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Large Declines in Defined Benefit Plans Are Not Inevitable: The Experience of Canada, Ireland, the United Kingdom, and the United States

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Large Declines in Defined Benefit Plans Are Not Inevitable: The Experience of Canada, Ireland, the United Kingdom, and the United States

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A report prepared for the Ontario Pension Board

Defined benefit pension plans have been an important part of retirement income systems with widespread pension plans. In Canada, Ireland, the United Kingdom and the United States, voluntary employer-provided pensions are widespread. In all four countries, however, defined benefit plans have declined while defined contribution plans have increased among private sector employees.

The decline in defined benefit plans has varied considerably across countries. Defined benefit plans have declined to a greater extent in the United Kingdom and the United States than in Canada and Ireland. While many policy analysts appear to believe that defined benefit plans have declined everywhere that they have been offered, in Canada and the other three countries, and in most countries, they have not declined in the public sector for government employees. In the United States, they have also not declined much among collectively bargained workers.

Employers have used defined benefit plans in competitive labour markets to attract and retain skilled employees. Defined contribution plans cannot be used to retain long-service workers because their account balances are fully portable once vested so they provide workers no incentive to stay with their current employer. The anticipated shortage of skilled workers accompanying the retirement of the baby boom generation raises the possibility that defined benefit plans might make a resurgence, if the regulatory environment were to facilitate such a development.

This report evaluates the causes of the decline in defined benefit plans and the move toward defined contribution plans. It analyzes the large changes in the United Kingdom and the United States, and the smaller changes in Canada and Ireland. It investigates the hypothesis that the costs of providing defined benefit plans have increased relative to the costs of providing defined contribution plans. It focuses on the regulatory environment, including changes in accounting rules. It also considers the increase in worker longevity at older ages. A factor not considered in previous studies is the level of fees charged by mutual funds, and how that differs across countries and over time. It also considers changes in the demand for the two types of plans. Differences in the decline across countries, across plan size, across industries, and across time are used to shed light on causes of the decline in defined benefit plans.

The switch from defined benefit plans to defined contributions shifts investment and longevity risks to workers. It may also shift pension costs to workers and away from corporate shareholders. This paper investigates reasons for these risk and cost shifts. It investigates the extent to which efforts by government policymakers to improve defined benefit plans by reducing the risks that workers bear and increasing the risks that employers bear have led to employers being less willing to offer them. For example, by requiring employers to index benefits in the United Kingdom, risks have been reduced for employees but increased for employers. It also considers the extent to which efforts to limit the tax expenditure by limiting funding have played a role. It examines the extent to which a non-level playing field, with regulatory advantages to defined contribution plans, has contributed. It compares those explanations to the economic and regulatory changes

occurring in Canada to determine what differences may account for the more favorable outcomes for defined benefit plans in Canada.

Analytic Framework

Policy analysts have identified a number of reasons for the decline in defined benefit plans. Those reasons can be divided into two categories: changes in the economy and changes in regulations. The changes in the economy can be divided into changes in the characteristics of workers, changes in the characteristics of employers, and macroeconomic changes. Regulatory changes include changes in laws and regulations and changes in accounting requirements.

Alternatively, the analysis can be reorganized within the standard framework used by economists of changes in demand for and supply of pensions. Changes in demand would include both demand by employees and demand by employers. Changes in supply refers to changes in the cost of providing pensions. Regulatory changes affect the cost of providing pensions. Changes in government regulation include regulations favoring defined contribution plans relative to defined benefit plans. Without formally estimating demand and supply functions, we attempt to shed light on the factors within this framework that have caused the decline in defined benefit plans.

Changes in demand are discussed first, and then the focus is placed on the way that regulatory changes and longevity increases have raised costs.

Changes in Demand for Defined Benefit Pensions

Changes in the characteristics of workers that may affect their demand for defined benefit pensions include a decline in unionism and an increase in job mobility. The decline in unionism has occurred in Canada, Ireland, the United Kingdom and the United States. Unions traditionally have favored defined benefit plans over defined contribution plans. In the United States, the job tenure of men ages 45-54 declined from 12.8 years to 8.1 years, a decline of 37 per cent, over the period 1983-2006 (Valetta 2006).

More mobile workers generally fare better in defined contribution plans than in defined benefit plans. Workers' account balances in defined contribution plans, once vested, are fully portable. By comparison, the accrued benefits in defined benefit plans generally are not portable, and are reduced in value for job changers.

The greater numbers of women in the labour force may be a factor in the reduced demand for defined benefit plans. Women may have less attachment to a particular employer than men because they have greater responsibility for care-giving. Also, they are more likely to be influenced by job changes of their husband than the reverse because they tend to have lower salaries than their husbands, though that tendency is declining. Furthermore, the increase in the percentage of the workforce that is dual earner families may reduce the job attachment to a particular employer for both men and women (Aaronson and Coronado 2005). These factors suggest that an increasing proportion of

workers would favor pensions that do not penalize job change, which would include defined contribution plans and cash balance plans.

Workers who anticipate changing jobs before retirement favor defined contribution plans because they suffer a portability loss when they change jobs with a defined benefit plan that they do not suffer in defined contribution plans. They suffer a portability loss when their benefits at retirement are based on their nominal earnings at job change. The real value of their nominal earnings at job change is eroded by inflation that occurs between that date and the date of first benefit receipt.

The portability loss suffered by job changers is considerably less in Ireland, the United Kingdom, and Québec than in the rest of Canada and the United States. The loss is less because in Ireland, the United Kingdom and the province of Québec, workers who leave an employer before being eligible to collect pension benefits have their benefits price indexed. Thus, they do not suffer the portability loss that occurs in other countries due to inflation eroding the real value of their benefits between point of job termination and point of first benefit receipt. For this reason, the policy in Ireland, the United Kingdom and Quebec would cause workers to have less of a demand for defined contribution plans than in other countries, but it raises the costs of defined benefit plans for employers relative to other countries.

Employers also have reasons for wanting to provide defined benefit pensions. Changes in characteristics of employers that may affect their demand for defined benefit plans include a decline in manufacturing, which has been associated with the provision of defined benefit plans, and a growth in the service industry, which has been associated with the provision of defined contribution plans. Those changes have occurred in all four countries. Manufacturing firms may have a greater need to retain experienced employees than service firms where skills are more transferable across employers, perhaps explaining the greater demand for defined benefit plans by manufacturing firms.

Changes in the Costs of Providing Pensions

A study using Australian data (Bateman and Mitchell 2003) found that defined benefit plans were about a third more expensive in terms of administrative and investment expenses than defined contribution plans, even controlling for plan size. Thus, costs doubtlessly play a role in the switch to defined contribution plans.

It is not just the costs of providing defined benefit plans that affect whether they are offered, the costs of providing defined contribution plans are also relevant. Factors affecting costs of providing defined benefit pensions relative to defined contribution pensions can be categorized into three groups: changes in asset markets, increasing longevity, and changes in regulations. After briefly mentioning the effects of changes in asset markets, the report focuses on increasing longevity and changes in regulations as possible explanations.

Changes in asset markets. The "perfect storm" of low interest rates, which raise the value of pension liabilities, and the stock market declines during the early years of the 2000s, have highlighted for employers the macroeconomic risks they face in financing defined benefit plans. The decline in asset markets means greater contributions are needed to provide a given level of assets at retirement. The decline in interest rates means that a larger asset base is needed when converting to an annuity to achieve the same level of annuitized benefits. The decline in defined benefit plans has been linked in part to a shrinking equity premium, which has made it more expensive to fund pension liabilities (Selody 2007). However, that change also affects defined contribution plans.

An explanation for the increased popularity of defined contribution plans that has been overlooked in previous analyses is the role of mutual fund fees. Mutual fund fees have declined in the United States over the past several decades but remain high in Canada, possibly providing an explanation for the different experiences in the two countries concerning the move toward defined contribution plans. The largest Canadian mutual fund, Investors Dividend Fund, charges a management expense ratio of 2.71 percent (Chevreau 2007). This fee is more than ten times as high as charged by Vanguard for index equity funds in the United States. Changes in fees would affect both defined benefit and defined contribution plans, but the changes would not necessarily be the same because defined benefit plans are charged institutional rates while pension participants generally are charged retail rates.

Longevity. Both the increase in life expectancy and the unexpectedly large size of the increase have been cited as reasons for the decline in defined benefit plans in all four countries. The increase in life expectancy means that a larger asset base is needed to provide the same level of benefits over the longer retirement period. The effect of this change can be large. Employers bear the cost of increases in life expectancy, and they bear the risk of unexpected increases in life expectancy. In 2003, an average U.S. male worker would expect to spend 18.1 years in retirement, compared to 11.5 years in 1950 (PBGC 2003). The additional 7 years of retirement must be funded.

Actuaries in all four countries have for the most part used historical tables to value plan liabilities, not attempting to project future increases in life expectancy. For this reason, future increases in life expectancy are not anticipated in the measurement of plan liabilities so that actual increases always come as a "surprise" in terms of the funding for the plan. Defined benefit plan actuaries may be under pressure from plan sponsors to use relative short life expectancy assumptions because those assumptions reduce the measured liability of defined benefit pension plans and improve the current measured and reported financial status of the plans and of the companies that sponsor them.

However, even government and NGO actuaries have systematically underestimated improvements in life expectancy. A study of UN population projections at older ages for North America and Europe showed an underestimation of the older population by 10 percent for projections of just 15 years (National Research Council 2000, Whitehouse 2007).

The effect of increased life expectancy on defined benefit plan liabilities is greater in the United Kingdom and in Ireland than in the other two countries. It is greater because the United Kingdom requires indexing of benefits post-retirement and in Ireland many of the larger plans index post-retirement benefits on a voluntary basis. The indexing of benefits raises the cost of benefits provided toward the end of life.

Changes in life expectancy generally occur slowly, perhaps explaining why pension researchers have tended to focus on other issues where short-term change is more dramatic. In most years, changes in interest rates have a larger effect on pension liabilities than do changes in life expectancy. Over a period of decades, however, the effect on pension costs of the increase in longevity can be considerable because life expectancy continually increases, while changes in interest rates generally have little effect because interest rates both rise and fall over long periods. The short run and long run importance of the effects on pension cost of changes in life expectancy are thus quite different.

While it is intuitively evident that increasing life expectancy raises pension costs because retired workers receive benefits for more years, the importance of that effect is not immediately clear. To estimate the effect of increased life expectancy on defined benefit pension costs, a simple present value calculation can be done. A 40-year-old U.S. man in 1980 was expected to live to 73 in the population life table for that year, but was expected to live to 78 in 2002 (Muir and Turner 2007). This difference in life expectancy would increase the expected length of retirement from 11 years to 16 years, assuming retirement at age 62—an increase in retirement years of 45 per cent.

Making a few assumptions, we can estimate the effect of increased life expectancy on defined benefit pension costs. For the purpose of making a calculation for a representative worker, assume a retirement age of 62 in both 1980 and 2002, a 4 per cent interest rate for discounting the value of future benefits, and no inflation indexing of benefits past retirement. With these assumptions, the growth in life expectancy since 1980 has increased the nominal cost (measured as the present value of benefits) of providing a defined benefit plan per male participant by roughly 30 per cent over those 22 years. A higher interest rate would yield a lower figure, while partial inflation indexing would yield a higher figure. This number is less than the 45 per cent increase in years in retirement because of the effect of interest discounting, which reduces the present value of distant future benefits.

Thus, these calculations suggest that defined benefit costs have grown by more than 1 per cent per year per male participant due to the increase in life expectancy. While this figure is a rough approximation, it indicates the possible magnitude of the effect for a typical defined benefit plan. The "feminization" of some pension plans due to more women in the labour force would further increase cost since that would further raise the average life expectancy of all participants in the plan.

Life expectancy increases in other countries provide further evidence as to the possible effects on pension plans. In Ireland and the United Kingdom, the effect of

increasing longevity on defined benefit plan costs is thought to be one of the reasons why employers are ending those plans in favor of defined contribution plans (Pensions Policy Institute 2003, Whelan 2003). According to a British survey, the primary reasons for large numbers of employers terminating defined benefit pension plans are increased costs due to lower real investment returns and greater longevity (White 2003). The adjustment to these factors in Ireland and the United Kingdom has been to terminate the plans rather than to adjust the plan parameters, such as by raising the early and normal retirement ages.

