The Risk Free Rate and the Present Value Principle

Alan Gregory[1]
Professor of Corporate Finance, Xfi Centre, University of Exeter

Contact details:

e-mail: a.gregory@ex.ac.uk

Telephone: +44 776 700 6730

[1] Note that the views expressed in this report are entirely my own and should in no way be taken to reflect those of the Xfi Centre, University of Exeter.

The Risk Free Rate and the Present Value Principle: Expert Report by Professor Alan Gregory

Terms of Reference

1. I have been asked to prepare an expert report which considers the following issues arising from the AER's recent decision in the Roma to Brisbane Pipeline Final Decision and the Draft Decisions for the Gas Distributors and APA GasNet:

    (a) The AER in its Draft Decisions for the Distributors and APA GasNet relies upon a report from Associate Professor Martin Lally titled *"The risk free rate and present value* principle" dated 22 August 2012. In this report Lally comments on the "present value principle" and expresses an opinion that adopting a risk free rate which is estimated on anything other than the most recently available data violates this principle.

    (b) Given the approach of UK regulators as outlined in your earlier report for the Distributors and APA GasNet, please comment on the analysis undertaken by Associate Professor Lally and whether in your opinion the present value principle prohibits the use of a long run average as a proxy for the risk free rate.

    (c) In addition, please take note of page 8 of an earlier Lally report dated 25th July 2012 and titled *"The cost of equity and the market risk premium"*. In that report at page 8, criticism is made of the Smithers & Co report. Please provide your response to the criticisms made of that report by Lally. Please explain whether any of the matters raised by Lally affects your earlier conclusions.

A Brief Summary of Associate Professor Martin Lally's Position

2. Associate Professor Martin Lally's view is that only the risk free rate current at the time of any regulatory decision satisfies the present value principle (PVP) and in doing so is consistent with the building block model, the cost recovery model and the Sharpe-Linter Capital Asset Pricing Model (CAPM), and that any use of a long run average risk free rate will not be consistent with such a principle.

3. If the regulatory period is greater than one year, then he concludes that the relevant risk free rate should be one with a bond that has the same duration as the regulatory cash flows. He concludes that a very close approximation is achieved by using the yield to maturity on a risk free bond with a term to maturity that matches the regulatory period.

A Critique of Associate Professor Martin Lally's Position

4. It is important to realise that the first thirteen pages of Lally's paper are concerned with establishing the position when regulatory rates of return are set at the beginning of each *single year* period. This is not, of course, the way in which the Australian regulatory model works in general, and in particular it is not consistent with the way returns are set for the Gas Businesses, where the allowed rate of return is set at the beginning of a five year period and held at that level until the next review.

5. Only at 3.2 does Lally start to tackle the problems that occur when regulators set a single cost of capital for a multi-year regulatory period at the start of that period. Unfortunately, the entire first thirteen pages are then rendered irrelevant to his analysis, and he fails to consider the complexities that are inevitably introduced when moving from a single year setting to a multi-year one.

6. In the first place, although it is not made explicit, Lally's argument from 3.2 on implicitly relies on something called the "expectations hypothesis", with the assumption that any risk premium is zero.

7. The expectations hypothesis states that the yield on a long government bond is equal to the average expectation of the yields on short government bonds over the life of that bond. If investors are risk averse, then in general they will require a risk premium for holding a long horizon bond. More precisely, the expected *n*-period return on an investment in a series of single-period bonds should be equal to the (certain) *n*-period return (or yield to maturity, $Y_{n,t}$) on an *n*-period bond. In the case of risk averse investors, the relationship can be stated (in log form) as:

$$y_{n,t} = \frac{1}{n}\sum_{i=0}^{n-1} E\left(y_{1,t+i}\right) + \phi_n$$

Where $y_{n,t} = \ln\left(1 + Y_{n,t}\right)$, ϕ_n is the risk premium and $E_t(.)$ is the expectation at time *t*..

