

The Role of Costs in Irish Pension Fund Performance.

Dr. Jim Stewart and Dr. Bridget Mc Nally. *

Abstract

This paper highlights the lack of transparency in the reporting of overall cost levels incurred by Irish pension schemes and demonstrates the impact of costs on pension fund performance. The paper relies on primary and secondary data analysis of financial statements of Irish pension schemes over a six year period. The paper finds that a significant portion of costs incurred by Irish pension schemes are not disclosed separately in the schemes' financial statements. This results in a significant lack of transparency as to overall costs incurred annually by pension schemes. The RIY impact of pension fund costs (administrative and all other charges) over the lifetime of a scheme highlights the need for greater focus to be placed on cost efficiencies and competitiveness in any proposals for pension reform in Ireland.

Field Of Research - Finance

Keywords – Transparency, R.I.Y. impact, Cumulative effect.

* Dr. Jim Stewart, Associate Professor of Finance, School of Business, Trinity College, Jim.Stewart@tcd.ie

Dr. Bridget McNally, Lecturer, Dept. Economics Finance and Accounting, National University of Ireland, Maynooth, Bridget.Mcnally@nuim.ie (Phone 0035317083811, Fax 0035317083934)

1.1 Introduction

The pensions system in Ireland (in common with many other countries) has two main elements, - a State - run Social Welfare system and a system of private, voluntary, supplementary, pensions provided through a variety of arrangements and regulated by a State approved body. The majority of voluntary pension arrangements take the form of occupational pension schemes although there is a sizable minority of other individual private pension arrangements. Occupational pension schemes are privately managed pension schemes offered by employers to some or all employees as part of an overall remuneration package. These schemes are funded by contributions from the employer and also in many cases the employees.

Ultimately, the objective of any pension arrangement is that it meets its targeted pension liabilities as they fall due. Although the assets in which the scheme's contributions have been invested, the investment strategy of the scheme, is an important factor in the valuation process and attracts most comment in any discussion on pension fund performance, it is not the only determinant of the reported performance of occupational pension schemes. The focus of this paper is to demonstrate the impact of costs on pension fund performance and the positive impact that efficiencies in costs can have on pension fund values and adequacy of cover.

There is an acceptance among some academics (Bateman and Mitchell (2004), Bikker and De Dreu (2009)) and some policymakers (UK Pensions Commission (2005), that pension costs "*over the lifetime of a scheme*" can substantially erode retirement assets. However in individual scheme cases, this number or a best estimate of this number is rarely if ever reported. Indeed as discussed later in this paper, there are inconsistencies and in many cases significant under – reporting of costs on an annual basis by pension schemes, and this in many ways means that there can be no easy tracking of the cumulative effect of costs. While pension scheme costs may or may not be a material number affecting the growth in scheme assets in any particular year, this is not

necessarily the critical factor. What is critical is the cumulative effect of yearly costs over the lifetime of a scheme on the final fund value (ie the long-term rather than the short-term impact). The lack of focus on the annual effects of costs and as a result, on the cumulative effect over the lifetime of a scheme, explains in part at least, why yearly costs and cost levels are not a principal target to date in the reform of pension provision in Ireland.

Costs faced by Irish pensions schemes may be levied in a variety of ways. This variety of charging mechanisms mirrors the pattern of pension fund cost structures elsewhere in the world as shown by the Whitehouse (2000) study of pension scheme costs across thirteen different countries. Costs may be fixed, charged on a transaction basis or a combination of both. They may be explicit or implicit, up-front (i.e. charged in a lump sum at the outset) or spread over the lifetime of the scheme. Cost rebates/discounts may be agreed depending on transaction volume or size of fund. The pension schemes of the larger financial institutions may benefit from cross subsidies where for instance the sponsoring company also provides investment management services to its pension scheme without charging at full rates or charging on an ad-hoc basis. All of the above have the effect of obscuring the cost structure of pension fund management and making the task of estimating/forecasting costs of pension fund management and administration difficult.

The Irish Government (2007) in its Green Paper on pensions describes explicit charges made by third party providers to funded supplementary pension arrangements as follows:

1. Fees, plus VAT charged by the service provider to the arrangement itself and /or to the sponsoring entity.
2. Contract charges which can take a number of forms including a charge on contributions, a monetary charge before investment of a contribution or a charge expressed as a percentage of the fund.

Implicit charges are additional to explicit charges. The Green paper includes as implicit costs, investment trading costs (e.g. commission and stamp duty) and margins in risk

benefit premiums charged by insurers, in relation to anticipated future mortality and morbidity rates.

