

# The performance of trustee pension funds

*Diane Galarneau*

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**W**ith reserves approaching \$158 billion at the end of 1988, trustee pension funds amounted to more than five times the federal deficit! Since a considerable part of these reserves comes from salary contributions and these funds will be used to pay many of our retirement pensions, we may well wonder how they are invested and what factors affect their rate of return on the financial markets.

This article examines the rate of return on trustee pension funds in terms of two important characteristics: the sector (public or private) and the investment decision maker. These characteristics were selected because they reveal fundamental differences in fund investment practices.

For example, public sector funds are often subject to regulations requiring the investment of a large portion of the assets in bonds. This policy significantly affects a fund's margin of flexibility on the financial markets. Private sector funds, however, only have to observe restrictions applicable to funds in general.

Similarly, the investment decision maker influences pension fund investment policy. The fund may be managed by trustees, investment counsellors or employers. Although a high rate of return is not the only goal of pension fund managers, it is an important one.

This study concludes by comparing trends in pension fund returns with two market indexes - the TSE Composite Index and the Universe Bond Index. These indexes are conceptually similar to the two main investment instruments of pension funds, stocks and bonds.

## A three-tiered system

Let us first place trustee pension plans in the context of the overall structure of retirement savings in Canada. Income support for the elderly is based on a three-tiered system. The first tier consists of the Old

Age Security and Guaranteed Income Supplement programs (OAS/GIS), which provide universal benefits unrelated to work history. The second covers the contributory Canada Pension Plan and Quebec Pension Plan (CPP/QPP) and the third encompasses employer-sponsored pension plans, registered retirement savings plans (RRSP) and other sources of personal savings.

This study concentrates on one component of the third tier, trustee pension plans. These plans are governed by a trust arrangement, which is only one alternative for the funding of pension plans. However, they account for the largest proportion of the reserves held on behalf of employer-sponsored pension plans (57% in 1987) and cover the largest proportion of the membership in these plans (approximately 71%). [\(1\)](#) Other methods for funding pension plans include insurance company contracts and government consolidated revenue arrangements.



## Figure 1 **Proportion of labour force covered by various retirement income programs, 1987**

*Source: Survey of Pension Plans in Canada, Labour Force Survey*

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The data used for the calculation of the rates of return were taken from the annual Survey of Trustee Pension Funds. Results are shown over a ten-year period from 1978 to 1988. This period was marked by interesting developments in the Canadian economy, including high inflation from 1978 to 1981, the 1981-82 recession and the stock market crash in the fall of 1987, otherwise known as "Black Monday".

## **Rates of return compared by different pension fund characteristics**

This section provides an analysis of the overall rate of return [\(2\)](#) for pension funds, followed by a comparison of rates of return by sector and investment decision maker. These findings are then linked with the asset portfolio.



## Table 1 **Reserves and membership in employer-sponsored plans**

*Sources: Survey of Trustee Pension Funds and Survey of Pension Plans in Canada*

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Rates are evaluated primarily on the basis of their real value in order to avoid the effect of inflation. Basing the entire study on the nominal rate might have led to a confusion of periods of real growth with inflationary growth. To convert a nominal rate of return into real terms, the rate of inflation based on the consumer price index for the same period is subtracted from the nominal rate.

Pension funds must fulfil other objectives besides profitability and are subject to restrictions; these can influence their investment policies and consequently affect their rate of return. For instance, a fund manager must ensure that the fund will be able to meet its obligations to future recipients. Such a constraint discourages excessive risk taking.

The degree of liquidity required in the fund may also pose a restriction on investment possibilities and affect investment policy. As well, some public sector funds are required by regulation to hold government bonds; it is not known to what extent yield is affected by this measure although it probably decreases as a result. In a similar vein, Revenue Canada imposes a penalty on funds that have over 10% of their assets invested abroad; this practice limits foreign investment and probably also affects the rate of return.

## Rates for all funds

During the 1978 to 1988 period, the nominal rate of return ranged from 8.9% to 13.8%, while the real rate fluctuated between -1.0% and 9.7%. From 1978 to 1982, there was a considerable spread between the real and nominal rates because of a high inflation rate. Consequently, even though the nominal rate of return reached fairly high levels during this time, price increases considerably reduced the real returns on trustee pension funds.