8. The expectations hypothesis is a standard part of finance theory. Unfortunately, it has also given rise to one of the important puzzles in empirical finance, as despite its theoretical appeal, it has not held historically (Fama and Bliss, 1987; Campbell and Shiller, 1991; Cochrane and Piazzesi, 2005), although new work (Bulkley et al, 2011) suggests that the US evidence for rejecting the expectations hypothesis is considerably weaker in recent time periods.

9. The implication of this empirical evidence is that we may not be able to rely on the current yield on a risk free bond being an unbiased expectation of the series of future risk free rates, which is a central assumption in the analysis made from Section 3.2 on in Lally's paper. So even if regulatory cash flows were risk free and durations of those cash flows exactly matched the duration of the bond, the empirical evidence would cast doubt on whether taking a short window estimate of the risk free rate is anything like as robust as Lally's report implies.

10. I note that at other points in his evidence to the AER, Lally is quite prepared to accept that market efficiency may not hold. For example, in the SPAusNet case, at Appendix B page 37 he is quoted, in the context of the dividend growth model being used to derive an estimate of the MRP, as saying: "The method assumes the current value of the market matches the present value of future dividends. If the current value of the market is below the present value of future dividends, then the resulting estimate of the market risk premium will be too high.". I would not disagree with this statement, but if his position is that he believes current market values may not be wholly reliable in the equity market, then he must acknowledge that this can also be the case in the bond markets. Such a position would certainly be consistent with the empirical evidence on the expectations hypothesis.

11. A further problem with Lally's analysis is that it completely ignores the impact of inflation. In contrast to the UK's procedure, the AER uses a nominal Government bond rate and establishes allowable revenues in nominal terms, so that expected revenues rise over the regulatory period, after allowing for any price changes embedded in the regulatory review (see, for example, SPAusNet Figure 3.1). Lally's analysis simply assumes inflation is zero. The effect is that even if the *real* regulatory cash flows are constant, the duration on regulatory cash flows will always be longer than the duration of the equivalent life nominal bond, as bonds pay a constant coupon irrespective of the rate of inflation.[2] The consequence is that if yield curves are upward sloping, as Lally acknowledges is generally the case, then the allowed rate of return will be systematically too low, *even if the expectations hypothesis held and even if all regulatory cash flows were entirely risk free*. In this respect, his analysis does not pass even the most basic scrutiny.

12. However, regulatory cash flows are not risk free, and so we need to risk-adjust any discount rate using an asset pricing model. In the context of Australian and UK regulation, the CAPM is generally the preferred model. As is well known, there are a number of empirical problems with the CAPM, and its use in a capital budgeting context also involves some simplifying assumptions. Strictly speaking, the CAPM is a single period model. Extending its use to a multi-period setting either involves the formal extension of the CAPM along the lines of the Merton (1973) model, or making some further restrictive assumptions. These assumptions are discussed in detail in, for example, Copeland and Weston (1988, pp 402-411), but if we are to retain the simple solution that it is valid to discount each period's cash flows at a constant risk-adjusted rate, which is effectively what is being done in normal regulatory practice, then, *inter alia*, we must also assume that the risk free rate and the risk adjusted rate are constant through time, a result originally due to Fama (1977).

13. Unfortunately, Lally quite specifically rules out a constant risk free rate and a constant risk adjusted rate in his assumptions and his examples. He assumes that the risk free rate changes each period, and since, elsewhere, he has argued for the use of a *constant* market risk premium (MRP), the implication is that the appropriate discount rate varies each period in line with changes in the underlying risk free rate. Whilst one can accommodate such changes, the result is either to introduce computational complexities that Constantinides (1980) describes as being "of little practical use" or requires a solution that takes into account additional covariation factors (Bogue and Roll, 1974), or puts additional restrictions on the evolution of the cash flows, the covariance of those cash flows through time, and an assumption of non-stochastic risk free rates and market risk premia (Fama, 1977 pp 19-20). Reduced to basics, the true position is far more complex than Lally suggests, to the point where his conclusions are invalid. To quote from Fama (1977, p.22) "If the [CAPM] model is to be useful for real decisions, the world probably must resemble the scenario that gives rise to a single cost-of-capital for investment projects of a given type."