The rest of this paper is structured as follows;

Section 1.2 outlines the data source for this paper. Section 1.3 shows the results of quantitative analysis carried out on the data source, which demonstrate the impact of cost factors on the valuation of a scheme over its lifetime and the current poor disclosure in annual reports to scheme members. Sections 1.4 considers the role of costs in future pension reform. Finally Section 1.5 sets out the papers' conclusions.

1.2 Data Sources.

Currently approximately 50 per cent of Irelands working population have voluntary pension arrangements in place.

For individuals who are employees, the vast majority of voluntary pension arrangements are either defined benefit (DB) or defined contribution (DC) schemes. A DB scheme is one where the pension on retirement is fixed in advance usually as a proportion of the member's salary in their last year of service or based on an average of their annual earnings for the last three years of service. Contribution levels are set at a level which is actuarially estimated to deliver the promised benefit on retirement. A DC scheme "defines" the contribution to be made by the employee and the employer rather than the benefit promised on retirement. The retirement benefits for each member depend on the value of the annuity that the member's "accumulated fund" at his/her retirement date can purchase and so it is not possible to know in advance what pension benefits the member will receive.

The Irish Association of Pension Funds (IAPF) is a non- profit, non- commercial organisation which represents the interests of Irish pension funds. For the purposes of this research, all pension schemes registered with the IAPF for 2003 (there were 352 schemes included on the IAPF 2003 register), were circulated, with a request for copies

of the schemes financial statements for the financial years ending 2002 to 2007 inclusive. As a result of this circulation process and enquiries (not all pension schemes are registered with the IAPF) financial data was obtained from 58 Irish pension schemes although as discussed below, there was varying amounts of data for each scheme.

A profile of the respondents across scheme type, number of members and total scheme assets is set out in Table 1.1 and the potential total population as reported by the Irish pensions regulatory body (Pensions Board) is described in Table 1.2. All of the schemes included in this study had in excess of 100 members. The number of schemes included in the study (58) accordingly represents approximately 10 per cent of all pension schemes with in excess of 100 members.

Table 1.1

Profile of Respondents in Study:

	Defined Benefit	Defined Contribution	Total
No. of schemes	43	15	58
No. of members at end 2007 (active and deferred)	371,653	3,138	374,791
Assets under management at end 2007	€21.09bn.	€0.04bn	€21.13bn

Table 1.2

Total Population of Pension Schemes at end 2007, as reported by the Pension Board Annual Report 2007.

	Defined Benefit	Defined Contribution	Total
No. of schemes	1,319 of which 972 have less than 100 members	98,483 of which 98,256 have less than 100 members	99,802 of which 574 have in excess of 100 members
No. of members at end 2007	530,933	269,465	800,398
Assets under management at end 2007	Approx. €65.9bn.	Approx. €20.7bn	€86.6bn.

Pensions Board (2008)

The schemes which provided data for the purpose of this study had an asset value of approximately €21.13bn or 24.4 per cent of total Irish pension fund assets at the end of

2007. The schemes account for approximately 375,000 members in total, some of which are described as active and some of which are described as deferred (Table 1.1).

A data base was compiled for the years 2002 to 2007 of the information provided on the key income and expenditure amounts disclosed by each of the schemes, the total assets of each scheme at the beginning and end of each period and any additional information disclosed in relation to scheme costs. The data is both cross sectional and time series. Each pension scheme annual report is treated as one observation. However there are variable amounts of data for each pension scheme. While all schemes showed the net increase or decrease in the fund size over the year in question and net inflows and outflows for the year, there was no uniformity across schemes in the levels of further detail given. Some schemes provided only summary information to members and included a statement that details could be obtained directly from the scheme trustees.

1.3 The Visibility and Impact of Costs.

A widely referred to analysis of pension schemes in Ireland (Pensions Board (2006) Appendix A - The Life Strategies/ESRI report) made reference to assumptions on average annual fund costs incurred by Irish occupational pension schemes. While the findings underpinning these assumptions were largely based on UK sources (James (2000), and other UK data sources), they are accepted by the industry in Ireland as being indicative of the Irish experience. In summary the Life Strategies/ ESRI report (2006) makes the following assumptions on average annual explicit and implicit costs incurred by Irish occupational pension schemes;

- Implicit trading costs of 0.65 per cent for equities, 0.25 per cent for corporate bonds and 0.1 per cent for Government and index-linked bonds.
- Explicit costs of selling, processing and administering pension products and explicit charges paid to fund managers, equivalent in total, to a reduction in yield (RIY) of 1.5 per cent.