However, from 1983 to 1986, the real rate showed a marked increase, due to a lower inflation rate and considerable growth in financial markets. This rapid increase in the real rate also reduced the gap between it and the nominal rate.



### Chart A Nominal and real rates of return on pension funds

*Source: Survey of Trustee Pension Funds*

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The stock market crash in late 1987, resulting from the price drop for most stocks, accounted for the decrease in the real and nominal rates for that year and 1988. However, due to exceptional growth in profits made on stock sales during the first three quarters of 1987, the real rate of return was still high for this year in comparison with the rest of the period under study. In 1988, the effects of the stock market readjustment were more pronounced. A drop in profits on stock sales was mostly responsible for the drop in the rate of return that year. In fact, profits in 1988 amounted to less than one-third of the profits in

1987.

## Real rate of return on funds by sector

Although most public sector funds are excluded in this study (see [Public and private sector funds](#)), those which are included are usually large in both membership and assets. In 1988, only 211 of the 3,700 funds were in the public sector, but they covered 43% of all members and 52% of total assets.

Some public sector funds are subject to restrictive investment policies. As a result, a high proportion of public sector funds is held in bonds. From 1978 to 1988, public sector funds invested an average of 59% of their assets in bonds, compared with close to 35% for private sector funds. On the other hand, private sector funds had higher average stock holdings for the same period, amounting to 30% of total assets, versus 17% for public sector funds.

It is generally recognized that stocks have higher associated risks than bonds, but their expected returns are also greater. The standard deviation of the rate of return on an investment over a given period of time was used to estimate the associated risk ([Ezra](#), 1979). The standard deviation is a statistical measure of variation. If the standard deviation of the return on one investment is high in comparison with another, it means that the rate of return is more variable and therefore carries a higher risk.



### Chart B Real rate of return by sector

*Source: Survey of Trusteed Pension Funds*

[Table 2](#) shows the average real rate of return and its standard deviation for stocks and bonds, as measured by Scotia McLeod, for 1978 to 1988. [\(3\)](#) The rate of return on bonds includes not only the interest rate but also the fluctuation in the price of the bonds. There is an inverse relationship between market interest rates and bond values (or prices). For example, if the market interest rate increases this year, the value of a bond purchased last year declines. This occurs because an equivalent amount invested this year would yield a higher return.



### Table 2 Average performance of stocks and bonds on the financial market, 1978 to 1988

*Source: Scotia McLeod*

The standard deviation for stock investments is considerably higher than for bonds. This suggests that stock investments expose funds to higher risks than bonds but their expected rate of return is higher. In fact, the average rate of return on stocks is over double that for bonds.

From 1978 to 1988, the average rate of return and the standard deviation were somewhat higher for funds in the private sector than for those in the public sector ([Table 3](#)). However, if the average rate of return is recalculated for the 1978-87 period (to remove the effect of the stock market crash which was felt more strongly in 1988), it rises to 4.7% for private sector funds and drops to 3.6% for public sector funds. The corresponding standard deviations are 4.0 and 3.8.



### **Table 3 Average performance of pension funds by sector, 1978 to 1988**

*Source: Survey of Trusteed Pension Funds*

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It appears that stock market adjustments were more strongly felt in private sector funds because of their greater share of stock investment. It is interesting to note that before the crash the rate-of-return gap between the sectors was wider, whereas the standard deviation gap was smaller.

As previously stated, the overall rate of return for all funds was calculated without considering the other objectives and restrictions imposed on pension fund managers. For example, the large proportion of government bonds that some public sector funds are required to hold has a negative impact on the rate of return but definitely meets other objectives. For this reason, it is difficult to say whether the funds are performing "well" or "poorly" overall because, in the end, each manager must judge this for the particular fund in question, according to its specific set of objectives.