Evidence suggests that life expectancy has improved substantially faster for people in the upper half of the income distribution than for people in the lower half of the distribution in some countries. This pattern has occurred in England and the United States, but not in Canada, where life expectancy differentials by social class have narrowed (Waldron 2007). Because pension participants tend to be in the upper half of the income distribution, the pattern of life expectancy improvements in England and the United States would further exacerbate the increase in pension costs for defined benefit plan sponsors. Death due to cardiovascular disease fell more rapidly for high socioeconomic groups in than low socioeconomic groups in England and the United States, but not in Canada (Waldron 2007).

Uncertainty as to future changes in life expectancy may also affect employers' pension decisions. The increasing levels of obesity in the population may cause life expectancy to increase less than currently projected, while a revolution in medical science may cause the improvements to be greater than projected. Experts disagree as to the likely future increases in life expectancy. The Social Security actuaries have projected an increase of 6 years between 2000 and 2080 for life expectancy at birth; but the 2003 Technical Panel on Assumptions and Methods (2003), which examined the basis for that projection, recommended projecting an even greater increase in life expectancy--about 7.5 years. Most of this increase will occur at older ages because mortality is already quite low at younger ages.

Pension plan sponsors may have poorly anticipated improvements in life expectancy. In Ireland and the United Kingdom, actuaries are blamed for underestimating life expectancy in determining plan costs in the past. Many defined benefit plans were established during the 1940s and 1950s. Life expectancy had increased relatively little at older ages during the preceding decades of the twentieth century. U.S. life expectancy at age 65 rose from 11.7 years in 1900 to 21.2 years in 2000, an 81 per cent increase. However, 75 per cent of this increase occurred after 1950, and thus may not have been anticipated by the sponsors of defined benefit plans at the time that many plans were started. The improvements in life expectancy at older ages generally accelerated over the century, thanks especially to an unprecedented reduction in mortality from cardiovascular disease, beginning in the late 1960s (Technical Panel on Assumptions and Methods 2003).

Going forward, projections indicate major differences across countries in expected future increases in life expectancy at older ages. Between 2000 and 2030, life

expectancy at age 65 for males is projected to increase by 4.8 years in the U.K., 3.4 years in Québec, and 2.0 years in the U.S., resulting in considerable differences in the expected future cost increases resulting from longevity increases (Boulanger et al. 2007).

Defined benefit pension plans face increased costs due to increased life expectancy, but that raises the question of why don't they pass the cost back to pension participants, who are the ones benefiting from the increased life expectancy? In the United States, because of the anti-cutback rule, it is not possible for pension plans to reduce benefits already accrued. The key to this rule is that accrued benefits are defined as annual benefits, not lifetime benefits. Thus, it is not possible for pension plans to reduce the generosity of benefits when increases in life expectancy raise the cost of benefits associated with past years of work. They can only make the reduction for future years of work. This issue could be resolved if the legal definition of accrued benefits were changed to the economic definition, which is the expected present value of future benefits. If this definition were used, the generosity of annual benefits could be reduced when life expectancy increased so long as the generosity of lifetime benefits was not reduced.

Part of the problem caused by increased life expectancy is that defined benefit plans may have difficulties adjusting for life expectancy improvements. Plans may face resistance from employees for what appears to employees as reductions in the generosity of benefits. From an employee-relationship perspective, it is easier for plans to reduce their generosity for new hires than it is to make adjustments for current employees. Periodically adjusting the benefit formula for new hires is a partial way of dealing with the increased costs due to increased longevity.

Regulations

While pension legislation has had a number of goals, increasing the likelihood that employers provide defined benefit plans has not been one of them. Regulations have been designed to make defined benefit plans more secure for those participants covered by them, and in the process shifted risks to employers.

Regulations have been designed to limit the loss in tax revenue to the government Treasury by restricting the amount of funding allowed in defined benefit plans. Regulations affect plan costs, but the effects are not the same for defined benefit plans and defined contribution plans. Regulations could have raised the cost of providing a dollar of benefits through a defined benefit plan relative to a defined contribution plan, and evidence suggests that has occurred.

<u>Compliance Costs</u>. Frequent changes in legal requirements and increased reporting requirements and administrative burdens raise the compliance costs for defined benefit plans. These elements of cost have a fixed cost aspect, not varying significantly by size of plan. The fixed cost aspect of regulation may explain at least in part why the decline in defined benefit plans has been greater among small and mid-sized plans than among large plans in all four countries.

Defined benefit plans require actuarial valuations, which is an aspect of costs not required for defined contribution plans. Defined benefit plans in the United States, the United Kingdom, and the province of Ontario in Canada must pay for government-provided pension benefit insurance, also an expense not required of defined contribution plans. One study found that PBGC premiums equaled 11 percent of contributions for single-employer defined benefit plans in the United States (Mitchell 1998). Premiums have increased since that study.

Regulatory Disincentives to Funding Plans: Ownership of Surplus Assets. Because employers are responsible for funding shortfalls, they argue that they should have ownership rights to funding surpluses. Limits on the ownership rights of employers to the excess assets create disincentives to plan sponsors to funding plans.

Viewed from the perspective of labour economics, the pension benefits provided by a defined benefit plan are deferred compensation for workers. Workers have a legally protected right to that benefit. However, from this perspective, especially in plans where workers do not contribute to the plan, workers do not have a claim to the underlying assets of the defined benefit plan. Thus, they do not have a claim to the surplus assets in defined benefit plans. In contributory defined benefit plans, such as in Canada, the issues may be different because workers have contributed to the funding of the plan.

<u>Disincentives to Funding Plans: Funding Limits</u>. In order to reduce the tax expenditure to pensions, as currently measured under the income tax system, countries have taken steps to limit the extent of overfunding. These limits have restricted the ability of plan sponsors to time their contributions in the way that best fits the cash flows of their companies.

<u>Volatility of Asset Markets</u>. Volatility of asset markets causes problems for sponsors of defined benefit plans because it leads to volatility in contributions. However, it is not clear that asset markets have become more volatile in recent years than in the past, and asset market volatility also affects defined contribution plans, though in that case it affects employees rather than employers.

<u>Volatility of Contributions</u>. Volatility and unpredictability of contributions are aspects of defined benefit plans that make them undesirable to employers. Regulations and accounting rules may have increased the volatility and unpredictability of employer contributions. An aspect of contribution volatility is the length of time that employers have to amortize an unfunded liability. Employers need to be given sufficient time to deal with the fluctuations in unfunded liability so that they do not face an excessive level of volatility of contributions.

As well as contribution volatility that arises due to underfunding in plans, contribution volatility also arises due to overfunding in plans. Restrictions generally prohibit plan sponsors from contributing to plans once overfunding reaches a certain level. With greater overfunding permitted, plans could build up more of a cushion to

carry them through times when liabilities are rising rapidly and asset values are falling.

<u>Problem of Underfunding</u>. The disincentives to funding may play a role in periodic problems of underfunding. The disincentives to funding result in defined benefit plans not having a sufficient cushion of assets to prevent underfunding from occurring when asset markets significantly fall.

<u>Incentives for Terminating Defined Benefit Plans</u>. Mandatory pension benefit insurance-- in the Province of Ontario, in the United States, and in the United Kingdommay provide incentives for not fully funding plans and for terminating defined benefit plans. The premiums for the insurance raise the cost of providing plans. They also, however, raise the security that participants have of receiving the benefits promised. The availability of the insurance may provide an incentive for plan sponsors to shift their benefit costs to the insurer by terminating the plans.

Accounting Rule Changes. Accounting rules may also provide a bias favoring terminating defined benefit plans. Ongoing plans in the United States are evaluated using the Projected Benefit Obligation (PBO), which values liabilities using wages projected to the expected retirement dates of plan participants. Terminated plans are valued using the Accumulated Benefit Obligation (ABO), which uses current wages. Thus, terminating a defined benefit plan will generally improve the reported financial status of a firm under current accounting rules because a lower value of wages is used, resulting in lower value of measured liabilities.

Accounting rules are much more of an issue for defined benefit plans than for defined contribution plans. Accounting rule changes as to the measurement and reporting of pension assets and liabilities have no effect on the underlying economics concerning the costs and the volatility of costs of providing pensions. They are simply conventions as to measurement. Nonetheless, they are frequently mentioned as a cause of the recent decline in defined benefit plans.

The ability of financial markets to adequately price pension liabilities is unclear (Clark and Monk 2006). Some argue that investors have not understood the underlying economics of pensions, given the accounting information that has been available. The new accounting requirements apparently have real effects because with the provision of information under the new rules investors now view pension costs differently than before.

The timing of accounting rule changes has differed across countries. The United Kingdom has adopted rules that affect the volatility of income statements of firms, while those rules have not yet been adopted in Canada and the United States. Those rules may account for a sharp recent decline in defined benefit plans in the United Kingdom.

Volatility in plan liabilities does not reflect the underlying profitability of a firm. An argument can be made that pension plan volatility should be noted in accounting statements as extraordinary events that do not affect the long run profitability of the firm.

Investors valuing firms are not just considering the best measure of the current market value of the assets and liabilities of the firm. They are presumably considering the expected present value of the firm's costs and income flows estimated many years into the future. For that purpose, a smoothed measure of pension values may be more useful than a volatile mark to market measure on income statements.

<u>Early Retirement Subsidies</u>. Many defined benefit plans provide generous early retirement subsidies. With the retirement of the baby boom generation causing a large number of workers to be eligible for these subsidies, these subsidies can be costly for firms. The desire by employers to end these subsidies may be one of the impetuses for the move from traditional defined benefit to cash balance plans in the United States.

<u>Decline in Real Value of Maximum Pensions for Upper Income Workers</u>. A decline in the real value of maximum pensions for upper income workers may be a factor in the decline in defined benefit plans. Upper income workers, who include the people making decisions as to whether a firm provides a defined benefit plan to its employees, no longer have a stake in the provision of tax qualified plans. They receive non-tax-qualified plans instead.

Effects on Retirement Age. Some policymakers have preferred defined contribution plans over defined benefit plans because defined contribution plans do not have built-in incentives concerning retirement age. Defined benefit plans often have incentives for retirement at particular ages built into the plans. With the aging of the workforce and increased longevity at older ages, many policy analysts believe that older workers should be encouraged to work longer, and that this change would be facilitated by a switch from defined benefit to defined contribution plans.

Costs of Defined Contribution Plans versus Defined Benefit Plans. The problem with many of the cost arguments as an explanation for the switch from defined benefit to defined contribution plans is that they apply equally to defined contribution plans. With a decline in asset markets, more contributions are needed to provide a given account balance at retirement. With a reduced interest rate, a larger account balance is needed to produce the same level of annuitized annual benefits. When people are living longer, a larger defined contribution account balance is needed to provide the same level of annual benefits. Regulatory costs generally do not fit this pattern, however, and differentially affect defined benefit and defined contribution plans.

Who Bears the Costs of Pensions? In considering cost arguments, often it is assumed that employers bear the costs of providing defined benefit pension plans. That assumption runs counter to the economic theory of compensating differentials, which suggests that the costs of pension plans generally would be borne by employees through reduced wages. For example, if regulations raised the cost of providing pensions by an amount equal to one per cent of wages, employers providing pensions when subsequently providing annual raises would raise wages by one per cent less than they otherwise would have done.

When employees consider competing job offers, they may accept an offer providing lower wages if that offer also includes an employer-financed pension plan. From this perspective, if the wage adjustment hypothesis is correct, the argument that defined benefit pension plans have become too expensive for employers does not make sense because employees are bearing the cost through reduced wages. It could be that regulatory burdens have raised the costs of providing defined benefit plans, and employees no longer feel that they are worth the cost. That theory is not widely accepted by non-economists.

The argument that employees bear the costs of compensation is particularly weak when considering the pension costs of unanticipated improvements in life expectancy. Unanticipated improvements in life expectancy raise the compensation costs associated with past service. The economic theory of compensating differentials arguably only applies to the effect of current compensation costs on current wages. Thus, while improvements in life expectancy raise the costs of providing benefits equally through a defined benefit or a defined contribution plan, and workers may bear the costs to the extent that the improvements are anticipated at the time the worker is accruing benefits, the costs associated with unexpected improvements in life expectancy may be borne by employers and consequently be a reason why employers would want to switch to defined contribution plans.

Country Studies

This section applies the framework developed above to analyzing the pension policies affecting defined benefit plans in four countries – Canada, Ireland, the United Kingdom, and the United States. Canada will be discussed last, taking into account the experience of the other countries.

Ireland

Occupational pension schemes are established on a voluntary basis either on the employer's own initiative or in negotiation between employers and trade unions. In the past, there was a strong relationship between the degree of unionisation in a firm and the existence of a pension scheme. The majority of workers in the public sector belong to occupational pension schemes due to the government's interest in providing lifetime employment for its employees and the high level of unionisation of public sector workers. Pension coverage is much lower in the private sector where employers' interest in offering lifetime employment to employees is limited by the volatility of the product markets in which they sell their goods.