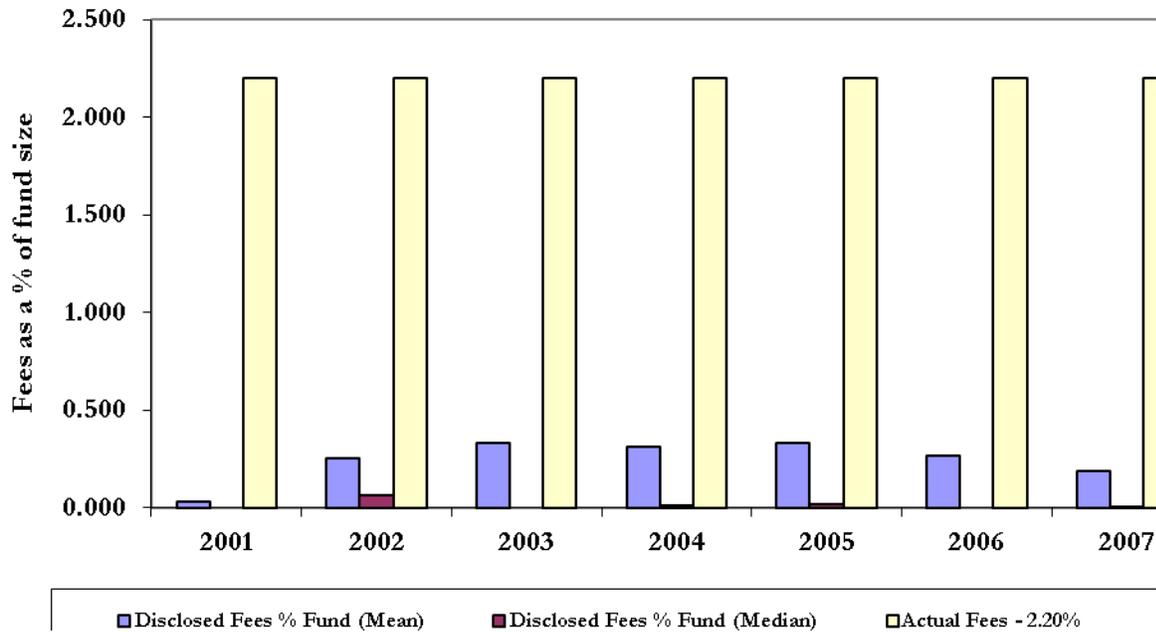
- Once - off expenses incurred in purchasing annuities for retiring members of 3 per cent of the members fund prior to annuitisation, reflecting typical annuity commission rates of 2 per cent plus an assumed profit margin of 1 per cent.

The average equity holding by Irish pension schemes was, close to 70 per cent (IAPF 2002-2008) during the period under review, so that trading costs incurred by most schemes were closer to 0.65 per cent of fund value (i.e. the trading cost for equities) rather than 0.25 per cent or 0.1 per cent, Combining this trading cost of 0.65 per cent of fund value with a fund management charge of 1.5 per cent and adding in some additional cost for purchasing annuities (currently, only a minority (35 per cent) of pensions in payment are annuitised), an average annual fund cost level of 2.2 per cent of fund value was calculated and used for the purposes of this research as representing actual average scheme experience.

Figure 1.1 below shows actual cost levels disclosed and reported in the financial statements of the schemes examined for the purposes of this research and compares them with an assumed average annual fund cost levels of 2.2 per cent of fund value.

Figure 1.1.

Disclosed fees as a % of fund value vs assumed actual fees of 2.2% of fund value



Note; Due to the skewed distribution the median figure for 2001, 2003, 2006 and 2007 is too close to 0 to register a reading on the graph.

The contrast depicted in Figure 1.1 is startling. If we assume that these schemes are experiencing actual costs close to the Life strategy/ESRI assumed average, the degree of non-disclosure makes what is disclosed meaningless and misleading in terms of providing members and trustees alike with an accurate picture of actual costs incurred. In effect, if we accept the Life Strategies/ESRI assumed Irish cost levels as being reliable then mandatory full cost disclosure by pension schemes would be likely to result in an increase well in excess of 100 per cent in costs currently disclosed. The median figure for 2001, 2003, 2006 and 2007 is too close to 0 to register a reading on the graph and for the remaining years is also relatively very low. This reflects the fact that a high percentage of schemes disclosed no fees at all.