It is also interesting to note the considerable difference between the standard deviations for the rates of return of the two market indexes ([Table 2](#)) and those shown by sector ([Table 3](#)). It might be expected that since private sector funds have a higher proportion of stock investments, the standard deviation of their average rate of return should be closer to that shown for stocks in [Table 2](#). In fact, the market indexes represent a combination of all stocks and bonds available on the market but pension fund managers do not necessarily opt for the securities included in these indexes. The difference between the standard deviations found in these two tables may mean that pension fund managers are choosing investments that are less risky on average than the market in general.

## **Real rate of return by investment decision maker**

Trust companies are not the only managers or investment decision makers of trustee pension funds. Investment decisions can also be made by employers or investment counsellors. In 1988, investments were employer-directed for 29% of the total assets of pension funds. These funds are, for the most part, in the public sector where managers are sometimes required by regulation to hold a portion of the fund assets in government bonds.



### **Chart C Real rate of return by decision maker**

*Source: Survey of Trustee Pension Funds*

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Funds whose assets were invested through investment counsellors held 27% of total assets in 1988. Most of these are in the private sector, since the public sector rarely uses such advisors.

Trustees managed the investment of the largest proportion of fund assets, directing over 43% of the total. Public sector funds make the most frequent use of trustees for the management of their portfolios, while private sector funds have tended to rely on them less since the early 1980s, favouring investment counsellors instead.

Because data on investment decision makers have been collected only since 1983, the following analysis covers the 1983-88 period. The rate of return on investment counsellor-directed funds averaged 8.5% between 1983 and 1988, the highest rate among the three types of investment decision makers ([Table 4](#)). Investment counsellors normally favour a higher proportion of stock investments, which carry a higher risk. The standard deviation associated with their portfolios is in fact higher (2.7 compared with 1.4 and 1.3 for funds invested by employers and trustees).



### **Table 4 Average performance of pension funds by decision maker, 1983 to 1988**

*Source: Survey of Trustee Pension Funds*

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Even though the proportion of stock investments is higher for funds invested by trustees than for employer-directed funds, the rate of return for trustees is somewhat lower and the standard deviation is about equal. This may be attributable to the types of stock held by funds with investments that are handled by trustees. It would seem that the characteristics of these stocks are closer to those of bonds in

terms of risk to the fund and their rates of return. However, the data are not available to determine the composition of fund portfolios.

## Real rate of return of two market indexes compared with pension funds

This section compares the rate of return on trustee pension funds with that of the two market indexes: the TSE Composite Index and the Universe Bond Index. These indexes are conceptually similar to the two most common investment vehicles in the pension fund area - stocks and bonds. This comparison shows the relative position of pension funds with respect to returns.

In 1988, stocks and bonds constituted almost three-quarters of trustee pension fund assets ([Table 5](#)). Note the slight decrease in the proportion of bonds from 1980 to 1988, despite favourable terms offered for these instruments during the period. Stocks, on the other hand, showed a strong proportionate increase, which may be linked to a rise in stock prices in the early 1980s.



### Table 5 **Distribution of assets of trustee pension funds, 1980 and 1988**

*Source: Survey of Trustee Pension Funds*

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"Other investments" cover mainly short-term, cash and mortgage investments. Short-term investments increased their portion of total assets from 9.3% to 12.5% between 1980 and 1988, while mortgage investments continued to decline over the period. The attractive interest rates offered on short-term investments for some portions of this period, combined with a loss of investor confidence in a volatile market, explain the growth in this area. Despite this increase, the effect of short-term investments on the overall rate of return on the funds is still too insignificant to be noticeable. The same is true for cash and mortgage investments. For these reasons "other investments" are excluded from the following analysis.



### Chart D **Real rate of return on pension funds, stocks and bonds**

*Source: Survey of Trustee Pension Funds and Scotia McLeod*

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The rates of return on stocks and bonds between 1980 and 1988 showed similar trends - apart from the 1982-84 period, when the stock market took a year longer than bonds to recover after the recession of the early 1980s. (4) The rate of return on pension funds fluctuated much less than it did for the two securities, pointing to a relatively low-risk investment policy.

It is interesting to note that even though the real rates of return on stocks and bonds were clearly negative in 1981 due to the recession, the rate of return on the funds themselves stayed close to zero. On the other hand, the negative effect on pension funds of the stock market crash of October 1987 was more pronounced in 1988, at a time when rates of return on stocks and bonds were improving.