Occupational schemes must be set up under an irrevocable trust which is subject to the agreement of the Revenue Commissioners. The deed of trust governs the operation of the pension scheme. It sets down how the scheme is to be administered and what entitlements members have to benefits. The trust fund must be separate from the employer's business and its assets are not available to the employer's creditors. The trust fund is administered by trustees who must act in the best interests of the members as a prudent person would in managing business affairs.

Until 1990 occupational pension schemes were regulated under trust law. However, the failure of a number of defined benefit schemes in the 1980s to deliver the benefits promised led to the introduction of specific legislation, the Pensions Act 1990, to regulate pension schemes. The primary purpose of this Act is "to provide a regulatory framework within which standards for the proper administration of pension schemes can be established to ensure that the pension rights of members and their dependants will be properly protected." The Pensions Act 1990 established a Pensions Board to supervise occupational pension schemes. It prohibited the refund of contributions to job changers and stipulated that benefits accrued after 1990 should be preserved and revalued in line with the lesser of the Consumer Price Index or 4 per cent per annum. It established a minimum funding standard, specified the duties and responsibilities of trustees, legislated for the equal treatment of men and women in pension matters and provided for the disclosure of information.

In relation to the minimum funding standard, the 1990 Act required that the market value of the assets of the fund must cover the liabilities of the scheme on termination, that an actuarial valuation should be provided every $3^1/_2$ years, and that an actuarial funding certificate must be submitted to the Pensions Board. The information to be provided to scheme members, prospective members and authorised trade unions

included an annual report on the pension scheme, an investment report, and the actuarial funding certificate. Members were given rights to information about the benefit and contribution structure, access to all scheme documents and an individual statement of benefit entitlements. In 1994, the members of schemes covering 50 or more persons were given the right to appoint half the trustees, while the employer could appoint the remaining 50 per cent and the chairperson of the Board of Trustees. The provision relating to equal treatment of men and women was implemented in a European Union directive against discrimination in relation to membership, level of contributions and benefit rights. In operating in accordance with the prudent person rule, the trustees are obliged to take decisions in pursuit of the best rate of return for the scheme, considering risk, and they are prohibited from allowing social considerations to enter into their investment decisions.

These regulations have removed the discretion that employers and scheme trustees had to refund the employee's own pension contributions to job changers and they have reduced the flexibility of the funding arrangements in cases where there is a shortfall between liabilities on termination and the market value of the scheme assets. Whelan (2003) argues that the introduction of a minimum funding standard has increased costs and that this has resulted in a shift away from defined benefit schemes in favour of defined contribution schemes. Before discussing the evidence relating to this argument, it is necessary to consider what has happened to pension coverage since the introduction of the Pensions Act 1990.

Change in Defined Benefit and Defined Contribution Coverage Rates

Information about the coverage of pension schemes before the Pensions Act 1990 is available only from irregular surveys which do not distinguish between defined benefit and defined contribution schemes. Following the requirement in the Pensions Act for firms to provide basic information on their pension schemes, it became possible to make this distinction. Trends in the coverage rate of the two types of scheme since 1992 are shown in Table 1.

Table 1. Percentage of Those At Work Covered by Defined Benefit and Defined Contribution Occupational Pension Schemes, Ireland, 1992-2006

		Defined	
Year	Defined Benefit	Contribution	Àll Schemes
1992	33.1	4.5	37.6
1993	34.4	5.2	39.5
1994	33.3	5.8	39.0
1995	31.7	6.2	37.2
1996	31.1	6.7	37.7
1997	30.4	7.3	37.6
1998	27.7	8.1	35.7
1999	26.7	9.1	35.8
2000	26.9	10.8	37.7

2001	26.5	12.5	39.1		
2002	26.7	13.5	40.2		
2003	26.9	13.5	40.4		
2004	27.3	12.3	39.6		
2005	25.9	12.2	38.1		
2006	26.9	12.6	39.5		
Source: Pensions Board, Annual Reports					

The coverage rate for defined benefit occupational schemes has fallen from a third to somewhat over a quarter in the last fifteen years (6 percentage points), while the coverage rate for defined contribution occupational schemes has increased from less than 5 per cent to nearly 13 per cent (8 percentage points). There has therefore been a steady shift away from defined benefit occupational schemes to defined contribution occupational schemes. Overall coverage has shown a small increase from 38 per cent in 1992 to 39 per cent in 2006. A recent projection of pension scheme membership by the Pensions Board (2005) suggests that the decline in the coverage of defined benefit occupational schemes will continue in the future.

The big shift away from defined benefit schemes has occurred among providers of small schemes with up to 99 members and to some extent in medium size schemes with 100-1,000 members. Table 2 shows the number of defined benefit schemes which were subject to the funding standard in 1992 and 2006, the number of defined contribution schemes and the number of members of those schemes by size category. The funding standard is specified by the Pensions Board under powers conferred by the Pensions Act, and it applies mainly to occupational schemes covering employees in the private sector. Defined benefit schemes covering employees working in the public sector are usually financed on a pay-as-you-go basis, so they are not generally subject to the funding standard.

Table 2. Number of Schemes and Scheme Members in Defined Benefit Occupational Schemes Subject to the Funding Standard and in Defined Contribution Occupational Schemes by Size Category, Ireland, 1992 and 2006

Scheme Size	Number of Schemes		Number of M	l embers	
	1992	2006	1992	2006	
	D	efined Benefit			
Small	2,229	925	42,044	24,608	
Medium	308	270	84,637	82,777	
Large	23	37	80,864	162144	
Total	2,560	1,232	207,545	269,529	
Defined Contribution					
Small	28,100	91,869	48,013	181,443	
Medium	25	193	4,773	44,520	
Large	0	13	0	29,045	
Total	28,125	92,075	52,786	255,008	
Source: Pensions Board, Annual Reports.					
Note: Small 1-99 men	nbers, medium 100-999	members, large 1,000	or more members		

The number of small defined benefit schemes has fallen by 58 per cent and the number of members of these schemes has fallen by 41 per cent, from 42,044 in 1992 to 24,608 in 2006. The number of medium size schemes has fallen by about 12 per cent, but the number of members of such schemes has fallen by just 2 per cent from 84,637 to 82,777. The number of large schemes with 1,000 or more members has increased by 60 per cent, while the number of members of these schemes has doubled from 80,864 to 162,144. If the argument that increased regulation is responsible for the decline of defined benefit schemes has validity it would need to be modified to reflect the very different trends between the coverage of small and medium size schemes and large schemes, for example, that it was more costly for small schemes than for large schemes.

In contrast to the decline and growth of defined benefit schemes in different size categories, the number of defined contribution schemes and the size of their membership increased in all size categories between 1992 and 2006. The total number of defined contribution schemes more than trebled in this period, from 28,125 to 92,075, while the total number of members nearly quintupled, from 52,786 to 255,008. The bulk of this growth was accounted for by small schemes, whose number increased from 28,100 to 91,869 and whose membership increased from 48,013 to 181,443. There was very strong growth in the number of medium size schemes from 25 in 1992 to 193 in 2006 and in their membership from 4,773 to 44,520. At the beginning of the period, there were no large defined contribution schemes, but at the end of it there were 13 large schemes with 29,045 members.

Demand vs Supply Issues in the Decline in Defined Benefit Plans

The data collected by the Pensions Board on the coverage of pension schemes is not analysed by industry so it is not feasible to identify whether the decline in defined benefit schemes has occurred across all industries. What is clear, however, is that the decline has been confined to defined benefit schemes provided in the private sector. Table 3 shows the changes in the number of schemes and scheme members in defined benefit schemes not subject to the funding standard because they are financed on a pay-as-you-go basis. Members of these schemes work in the public sector and include civil and other public servants, teachers, health workers, the police and the armed forces. A quarter of these schemes fall into the large size category. The great majority of the members are employed in large organisations. In contrast to the data on the schemes subject to the funding standard in Table 2, the number of schemes covering public sector

Table 3. Number of Schemes and Scheme Members in Defined Benefit Schemes Not					
Subject to the Funding	ng Standard by Size C	Category, Ireland	l, 1992 and 2006		
Scheme Size					
	1992	2006	1992	2006	
Small	29	46	854	1,588	
Medium	16	19	5,237	5,740	
Large	16	22	171,585	262,418	
Total	61	87	177,676	269,746	

workers increased in all size categories between 1992 and 2006 and the number of members in each size category has also increased. The different trends in relation to defined benefit schemes in the public and private sectors are not surprising as funded schemes in the private sector have to take action relatively quickly to respond to developments in financial markets, longevity projections and other factors to ensure that they conform to the funding standard, whereas pension schemes in the public sector financed on a pay-as-you-go basis are not subject to this discipline.

Changes in Pension Regulations that Could Have Hastened the Decline in Defined Benefit Schemes

Legislation in Ireland over the last twenty years has not had an objective of increasing the likelihood of employers providing defined benefit schemes. Legislation has focused on reducing the risks faced by workers, ensuring that there is a match between assets and liabilities sufficient to ensure that the promises of defined benefit schemes can be honoured, and to regulating funding in order to limit lost tax revenue. Moral suasion has been used from time to time to try and encourage pension funds to increase their investments in Irish assets. However, this policy has not been very effective as before exchange controls were removed in 1988 pension funds were free to invest in the Sterling area and after 1988 they were free to invest wherever they wished. Since Ireland became a member of the European Monetary System in 2002, Irish pension funds have been able to invest in the Euro area without any exchange risk.

The introduction of Personal Retirement Savings Accounts (PRSA) in 2003 could have posed a threat to defined benefit schemes. These are individual savings accounts for retirement which operate on a defined contribution basis. Anyone can take out a PRSA, but employers are obliged to designate at least one pension provider for their employees who are not covered by an occupational pension scheme. However, employers are not obliged to make any contribution to PRSAs, and most employers do not do so. About half of the total number of firms listed in the Companies Registration Office have designated a PRSA provider, but contributions are being made by employees in only 15 per cent of these firms. The introduction of PRSAs has not fulfilled the expectations of policy makers that they would result in a significant increase in pension coverage. Four years after the launch of these accounts less than 2 per cent of those at work are contributing to them.

There were fears that the introduction of individual accounts in Ireland, which were similar to personal pensions in the UK, might result in a repeat of the mis-selling scandal in the UK. This scandal occurred when employees covered by good occupational pension schemes were persuaded to switch out of them into personal pension accounts. To forestall this, the legislation governing PRSAs specified that employees who had been a member of an occupational pension scheme for fifteen years or more could not switch to a PRSA.

Advantages Defined Contribution Schemes Have Over Defined Benefit Schemes

A shift to defined contribution schemes has been underway since data first became available on types of scheme in 1992. Most of the increase in the coverage rate of defined contribution schemes occurred between 1992 and 2001. The shift to defined contribution schemes therefore predates the downturn in the stock market during the period 2001-2003.

For employers, defined contribution schemes have the advantage that the risks of poor stock market performance, increased life expectancy and a fall in interest rates are borne by the employee. They also have the advantage for employers that they cost less than defined benefit schemes. Table 4 reports the results of a survey carried out by the Irish Association of Pension Funds (2003) which showed that in 2002 the average employer contribution rate for defined contribution schemes was 6.7 per cent, whereas the average for defined benefit schemes was 10.7 per cent. The survey also showed that the average total contribution rate paid into defined contribution schemes by employers and employees was significantly less, 11.3 per cent, than the average total contribution paid into defined benefit schemes, 16.0 per cent.

Table 4: Average Employer and Employee Contribution Rates for Defined Benefit and Defined Contribution Pension Schemes, Ireland, 2002 (Per cent)

Contributor	Defined Benefit	Defined Contribution		
Employer	10.7	6.7		
Employee	5.3	4.6		
Total	16.0	11.3		
Source: Irish Association of Pensions Funds (2003) and Kenny (2003)				

A survey carried out by Mercer (2006) showed that employer contributions to defined benefit schemes increased from 8.8 per cent of pensionable salary in 2000 to 11.4 per cent in 2003 and to 16.8 per cent in 2006.

Regulations that Raised the Cost or Decreased the Desirability of Defined Benefit Schemes

There has been little research into the reasons for the decline of defined benefit schemes in Ireland so it is not possible to quantify the extent to which different factors may have contributed to their decline. It is possible that the introduction of the Pensions Act in 1990 contributed to the decline of defined benefit schemes because it restricted the freedom of employers to take decisions about the operation of pension plans which had been set up voluntarily by employers or in negotiation with trade unions. However, government regulation may be a convenient scapegoat because there are other factors which could have influenced the decline of defined benefit schemes such as the increasing mobility of the labour force, the greater labour force participation of women and the introduction of new accounting standards which forced companies to value their pension assets and liabilities in a more transparent fashion.