It is not assumed in this paper that costs are not being fully accounted for by pension schemes currently but rather that a significant portion of costs incurred are netted off

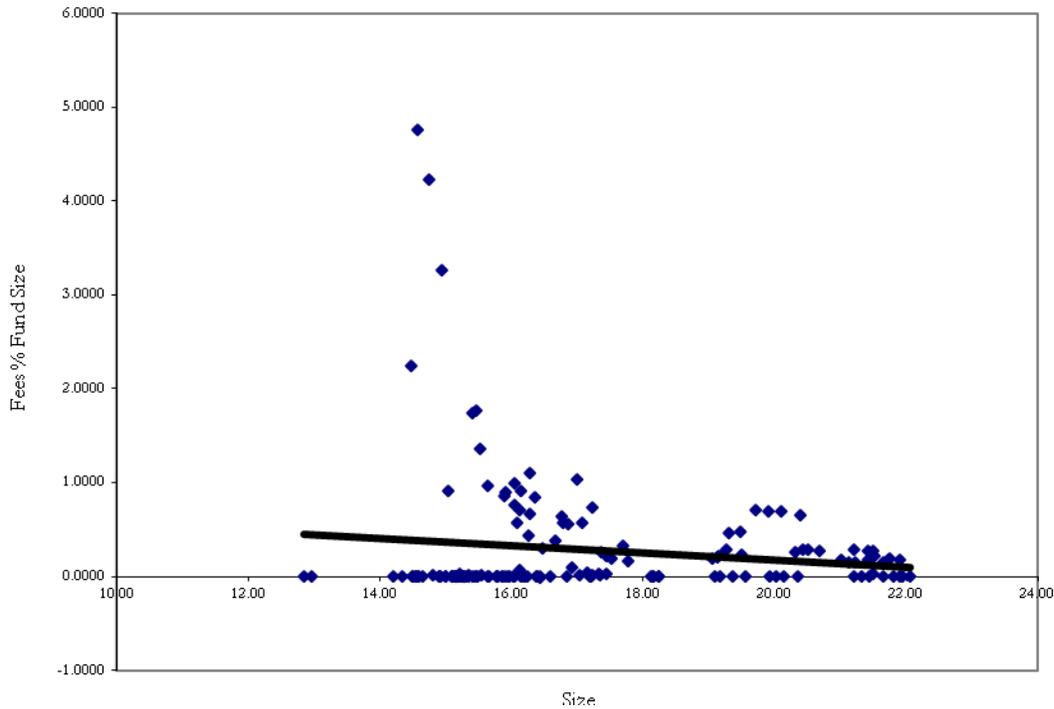
against investment income in scheme financial statements rather than shown separately. Hence if returns were reported gross of costs with costs disclosed separately, the reported numbers for each would be higher.

The scheme financial statements examined, were categorised by industry type - Services (other than financial services), Retail, Manufacturing, and Financial Services to assess whether disclosure rates varied across industries. Significant non disclosure featured across all industry types and for all years under review.

As demonstrated by figure 1.2, there was a negative relationship between the size of the pension scheme and the rate of costs disclosed – i.e. the greater the size of the scheme (over a certain minimum fund level) the lower the rate of disclosed costs (the straight line indicating overall a downward trend as size increases).

Figure 1.2

Scatter of Size of Fund (Ln) and Fees % of Fund Size



Note: The log of fund size was used because of the disparity in fund size

This inverse relationship between size and rate of costs disclosed is not entirely surprising as it is likely that while larger firms incur larger absolute costs, their cost ratio (i.e. costs as a per cent of fund size) would be smaller due to economies of scale.

Table 1.3 below summarises in column 2, the mean and median comparative results over time (2002-2007) for levels of costs disclosed in each of the categories as follows;

—

1. Schemes with and schemes without a professional trustee,
2. DB schemes compared with DC schemes,
3. Schemes where the sponsoring parent is a publicly quoted company and schemes where the sponsoring parent company is not publicly quoted,

4. Schemes with a sponsoring parent in the financial services sector and schemes where neither the sponsoring company or a related company was a financial services company.
5. Disclosure rates across the industry sectors, - financial services, services other than financial services, manufacturing, and retail.