One should note that the indexes are made up of a group of stocks and bonds chosen to reflect securities normally available on the market. Pension fund managers choose from these stocks and others those they judge will best meet their objectives. Consequently, they do not necessarily choose the stocks and bonds that are listed in these two indexes, which is one of the reasons why the rate of return on funds shows variations that are different and less extreme than the index rate fluctuations.

Again, this study deals with the overall rate of return on all funds combined. It is therefore possible that the rate of return of particular funds may fluctuate more than that of the combined group, just as others may vary less. The rate given here is a weighted average rate of return for all funds, which falls between the two extremes.

Nevertheless, it seems that pension fund managers are generally inclined to follow a relatively less risky investment policy, since the fluctuations in the rate of return for the funds are considerably narrower than those of the two indexes used for comparison. It is true that there is some divergence in the case of funds directed by investment counsellors, but these only account for a quarter of the total assets of trustee pension funds.

## Conclusion

This study offers an analysis of the rate of return on trustee pension funds in terms of their different characteristics and compares the rate with some financial market indexes. The rate of return was calculated for all of the funds combined.

The real rate was considerably lower than the nominal rate from 1978 to 1982. This is attributed to the relatively high inflation rate during that period, following which the real and nominal rates moved closer together.

Fund portfolios in the private sector contain a higher proportion of stocks than those in the public sector. Even though such investments generally increase the level of risk to a fund, the estimated risk and real rate of return for private sector fund portfolios are only slightly different from those of public sector funds.

The investment management of a fund may be entrusted to investment counsellors, employers or trustees. Funds invested by counsellors tend to have a higher proportion of stocks, which increases the associated risks but also leads to a higher rate of return.

The real rate of return on stocks and bonds fluctuated substantially and in a similar fashion from 1980 to 1988, while the return on pension funds was much more stable. This implies a relatively low-risk investment policy for pension funds in general.

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## Concepts and definitions

In this article, a trustee pension fund is defined as an arrangement under which pension plan contributions are deposited with a trustee who is responsible for their administration. The trust is a fiduciary relationship in which a group of three or more individuals, or a trust company or an incorporated pension fund society holds title to the assets of the fund on behalf of the plan members, in accordance with the terms of a written trust agreement. In many cases, the individual fund may be split among different investment managers through contractual arrangements with several trust companies, insurance companies or investment counsellors.

The concept of a "fund", as opposed to a "plan", is used for measuring the rate of return. There is a difference between the two, as the reserves of several plans may be invested in the same fund. Accordingly, in 1988 there were about 3,700 trustee pension funds and 5,400 trustee pension plans.

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## Public and private sector funds

Public sector funds are those set up by the federal, provincial and municipal governments. They also include those of crown corporations and some educational and health-related institutions. Most of the funds associated with public service employees are not covered by this study, however. This is because their contributions are paid into the consolidated revenues of the applicable governments and are used for general government purposes. In other words, these plans have no invested assets, so none of the funds are channelled into the financial markets.

Private sector funds are those established by incorporated and unincorporated companies, cooperatives,

religious organizations, unions, charities and any other organization not belonging to the public sector.

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## Technical notes

The formula for the rate of return used in this article is calculated on an annual basis and is adapted from Peter O. Dietz's classic equation, which can be summarized as follows:

$$R = \frac{(I + P - L)}{0.5*(A_1 + A_2 - I - P + L)}$$

where:

R = annual rate of return

I = investment income

P = profits on the sale of securities

L = losses on the sale of securities

A<sub>1</sub> = value of assets at the beginning of the year

A<sub>2</sub> = value of assets at the end of the year

The equation's denominator assumes that contributions to a fund are either made entirely in the middle of each year or half are made at the beginning of each year and the other half are made at the end.

The book value of assets has been used to calculate the rate of return on pension funds. It is usually recommended that the market value be used since it is supposed to reflect the current price of securities on the market, while the book value, in theory, represents the price of securities at the time they were acquired. Since an acquisition can have taken place many years before and its book value may be far removed from its current value, when rates of return are calculated, the current (or market) value of the security is usually preferred.