The argument that government regulation is responsible for the decline of defined benefit schemes has been made by Whelan (2003) who argued that:

"Recent changes to the regulation of occupational pension funds in Ireland have demanded that defined benefit plans must demonstrate that the assets of the scheme are sufficient at all times to meet the termination liabilities of the scheme... These regulations emphasise short-term mismatch risks and encourage a move to assets that most closely match the termination liabilities. This entails a move of Irish pension assets away from equities towards bonds as, ..., a bond portfolio most closely matches this liability."

The argument that the minimum funding standard encourages a move from equities to bonds is not supported by Whelan's own data. The data in his paper show that the weighting of equities over the period from 1980 to the stock market crash in 2001 increased from 37 per cent to 65 per cent. In 2005, the weighting of equities remained at 65 per cent according to an IAPF (2006) survey of asset allocation. Whelan's argument does not explain why the minimum funding standard would have resulted in a decline in the membership of small schemes, hardly any change in the membership of medium size schemes and growth in the membership of large schemes.

A factor which is more likely to have influenced the shift from defined benefit to defined contribution schemes is increased longevity, which was largely unanticipated by actuaries in valuing the liabilities of defined benefit schemes. Whelan (2003, p. 55) points out that:

"One less publicised factor has been the increasing realisation that mortality rates are improving faster than previously projected at the older ages, leading to increased reserves and funding for pensions to reflect the expected longer term of payment."

He goes on to note that a working group of the Society of Actuaries estimated that life expectancy for a male at age 65 will increase from 13.7 years in 1996 to 19.5 years in 2056 and for a female from 17.4 years in 1996 to 23.4 years in 2056 according to projections given by Harney, et al. (2003).

Employers who provide defined benefit plans are themselves concerned about the longevity risk to which they are exposed. In a survey carried out by the Irish Association of Pension Funds (2007), employers were asked what challenges were facing defined benefit schemes, and 85 per cent of them ranked longevity risk as important or extremely important, while 79 per cent mentioned the impact of the funding standard as important or extremely important. The reaction of employers to the underestimation of the longevity risk and other factors such as poor stock market performance and falling interest rates has been to close off defined benefit schemes to new members. The Mercer (2006, p.1) survey found that "nearly 40% of [defined benefit] schemes are now closed to new entrants and this is expected to rise to 60% over the next three years." Closure of the schemes has been favoured rather than increasing the retirement age because employers cannot change the normal retirement age of a scheme without the approval of the Revenue Commissioners and the trustees of the scheme. As the trustees have an obligation to protect the benefits of the scheme members, it would require exceptional circumstances for them to approve an increase in the retirement age

Another factor which is frequently mentioned by employers and pension professionals as contributing to the decline of defined benefit schemes is the imposition of a new reporting standard for retirement benefits on all companies for accounting years ending on or after 23 June 2001 under FRS17 (Financial Reporting Standard – Retirement Benefits). This standard has been adopted by many Irish companies with the intention of making explicit for investors the market-based value of their pension fund's assets and liabilities. During the transitional period from June 2001 to January 2005, the valuations could be given in footnotes to the company accounts. From 2005 onwards, the valuations had to be included in the balance sheet, and so they impacted directly on the profit and loss account.

Under the previous accounting standard SSAP24, companies were able to estimate the cost of retirement benefits over the long period during which the employer benefited from the employee's services. As Atherton (2001, p.2) points out, "the standard was therefore driven by the desire to produce a stable pension expense from year to year, and in combination with the use of 'long-term', off market actuarial bases was generally successful in achieving this." The drawbacks of SSAP24 were that it did not show the actual funding position of the pension scheme, and it allowed the actuary considerable discretion in valuing pension scheme assets and liabilities which made it very difficult to compare actuarial valuations across schemes. Atherton (2001, p. 2) also notes that FRS17 assumes that "the assets and liabilities of a pension plan are essentially assets and liabilities of the sponsoring employer, and as such should be recognised at fair value on the company balance sheet" in the period in which they arise. The different approach adopted in FRS17 leads to much greater volatility in the net balance between pension scheme assets and liabilities.

McGinty (2007), a representative of the Irish Business and Employers Confederation (IBEC), has argued that the introduction of the FRS17 standard coincided with a downturn in the performance of equities, increased longevity and a fall in interest rates. The deficits which emerged on defined benefit pension funds as a consequence of these developments made employers acutely aware of the risks and high costs of defined benefit schemes and provided a strong incentive for them to close the schemes to new entrants.

United Kingdom

Private provision of pensions has generally been given precedence over public provision in the UK. Legislation has been designed to support the role of employers in providing occupational pensions and of individuals in contributing to a personal pension. During the period of the Thatcher government, efforts were made to expand the role of private plans through personal pension plans and defined contribution occupational plans. Government regulation of occupational pension schemes was relatively light until the scandal over the mis-selling of personal pensions to 1.7 million people in the period 1988-1994 and the scandal in 1991 in which Robert Maxwell stole £400 million from 32,000 members of the Mirror Group Pension Fund. These scandals resulted in a series of reforms to protect the interests of pension scheme members. The Pensions Act 1995 strengthened the rules governing fiduciary conduct, created new enforcement mechanisms and an insurance fund against fraud, and established a minimum funding requirement to ensure that schemes would have sufficient assets to meet 90 per cent of the liabilities should they be terminated.

The Blair government continued the policy of expanding the private pension system. In 1998, it committed itself to reversing the balance of public-private provision of pension income from 60:40 to 40:60 (Department of Social Security 1998). In pursuit of this rebalancing of public and private pension provision, the Stakeholder Pension was introduced in 2001 to encourage individuals to make their own pension arrangements. This initiative was followed in 2002 by proposals to introduce financial education in the public school curriculum and a broad campaign to promote financial literacy and voluntary retirement saving (Department for Work and Pensions 2002) The Pensions Act 2004 replaced the minimum funding requirement (MFR) with scheme specific funding standards, in response to criticisms of the MFR, and a Pension Protection Fund to secure the benefits of members where a company becomes insolvent.

Change in Active Membership of Defined Benefit and Defined Contribution Schemes

Until 1986, only defined benefit occupational pension schemes were approved by HM Revenue and Customs for tax purposes (Budd and Campbell 1998). Consequently, the regular surveys of scheme membership carried out by the Government Actuary's Department did not distinguish between defined benefit and defined contribution occupational pension schemes before that date. Table 5 shows how active membership of defined benefit and defined contribution occupational schemes has changed since 1987.

In 1987, the year after the recognition of defined contribution schemes for tax purposes, the total active membership of occupational pension schemes was 10.6 million. Nearly all of the active members (10.5 million) were in defined benefit plans and membership of defined contribution schemes amounted to around 0.2 million. Membership was divided more or less evenly between the public and private sectors, with 5.7 million members in the private sector and 5 million in the public sector. Total active membership fell slightly to 10.3 million up to 1995. Most of this decline is attributable to

Table 5. Active Membership of Defined Benefit and Defined Contribution Schemes, UK, 1986-2005 (millions)

Year	Defined Benefit		t	Defined Co	Defined Contribution	
	Private	Sector	Public			
			Sector			
	Open to	Closed to		Open to	Closed to	
	New	New		New	New	
	Members	Members		Members	Members	
1987	5	.5	5.0	0	.2	10.6
1991	6	.0	4.2	0	.5	10.7
1995	5.0	0.2	4.1	1.0	-	10.3
2000	4.1	0.5	4.5	0.9	0.1	10.1
2005	2.1	1.6	5.0*	0.9	0.1	9.7
2006	1.6+	1.7	5.1	1	.2	9.6

Sources: Government Actuary's Department (2003, Tables 3.1 & 3.3, 2004, Table 3.1, 2006, Table 3.3); Pensions Commission (2005, p. 52 & p. 85)

Note: The distinction between open and closed schemes was first made in the 2000 survey. The number of members of defined benefit and defined contribution schemes in 1991 and of open and closed schemes in 1995 are taken from the Pensions Commission (2005). The Commission does not explain why its figures for 1991 and 1995 differ from those in the survey reports for those years which are given in Table 6.

a fall in the membership of public sector schemes to 4.1 million due to privatisation of a large number of organisations previously included in the public sector.

The big change which occurred between 1987 and 1995 was the start of the decline in membership of defined benefit schemes and the increase in membership of defined contribution schemes. From 1987 to 1995, membership of defined benefit schemes fell from 5.5 million to 5.2 million, while membership of defined contribution schemes increased from 0.2 million to 1.0 million.

The Government Actuary introduced a distinction in the survey of occupational schemes in 1995 between schemes that were open to new members and schemes that were closed to new members This distinction showed that about 4 per cent of active members of private sector defined benefit schemes in 1995 belonged to closed schemes while none of the active members of defined contribution schemes were in closed schemes. The decline in membership of defined benefit schemes in the private sector gathered pace between 1995 and 2000 with the loss of 0.6 million active members. This figure partly disguises what was happening as the number of active members in open schemes fell by 0.9 million, while the number of active members of closed schemes increased by 0.3 million. During this period, the number of active members in public sector schemes increased by 0.4 million, and the only change in membership of defined contribution schemes was a transfer of 0.1 million members to closed defined contribution schemes.

⁺ Levy and Miller (2006, p.40) do not give precise figures for open and closed schemes but they note that "...under half of the active members of private sector defined benefit schemes were in open schemes"

The decline of defined benefit schemes in the private sector quickened between 2000 and 2005, the last year in which the Government Actuary's department was responsible for carrying out the survey of occupational pension schemes. In this period membership of open private sector defined benefit schemes fell by almost 50 per cent from 4.1 million to 2.1 million and membership of closed private sector defined benefit schemes tripled from 0.5 million to 1.6 million. Membership of defined benefit schemes in the public sector grew by 0.5 million from 4.5 million to 5.0 million, and there was no change in the membership of defined contribution schemes or its allocation between open and closed schemes.

Between 2005 and 2006, the rate of decline in private sector defined benefit schemes increased according to the results of the first annual survey of occupational schemes carried out by the Office of National Statistics (Levy and Miller 2008). The 2006 survey shows that membership of open private sector defined benefit schemes fell by almost a quarter between 2005 and 2006 from 2.1 million to around 1.6 million. In the same period there was only a slight increase in the number of members in closed private sector defined benefit schemes and in defined benefit schemes in the public sector. Membership of defined contribution schemes increased from 1 million to 1.2 million.

As in the case of Ireland, the decline in membership of schemes and in the number of members differed greatly by scheme size. Table 6 shows that the total number of private sector schemes increased from 128,000 in 1991 to 151,000 in 1995. There was hardly any change in the number of private sector defined benefit schemes whereas the number of private sector defined contribution schemes grew by nearly a quarter. Almost all of this growth was concentrated in small schemes. There was a reduction of about 7 per cent in the total membership of private sector schemes between 1991 and 1995 from 6.4 million to 6.1 million. Nearly all of this decline occurred in large private sector defined benefit schemes. Their membership fell from 3.9 million in 1991 to 3.0 million in 1995. The membership of private sector defined contribution schemes increased in all size categories but particularly in large schemes which nearly tripled their membership from 140,000 in 1991 to 415,000 in 1995. The divergent trends in the membership of large defined benefit and defined contribution schemes suggests that some large employers must have shifted a significant number of members of defined benefit schemes into defined contribution schemes in the early 1990s.

The major decline in the number and membership of private sector defined benefit schemes took place in the period 1995-2005. The number of defined benefit schemes fell by over two-thirds from 37,980 to 12,027, although this somewhat overstates the extent of the decline because single member schemes were omitted from the small size category in the 2005 survey. However this omission would have had only a slight impact on the figures relating to total membership of private sector defined benefit schemes which fell by 22 per cent from 4.7 million to 3.7 million. There was a precipitous decline in the membership of small private sector defined benefit schemes from 625,000 in 1995 to 40,000 in 2005, a decline of almost 94 per cent in membership.

There was hardly any change in the number of medium size private sector defined benefit schemes in the period 1995-2005 but the membership of these schemes fell by over 60 per cent from 1.1 million to 410,000. The number of large defined benefit private sector schemes increased from 630 in 1995 to 1,017 in 2005 and the membership of large schemes grew from 3 million to 3.2 million.