Table 1.3
Fees disclosed as a percentage of fund size
Summary Statistics

Column 1	Column 2		Column 3	
	Summary Statistics		Significance Tests	
	Mean	Median	Mean (t-test)	Median (Z-test)
Professional Trustee	0.217	0.000	0.81	1.15
Non-Professional Trustee	0.310	0.014		
Defined Contribution	0.000	0.000	5.58***	5.65***
Defined Benefit	0.345	0.035		
Public Company	0.215	0.000	1.09	0.07
Private Company	0.307	0.000		
Parent (Financial)	0.144	0.000	1.94**	0.067
Parent (Non-Financial)	0.308	0.006		
Manufacturing	0.177	0.000		
Services	0.484	0.187		
Financial Services	0.144	0.000		
Retail	0.172	0.201		
Manufacturing vs. Services			2.46**	2.24**
Manufacturing vs. Financial Services			0.40	0.33
Manufacturing vs. Retail			0.04	1.54
Services vs. Financial Services			1.66*	1.49
Services vs. Retail			0.91	0.20
Financial Services vs. Retail			0.27	1.44

Note: This table reports the mean and median “fees disclosed as a percentage of fund size” for each of the categories of fund set out in Column 1 and by industry type. In column 3, the t and z-stats test the equality of means/medians, respectively between the two groups where ***, **, and * represents significance at the 1, 5, and 10 per cent level, respectively.

In column 3 of Table 1.3 (above) the t and z –statistics test for each of the categories examined, whether the mean/median differences are statistically different from one another. The summary statistics and significance test results reported in Table 1.3

suggest that fund type, i.e. whether the scheme is a DB scheme or a DC scheme is a significant determining factor in the level of costs disclosed (significance level in excess of 2 – t-test 5.58, z -test 5.65). The results also suggest that differences in cost levels disclosed between a scheme with a sponsoring parent in the financial services sector and a scheme with a non financial services parent are also statistically significant, (t-test 1.94). Finally, Table 1.3 also indicates that the increased levels of costs disclosed by schemes in the services industry (other than financial services) are statistically significant, compared with the manufacturing industry (t-test 2.46, z-test 2.24), or the financial services industry (t -test 1.66, z-test 1.49).

The univariate comparisons summarised in Table 1.3 do not take cognizance of the fact that more than one factor may be influencing the results. For example, relative to DC schemes, DB schemes report a significantly higher level of costs (as a function of size), and relative to the manufacturing industry, schemes of companies in the services sector (other than the financial services sector) also report greater levels of costs. However it may be that the majority of schemes within the services sector are also DB schemes so that more than one variable may be affecting the result. The multiple pooled regression analysis presented in Table 1.4 tests the strength of the principal correlation findings when other known factors are controlled for.

The results in Table 1.4, however fall short of establishing causation, because it must be accepted that there may be other factors, not controlled for, which may be driving the relationship. To test for multicollinearity, variance inflation factors (VIF's) were calculated. The VIF is a measure of how much the variance of an estimated regression coefficient is increased because of collinearity. The VIF results were less than 3 for each calculation, i.e. significantly below the cut-off value of 10 proposed by Kutner, Nachtsheim and Neter (2004) in terms of an acceptable level of multicollinearity.

Table 1.4
Regression Estimates

	(1)	(2)	(3)	(4)	(5)	(6)
Size of Pension Fund	-0.045** [1.98]	-0.043* [1.87]	-0.061*** [2.67]	-0.062*** [2.70]	-0.062*** [2.64]	-0.087*** [3.64]
Professional Trustee		-0.067 [0.57]	-0.164 [1.40]	-0.167 [1.38]	-0.151 [1.12]	-0.221* [1.66]
Defined Benefit			0.487*** [3.36]	0.490*** [3.36]	0.487*** [3.31]	0.469*** [3.30]
Public Company				0.015 [0.13]	0.047 [0.28]	0.148 [0.88]
Parent (Financial)					-0.062 [0.27]	
Services						0.431*** [3.59]
Financial Services						0.118 [0.52]
Retail						0.091 [0.38]
Time Dummies	Included	Included	Included	Included	Included	Included
R-Squared	0.035	0.037	0.105	0.106	0.106	0.180

Note: This table reports coefficient estimates from pooled ordinary least squares regressions, with t-statistics (absolute value calculated using standard errors adjusted for clustering at the fund level) reported underneath in square brackets.

The dependent variable is fees (disclosed) as a percentage of fund size. Size of Pension Fund is the log of the size of the pension fund (in euros) (The log is used to take account of the disparity in fund size).

Professional Trustee, Defined Benefit, Public Company, and Parent (Financial) are dummy variables which are 1 if the pension fund has a professional trustee, is a defined benefit, is a public company, and whose parent is a financial services company, respectively.

Services, Financial Services, and Retail are industry variables, where manufacturing is the excluded (and thus reference) industry class.

The coefficients were bootstrapped to take account of sample size. Bootstrapping provides a way to account for the distortions caused by a specific sample which may not be representative of the population

The multiple pooled regression analysis in Table 1.4 above demonstrate that when certain other known factors are controlled for, there remains a significant negative correlation between fund size and the levels of costs disclosed. This is most likely explained by economies of scale. DB schemes disclose higher cost levels than DC schemes. Disclosure rates reported by the services industry other than the financial services industry remain significantly higher relative to the manufacturing industry. The reduction in levels of costs disclosed by schemes using the services of a professional trustee is found to be significant at the wider confidence levels only.