However, a number of respondents to the survey do not report the market value so it must be estimated more frequently than the book value. In addition, it is often difficult to distinguish between the book value and the market value of an asset. For example, it is known that pension fund managers periodically adjust the book value of their securities to better reflect their worth on the market. It is this "adjusted" book value which is reported in the Survey of Trustee Pension Funds and which has been used in this study.

The following compares the rate of return based on the book value with the rate based on the market value. Up to 1982, there is little difference between the two rates. But, from 1983 to 1986, the rates tend to diverge, then they begin to converge again. This pattern can be explained by fluctuations observed in financial markets which led to increases in the market value of stocks from 1983 to 1986. Since the asset value appears in the denominator of the equation, the rate based on the market value increases more slowly over this period.

Given these observations, it appears that the rates of return shown in this study may be upwardly biased. However, this bias is preferable to the unknown bias of a rate based on a more frequently estimated market value.



## Chart Real rate of return on total assets of pension funds

*Source: Survey of Trusteed Pension Funds*

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## Notes

### *Note 1*

Also included in this category are members of plans managed by a combination of trust and insurance companies.

### *Note 2*

In this article, the rate of return has been calculated using the book value of assets. See the [\*Technical notes\*](#) for details.

### *Note 3*

The rate of return on bonds corresponds to the real rate of return on the Universe Bond Index and the return on stocks to the real rate of return on the Toronto Stock Exchange Composite Index (TSE 300).

### *Note 4*

The real average *annual* rate of return on the Scotia McLeod Universe Bond Index was used to estimate the rate of return on bonds. For stocks, [\*Scotia McLeod's\*](#) real average *annual* rate of return on the TSE 300 was used.

## References

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## Source

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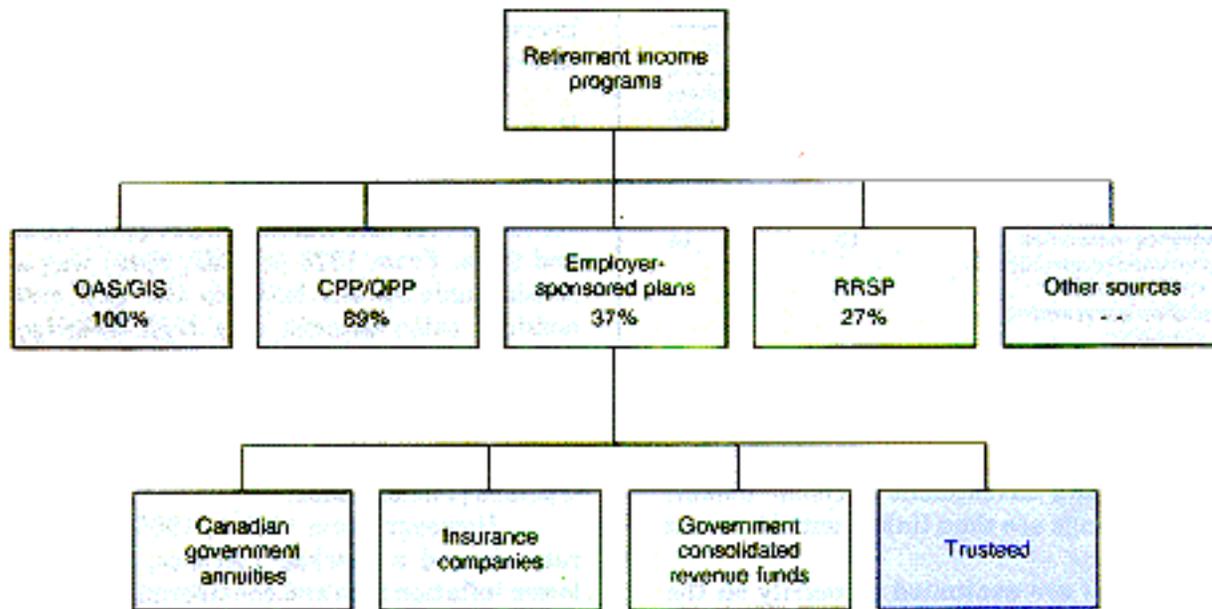
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### Proportion of labour force covered by various retirement income programs, 1987