14. Indeed, the only way that one could "prove" that the use of an *n*-year CGS yield (where *n* is the length of the regulatory period) is the only rate consistent with the PVP is under the following strict conditions: all regulatory cash flows are known and certain; these regulatory cash flows are level and constant (implying, *inter alia*, that there is zero inflation and any new

[2] Note that in contrast to the Australian position, the UK regulatory process for the gas, electricity and water industries uses an "RPI-X" formula in conjunction with an index-linked (or real) interest rate.

investment required per period is constant); the expectations hypothesis holds with a risk premium of zero. Fairly obviously, these conditions are not met.

Does the PVP Prohibit the Use of a Long Run Average as the Proxy for a Risk Free Rate?

15. In answering this question, it is important to think about the aim of the regulatory process when setting a regulatory rate of return. This is to attempt to establish the best possible estimate of the overall WACC of the firm, and by extension the best possible estimate of the cost of equity, so that over the regulatory period the present value of the expected regulatory net cash flows plus the present value of the closing regulatory book value equals the opening book value at the start of the regulatory period.

16. The key focus here is on estimating the correct WACC, and if we assume for simplicity that the firm is all-equity financed, then this is equivalent to estimating the correct cost of equity. This is all the PVP requires. The reality is that all the parameters in the calculation of any cost of equity are subject to uncertainty, and so coming to a final point estimate of that cost of equity inevitably involves an element of judgement. For example, in a UK regulatory context, this is made explicit by the presentation of a range of estimates for each component (see below).

17. Turning to the specifics of the risk free rate of return, a risk-free asset is one that removes *all* risk from an investor. Such risks include default risk, re-investment risk, and inflation risk. If we make the not unreasonable assumption that a Commonwealth Government Security (CGS) is virtually default free, then an investor is still left with the coupon reinvestment risk attaching to such a bond, and inflation risk.

18. Given the highly unconventional monetary policies being followed around the world, these risks are non-trivial, and to the extent that international investors buy CGS, they will inevitably have an impact on yields, even if Australia itself does not follow such policies. For example, a decision by the US Federal Reserve to either extend or terminate "quantitative easing" programmes would almost certainly have an impact on CGS yields, and hence reinvestment rates, in Australia.

19. Furthermore, we know that the expectations hypothesis does not hold, not just in the US but in an international context (Hardouvelis, 1994).

20. In addition, the assumptions underlying the Sharpe-Lintner CAPM include the assumption that investors can both borrow and lend unlimited amounts at this risk-free rate, so even this basic assumption is violated as investors cannot borrow at the CGS rate to invest in the market portfolio (as the CAPM requires).

21. So a key question that arises is just what is the best practical proxy for the true risk-free rate? The answer to this question is that we simply do not know, as that rate is unobservable. The UK regulatory authorities deal with this issue in a pragmatic fashion by attaching some weight to the historical evidence, and some weight to current market rates on index-linked gilts. In effect, this is a similar position to that taken when estimating the expected return on the market (and, by extension, to the MRP). There is absolutely nothing in the PVP that suggests such an approach is invalid, given the *true* risk free rate is simply unobservable, and

that it must be borne in mind that ultimately the aim is to estimate the best possible approximation for the (unobservable) true WACC.

22. It further needs to be understood that applying the CAPM framework to any multi-period capital budgeting problem, including the application to regulatory price setting, requires a series of compromises and assumptions, many of which assumptions are unlikely to hold precisely in the real world. In this context, it is pseudo-precise to claim that only one particular risk free rate can possibly be tolerated, and wrong in theory if that risk-free rate is time varying (Fama, 1977).

23. In addition, the estimates of each component of the cost of equity capital (the risk free rate; the expected return on the market [or the market risk premium], and; the beta) are subject to uncertainty.