The inconsistencies in the level of disclosure of costs across schemes and overall low levels of disclosure of costs can be attributed to both the complexity of charging structures as set out earlier as well as a lack of any statutory requirement with regard to specific disclosures on total costs as one number to be included in the financial statements of pension funds.

Table 1.5 replicates in column 1 the reported Income and Expenditure account of one of the schemes surveyed – (to be known as Scheme A), for the year 2002. The Income and Expenditure Account as presented would lead an uninformed reader to understand that total fees and costs incurred for the year was in fact €501,000 and that - €66,031,000 represents losses made on investments before costs are taken into account. However if it is assumed that the scheme actually incurred costs approximating 2.2 per cent of the scheme value at the beginning of the year (the Life Strategies/ESRI assumed actual cost level), then the scheme costs were in fact €6,352,000 (2.2 per cent of €288,709,000 – Col 1, line 32), suggesting that undisclosed costs amount to €5,851,000 (line 38). This would suggest that gross investment losses for the year before costs were € 60,180,000 and that this loss position were exacerbated by costs and fees of €6,352,000.

Column 2 of Table 1.5 restates the income and expenditure accounts of the Scheme A for 2002 on a full cost disclosure basis, assuming average fund cost levels of 2.2 per cent (based on the Life Strategies/ESRI report). Investment return is restated on a gross basis with a separate distinct disclosure of costs incurred. While the “bottom line” result remains unchanged (i.e. the fund value at the end of the year is stated at €217,019,000 in both columns 1 and 2 – line 34), the body of the income and expenditure account is significantly more informative in terms of the absolute amount of costs incurred and the resultant impact on gross income earned.

