 28 notes that a preference for bank deposits can lead to a loss of investment returns equal to a loss of half the capital.

[95]Friedman & Savage 1948 *JPE* 279 280 284.

[96]$1{,}075 \div 1{,}05 = 1{,}024$.

[97]$1{,}175 \div 1{,}15 = 1{,}022$.

[98]Kantor as published in Koch `Damages' 244 245; Gibson 1978 8 *MLJ* 637 650-1; Anderson `Actuarial Evidence' 30; *Todorovic v Waller* (1981) 37 *ALR* 481 (HC) 512-13.

exposure to risk.[99]

[8.4.4] Results of studies: Examination of interest and inflation rates in the United Kingdom over the period 1824 to 1983 has led Pepper to expect a real rate of return in the long term of 3,25% to 3,5% per year before tax on fixed interest investments.[100] The period examined includes a number of major wars, the great depression, and the rise of communism. Kantor[101] after comparing historical yields on Government long-term stock with the associated rates of inflation expresses the opinion that South African real rates will average between 1% and 3% per year over periods of 15 to 20 years. Yields on long-dated Escom stock have averaged 0,7%% per year more than Government stock over the years 1960 to 1991.[102] The yield guaranteed on `increasing annuities certain' sold by life offices in South Africa has exceeded the Escom yield by about 1% per year.[103]

The above analyses have all focused on fixed interest investments and have no regard to the effect of income tax. These considerations do not invalidate the analyses if one accepts that the returns on fixed interest investments provide only indirect evidence of the investment returns available generally on a very much wider range of investments, that is to say serve as an index of investment conditions. As I have already noted fixed-interest investments per se are only attractive to persons who incur little or no tax liability, such as pension funds, banks and investors of relatively small sums of money.

It has been said that the real rate of return proposed by actuaries for assessing compensation matters has been decreased over the last 30 years `from 5 per cent to 4 per cent to 3 per cent and now, the majority, to 2,5 per cent'.[104] This trend, it has been argued, suggests that further decreases may be prognosticated for the future. There is little doubt that actuarial credibility as experts on the real rate of return is called into question by this trend. In fairness to actuaries, however, it should be borne in mind that the higher rates of 5% and 4% per year were nominal rates before allowance for future inflation.[105] Economic theory suggests that if there is to be any motivation to save then the **expected** real rate of return must be greater than zero by a sufficient amount to make saving attractive as compared to immediate consumption

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[99]Pepper 1984 *TFA* 145 147 `My preferred approach is, first, to examine the history of *short*-term real rates and, secondly, to investigate the liquidity premium, ie the difference between short- and long-term *nominal* interest rates'.

[100]Pepper 1984 *TFA* 145 150.

[101]Published in Koch `Damages' 244 245.

[102]See table 10B at 123.

[103]Based on a survey by my office conducted in March 1987. Replies were received from 5 life offices to a request for the price to issue a contract for R500 per month increasing at 13,2% for a fixed period of 25 years. The Escom yield at March 1987 was 15,7% per year compared to a 17,0% per year average yield for the annuities certain. A repeat survey in 1991 yielded similar results.

[104]*Dusterwald v Santam Insurance* 1990 4 C&B A3-45 (C) 62 (per actuary Munro).

[105]In other words they were nominal rather than real rates. Until the ruling in *Bailey v Southern Insurance Assn* 1984 1 SA 98 (A) it was still arguable in court that allowance for future inflation was speculative and thus to be ignored. Rulings such as *New India Assurance v Naidoo* 1950 (A) (unreported 19.5.50) allowed for future wage escalation but would seem to have been ignored in the debate, possibly due to non-publication.

of the capital. Low investor confidence for the future, such as prevailed in South Africa in 1992 and 1993, will generally give rise to reduced asset values, that is to say good long-term investment opportunities. Economically difficult periods such as the great depression have historically not lasted for extremely long periods compared to the 20 to 50 years generally required for damages calculations in respect of personal injury and death.[106]

One would also like to think that consistency between different awards is an important consideration.[107] General consensus as to the real rate of return is essential to achieving such consistency. If one accepts the view proposed in this thesis that an award for damages is no more than a fair price for what has been lost, that is to say the lump-sum award is not the means by which to replace the lost income but merely a substitute for it, then it becomes evident that actual investment returns are not as important as the discount for delay that claimants' are prepared to accept now for immediate payment in lieu of the uncertain prospect of some future financial accrual or expense.

