AN EMPIRICAL ANALYSIS OF A SELLING POLICY
TO INCREASE DIVIDEND INCOME IN THE INVESTMENT
MANAGEMENT OF AN INCOME TRUST

by

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A THESIS SUBMITTED IN PARTIAL FULFILMENT OF
THE REQUIREMENTS FOR THE DEGREE OF
MASTER OF BUSINESS ADMINISTRATION

in the Faculty
of
Commerce and Business Administration

We accept this thesis as conforming to the
required standard

THE UNIVERSITY OF BRITISH COLUMBIA
October 1975
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ABSTRACT

Trustees of income trusts have generally been given over the period 1959-1971 power to invest trust funds in common stocks. Their objectives are to invest trust funds to produce an income for a life tenant while preserving the capital of the trust for the ultimate remainderman. A clear division between capital and income is required by legal rules and reference is made to selected legal decisions to illustrate the attitude of the courts. A trustee of an income trust cannot accept the attitude of indifference between dividend income and capital gains adopted by some individual investors and many academic researchers. It is submitted that it is difficult to construct appropriate investment policies for an income trust through reading recent literature on common stock investment strategies; trustees cannot accept the normal assumption that dividend income and capital gains are equivalent.

The general proposition that risk and return are positively related, which Soldofsky and Miller (1969) seek to support could induce a trustee to purchase risky securities. However analysis of their own data reveals a negative relationship between risk and return among American common stocks, roughly over the years 1955-1962. The report by Litzenberger, Joy and Jones (1971) on a policy of investing in low P/E ratio American common stocks is analysed to reveal some difficulties in evaluating their results.
In a trust portfolio a stock can come to produce a low dividend yield through stock price appreciation. It could be retained under a Buy and Hold Policy, or sold and the proceeds reinvested in another stock with a larger current dividend yield under an Administrative Policy. An empirical evaluation of these alternative policies was undertaken using stock market data on 108 Canadian firms over the periods April 1960 to September 1964 and January 1965 to June 1969.

Any Administrative Policy requires two decision rules, one to initiate sales and one to direct purchases. To isolate the impact of the decision to sell, which was based upon a decline in current dividend yield, a reinvestment policy was adopted employing random selection from those securities then within a desired current dividend yield range. For the first period, Fortran programs were used to produce discounted dividend and capital gains statistics. These were expressed as an average annual discounted yield based upon the capital originally invested, for the Buy and Hold Policy and for 9 differing operational definitions of an Administrative Policy, these latter statistics being grand means based upon twenty trials. From these results 3 hypotheses were developed for testing in a subsequent non-overlapping period. The only hypothesis that survived this test was that an Administrative Policy will increase the dividend yield statistic over that produced by a Buy and Hold Policy. The impact of an Administrative Policy upon the capital gains statistic did vary, being negative in the first period and positive in the second.
The ability of an Administrative Policy to increase the dividend yield statistic can be related to two propositions in current financial theory: that companies are slow to translate increased earnings into larger dividends, and that widespread anticipation of larger corporate earnings in the future may cause a share's price to rise and its current dividend yield to fall. An Administrative Policy may have produced an increased dividend yield by not holding stocks whose current dividend yield has fallen, during the interval between the market's anticipation of increased earnings, and the payment of normal dividends upon the increased earnings.
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<td>59</td>
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CHAPTER 1

Introduction

The term, "Income Trust" can be used to describe a well established and commonly used arrangement whereby a personal or corporate trustee holds and invests trust money and pays all the income thereby produced to the beneficiary of the trust. It is our submission that the financial goals of the trustee of an income trust are not identical to those of an individual investor, or to those of a mutual or pension fund manager and that recent financial literature has not dealt specifically with the financial problems inherent in the investment management of an income trust.

The object of this thesis is to examine the financial problems posed by an income trust, discuss the difficulties in applying much of modern financial theory to this field, articulate a possible formulation of the financial objective of such a trustee, and finally to propose and conduct a limited test of one proposition concerning the investment management of an income trust fund.

In the administration of an income trust the basic legal distinction between "capital" and "income" must be understood and consistently applied. The trustee generally has two obligations: to preserve the "capital" for the ultimate remainderman and to invest the "capital" in the meantime to produce "income" for the present life tenant or life
tenants. In this paragraph "income" and "capital" have been placed in quotation-marks to emphasize that these are legal terms. Unfortunately these two obligations are normally in conflict and a trustee faced with this conflict, should keep an even hand between life tenant and remainderman and not benefit one at the expense of the other.

This legal duty implies that a trustee of an income trust must always be concerned about realized capital gains and losses and about the nature of income payments. Capital gains realized on the sale of trust assets are capital receipts and must be held, reinvested and ultimately paid to the remainderman upon the termination of the trust; they cannot be considered to be income and paid to the life tenant. Therefore unlike the individual investor or mutual fund or pension fund manager, the trustee of an income trust cannot be indifferent between capital gains and dividend income, as the nature of the payment determines who shall receive it.

From the viewpoint of an income trust, one cannot accept the hypothesis of indifference between capital gains and dividend income that underlies much of modern financial theory and many empirical studies.