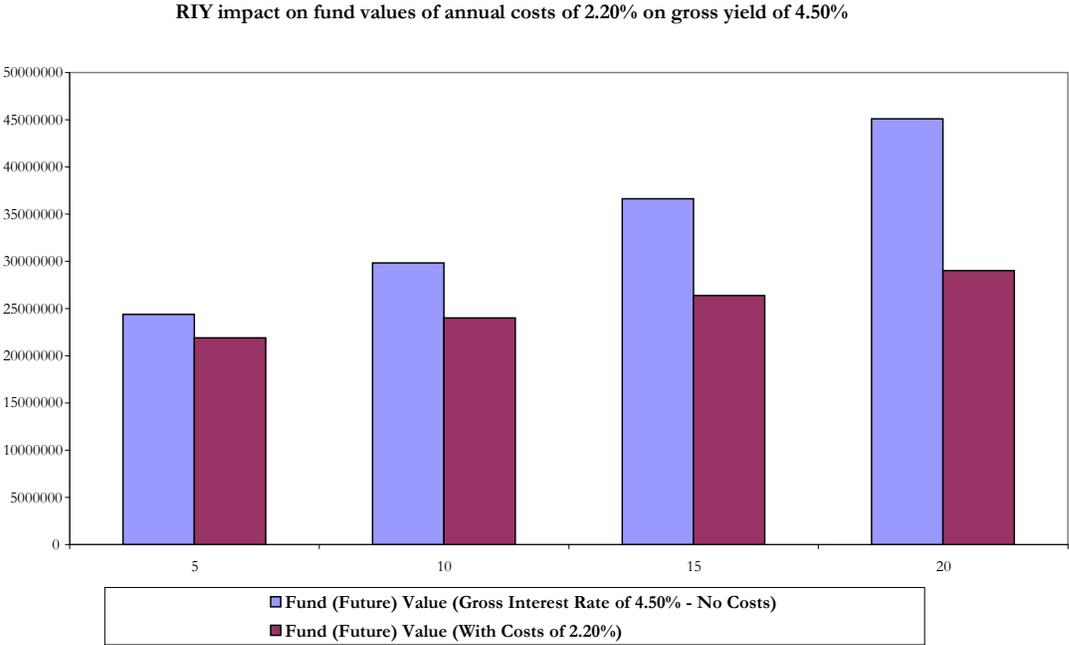
Table 1.5

Income and Expenditure Account of Scheme A for the year ended 31 December 2002

	As provided to Scheme members 2002	Restated to show costs of 2.2 per cent	
	Col. 1	Col 2	Line
Contributions and benefits	(000's)	(000's)	1
Company contributions: Normal	2778	2778	2
Members contributions: Normal	2008	2008	3
Transfers from AVC scheme	21	21	4
Transfers from other funds	210	210	5
	5017	5017	6
			7
Pensions	6086	6086	8
Commutations	2615	2615	9
Death in service benefits	218	218	10
Refund to members leaving service	234	234	11
Transfers to other funds	534	534	12
Insurance premium	26	26	13
			14
Net deductions from dealing with members	-5088	-5088	15
			16
Return on Investments			17
Investment income	5592		18
Foreign exchange losses	-61		19
Overseas tax	51		20
(Loss)/profit on sale of investments*	-24076		21
Unrealised losses on investments**	-47537		22
Investment manager and custodial fees	-501		23
Net return on investments	-66532	-60180	24
			25
			26
Total costs and fees		-6352	27
			28
Net decrease in fund during period.	-71620	-71620	29
			30
Net assets of the scheme:			31
At beginning of period	288709	288709	32
			33
At end of period	217089	217089	34
			35
Costs as disclosed:	501		36
Total costs		6,352	37
Costs not disclosed	5,851		38

Figure 1.3 shows the RIY impact on fund values over a 5, 10, 15 and 20 year period, of an annual cost level of 2.2 per cent on a fund with a starting value of €20m, annual net contributions of €100,000 and an assumed average annual gross rate of return of 4.5 per cent. The RIY is determined by comparing the future fund value assuming no costs with the future fund value assuming annual costs of 2.2 per cent to bring the net rate of return down to 2.3 per cent.

Figure 1.3



The compound effect of costs over the lifetime of a fund can be considerable as shown by Figure 1.3 (in excess of €15m or 33 percent of the gross fund, based on the data in Figure 1.3).

1.4 Costs – An issue or not in dealing with pension provision into the future?

The UK Pensions Commission (2005) recommended as part of a package of reform measures, the provision of a low cost pension provision option, which would in the longer term achieve annual management charges of as low as 0.3 per cent. Reductions in annual management charges from rates approximating 2.2 per cent of fund value down to rates as low as 0.3 per cent of fund value would (if they could be achieved) result in significant savings over the lifetime of a fund.

The RIY impact and effect on fund value of a reduction in costs from 2.2 per cent (Life Strategies/ESRI assumed average) to 0.3 per cent, on a fund with a starting value of €20,000,000, annual net contributions of €100,000 and a gross rate of return of 4.5 per cent is depicted in Figures 1.4 and 1.5 below.

Figure 1.4

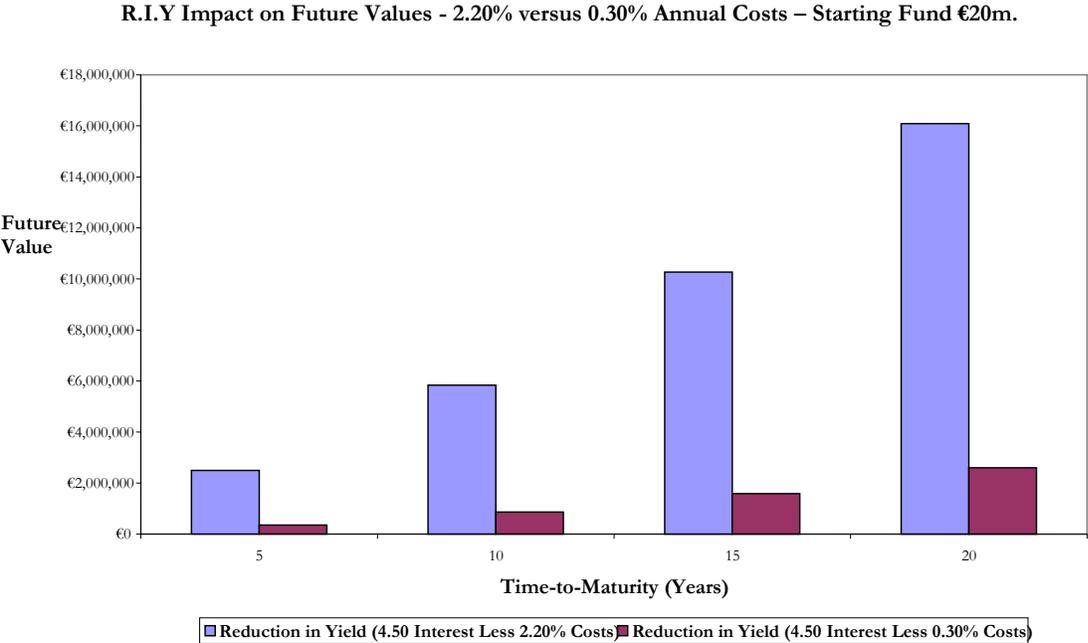
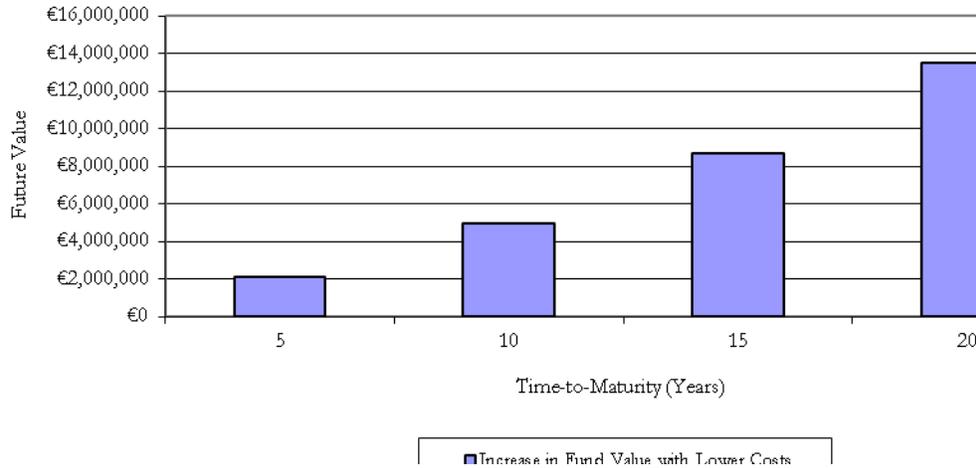