24. In a UK regulatory context, these range estimates are explicitly presented and discussed. For example, in the Competition Commission's (CC) recent Bristol Water Appeal Case,[3] range estimates are presented for the risk free rate, the equity beta and the market risk premium. The problem of establishing the correct WACC is seen in the round, with a series of cross-checks on the WACC figure, as opposed to setting out pseudo-exact point estimates of each component. After some discussion of the possible WACC ranges, the CC concludes (Appendix N, Paragraph 156): "In the light of these cross-checks and taking into account the continuing uncertainty in financial markets, we estimate a WACC at the top end of our range". A similar approach is adopted by IPART in the recent SDP case,[4] where a range of estimates is presented, with a WACC being adopted towards the upper end of the range.

25. I do not believe that either the UK approach or the IPART approach is inconsistent with the PVP, because both methods represent a genuine attempt to establish the WACC as accurately as is possible in a real world setting with uncertainty surrounding each of the parameters (including the risk free rate). There is nothing in this approach that prohibits the incorporation of a long run average risk free rate

Response to the criticisms made of the Smithers & Co Report by Associate Professor Lally

26. At page 8 of his report titled *"The cost of equity and the market risk premium"* (dated 25 July 2012), Lally makes the following statement:

> "In turn Smithers and Co reach this view based upon the observation that the real return on US stocks over the last 100-200 years has been much more stable than the real risk free rate, and they refer to this as "Siegel's Constant" (ibid, pp. 31-38). This view presumably comes from Siegel (1992,1999), who claims that the real return on equities is *more* stable than that on long-term government bonds, that this is due to significant unexpected inflation during the 20th century, that historical average excess returns from 1926 overestimate the true MRP during that period, and that the MRP in the future will therefore be significantly less than that estimated by historical average excess returns using data from 1926."

[3] More generally, the UK Regulatory Approach is discussed in detail in my accompanying expert report: "The AER approach to establishing the cost of equity – analysis of the method used to establish the risk-free rate and the market risk premium".
[4] IPART, Review of water prices for Sydney Desalination Plant Pty Limited – Final Report, December 2011

27. In the first place, this is not strictly correct as the term "Siegel's Constant" comes from Smithers and Wright (2002), as is made clear in the report. But the more important matter is that the Smithers Report conclusion is "There is considerably more uncertainty about the true historic equity premium and (hence the risk-free rate) than there is about the true cost of equity capital", leading to the following recommendation that "For this reason we regard the standard approach to building up the cost of equity, from estimates of the safe rate and the equity premium, as problematic. We would recommend, instead, that estimates should be derived from estimates of the aggregate equity return (the cost of equity for the average firm), and the safe rate." (the Smithers Report, 2003, p.48). This conclusion does *not* just depend on the US evidence in Siegel (1998) and Smithers and Wright (2002), but explicitly draws on the UK and international market evidence in Dimson, Marsh and Staunton (2001).

28. Rather more puzzlingly, Lally then makes the following observation:

> "However, Siegel's arguments are concerned with real rather than nominal returns. Furthermore, even in respect of real returns, Siegel does *not* argue that the MRP moves inversely with the risk free rate to the point that the cost of equity is largely unchanged"

29. In the first place, it is the general practice to analyse the historical return on Treasury Bills, Government bonds and equities in real terms as inflation has a confounding effect on nominal returns, making time series and international cross-sectional analysis difficult. The convention is therefore to work with real term returns.

30. Indeed, theoretical relationships imply that in integrated capital markets it is the *real* interest rate, and the *real* price of risk that should be constant across countries. To give a simple example. Suppose two countries, A and B have very similar economies, similar stock markets with identical aggregate market risk, both governments are stable with their bonds having zero default risk, and that both countries operate in integrated international markets. The only difference between them is that Country A has zero inflation, a 2% yield on its bonds and an expected return on its stock market of 7% p.a., whilst Country B has an inflation rate of 10%.