Source: *Survey of Pension Plans in Canada, Labour Force Survey*

Table 1

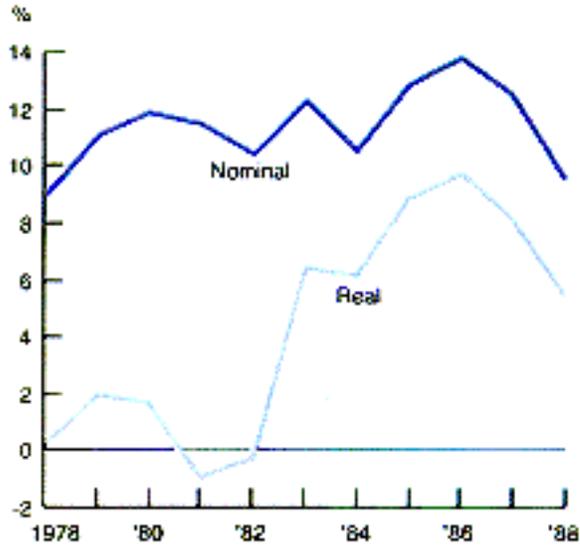
**Reserves and membership in employer-sponsored plans**

Funding agency	Proportion of all plans	
	Reserves in 1987	Members in 1988
	%	%
Trusteed	57	71
Insurance companies	13	14
Government consolidated revenue funds	30	15
Canadian government annuities	--	..

*Sources: Survey of Trusteed Pension Funds and Survey of Pension Plans in Canada*

### Nominal and real rates of return on pension funds

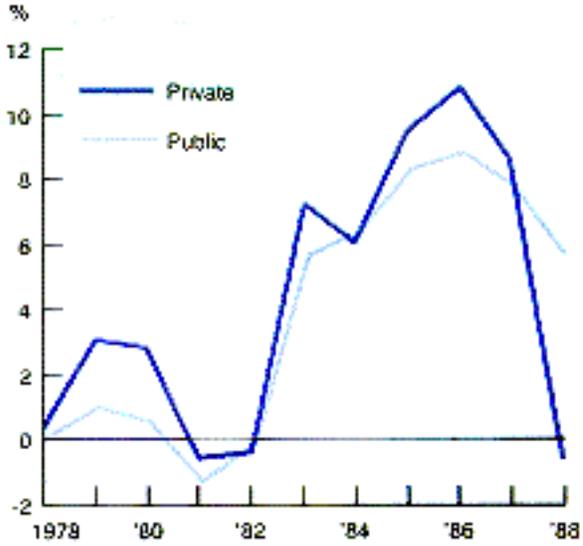
The gap between the two rates was wider prior to 1982 mainly because of inflation.



Source: Survey of Trusteed Pension Funds

### Real rate of return by sector

The real rate of return on public sector funds tends to be slightly lower.



Source: *Survey of Trusteed Pension Funds*

Table 2

**Average performance of stocks and bonds on the financial market, 1978 to 1988**

	Universe Bond Index	TSE 300 Index
Average real rate of return	5.0%	12.2%
Standard deviation	10.6	23.0

*Source: Scotia McLeod*

Table 3

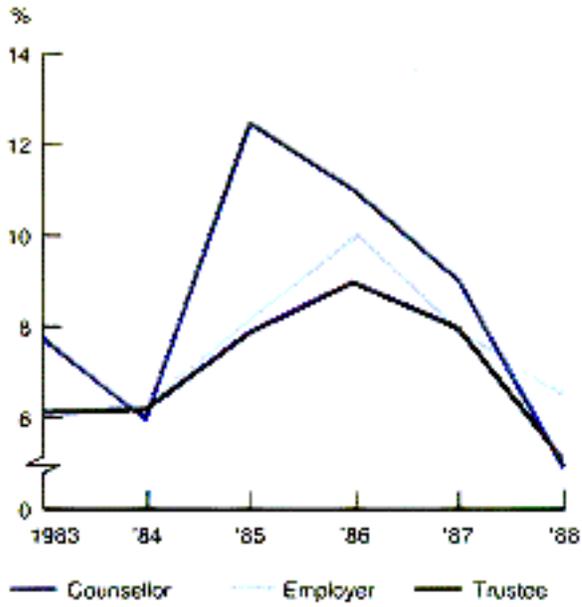
**Average performance of pension funds by sector, 1978 to 1988**