Table 6. Number of Schemes and Number of Members Distinguishing Between Defined Benefit and Defined Contribution, UK, 1991, 1995 and 2005

No. of members	Number of Schemes		,	Number of Members (000s)		Os)
	1991	1995	2005	1991	1995	2005
		All Private	Sector Schen	mes		
Small	122,300	145,800	62,510	1,150	1,330	230
Medium	4,900	4,480	4,830	1,280	1,290	570
Large	800	720	1,616	4,020	3,440	3,890
Total	128,000	151,000	68,956	6,450	6,060	4,690
Public sector	180	200	n.a.	4,200	4,240	n.a.
Total	128,180	151,200	n.a.	10,700	10,300	n.a.
		Defined Bene	efit: Private S	Sector		
.Small	32,300	33,740	7,470	535	625	40
Medium	4,230	3,610	3,540	1,135	1,060	410
Large	755	630	1,017	3,930	3,025	3,200
Total	37,285	37,980	12,027	5,600	4,710	3,650
	De	Defined Contribution: Private Sector				
.Small	90,000	112,060	52,410	615	705	190
Medium	670	870	806	145	230	160
Large	45	90	249	140	415	680
Total	90,715	113,020	53,465	900	1,350	1,030
Sources: Government Actuary's Department (1991 Tables 5.1 & 5.2, 1995 Tables 5.1 & 5.2, 2005 Tables						

Sources: Government Actuary's Department (1991 Tables 5.1 & 5.2, 1995 Tables 5.1 & 5.2, 2005 Tables 2.1, 2.3, 3.1& 3.2)

Note: The size categories are the same as those used in Table 2. The figures for the number of small schemes in 2005 refer to schemes with 2-11 members. The figures for the number of members of defined benefit and defined contribution schemes for 2005 refer to schemes with only one section, i.e, they omit the number of schemes which have both defined benefit and defined contribution sections.

The number of defined contributions schemes also halved between 1995 and 2005 and the total membership fell from 1.3 million to 1 million. Nearly all of the change in the number of schemes occurred in the small size category, while decline in the membership of defined contribution schemes took place in both small and medium size firms. Membership of small defined contribution schemes fell by almost 75 per cent from 705,000 to 190,000 while membership of medium size schemes fell by 30 per cent from 230,000 to 160,000. In sharp contrast, the number of large defined contribution schemes nearly tripled from 90 to 249 and the membership of large schemes increased by over 60 per cent from 415,000 to 680,000.

Membership of defined benefit schemes is very uneven in the United Kingdom with around 85 per cent of public sector workers and 20 per cent of private sector

workers being covered by employer sponsored defined benefit pension plans. About 10 per cent of private sector workers are in occupational defined contribution plans and below 10 per cent are in group personal pensions. About 75 per cent of private sector defined benefit plans are now closed to new entrants. A minority of defined benefit plans have also been closed to future accrual and some have been wound up (terminated). As Watson Wyatt (2006) point out replacement plans are generally defined contribution plans with lower benefits. So far membership of defined benefit plans in the public sector has been largely maintained unchanged from what it was in 1987 because these schemes are financed on a pay-as-you-go basis and they do not have to meet minimum funding or accounting standards. However, there is considerable pressure from employers and taxpayers to reduce the benefits of public sector schemes because of the big gap that has opened up between the pension benefits now accruing in the public and private sectors of the economy.

Demand vs Supply Issues in the Decline of Defined Benefit Schemes

In the first report of the Pensions Commission (2004, Chapter 3 Annex) the reasons for the decline of defined benefit schemes are addressed. The Commission argues that growth of defined benefit schemes up to the beginning of the 1990s was driven by tax relief in an era of high personal and corporate marginal tax rates, incomes policies in the 1960s and 1970s which constrained the cash element of the total compensation package, redistribution from average to high earners and from job leavers to stayers before 1975, and the lack of price indexed benefits after retirement. All of these factors contributed to employers making benefit promises and expanding pension coverage in an environment in which the number of contributors was much higher than the number of beneficiaries and in which the impact of high levels of inflation fell on pensioner incomes rather than on the employer.

The cost of these promises gradually became apparent following equality legislation providing equal access to pension schemes for women and men and part-time workers, the right given to leavers by the Social Security Acts of 1973 and 1985 of a refund of contributions by those who left their employment within five and then two years, the preservation of early leaver benefits through indexation the indexation of benefits in payment in line with the RPI or 3 per cent in 1985 and the RPI or 5 per cent in 1997 The Pensions Commission (2004, p. 123) estimated that:

"The combined impact of all these changes is that the total long-term cost [i.e. the combined employer and employee contributions required]... of a final salary pension, has increased from something like 10-14% when many schemes were initially introduced, to about 22-26% today."

In the United Kingdom, increases in longevity have been more prominently mentioned as a factor in the decline in defined benefit plans than they have in the United States. For example, the Pensions Commission (2004, p.122) observed that in 1981 the Government Actuary's Department estimated that a 65 year old male could be expected to live for a further 14.8 years whereas in 2004 the estimate had increased to 19 years. Estimates of longevity have played a greater role in the United Kingdom than in the United States because of the requirement in the United Kingdom that benefits be price

indexed, which increases the relative cost of benefits later in life, and thus causes increases in longevity to be relatively more costly. For the same reason (indexation), inflation risk has been a greater issue in the United Kingdom than in the United States. The decline in unionism in the UK has also been listed as a factor in the decline of defined benefit schemes.

Advantages Defined Contribution Schemes Have Over Defined Benefit Schemes

In Ireland and the UK both occupational defined benefit and defined contribution plans have to annuitise or pay benefits out of the ongoing fund, they receive the same tax relief on employer and employee contributions and investment income and there are few regulations governing how many or what type of worker have to be included in either type of plan. The primary advantages that defined contribution plans have in Ireland and the UK are that they are less costly to run than defined benefit plans and the employer is entirely free to decide how much or how little to contribute to a defined contribution plan. The latter feature is taken advantage of extensively in both Ireland and the UK where the employer contribution to defined contribution plans tends to be about half of the employer contribution to defined benefit plans. Table 4 above shows that in Ireland the employer contribution to defined contribution schemes is about 7 per cent compared with around 11 per cent for defined benefit schemes while Blake (2003, p. 355) reports that the average employer contribution to defined contribution plans in the UK is 6 per cent compared with 10-12 per cent for defined benefit plans.

Regulations that Raised the Cost or Decreased the Desirability of Defined Benefit Schemes

A development that appears to have played a greater role than any of the factors mentioned by the Pensions Commission in the decline of defined benefit schemes was the coincidence of the ending of the equity bull market in 2000 and changes in accounting rules concerning the reporting of pension assets and liabilities in the financial statements of companies. During the bull market of 1974-2000 the average annual real return on UK equities was 13 per cent compared with the long-term historic average of 5.5 per cent (Pensions Commission, 2004, p 124). Since equities had a very big weighting in UK pension funds this high real rate of return made the promises of defined benefit schemes appear affordable even when the tax relief on investment income fell from £7.1 billion in 1996-97 to £3.3 billion in 2001-02 because of the removal of dividend tax credits in 1997.

The Accounting Standards Board (ASB) issued a new accounting standard in 2000 for retirement benefits in the form of FRS17. This was "a radical departure from conventional practice" as Blake (2003, p. 349) points out. Companies were obliged to provide information on a marked-to-market basis of the value of their pension assets and liabilities. This fair value approach to accounting was "a conscious effort to move away from smoothing techniques, towards the use of market prices to value assets and liabilities" as Fore (2004, p.9) points out.

Because the UK wished to more closely align its pension accounting standard with that of the International Accounting Standards Board (IASB) and the US Financial Accounting Standards Board (FASB) a transition period for the reporting of the results in footnotes to the accounts was allowed up to 2005. Thereafter companies in the UK and Ireland were obliged to show the current values of pension schemes assets and liabilities on their balance sheets and profit and loss accounts. FRS17 went a step further in imposing immediate recognition of gains and losses than the US standard SFAS87 which was in operation from 1986 to 2003 and which allowed smoothing over a period of up to five years.

In Summer 2003, the FASB as part of a project with the IASB on the convergence of accounting standards released an Exposure Draft of Statement 132 to replace SFAS87 and it issued the final version of SFAS132 in December 2003. It did not go as far as FRS17 as it requires only a description of how the overall rate of return on assets is estimated. Consequently, the assumptions used can differ from one pension plan to the next.

The approach favoured by the UK and the IASB had a significant impact on the way pension costs are measured and recognized on companies' financial statements as well as on the continued existence of defined benefit pension plans. It made financial statements more transparent in the following ways by depicting the real picture:

- It resulted in more meaningful balance sheets, as the asset or liability recorded on the balance sheet actually represent the value of the pension plan for the company (generally equal to the plan surplus or deficit).
- It made pension costs much more volatile (unless 100 per cent of assets are invested in fixed income securities to immunize against changes in liabilities resulting from changes in interest rates), as actuarial gains and losses are fully recognised as they occur. This enables investors to understand the source of the volatility in order to make appropriate assessments of companies.

Critics of FRS17 have argued that the new accounting standard is largely responsible for many employers closing their defined benefit schemes. Research by Klumpes et al. (2003) on the effect of the change in accounting standard found that 37 of 90 firms they examined had closed their defined benefit scheme but that the change in the discount rate mandated by the new standard was not a statistically significant predictor of plan termination. Nevertheless, firms which terminated tended to be more highly leveraged so the impact of FRS17 on their balance sheets could have been indirectly responsible for the terminations. A recent survey by the Committee on Investment of Employee Benefit Assets (CIEBA), an association which represents some of the largest private sector pension plans in the U.S., provides further support for this argument.

In a paper addressing the key issues facing the UK pension system, Blake (2003, p. 350) pointed out that the Association of Chartered Certified Accountants welcomed the introduction of FRS17 but that the FIA warned that it would have "adverse impacts on pension scheme members because it will introduce new volatility into the assessment of pension costs and liabilities." At the time that Blake was writing it was too early to

assess the long-term impact of FRS17. However, he noted that in the previous few years large actuarial deficits had emerged due to the falling value of equities and increasing longevity. Blake (2003, p. 353) argued that "as a consequence of this most defined benefit pension schemes in the UK have closed their doors to new members in an attempt to cap their liabilities" and that for new employees defined benefit schemes have been replaced by defined contribution schemes which allow employers to strictly control costs. Blake (2003, p. 371-372) concluded that:

"The regulatory framework for pension schemes should be kept as simplified as possible in order to minimize compliance costs"

and that

"if governments wish to promote the efficient investment management of pension assets, they should not put in place regulations that distort pension fund asset allocations that could happen with FRS17 or the proposed MFR" (Minimum Funding Requirement).

This advice went unheeded as the Pensions Act 2004 replaced the MFR with a new scheme specific funding standard. Harrison, Byrne, Rhodes, and Blake (2005) argue that this Act has inadvertently helped to accelerate the decline of the defined benefit schemes it was intended to protect. In a study based on mainly anonymous interviews with over 70 individuals and organisations responsible for implementing the Act in their companies Harrison et al. (2005) report the almost unanimous view of employers that the Act has altered the voluntary arrangements underpinning defined benefit pension schemes and has forced successful companies to subsidise weak companies through the Pension Protection Fund. Employers argued that the regulations regarding member nominated and independent trustees would have a much bigger impact on small and medium size companies than on large companies because the compliance costs are significantly higher for small and medium size companies. However, the 2004 Act was welcomed by the Trades Union Congress and representatives of occupational pension scheme members. It responded to some high profile company failures in which pension scheme members received only a fraction of the pension they were expecting. It strengthened the position of member nominated trustees, provided for independent trustees and a Pension Protection Fund to secure the pension guarantee.

The different views on the 2004 Act of employers and employees reflect the different interests that policy makers have to try to reconcile in meeting the needs of plan sponsors and plan members. Plan sponsors wish to minimise pension costs, while plan members wish to minimise the risk of benefit cuts to beneficiaries. These divergent interests are reflected in the different ways in which pension regulators and accounting standards boards evaluate the performance of pension schemes in meeting the requirements of investors and regulators. Blome et al. (2007) show that while government regulation to protect pension entitlements has a significant impact on costs in five OECD countries (Germany, Japan, the Netherlands, the United Kingdom and the United States) the response has varied from closing defined benefit schemes in the UK to reforming them in Germany, the Netherlands and Japan in ways which have maintained them and allowed only marginal growth in defined contribution plans. They also show that the application of new accounting standards has increased the size and volatility of pension

liabilities relative to the evaluation method used by the regulators. They conclude that some aspects of the accounting standards evaluation method are not suitable for regulatory purposes, and there needs to be greater coherence between valuations under accounting and regulatory standards.