31. In Country A, the market risk premium is therefore 5% (7% - 2%). As there is zero inflation, nominal and real rates of return are identical. In Country B, nominal rates will be given by the standard Fisher relationships, so that 1 + the nominal rate will be equal to 1 + the real rate times 1 + the inflation rate. Thus the nominal government bond rate will be (1.02 x 1.1)-1 = 12.2%, whilst the expected return on the market will be (1.07 x 1.1) – 1= 17.7% and the market risk premium is 5.5% (17.7% - 12.2%). It would clearly be misleading to infer that Country B's market is somehow more risk than that of Country A, as the apparent higher risk premium is simply the effect of inflation.

32. Turning to the second point that "Siegel does *not* argue that the MRP moves inversely with the risk free rate to the point that the cost of equity is largely unchanged", I am unaware of any claims that he does make this argument. Nor does the Smithers Report (2003), as is clear from the above quote. All that is being argued is that there is more uncertainty about the historical MRP than there is about the historical return on equities.

33. In summary, there is nothing in Lally's criticisms of The Smithers Report (2003) that in any way causes me to change my views presented in my earlier expert report.

Statement by Alan Gregory

I am Professor of Corporate Finance at the Xfi Centre (Centre for Finance and Investment) at the University of Exeter, and a former Director of the Centre. I was a reporting panel member of the UK Competition Commission from 2001-2009, and am currently an External Advisor to the UK Competition Commission's Finance and Regulation Group. A summary CV is attached setting out my qualifications and publications.

I confirm that I have made all the inquiries that I believe are desirable and appropriate and that no matters of significance that I regard as relevant have, to my knowledge, been withheld from the report.

Signed:

Alan Gregory 5th November 2012

References

Bogue, M.C. and R.R. Roll (1974). "Capital Budgeting of Risky Projects with 'Imperfect' Markets for Physical Capital". *Journal of Finance*, May, 601-613.

Bulkley, G., R. D.F. Harris and Nawosah, V. (2011). 'Revisiting the expectations hypothesis of the term structure of interest rates' Journal of Banking & Finance 35, 1202–1212.

Campbell, J., Shiller, R., (1991). "Yield spreads and interest rate movements: a bird's eye view". *Review of Economic Studies* 58, 495–514.

Cochrane, J.H., Piazzesi, M., (2005). "Bond risk premia". *American Economic Review* 95, 138–160.

Constandinides, G. (1980). "Admissible Uncertainty in the Intertemporal Asset Pricing Model", Journal of Financial Economics. March. 71-86.

Copeland, T.E. and J.F. Weston (1988) *Financial Theory and Corporate Policy*, (Addison-Wesley,).

Dimson, E., Marsh, P. and Staunton, K. (2001), *Global Investment Returns Yearbook, 2001*, London: ABN AMRO/ LBS.

Fama, E.F. (1977). "Risk-Adjusted Discount Rates and Capital Budgeting Under Uncertainty", *Journal of Financial Economics*, August. 3-24.

Fama, E.F., Bliss, R.R., 1987. "The information in long-maturity forward rates". *American Economic Review* 77, 680–692.

Hardouvelis, G., (1994). 'The term structure spread and future changes in long and short rates in the G7 countries: Is there a puzzle?'. *Journal of Monetary Economics* 33, 255–283.

IPART, 2012, Review of water prices for Sydney Desalination Plant Pty Limited, From 1 July 2012, Water — Final Report, December 2011; Independent Pricing and Regulatory Tribunal, NSW.

Merton, R. (1973). "An Intertemporal Capital Asset Pricing Model", *Econometrica*, September, 867-888.

Siegel, J. (1998). *Stock for the Long Run*. 2nd Ed. New York. McGraw-Hill.

Smithers, A., and S. Wright (2002). "Stock Markets and Central Bankers: The Economic Consequences of Alan Greenspan," World Economics, 3(1).

Wright, S., Mason, R. and Miles, D. (2003), *A Study into Certain Aspects of the Cost of Capital for Regulated Utilities in the UK*, Smithers & Co. Ltd, London.