	Public sector	Private sector
Average real rate of return	3.8%	4.2%
Standard deviation	3.7	4.2
Average proportion of funds accounted for by:		
Bonds	59%	35%
Stocks	17%	30%

*Source: Survey of Trusteed Pension Funds*

### Real rate of return by decision maker

Investment decisions based on the advice of counsellors generally show a higher rate of return.



Source: Survey of Trusteed Pension Funds

Table 4

**Average performance of pension funds by decision maker, 1983 to 1988**

	Investment counsellor	Employer	Trustee
Average real rate of return	8.5%	7.4%	7.0%
Standard deviation	2.7	1.4	1.3
Average proportion of funds accounted for by:			
Bonds	40%	59%	40%
Stocks	35%	19%	28%

*Source: Survey of Trusteed Pension Funds*

Table 5

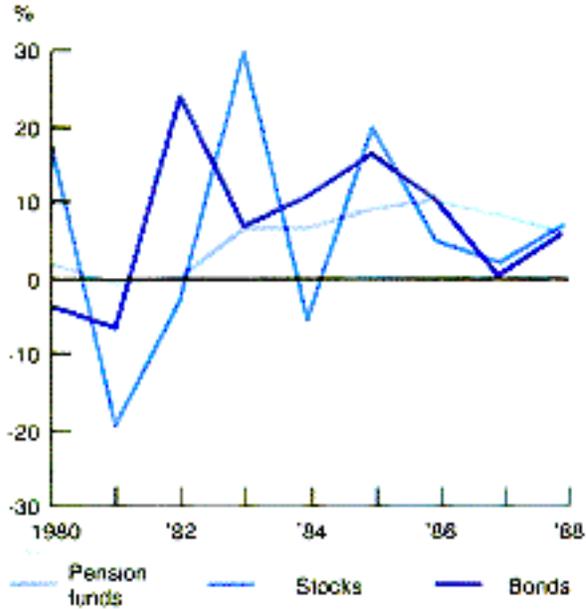
**Distribution of assets of trustee pension funds, 1980 and 1988**

	1980	1988
	%	
Total assets	100	100
Bonds	49	45
Stocks	20	27
Other investments	30	28

*Source: Survey of Trusteed Pension Funds*

### Real rate of return on pension funds, stocks and bonds

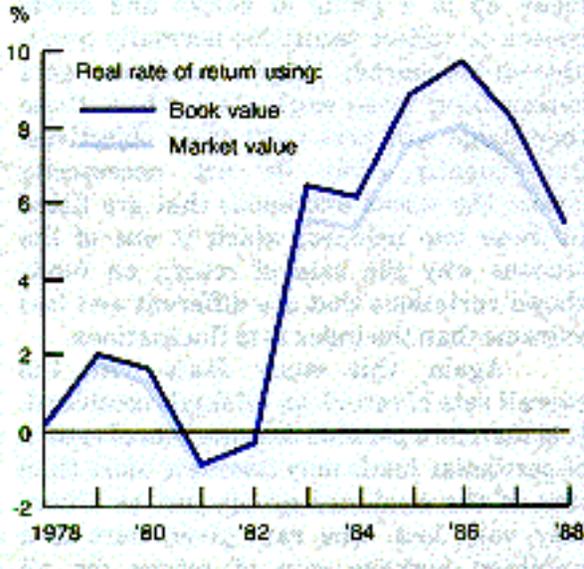
The real rate of return fluctuates less for pension funds than it does for stocks and bonds.



Source: *Survey of Trusteed Pension Funds and*  
*Scotta McLeod*

### Real rate of return on total assets of pension funds

Since 1983, the rates have diverged because of the rapid growth in market value.



Source: Survey of Trusteed Pension Funds