As has occurred in Ireland, employers in the UK may be inclined to blame government regulation for the collapse of defined benefit pension schemes instead of acknowledging the weaknesses inherent in small and medium size schemes which made them unaffordable once their true costs began to emerge when FRS17 was introduced. The chairman of the Pensions Commission and past head of the Confederation of British Industry, Adair Turner, has argued in an article in the Financial Times that the private pension system in the UK was a house of cards that was going to collapse. He suggested that there were two reasons for the delay in the collapse of defined benefit schemes in the UK. These were the actuarial profession's underestimation of the longevity risk and the long bull market of the 1980s and 1990s which "together ... created a fool's paradise in which companies ignored the rising underlying cost of their pension promises" (Turner 2007). When the investor community's demand for financial information on the current value of pension scheme assets and liabilities was met by the introduction of FRS17 at the same time as equities lost a lot of their value, interest rates fell and the underestimation of longevity risk emerged, employers appear to have decided that action would have to be taken to replace expensive defined benefit schemes with cheaper defined contribution schemes.

Reasons Why the Decline of Defined Benefit Schemes Was Greater in the UK than in Ireland

It is evident from the data on the number of schemes and their membership in the UK and Ireland that the decline of small and medium size defined benefit schemes has been much greater in the UK than in Ireland and that small and medium size defined contribution schemes have declined in the UK while they have grown in all size categories in Ireland. Although no comparative research has been done which would explain why the Irish experience differs from the UK, there are a number of differences in pension arrangements in the two countries which are likely to be part of the explanation.

Occupational pension schemes in the UK and Ireland take account of the existence of the State pension by deducting it from the occupational pension that an employee would be entitled to based on years of service. Hence, the cost of occupational schemes in both countries is considerably reduced by their integration with the State pension schemes. The benefit of the integration arrangements is much greater in Ireland because the State pension has been increased from about a quarter to a third of gross average industrial earnings between 1997 and 2007 whereas the value of the basic State pension in the UK has fallen from 24 per cent of average earnings in 1981 to 16 per cent in 2006 (Hansard 24 January 2007, col. 1879)

While defined benefit occupational pension schemes are obliged by legislation in both countries to increase deferred pensions up to specified limits there is no obligation in Ireland for defined benefit schemes to increase pensions in payment. In the UK, defined benefit schemes were obliged to increase pensions in payment in line with the Retail Price Index or 5 per cent between 1997 and 2004. The indexation requirement for pensions in payment was reduced to 2.5 per cent in 2005 and in 2007 the government announced the same figure would apply to deferred pensions in the future (Saunders 2007). In Ireland most occupational pension schemes increase pensions in payment on a voluntary basis up to a ceiling of about 3 or 4 per cent or the annual increase in the Consumer Price Index, whichever is the lesser.

These and other reasons may underlie the view of the Head of the Pensions Board in Ireland, given in a recent interview (Kirby 2003), that FRS17 had a much greater impact in the UK because pension schemes were generally better funded in Ireland.

United States

Pension plans in the private sector are regulated by the federal government, with federal law pre-empting state law. Only the plans of government employees and church plans are exempt from this regulation.

The number of defined benefit plans reached a peak about 1985 and has declined continuously since then. The same pattern holds for plans with 100 or more participants (Table 7). The pattern for number of participants is similar to pattern for plans (Table 8).

Table 7. Defined Benefit and Defined Contribution Plans in the United States, 1975-2005					
Year	All I	Plans	Plans with 100	Plans with 100+ Participants	
	Defined Benefit	Defined	Defined Benefit	Defined	
		Contribution		Contribution	
1975	103,346	207,748	20,035	8,587	
1980	148,096	340,805	24,505	13,350	
1985	170,172	461,963	24,742	23,917	
1990	113,062	599,245	19,242	33,922	
1995	69,492	623,912	17,087	45,200	
2000	48,773	686,878	13,557	57,635	
2005	47,614	631,481	11,557	67,278	
Source: U.S. Dep	partment of Labor 2	2008			

Table 8. Defined Benefit and Defined Contribution Participants in the United States,					
1975-2005 (thous	sands)		•		
Year	All I	Plans	Plans with 100	Plans with 100+ Participants	
	Defined Benefit	Defined	Defined Benefit	Defined	
		Contribution		Contribution	
1975	27,214	11,217	25,691	8,709	
1980	30,100	18,896	28,305	15,315	
1985	28,895	33,168	27,145	27,896	
1990	26,205	35,340	25,182	28,705	
1995	23,395	42,203	22,724	34,477	
2000	22,218	50,874	21,707	41,389	
2005	20,310	62,355	19,991	53,319	
Source: U.S. Dep	Source: U.S. Department of Labor 2008				

The percentage of private pension participants in defined benefit plans has declined since at least 1975. In 1975, just after passage of the landmark pension legislation, the Employee Retirement Income Security Act of 1974, 71 per cent of active participants in private sector pension plans were in defined benefit plans. By 1980, that figure was down to 66 per cent. By 1996, the percentage had fallen to 34 per cent, and by

2004, it had fallen to 28 per cent (U.S. Department of Labor 2007).

Contributions provide a different measure of the changes. In 1980, contributions to individual account plans were 2.8 per cent of private sector wage and salary earnings to 5.8 per cent in 2004. Conversely, contributions to defined benefit plans went from 3.8 per cent of wage and salary earnings in 1980 to 2.1 per cent in 2004 (Poterba et al. 2007).

In the 1980s, 401(k) plans, a type of defined contribution plan named after the section of the Internal Revenue Code that enabled them, were mainly offered by large employers as a supplement to defined benefit plans. Between 1984 and 1997, there was little replacement of defined benefit plans by 401(k) plans. Most of the new 401(k) plans were supplemental to defined benefit plans (Poterba et al. 2004). Gradually, however, employers without defined benefit plans and new companies started offering 401(k) plans as their only pension plan. Many smaller- and medium-sized companies with defined benefit plans terminated them and offered 401(k) plans instead. Until recently, larger employers that had defined benefit plans have kept both defined benefit and defined contribution plans (Coronado and Hewitt 2005).

Cash balance plans are a relatively new type of pension plan in the United States. In 2004, 24 per cent of active participants in defined benefit plans were in cash balance plans, while a decade earlier few of these plans existed. Cash balance plans are categorized in pension law as defined benefit plans but from an economic perspective they are hybrid plans. They define the worker's benefit in terms of an account balance and generally pay benefits as a lump sum. Taking into account the growth of cash balance plans, the decline in traditional defined benefit plans has been even more dramatic than indicated above. In 2004, the percentage of active participants in traditional defined benefit plans (excluding participants in cash balance plans) was 21 per cent, compared to 28 percent measured in official statistics that include cash balance plans.

Reasons for the popularity of cash balance plans may shed light on the decline of traditional defined benefit plans. Cash balance plans free the plan sponsor from longevity risk because they define the benefit as an account balance. With both the switch to 401(k) plans and the switch to cash balance plans, employers have shifted longevity risk to participants and away from stockholders.

Another similarity that cash balance plans have to defined contribution plans is that because benefits are defined as an account balance, cash balance plans do not penalize job changers. In addition, cash balance plans do not provide the early retirement subsidies that are typical of traditional defined benefit plans.

Because they are categorized as defined benefit plans, cash balance plans bear the regulatory costs of defined benefit plans. Thus, the switch to cash balance plans suggests that regulatory costs are not the whole story in explaining the decline in defined benefit plans. However, some regulations affect cash balance plans differently than traditional defined benefit plans. The Omnibus Budget Reconciliation Act of 1987 made it more difficult to fund traditional defined benefit plans with their backloading of benefit

accruals. Cash balance plans are not backloaded but have more even benefit accrual over a worker's career (Coronado and Hewitt 2005).

Plan freezes are the most recent development in the decline in defined benefit plans. While in the past, firms that terminated their defined benefit plans were primarily either small firms or large firms in financial distress, in the 2000s, a number of plan sponsors in large, healthy companies have frozen their defined benefit plans. With a hard freeze, which is the most common type (Munnell and Soto 2007), no new benefits are accrued in the plan. A freeze differs from a termination in that the plan is not shut down. A freeze provides the plan sponsor time to continue contributing to the plan to raise its funding, if it is underfunded. A plan freeze is a good alternative for a plan sponsor wishing to stop accrual of benefits but facing a plan that is underfunded. Eventually, it is expected that plans that are frozen will be terminated when they have adequate funding. Plan freezes are occurring as a way for plan sponsors to end the financial commitments they have in defined benefit plans.

A study of plan freezes has concluded that certain characteristics of plans make it more likely that they will be frozen (Munnell and Soto 2007). Plans that have a lower funding ratio are more likely to be frozen. Similarly, plans with high legacy costs for past workers are more likely to be frozen.

Pension plans are required to record the Projected Benefit Obligation (PBO) on their balance sheet. The PBO is their pension liability based on the assumption that the plan is ongoing and that the liabilities accrued due to work this year will ultimately be valued based on future wage rates near the retirement ages of the current workers. However, if they freeze the plan, then they report the Accumulated Benefit Obligation (ABO) on the balance sheet. The Accumulated Benefit Obligation does not take into account pension liabilities arising from future benefit growth, and can be considerably lower than the Projected Benefit Obligation. Thus, freezing a plan can give the impression on the firm's balance sheet of considerably improving the financial status of a firm. For this reason, the accounting requirement of using the Projected Benefit Obligation may be one factor leading firms to freeze their defined benefit plans.

Defined benefit plans have declined in all industries but the decline varies considerably across industries (Table 9). These findings suggest that factors that affect all industries, such as changes in regulations and increasing longevity, have played a role, but that factors that vary across industries have also played a role. The study finds that technological changes in some industries have reduced the value to having long-term employees. A feature of defined benefit plans is that they encourage long-term employment.

Table 9. Change in defined benefit plan coverage in selected industries, 1979-1998					
Industry	Percentage point change in	Percentage point change in			
	defined benefit plan	defined contribution plan			
	coverage rate (%)	coverage rate (%)			
Textiles	-39.1	17.8			
Fabricated metals	-36.7	23.6			
Communications	-35.9	26.4			
Food	-29.2	15.2			
Transportation	-20.7	7.8			
Insurance	-15.4	18.6			
Construction	-14.0	6.7			
Retail trade	-10.3	9.4			
Hotels and lodging	-10.3	13.5			
TOTAL	-21.1	14.1			
Source: Aaronson and Coron	Source: Aaronson and Coronado (2005)				

Changes in Pension Regulation in the U.S. that Have Hastened the Decline in Defined Benefit Plans

Increasing the likelihood that employers provide defined benefit pensions has never been a goal of pension legislation over the past 30 years. The goals of legislation have included to reduce risks faced by workers, shifting those risks to employers; and to limit funding in order to limit lost tax revenue.

Changes in regulations adversely affecting defined benefit plans can be categorized into two groups: First, regulations that provided 401(k) plans desirable features that were not provided to defined benefit plans, and second, regulations that raised the cost or otherwise decreased the desirability of defined benefit plans.

A study of administrative costs of pension plans has shown that the administrative costs of defined benefit plans have grown relative to defined contribution plans (Table 10). In addition, the costs have grown relatively more for small defined benefit plans compared to large defined benefit plans.

Table 10. Annual plan sponsor administrative cost, 1981-1996				
Year	Cost ratio: DB/DC			
	15 Employee plans 10,000 Employee plans			
1981	1.42	0.91		
1985	1.52	0.96		
1990	2.01	1.40		
1995	2.16	1.41		
1996	2.16 1.39			
Source: Hustead (1998)				

Inherent Advantages 401(k) Plans Have Over Defined Benefit Plans

A shift toward 401(k) plans has been occurring since the enabling regulations for these plans were promulgated in 1981. Thus, a way to analyze the decline in defined benefit plans is to compare 401(k) plans to defined benefit plans to see what advantages 401(k) plans have for employers compared to defined benefit plans.

From the employer's perspective, 401(k) plans have a number of advantages over defined benefit plans. First, the big three risks – financial market risk, longevity risk, and annuitization (interest rate change) risk – all are borne by employees in 401(k) plans but are borne by employers in defined benefit plans. Longevity risk and annuitization risk are borne by the employees because employers are not required to provide an annuity for 401(k) plans and generally do not do so.

Second, employers pay all the fees for defined benefit plans, but employees generally pay most or all of the fees for 401(k) plans.

While the growth of 401(k) plans presumably is the result in part of the diffusion of a financial product innovation, policy analysts have tended to view it as the result, at least in part, of other changes that have occurred since those plans first became available.