Figure 1.5

Increase in Fund Value at starting value of €20m, if Costs are reduced from 2.2% to 0.30% of fund value.



1.5 Conclusion

The RIY impact of pension fund costs (administrative and all other charges) over the lifetime of a scheme highlights the need for greater focus to be placed on cost efficiencies and competitiveness in any proposals for pension reform in Ireland. The lack of full consistent disclosure in fund financial statements, potentially contributes to an overall lack of emphasis on costs and hampers meaningful analysis and comparison. An immediate measure to require uniform full disclosure of total costs as one number in financial statements would help focus attention on costs levels and potentially introduce cost competitiveness. Even a small percentage reduction in costs per annum can have a significant impact over the lifetime of a fund.

REFERENCES.

Attorney General (1990). Pensions Act 1990. *Irish Statute Book*. Available at www.irishstatutebook.ie.

Bateman, H., and Mitchell, O.S (2004). New Evidence on Pension Plan Design and Administrative Expenses. *Journal of Pension Finance and Economics*. Vol.3(1): Cambridge University Press, pp. 63-76.

Bikker, J.A. and De Drew, J. (2007). Operating Costs of Pension Funds: the impact of scale, governance and plan design. *Journal of Pension Economics and Finance*. Vol.8. Cambridge University Press, pp. 63-89.

Central Statistics Office, (2008) *QNHS Pensions Update*. Available at www.cso.ie

Irish Association of Pension Funds, (2002-2008). *Asset Allocation Survey*. Available at www.iapf.ie

Irish Government. (2007). *Green Paper on Pensions*. Government Publications sales Office, Government of Ireland.

Irish Government (2012). *Report on pension charges in Ireland*. Government Publications office, Government of Ireland.

Kutner, M., Nachtsheim, C., & Neter, J., (2004). *Applied Linear Regression Models*. 4th ed. McGraw- Hill Irwin.

Mc Nally, B. (2003). Occupational Pension Schemes in Ireland – A Review of Risk and Investment Strategies. *Proceedings of the Irish Accounting and Finance Association Annual Conference*. Dublin, 2003.

Pensions Board. (2006). *National Pensions Review*. Available at www.pensionsboard.ie

Pensions Board, (2008). *Annual Report and Accounts, 2007*. Available at www.pensionsboard.ie, pp15.

Pensions Board, (2009). *Annual Report and Accounts, 2008*. Available at www.pensionsboard.ie, pp15.

UK Government. (2008). *UK Pensions Act, 2008*. Available at www.legislation.gov.uk.

UK Pensions Commission. (2005). *A New Pension Settlement for the Twenty – First Century. The Second Report of the UK Pensions Commission*. Available at www.pensionscommission.uk

Whitehouse, E. (2000). *Paying For Pensions; An International Comparison of Administrative Charges in Funded Retirement–Income Systems. FSA Occasional paper Series 13*. Available at SSRN;[http//ssrn.com](http://ssrn.com).