Summary CURRICULUM VITAE for Alan GREGORY

CURRENT POSITION: Chair in Corporate Finance, and Director, Xfi Centre for Finance and Investment, University of Exeter Business School

DATE OF BIRTH: 19.3.1954

PLACE OF BIRTH: Mountain Ash, Wales

ACADEMIC AND PROFESSIONAL QUALIFICATIONS:

MSc in Accounting and Finance (London School of Economics and Political Science, 1983)

Fellow of the Chartered Institute of Management Accountants (CIMA) (qualified in 1974); elected to associate membership 1978; elected to Fellowship 1986)

Certificate in Education (1978).

BACKGROUND:

Alan is Professor of Corporate Finance at the University of Exeter. His research interests are in the general area of market-based empirical research. This interest includes risk pricing, together with returns to, and valuation of, corporate social responsibility agenda. Related work has focused on market reaction to directors' trading activity, the success of initial public offerings, and returns following mergers and acquisitions.

From September 2001 to September 2009 he was a Reporting Panel Member of the UK Competition Commission where he was involved in a number of inquiries, including the two potential European takeover bids for the London Stock Exchange, and most recently the Groceries or "supermarkets" inquiry.

His consulting interests have covered investment portfolio analysis, company valuation and cost of capital, particularly for regulatory purposes, and includes expert witness work. His past clients include fund managers, stockbrokers, large accounting firms, HM Treasury, Ofcom, and the Competition Commission. He is currently External Advisor to the UK Competition Commission's Finance and Regulation Group.

PUBLICATIONS:

Refereed journal articles since 2000:

'Constructing and Testing Alternative Versions of the Fama-French and Carhart Models in the UK' (with Rajesh Tharyan and Angela Christidis) – forthcoming, *Journal of Business Finance and Accounting*

'Exploring the Valuation of Corporate Social Responsibility—A Comparison of Research Methods' (with Julie Whittaker) – forthcoming in *Journal of Business Ethics.*

'Gender Diversity on Corporate Boards: What Can We Learn from Market Reaction to Insider Trades' (with Emma Jeanes, Rajesh Thrayan and Ian Tonks) – forthcoming in *British Journal of Management.*

‘More Than Just Contrarians: Insider Trading in Glamour and Value Firms’ (with Rajesh Tharyan and Ian Tonks) – forthcoming, *European Financial Management*

‘Expected Cost of Equity and the Expected Risk Premium in the UK’. *Review of Behavioral Finance*, 3(1), pp. 1-26, June 2011

‘Stock Market Driven Acquisitions versus The Q Theory of Takeovers – The UK Evidence’ (with X. Bi) *Journal of Business Finance and Accounting* 38, 5 & 6, pp 628-656 (July 2011)

‘UK IPOs: Long Run Returns, Behavioural Timing and Pseudo Timing’ (with C. Guermat and F. Al-Shawraweh), *Journal of Business Finance and Accounting* June/July 2010, 37(5-6), pp 612–647.

‘Industry Cost of Capital: UK Evidence’, (A.Gregory and M. Michou), *Journal of Business Finance and Accounting,* June/July 2009, pp 679–704.

‘Performance and Performance Persistence of Ethical Unit Trusts in the UK’ (A.Gregory and J.Whittaker), *Journal of Business Finance and Accounting,* Sept/Oct 2007, pp 1327-1344.

‘The Long Run Abnormal Performance of UK Acquirers and the Free Cash Flow Hypothesis’, (A. Gregory), *Journal of Business Finance and Accounting*, June 2005, pp. 777-814.

‘A UK Test of an Inflation-Adjusted Ohlson Model’, (A.Gregory, W.Saleh and J.P.Tucker), *Journal of Business Finance and Accounting,* April/May 2005, pp 487-534.

‘Foreign Acquisition by UK Limited Companies: Short and Long-Run Performance’ (Alan Gregory and Steve McCorriston), *Journal of Empirical Finance*, 12, 2005, pp 99-125.