Regulatory Advantages 401(k) Plans Have over Defined Benefit Plans

First, employees contribute to 401(k) plans and receive a tax deduction. Employee contributions to defined benefit plans do not receive a tax deduction and are rare in the U.S. private sector. A feature of 401(k) plans that appears to account for their vastly greater popularity over other types of defined contribution plans is that they permit tax deductible employee contributions. Tax deductible employee contributions are not permitted for other types of defined contribution plans and are not permitted for defined benefit plans in the U.S. private sector. They are permitted for defined benefit plans for state and local government employees, where, the decline in defined benefit plans has been slight.

Second, the volatility of employer contributions is considerably less in 401(k) plans than in defined benefit plans. In 401(k) plans, employer contributions are tied to wages. In defined benefit plans, employer contributions can be zero for a number of years and then jump up due to newly appearing underfunding of the plan. The volatility of funding in defined benefit plans is partly the result of regulations.

Third, defined benefit plans generally are required to provide annuitized benefits, while 401(k) plans do not face that requirement.

Fourth, defined contribution plans can be structured so that employers need to contribute for fewer workers than would be the case with a defined benefit plan. Employers have greater flexibility in 401(k) plans than in defined benefit plans to structure them so that they primarily benefit higher paid workers.

Fifth, workers can receive pension benefits from a 401(k) plan while still working for the sponsoring employer at age 59 ½ but not until age 62 from a defined benefit plan.

Regulations that Raised the Cost or Decreased the Desirability of Defined Benefit Plans

Defined benefit plans are more costly for employers to provide than are defined contribution plans. One study found that the per participant administrative costs of a defined benefit plan were between \$90 and \$150 a year (1992 dollars), compared to \$31 a year for a defined contribution plan (Mitchell 1998).

Legislation enacted over a number of years has had a negative effect on the willingness of employers to provide defined benefit plans. The Tax Reform Act of 1986 placed restrictions on small defined benefit plans that prevented those plans from mainly benefiting highly compensated individuals. Following the enactment of that law, a number of small defined benefit plans terminated.

Further, employers no longer are able to claim through reversions the excess assets in defined benefit plans without paying steep excise taxes. If the plan sponsor terminates an overfunded defined benefit plan and reverts the excess assets to the employer, there is a 50 percent tax on the reversion. This tax is in addition to a 35 percent corporate income tax and state income taxes. Together, the taxes rise nearly to 100 percent, with the purpose of the excise tax to discourage plan terminations with reversions. Not surprisingly, no tax revenue is raised by this tax because no reversions are taken (Warshawsky and Pang 2007).

Applications for new defined benefit plans dropped after 1990 when restrictions were placed on the ability of companies to take reversions from overfunded pension plans. Together, these two changes—the restrictions on small plans and the restrictions on reversions--accounted for a 25 per cent decline in defined benefit plans (Munnell and Soto 2007).

The Omnibus Reconciliation Act of 1987 considerably restricted funding to defined benefit plans so that those plans cannot fully fund the current accrual of liabilities for younger workers. This change was enacted to reduce the amount of money the U.S. Treasury lost due to pension funding. Those restrictions on funding were loosened by the Pension Protection Act of 2006.

Employers have faced volatility in required contributions to defined benefit plans due to the restrictions on contributions. These restrictions limited how much they could contribute during the 1990s when the stock market was booming, and have required them to contribute when the economy was performing relatively poorly in the early 2000s, which is exactly the opposite of the pattern of contributions that would be desirable for employers.

Accounting Rule Changes. Proposed accounting rule changes will make the recorded volatility of defined benefit plan funding have a much greater effect on the balance sheets of companies. The Financial Accounting Standards Board (FASB) governs pension accounting in the private sector in the United States. Accounting rules taking effect in 2006 (FAS 158 Employers' Accounting for Defined Benefit Pension and Other Postretirement Plans) required U.S. companies to recognize pension over- or under-funding on their balance sheets for the first time. Previously, this information was disclosed in the footnotes to the financial statements. For purposes of this reporting, the funding status is recorded as the difference between the plans assets valued at fair market value and its liabilities, calculated using the projection of future wages to value future benefits.

FAS 158 will change the balance sheets of companies with defined benefit pension plans. A company with a credit agreement, indenture, or other debt agreement that contains covenants or events of default that are tied to the balance sheet needs to assess the impact of the FAS 158 changes. Waivers from lenders or amendments to credit documents may be necessary (JonesDay 2006).

Changes in pension funding affect the income statement, but that effect is phased in using smoothing over several years, rather than being recorded immediately. Within the next few years, FASB may require pension expenses recorded on income statements to use market values rather than smoothed, less volatile, values (Goebel and Kivarkis 2007). This change will cause greater volatility in the reported profits of firms. This change could cause pension volatility to dwarf changes in the underlying profitability of the firm, causing some experts to consider that it would greatly reduce the usefulness of the income statement. An alternative proposal would be to place the market value of the change in funding on the income statement at the end as a non-recurring event. It would report, for example, that pension assets performed poorly this year, but this result is not expected to repeat every year in the future.

Increased Life Expectancy. If plan sponsors wish to maintain a constant cost of providing benefits despite increases in life expectancy, they in principle could do so by raising the early or normal retirement ages in the plan. To do so, they would need to amend their defined benefit plan. ERISA (the Employee Retirement Income Security Act of 1974) and the Internal Revenue Code (IRC) contain parallel provisions that prohibit a plan sponsor from amending a defined benefit plan if the amendment would decrease accrued benefits. This prohibition, known as the "anti-cutback" rule, makes it difficult for a plan sponsor to increase the normal retirement age and early retirement age. ERISA also contains a provision prohibiting plans to set the normal retirement age higher than 65.

Because the anti-cutback rule prohibits a decrease in accrued benefits, it is important to understand how ERISA defines accrued benefits. According to the statute, an accrued benefit is "determined under the plan and . . . expressed in the form of an annual benefit commencing at normal retirement age" (ERISA §3(23)). ERISA establishes parameters that limit plan flexibility in setting accrual rates (ERISA §204).

For employees with at least 5 years of plan participation when they reach age 65, the statute defines "normal retirement age" as the earlier of the date specified by the plan or age 65 (ERISA §3(24)). For employees who do not have 5 years of plan participation by the time they reach age 65, the NRA is the earlier of the date specified by the plan or their fifth anniversary of plan participation (Muir and Turner 2007).

The ERISA anti-cutback rule governs changes in annual benefits rather than lifetime benefits. For this reason, a change in the benefit formula that maintained constant the lifetime present value of benefits in the face of increasing longevity would violate the anti-cutback rule because it would reduce annual benefits. This problem could be solved if the anti-cutback rule were redefined using the economic definition of accrued expected lifetime benefits. Future annual benefits already accrued could be reduced without violating this anti-cutback rule so long as the present value of lifetime benefits with increased life expectancy was not reduced.

Trends in Mutual Fund Fees

About half of the money invested in 401(k) plans is invested in mutual funds. The growing popularity of these plans may arise in part due to the substantial reduction in fees that mutual funds charge. To understand trends in mutual fund fees, the Investment Company Institute (ICI 2007) has combined major fund fees in a single measure. ICI created such a measure by adding a fund's annual expense ratio to an estimate of the annualized cost that investors sometimes pay for one-time sales charges.

Mutual fund fees that investors pay have trended downward since 1980. In 1980, investors in stock funds, on average, paid fees and expenses of 2.32 per cent of fund assets. By 2006, that figure had fallen to 1.07 per cent of fund assets. Fees and expenses paid on bond funds have declined by a similar amount.

Several reasons explain the dramatic drop in the fees and expenses incurred by mutual fund investors. First, investors pay much less in sales loads than they did in 1980. For example, the maximum front load that an investor might pay for investing in an equity fund has fallen from an average of 8 per cent of the investment to about 5 per cent. The front loads that equity fund shareholders actually paid have fallen even more, from 5.6 per cent in 1980 to only 1.3 per cent in 2006. A key factor in the decline in loads paid has been the growth of mutual fund sales through employer-sponsored retirement plans. Load funds often do not charge loads for purchases of fund shares through such retirement plans (ICI 2007).

Mutual fund fees also have been pushed down by economies of scale and competition within the mutual fund industry. From 1980 to 2006, the number of households owning mutual funds rose from 4.6 million to 54.9 million (ICI 2007). Increased familiarity of workers with mutual funds, as well as the lower costs of the funds, may have contributed to the growth of defined contribution plans.

If the fees for managing investments in defined benefit plans also fell by half over this period, then the relative price of defined benefit and defined contribution plans would have been unchanged. While comparable data are not available, it appears likely that the fees for managing investments for defined benefit plans, which would be charged at an institutional rate rather than a retail rate, may have fallen but by not nearly as much.

Canada

In a recent Canadian survey, 61 per cent of chief financial officers reported that defined benefit plans are facing severe problems, including volatile valuations, diminished affordability, and high regulatory burden (Watson Wyatt and Conference Board 2006, Selody 2007). In another survey, 43 per cent of plan sponsors indicated that cost containment was the most serious problem they faced. The survey found that 90 per cent of plan sponsors contributed more than 5 per cent of payroll to their defined benefit plans, which is well above the average employer contribution to defined contribution plans (Moore 2008, Buck Consultants 2008).

Pension policy in Canada is determined partly at the national level, through tax policy toward pensions and the regulation of pensions in some nationwide industries, and partly at the provincial level, through provincial regulation of most pension plans. For constitutional reasons, each province has its own pension benefits law, and thus legal and regulatory conditions affecting pension plans differ across the provinces. Differences across provinces may shed light on reasons why defined benefit plans have declined.

Registered Pension Plans (RPPs) and Registered Retirement Savings Plans (RRSPs) are the two main vehicles for private pensions and personal retirement savings in Canada. RPPs are occupational pensions voluntarily established by employers. They are predominantly defined benefit, but defined contribution plans have been playing an increasingly important role. RRSPs are personally managed, individual savings plans.

The Decline in Defined Benefit Plans

The decline in defined benefit plans has been less in Canada than in the United Kingdom and the United States, with the comparison to Ireland not as clear cut. Data on pension assets for Canada, the United Kingdom and the United States show that defined benefit plans account for a far higher percentage of pension assets in Canada than in the other two countries (Table 11).

Table 11. Share of defined benefit plan assets in pension assets, 2006			
Country	Share of pension assets in defined benefit		
	plans, percent of assets, 2006		
Canada	91%		
United Kingdom	78%		
United States	63%		
OECD Global Pension Statistics, cited in Baily and Kirkegaard (2008).			

From 1992 to 2003, following the extensive overhaul of the pension and tax law in the late 1980's, defined benefit coverage for private sector workers declined from 29 per cent to 21 per cent (Canadian Institute of Actuaries 2007). The decline was disproportionately large among small defined benefit plans (Baldwin 2006).

Two separate but related trends have occurred. The coverage rate for defined benefit plans has declined modestly, as described above. The coverage rate for defined contribution plans has increased. The combination of these two trends has caused a substantial decrease in the percentage of covered workers who are covered by defined benefit plans. In 1974, 91 per cent of private sector pension participants were in a defined benefit plan. That percentage increased slightly to a peak of 92 per cent in 1982 and has declined since then. By 1992, the first decade following the peak, the percentage had declined 8 percentage points, to 84 per cent. By 2002, the second decade following the peak, it had declined another 9 percentage points, to 75 per cent. By 2004, it had declined a further percentage point, to 74 per cent (Table 12). Thus, there has been a fairly steady decline in the percentage of covered workers in defined benefit plans over a period of slightly more than two decades. The decline in defined benefit plans started earlier in the United States than in Canada, while it started later in the United Kingdom.

Table 12. Per cent of			
private sector pension			
participants in defined			
benefit plans in Canada,			
1974-2004			
Year	Per Cent		
1974	90.6		
1976	91.1		
1978	91.0		
1980	91.4		
1982	91.8		
1984	90.6		
1986	88.8		
1988	87.9		
1990	86.5		
1992	84.1		
1994	82.9		
1996	81.6		
1998	78.5		
2000	76.2		
2002	75.3		
2004	74.2		
Source: Tamango (2006)			

Registered Retirement Savings Plans (RRSPs) are individual account defined contribution plans that were introduced in 1957 to provide pensions for people not covered by employer-provided pension plans. In 2002, roughly 40 per cent of taxpayers who were eligible contributed to an RRSP. Thus, these individual account pensions play a substantial role in the retirement income system.