[8.4.5] 2,5% per year real return: The above considerations suggest that the expected real rate of return net after tax on a mixed portfolio substantially exceeds 1% per year and may well be as high as 4,5% per year. A middle path view would thus be about 2,5% per year.[108] This presumes that the investor seeks professional advice from a reputable organisation. For larger sums the money to be invested might be split equally between two and possibly more investment managers with a view to making performance comparisons. Extended investment in fixed-interest stocks or deposits will generally be avoided. For small sums of money[109] immediate life annuities with increasing instalments provide an attractive investment medium.[110] Every effort should be made to avoid investment in the Guardian's Fund.[111] By far the greatest investment risk faced by a compensated victim is the choice of a suitable investment advisor.[112]

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[106]For a man aged 40 the standard actuarial calculation will be taken to age 99, that is to say over a period of 59 years. The expected age at death would be about 65, that is to say some 25 years in the future. When analysing investments periods of 20 years or more in the future would generally be classed as being of very long term.

[107]In *Dusterwald v Santam Insurance* 1990 4 C&B A3-45 (C) 63 the court dismissed as irrelevant the general consensus of the majority of actuaries and the fact that their opinion had remained unchallenged. This was effectively a rejection of the normal basis used to assess damages.

[108]In *Dusterwald v Santam Insurance* 1990 4 C&B A3-45 (C) 60-4 the court took an average view of future investment returns and found in favour of 1% per year.

[109]Typically awards to dependent children.

[110]These are subject to the favourable tax provisions of s10A of Income Tax Act 58 of 1962. As a rule funds are invested in one of the so-called `10x10 plans' which combine an immediate annuity with an endowment policy having a 10-year term to maturity.

[111]The average return on investments in the Guardian's Fund over the period 1960 to 1992 (see table 10B at 123) was 8,1% per year compared to participation mortgage bonds at 11,6% per year and inflation at 9,5% per year. See Anderson `Actuarial Evidence' 28 concerning the dangers of so-called `safe investments'.

[112]See, for instance, the article `I relied on professional advice' published in *Finance Week* 19.12.85 790 and 27.2.86 413-16. For more recent instances in South Africa see *S v Vermaas* (T) *sub iudice* 1991 to 1993 and the Masterbond debâcle. The Financial Services Act 1986 in England requires that investment managers

The MMF capitalizes claims by discounting at 4% per year. This is done, however, without separate and explicit allowance for mortality as is done by actuaries.[113] The higher net capitalization rate includes the additional discount needed to allow for early death and thus tends to reproduce the results of actuaries fairly well.

The English net multipliers are based on a fairly high net capitalization rate of 4,5% per year. This does not seem to include allowance for the risk of early death but does seem to include allowance for the discount for general contingencies.[114]

[8.4.6] Prescribed real rate of return: There has been increasing disagreement in South Africa as to an appropriate real rate of return for discounting damages awards.[115] If there is to be conformity between awards, and the principle of distributive justice applied, then much the same rate should be used for assessing all claims. Determination of the real rate of return by reference to the evidence[116] is to be condemned if it opens the door to wildly differing assessments.[117] Persistent substantial divergences require the introduction of a prescribed real rate of return,[118] ideally by amendment to the Uniform Rules of Court.[119] One might argue that the rate should be introduced by statute. However, if one bears in mind that the laid down rate is a procedural formalism[120] rather than a rule of law then resort to statute does seem to be unnecessary.

[8.5] NET CAPITALIZATION RATES

[8.5.1] Real increases in earnings: The standard net capitalization rate laid down for British Colombia in Canada includes allowance for real increases in earnings of 1%

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be registered with an approved financial body.

[113]See 129.

[114]See, for instance, the discussion of net multipliers in *Mallett v McMonagle* [1969] 2 All ER 178 (HL) 191. See too table 11 at 161.

[115]See paragraph 8.2.2.

[116]The South African courts have on the whole avoided the excesses that led the Australian High Court to lay down a fixed net capitalization rate of 3% per year compound (*Todorovic v Waller* (1981) 37 ALR 481 (HC)). Many Australian courts had failed to distinguish between a net capitalization rate and the nominal discount rate. An excessive proportion of court time had been devoted to extensive inconclusive evidence as to investment returns, inflation rates and taxation.

[117]In *Kotwane v UNSBIC* 1982 4 SA 458 (O) 466-7 the court allowed for wage escalation at 12% per year coupled with a discount rate of interest of 5% per year, a so-called negative net capitalization rate. A return in excess of 13% per year could have been obtained by investment in an immediate annuity with a life office. The low rates ordered in a series of Cape judgments of 1% to 1,5% per year (see footnote 19) are modest in comparison.