‘Contrarian Investment and Macroeconomic Risk in the UK’ (Alan Gregory, Richard Harris and Maria Michou). *Journal of Business Finance and Accounting*, Jan/March, 2003, pp 213-255.

‘Short-Run Returns around the Trades of Corporate Insiders on the London Stock Exchange’ (S. Friederich, A. Gregory, J. Matatko and I. Tonks). *European Financial Management,* March 2002, pp.7-31.

‘An Analysis of Contrarian Investment Strategies in the UK’ (Alan Gregory, Richard Harris and Maria Michou). *Journal of Business Finance and Accounting,* December 2001, pp 1193-1228.

‘*Discussion of* Acquisition-Related Provision-Taking and Post-Acquisition Performance in the UK Prior to FRS7’ (A. Gregory), *Journal of Business Finance and Accounting*, (November / December 2000)

‘Testing the Robustness of Long-Term Under-performance of UK Initial Public Offerings’ (S. Espenlaub, A. Gregory and I. Tonks), *European Financial Management*, September 2000.

‘Motives underlying the method of payment by UK acquirers: the influence of goodwill’ (A. Gregory), *Accounting & Business Research*, Summer (2000)

Research Grants obtained since 2000:

£284,355 from ESRC for "Cost of Capital and Asset Pricing in the UK" (as Principal Investogator; joint with Christina Dargenidou, Rajesh Tharyan and Penguo Wang). 2012-2015.

£25,000 from ICAEW for £25,000 for "The valuation and long run returns of firms with positive corporate social responsibility (CSR) indicators" (as Principal Investigaor; with Julie Whittaker) 2011-13.

£78,000 from Leverhulme to investigate directors' trading patterns around takeover announcements (2008-2010, I was lead applicant – the bid was joint with Ian Tonks).

EXTERNAL AND PROFESSIONAL LINKS:

1. Appointed to REF Panel 19 as assessor for 2009-2014REF.
2. Member of the Competition Commission (2001-2009). External Advisor to the UK Competition Commission's Finance and Regulation Group, September 2009-date.
3. OECD Round Table panellist on Excessive Pricing and Role of Profitability Testing, October 2011.
4. Member of the Editorial Board of *Journal of Business Finance and Accounting.*
5. Member of the Editorial Board of *Accounting and Business Research.*
6. Director, Exeter Enterprises Ltd (the University of Exeter consulting arm) until August 2007.
7. Former member of CIMA's Management and Professional Development Committee, now CIMA Enterprises Advisory Board.
8. Former consultant to Her Majesty's Treasury on the Government Profit Formula for non-competitive contracts
9. Former consultant to various accounting firms and fund management companies on areas related to cost of capital, risk and return, and equity portfolio construction.
10. External assessor on chair appointments at Edinburgh and Stirling Universities.
11. External examiner on numerous PhDs including Cass, University of Cambridge, Lancaster Management School, Reading University and Manchester Business School.
12. Assessor on a number of AMBA accreditation panels.

PREVIOUS EMPLOYMENT:

Jan. 1996 - Sept 97: Professor of Business Studies, University of Wales, Aberystwyth.

Sept. 1995- Dec. 96: Professor of Accounting, University of Glasgow

Sept. 1989-Sept. 95: Lecturer in Accounting and Finance, University of Exeter.

Sept. 1986-Aug. 89: Principal Lecturer in Accounting and Finance, City of London Polytechnic.

Sept. 1983-Aug. 86: Senior Lecturer in Accounting, Brighton Polytechnic.

Apr. 1978-Aug. 83: Senior Lecturer in Accounting, Luton College of Higher Education.

Sept. 1977-March 78:	Lecturer II, South West London College.
Jan 1977-Aug. 77:	Budgets Controller, Green Shield Stamps.
Jan 1976-Dec. 76:	Manager, Western Region Settlement Accounts Section.
Aug. 1974-Jan 76:	Assistant Development Accountant, British Rail Western Region.
Aug. 1971-Aug. 74:	Management Trainee, British Rail