Some movement has occurred from employer-sponsored Registered Pension Plans (RPPs) to collections of individual plans set up through employers called group Registered Retirement Savings Plans (G-RRSPs), presumably because RPPs are subject to more costly regulations and are more costly to administer. RRSPs receive favorable tax treatment, but, unlike RPPs, are not subject to federal or provincial regulation (Morisette and Zhang 2004).

Canadian statistics on the switch to defined contribution plans generally only count RPPs and understate that trend by not including RRSPs. Roughly 40 per cent of the workforce, including government workers, is covered by a RPP, while the coverage rate rises to about 66 per cent if RRSPs are included (Ambachtsheer 2004). Thus, a sizable percentage of the Canadian private sector is covered by defined contribution plans when the RRSPs are included. Workers can contribute the same amount to an RRSP as they can contribute to a RRP defined contribution plan or to a RPP defined benefit plan.

In recent years, unregistered (non-tax-qualified) plans have grown because the real value of the maximum benefit allowed through RPPs has declined over time (International Network of Pension Regulators and Supervisors 2003). For a number of years, Canada had a policy of allowing maximum benefits from defined benefit plans equal to 2.5 times the average wage. It froze the maximum nominal benefit level in the late 1990s, reducing the maximum benefit down to 2 times average wages.

Policy Affecting Defined Benefit and Defined Contribution Plans

Pension policy in Canada has long had the principle of establishing a "level playing field" between defined benefit and defined contribution plans. The goal, however, has not been reached. Because defined contribution plans have played a relatively minor role in the pension system until recently, the regulation of them has received less attention than for defined benefit plans. RRSPs are subject to less regulatory oversight than defined contribution RPPs.

Tax reform enacted in 1990 attempted to level the playing field in terms of the amounts that could be contributed to defined benefit and defined contribution plans. Prior to that reform, much larger benefits could be accumulated through a defined benefit plan than through a defined contribution plan (Baldwin 2007), and thus the change favored defined contribution plans.

An aspect of the level playing field between defined benefit and defined contribution plans, in some jurisdictions in Canada, defined contribution plans must provide benefits in the form of an annuity (Cohen and Fitzgerald 2007). This requirement is not the case in the province of Ontario. This requirement reduces the differences between defined benefit and defined contribution plans, as compared to those plans in the United States, where few defined contribution plans provide annuities.

Commentators have noted that regulations established in the late 1980s have placed a greater regulatory burden on defined benefit plans than on defined contribution plans. Those reforms required pension plans to provide new benefit protections for plan members concerning eligibility for plan membership, benefits on termination of employment, survivor benefits and early retirement benefits (Baldwin 2007).

A tax law change taking effect in 2008 for tax year 2007 favors RPPs over RRSPs. This change allows couples to split their RPP income in retirement, which is advantageous if one person has substantially higher RPP income and is in a higher tax bracket. Splitting was not extended to RRSPs (Turchansky 2008).

Some evidence suggests that the province of Ontario has experienced more rapid decline in defined benefit plans than has the rest of Canada (Sebastiano 2007). The province of Ontario is the only province providing defined benefit plan insurance. Whether that insurance has been a factor in the greater decline in defined benefit plans in Ontario than elsewhere has not been investigated. However, at least two authors have speculated that the greater decline in defined benefit plans in the U.S. than in Canada is due in part to the presence of the Pension Benefit Guaranty Corporation in the U.S. The PBGC makes it easier for plan sponsors in the U.S. to end defined benefit plans, while in Canada plan sponsors are more likely to try and fix them, for example by reducing their generosity (Cohen and Fitzgerald 2007).

In Canada, 17 per cent of pension plans provide automatic inflation indexation (Certified General Accountants Association of Canada 2004). This percentage is far higher than in the United States, where such indexation is rare. Such indexation interacts with longevity, making increases in longevity more expensive for plan sponsors.

Until the mid 1980s, it was fairly easy for employers to withdraw funds from surplus pension funds. Changes in law since then have made that considerably more difficult (Cohen and Fitzgerald 2007). Employers have expressed concerns over clarity as to ownership rights to plan surpluses. However, the experience from the United States suggests that clarity is not sufficient. The disposition of the ownership rights also matters.

In Canada, when surpluses arise in pension plans, which inevitably occurs for many plans during times of sharply rising asset markets, employers are not permitted to contribute to the plans once funding exceeds a certain level. Federal income tax laws prevent pension plan sponsors from contributing to the plans when the plan assets are more than 110 per cent of plan liabilities. This rule assures that plans will be in deficit at least part of the time due to normal fluctuations in the stock market and interest rates.

Employee groups in Canada have argued that employers receive all the advantage when there is overfunding and the employers do not make contributions. The employee groups have argued that some of that advantage should be shared with workers through benefit increases. Because of the pressure they face for benefit increases when plans are overfunded, employers have been reluctant to fund plans at more than the minimal level

permitted. Conflicts over defined benefit plan surpluses that have been taken to court have generally been found in favor of employees (Baldwin 2006).

New accounting rules in Canada will require balance sheet recognition of the funded status of defined benefit pension plans. Following implementation of Financial Accounting Standard 158 in the U.S., Canada's Accounting Standards Board in March 2007 introduced an exposure draft to move the funded status of defined benefit pensions to the balance sheet from footnotes.

Between 1971 and 2002, life expectancy for males at age 65 in Canada increased by 4.0 years, from 13.7 to 17.7 years. This increase was more rapid than for the U.S., where the increase was 3.1 years, from 13.1 years to 16.2 years, increasing the gap in life expectancy at older ages between Canada and the United States (Wade and Ménard 2007). Thus, increases in life expectancy may have raised defined benefit plan costs more in Canada than in the United States.

Disadvantages for Canadian Defined Contribution Plans Relative to the U.S.

In the United States, retail clients can purchase equity index mutual funds from Vanguard with expense ratios of less than 0.2 per cent (20 basis points), while in Canada the largest mutual fund, Investors Dividend Fund, charges a management expense ratio of 2.71 per cent (Chevreau 2007). This difference in mutual fund costs would make defined contribution plans considerably more attractive to participants in the U.S. than in Canada. An international study has found that mutual funds are more expensive in Canada than in the United States, the United Kingdom or Ireland (Table 13).

Table 13. Mutual Fund Expenses, 2002 countries (per cent of assets)				
Country	Management	Total expense ratio	Total shareholder	
	expenses		costs	
Canada	2.11	2.87	4.93	
Ireland	1.33	1.96	2.81	
United Kingdom	1.15	1.39	2.43	
United States	0.79	1.71	1.99	

Note: Management expenses include charges levied each year for management services. The total expense ratio includes all annual expenses charged against account balances, including investment expenses. Total shareholder costs include all annual expenses plus an annuitized form of loads assuming a five year holding period.

Source: Khorana et al. 2006.

According to the Fidelity Canada website, the Fidelity True North Fund won the 2007 Canadian Investments Award for the best equity fund. The annual report for this fund is available online. It indicates that for the different share classes the Annual

Management and Advisory Fee Rate varied from 0.85 per cent to 2.00 per cent, with all but one of the seven share classes having a fee of 1.85 per cent or higher. For all seven share classes, the total management and advisory fees were \$58.2 million, out of a total fee amount of \$70.5 million. Thus, the management and advisory fees were 82.6 per cent of the total fees listed, which included transfer agent fees, pricing and bookkeeping fees, directors' and trustees' fees, custodian fees, audit fees, filing fees, legal fees, and goods and services tax (Fidelity Canada 2007). The actual fees in percentage terms are roughly 20 per cent higher than the management fees.

Regulatory Advantages Canadian Defined Benefit Plans Have Compared to the U.S.

Employees can make tax deductible contributions to defined benefit plans, and are often required to do so. This is an advantage defined benefit plans in Canada have over defined benefit plans in the United States, where employee tax deductible contributions are not permitted for private sector pension plans. Instead of terminating defined benefit plans, some employers have adjusted to increased costs by raising the level of employee contributions (Cohen and Fitzgerald 2007).

Plan sponsors in Canada can change the early retirement conditions for persons not yet qualified for early retirement (Certified General Accountants Association of Canada 2004). This appears to give plan sponsors greater flexibility concerning defined benefit plans in Canada than in the United States.

Actuarial valuations of defined benefit plans, which add to the administrative cost of these plans, must be carried out at least every three years, except in certain provinces where they must be carried out annually if funding is below a certain level. The requirement in the United States is annual, while in Ireland it is every three-and-a-half years. Deficits determined by valuing plan liabilities on a going-concern basis, which involve using projected future wage rates, must generally be made up over a fifteen-year period in Canada. The 15-year period is considerably longer than the period of 7 years or 10 years, respectively, that is currently required in the United States and Ireland for deficits determined on an ongoing basis. However, in Canada deficits arising on a solvency or termination basis must generally be made up within five years.

CONCLUSIONS

The large declines in defined benefit plans that have occurred in some countries are not inevitable. They can be prevented or reversed by public policy if governments decide that preserving defined benefit plans as an important part of the retirement income system is desirable. Public policy changes in this respect can be grouped into three categories: 1) changes that reverse policies that have lead to the decline in defined benefit plans, 2) innovative policies that strengthen defined benefit plans by shifting some of the cost and risk to workers, and 3) policies that level the playing field with defined contribution plans by providing stricter regulation of defined contribution plans.

The decline in defined benefit plans has generally been larger among small plans than among large plans, which appears to be consistent with an explanation focusing on regulatory costs. This result may be because the cost increase for defined benefit plans due to an increased regulatory burden generally is larger for small plans than for large plans. This pattern occurs because often there is a fixed cost element to complying with government regulations and reporting requirements. Efforts to reduce the regulatory costs on defined benefit plans could address this issue.

The principle of a level playing field between defined benefit and defined contribution plans may have helped to preserve defined benefit plans in Canada. Defined contribution plans in Canada generally require that benefits be paid out as an annuity, making them similar to defined benefit plans in that respect. There is no such requirement for defined contribution plans in the United States.

Defined benefit plans in Canada have an advantage over defined benefit plans in the United States in that they can be financed in part by tax deductible employee contributions. The increased costs due to increased longevity can be financed in part by increased employee contributions.

A notable difference between Canada and the U.S. that affects defined contribution plan participants particularly is the fees charged by mutual funds, which are considerably higher in Canada than in the United States. Mutual fund fees in the United States have declined considerably since 1980, corresponding to the period of growth of 401(k) plans. Differences across countries and across time in mutual fund fees may be part of the explanation for the decline in defined benefit plans. Since 1980, the average expense ratio for equity mutual funds in the US has declined by half. Mutual funds are considerably more expensive in Canada than in the US. Thus, the simple correlation fits, with DC plans being more prevalent when their price (as measured by the expense ratio for mutual funds) is relatively low.

In all four countries, it appears that unexpectedly large increases in life expectancy have played a role in the decline in defined benefit plans. Defined benefit plans in none of these countries provide benefits that are indexed to increases in life expectancy. Thus, generally the plan sponsor bears the cost of increased life expectancy.

Regulatory changes could be considered to make it easier for defined benefit plans to deal with the increased cost arising from increases in life expectancy.

While Canadian employers are responsible for making good on any plan underfunding, they generally are not able to withdraw assets when plans have excess assets. This asymmetry reduces the motivation of employers for funding plans and, as a consequence, increases the volatility in employer contributions, which lessens the desirability to employers of providing defined benefit plans.

The provision of pension benefit insurance, as done in the province of Ontario, raises the cost of providing defined benefit plans. It also creates a more favorable environment for terminating defined benefit plans because employees suffer fewer adverse consequences when that is done.

Moving from current Canadian and US accounting rules to those favored by the UK and the IASB would represent a shift from one end of the range to the other. Current Canadian and U.S. accounting rules allow for smoothing of asset variations which serve to defer costs in times of poor investment returns. The rules allow for investment and actuarial gains and losses to be amortized over long periods. In the case of actuarial losses, the amortization period could extend beyond the period over which they must be funded. These smoothing and deferral mechanisms are generally viewed by investors and analysts as being too lenient. Nevertheless, a change to immediate recognition of gains/losses is perhaps too radical since a plan is long term in nature and funding of a plan occurs over time.

Although a shift to fair market valuation may not be prudent in the US or Canada in existing financial market conditions, such a shift is probably inevitable in the longer-term. There is an expectation that accounting standards will experience increased convergence in the near future. While substantial change in pension accounting has been brought forward in Canada in recent years through the issuance of Section 3461 of the Handbook as well as in the U.S. by way of SFAS 132, there continues to be substantial interest in participating in the design of global converged standards. Currently in Canada, the Accounting Standards Board (AcSB) is awaiting the outcome of the joint meetings of the International Accounting Standards Board (IASB) and the U.S. Financial Accounting Standards Board (FASB).

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