[118]Anderson `Actuarial Evidence' 12 records laid down net capitalization rates in Canada of 2,5% per year for Ontario and Nova Scotia with 2% per year for British Colombia (the latter includes allowance for real increase in earnings at 1% per year above the rate of inflation). 3% per year has been laid down for Australia in *Todorovic v Waller* (1981) 37 ALR 481 (HC). A similar result has been achieved in England by *Mallett v McMonagle* [1969] 2 All ER 178 (HL) 190 which held that the multipliers should be assessed without express allowance for inflation. The effect of this ruling is to lay down a net capitalization rate of about 4,5% per year, that being the rate implicit to the English multipliers.

[119]Anderson `Actuarial Evidence' 12 records that the rate for Ontario is laid down in terms of the Supreme Court Rules of Practice.

[120]See 34.

per year compound above the rate of inflation.[121] This reflects the general tendency in the past[122] for wages in the Western World to increase in real terms.[123] South Africa has special features compared to the highly industrialized and homogeneous populations of North America and Europe. Real growth in gross national product needs to exceed 3% per year in South Africa merely to ensure adequate job creation. Much of the growth in Western earnings has stemmed from labour saving technology, particularly computers. In South Africa a major trend is to `narrow the wage gap' between whites and non-whites. Average real earnings for whites in South Africa have barely increased between 1975 and 1990,[124] whilst blacks have had real increases of 2,7% per year compound over the same period.[125] The very high levels of unemployment in South Africa are bound in time to weaken the negotiating strength of employees and it seems unlikely that the substantial real increases of the past will be maintained in the future. At the same time one may postulate the decline of real earnings for whites.[126] Older workers tend to be better paid than younger ones performing the same task.[127]

[8.5.2] Medical inflation: It is frequently necessary to capitalize expected future expenses by way of medical treatment or prostheses and related equipment. In some instances judges have dispensed with discounting altogether and merely multiplied the expense by the period over which it is expected to be incurred.[128] This practice led to speculation that there was a rule of law that future expenses should be treated

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[121]See footnote 118.

[122]Indications are that these real rates of increase in earnings will not be repeated in the future to the same extent.

[123]Cooper-Stephenson & Saunders `Damages in Canada' 157 record real increases in earnings of 2,72% per year compound since the beginning of the century with 3,3% per year after World War II until 1975. Anderson `Actuarial Evidence' 30 records more modest increases of 1,8% per year for the years 1958 to 1982 with -0,6% for the years 1978 to 1982. Atiyah `Accidents Compensation & the Law' 3ed 208 records that average earnings in the United Kingdom increased by almost a factor of 10 between 1948 and 1977 compared to a price escalation factor of about 5.

[124]*TRENDS* 3 1991 86.

[125]TRENDS 3 1991 86. De Bruijn has stated that this real rate of increase includes allowance for promotions which are normally assessed separately in a damages calculation (Koch (1982/83) *TASSA* 78 109). Anderson `Actuarial Evidence' 31 states that `The wage and salary index is based on national averages and, therefore, does not reflect increases resulting from individual seniority, merit and promotion'. Anderson's view would be correct if the proportion of managers to workers was fixed throughout the period of observation. A black wage index would undoubtedly be greatly effected by the promotion of large numbers of blacks to management and other skilled posts such as nursing and teaching.

[126]In *Dusterwald v Santam Insurance* 1990 4 C&B A3-45 (C) 60 68 the court allowed for future salary increases in line with inflation every second year with only one third of inflation for intervening years, an effective investment differential of 4,5% per year average. In *Brunt v AA Mutual Insurance* 1990 (W) (unreported 26.2.90 case no 19198/87) the court ordered a discount rate of return of 15,5% per year coupled with salary escalation of 10,96% per year, an investment differential of 4,1% per year.

[127]Kantor & Rees `SA Economic Issues' 47. That is to say for persons who are not promoted and thus remain in the same job grade.

[128]See, for example, *Stockenström v Commercial Union Assurance* 1974 2 C&B 435 (C) 436; *Erdmann v Santam Insurance* 1985 3 SA 402 (C) 404G. Newdigate & Honey `The MVA Handbook' 158 express the opinion, in consultation with an actuary, that medical expenses will increase faster than inflation and should thus be discounted using a marginally lower net capitalization rate of 2% per year.

in this manner. This speculation has been laid to rest by an appellate division ruling[129] that the rate determined by actuarial evidence should apply. Past medical inflation has averaged below the rate of inflation in the long term but has exceeded the rate of inflation in the short term.[130] The earnings of medical practitioners have not generally kept pace with inflation[131] but have increased well above the rate of inflation over short periods.[132] These trends illustrate the point that care should be exercised with the interpretation of a substantial short-term increase in prices which may be no more than a temporary phenomenon. Allowance for the costs of future equipment and prostheses may justify an allowance for increases in excess of inflation if the goods are likely to be imported for long periods in the future.[133] Modern technology has, for instance, increased the costs of motor cars due to the addition of enhanced features.[134] Much of the related price increases have, however, contributed to the increase in the rate of inflation. In other words the rate of inflation as measured by the consumer price index includes a substantial component representing an improved standard of living and quality of goods rather than pure depreciation in currency values. The rate of inflation is also increased by high prices for expensive imported goods, usually technically advanced. Technology, on the other hand, has also greatly reduced the cost of devices such as radios and computers. In some instances price reductions will be achieved by local manufacture.[135] Persistent price rises above the rate of inflation are likely to bring about substitution as buyers seek cheaper alternatives or change their lifestyles by doing without.[136] Alternatively the rate of inflation will increase to accommodate the higher price levels. Over and above this consideration claimants who have been compensated by

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[129] *Ngubane v SATS* 1991 1 SA 756 (A) 769H 781E.

[130] The medical component of the consumer price index increased by an average 16,5% per year over the 10 years 1981 to 1991. The overall index increased by a comparable 14,6% per year. This indicates average medical price escalation of 1,7% per year compound in excess of the rate of inflation. However over the longer period 1970 to 1991 medical inflation was 12,2% per year compared to the overall index at 12,6% per year. Thus over the longer term medical inflation has been marginally below the rate of inflation.

[131] The earnings of self-employed medical practitioners have increased by an average 11,8% per year compound over the period 1973 to 1990 with inflation averaging a comparable 13,7% py over the same period, that is 1,7% py below the rate of inflation. The earnings of self-employed surgeons have, however, increased by a higher 12,6% py which is only 1% py below the rate of inflation (`The Income of Male Graduates' HSRC reports for 1984 1987 1990).

[132] For self-employed general practitioners the rate of increase in earnings has been 2,4% py above the rate of inflation for the period 1987 to 1990. For self-employed surgeons the rate has been 1,4% py above.

[133] Over the 20 years 1970 to 1990 the Consumer Price Index escalated by an average 12,6% per year compound. Over the same period the combined effect of currency depreciation and foreign inflation gave rise to effective import price escalation of 13,3% py for United States of America, 15,6% py for United Kingdom and 15,3% per year for Federal Republic of Germany. This reflects real increases of 0,6% py, 2,6% py and 2,3% py respectively (*TRENDS* September 1991).

[134] See, however, paragraph 12.15.1 and the associated adjustment to the award of general damages.

[135] A locally manufactured stand-up wheelchair is less than half the cost of an imported one.

[136] *Dusterwald v Santam Insurance* 1990 4 C&B A3-45 (C) 75-6.

lump sum will be spending their own money and may be expected to optimize cost relative to effectiveness of goods or services purchased.

In suitable circumstances medical and prosthetic expenditure may be deducted from taxable income.[137] Allowance for this advantage may be by way of a deduction for general contingencies or by way of an increase to the net capitalization rate.

[8.5.3] Reducing rates of inflation: The reports of many actuaries state a rate of inflation that reduces each year for 3 to 5 years after the date to which discounting is done. This is not, as one would suppose, in anticipation of lower inflation rates in future. Discussions with such actuaries reveals that the assumed declining rate of inflation is intended to adjust for the phenomenon under stable investment conditions whereby short-term rates are lower than long-term rates.[138] For this reason the actuary seeks to use a lower net capitalization rate for the cost of items in the near future than in the more distant future. The approach is acceptable in principle but would be less confusing if it were achieved by using a discount rate of return that increased rather than an inflation rate that reduced. The approach may also be criticized on the ground that South African investment conditions have in recent years inverted the normal state of affairs with short-term rates higher than long-term rates.[139] On no occasion observed by my office[140] has the actuarial inflation/interest assumption been adjusted on this account. It would be preferable if actuaries did not reduce their rate of inflation but used instead a suitable flat average rate.[141]

[8.6] CONCLUSIONS

Although it is usual to speak of the `discount rate of interest' it needs to be borne in mind that this is a reference to the expected investment rate of return obtainable on a wide variety of possible investments including shares and immovable property. Fixed interest investments are but one of the investment options. The discount for interest is best explained as the reduction to the present utility of a payment by reason of its being deferred in time. There is no evidence which can conclusively decide the choice of a discount rate. In order to ensure consistency in awards it is desirable that the real rate of return to be used for discounting damages claims be prescribed by the authorities at a level of about 2,5% per year compound. Medical expenses and the costs of assistative devices can be expected to increase in the long term in line with inflation.

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[137]See footnote 118 at 231.

[138]What is known technically as the normal yield curve.

[139]A phenomenon described by analysts as an inverted yield curve.

[140]Over a period of 15 years embracing several thousand actuarial reports.

[141]This view is not altered by the reduction in inflation in late 1992 because expected long-term investment returns reduced together with the rate of inflation.