Since 1951 empirical studies in Finance have normally used one-period return as a measurement variable and it has been calculated generally as the sum of capital gains (or losses) and dividends received, divided by the market price at the beginning of the period. This summation implicitly assumes that the researcher is indifferent between dividends
and capital gains. There has been a lengthy theoretical discussion in the financial literature as to whether a rational individual investor should be indifferent between capital gains and dividend income. Other literature points out that considerations of relative tax rates,\(^2\) and brokerage commissions,\(^3\) may cause an individual investor to prefer either capital gains or dividend income depending upon his particular status. The writer wishes to point out that there is in addition a class of investment managers--trustees of income trusts--who must distinguish capital gains from income.\(^4\)

In order to clarify the legal definitions of "capital" and "income" the writer proposes in Chapter 2 to discuss leading legal principles and some recent cases in which they have been applied.

Difficulties encountered in applying some recent financial articles to the management of an income trust, will be considered in Chapter 3.

The basic financial problem of a trustee of an income trust is to determine what interest and dividend income he wishes for his life tenant and what total rate of capital gain or loss will, in the event, be associated with that dividend income. A trustee could be visualized as trying to position his portfolio in an anticipated dividend income and anticipated capital gains-loss space, as illustrated on Graph 1 at page 6. The trustee should also be aware of the tax position of the beneficiary of the trust and of the
probable effects of inflation in reducing the purchasing power of both capital funds and future income.

In the balance of this thesis one problem often encountered in the investment management of an income trust is posed for empirical evaluation. When a common stock investment enjoys market appreciation such that its current dividend yield falls, which is the best course to follow:

(a) continue to hold the stock in anticipation of additional capital gains; or

(b) sell it and reinvest the proceeds in another stock with a larger current dividend yield?

In order to make this comparative evaluation relevant to the investment management of an income trust in Canada, an allowance was made for the impact of brokerage commissions on the purchase and sale of securities and the policies were tested using Canadian stock market data.

The policy of continuing to hold stocks despite a decline in the current dividend yield was interpreted as a simple Buy and Hold Policy, and the investment results of this policy both for dividends and capital gains were calculated for each stock and an average prepared for a group of higher yielding stocks treated as a portfolio.

It was more difficult to devise a computer algorithm to imitate the actions of a trustee selling stocks when their current dividend yield declines and selecting other higher yielding stocks as replacements. This type of administration involves two policies—one policy directs stocks to be sold
due to a decline in current yield and another policy selects stocks for purchase. The investment results of any administrative policy will inevitably be a joint product of both the 'selling' policy and the 'buying' policy. In order to isolate the effects of a 'selling' policy based upon a decline in current dividend yield, it was advisable to adopt as neutral a re-investment policy as possible. After dividing all stocks into 14 yield categories based upon their current dividend yield, each with a range of 0.5%, a desired dividend yield range was selected based upon the stock's initial dividend yield, and then a replacement stock was chosen at random from those stocks within the desired dividend yield range. Thus when a stock is sold due to a decline in its current dividend yield, the only known attribute of its replacement is that the replacement has a larger current dividend yield.

This blind stock selection policy is not an appropriate investment policy for a trustee of an income trust and it was devised only as a method of isolating the investment consequences, both for the life tenant and for the remainderman, of a policy of realizing capital gains when current dividend yields fall to unsatisfactory levels.
GRAPH 1

GRAPHICAL ANALYSIS OF PORTFOLIO RETURN
IN TERMS OF DIVIDEND INCOME AND CAPITAL GAINS

% CAPITAL GAIN OR LOSSES

PER ANNUM

% DIVIDEND RETURN

PER ANNUM

1 2 3 4 5 6 7 8 9 10

% CAPITAL LOSS

PER ANNUM

Note: This geometrical analysis of portfolio returns is an adaptation of Markowitz's two factor analysis, employing annual dividend yield and annual capital gains yield in place of the expected return for a period and a measure of risk.
Footnotes to Chapter 1

1. The one-period return on an asset or portfolio can be defined as the change in wealth during the horizon period divided by the initial wealth invested in the asset or portfolio. This definition was employed by Eugene F. Fama in his article Risk, Return and Equilibrium Some Clarifying Comments. *Journal of Finance.* March, 1968, p. 29.


4. The total asset value of all income trusts administered by trustees in Canada, is not readily available. Statistics Canada in its publication 61-006 "Financial Institutions, Financial Statistics" reports only the common and preferred stock holdings of Canadian trust companies on their own account. The assets held in estate, trust and agency accounts by five Canadian trust companies were reported in their 1974 annual reports to be:

<table>
<thead>
<tr>
<th>Trust Company</th>
<th>Asset Value</th>
</tr>
</thead>
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<tr>
<td>Canada Permanent Trust and Mortgage</td>
<td>2.38 Billion</td>
</tr>
<tr>
<td>Guaranty Trust</td>
<td>.62 &quot;</td>
</tr>
<tr>
<td>Canada Trust Co.</td>
<td>2.72 &quot;</td>
</tr>
<tr>
<td>National Trust</td>
<td>2.72 &quot;</td>
</tr>
<tr>
<td>Royal Trust</td>
<td>10.47 &quot;</td>
</tr>
<tr>
<td></td>
<td>18.91 &quot;</td>
</tr>
</tbody>
</table>

(Note: The annual report of the Montreal Trust Co. did not reveal the total value of estate, trust and agency accounts.) However what proportion of these sums is held in strict income trusts is not readily ascertainable. There are also many private trusts administered by individual trustees in Canada but only the Department of National Revenue would have an accurate record of their existence. As well, one public corporation--The Fulcrum Investments Co. Ltd.--with ten million dollars in assets approximates a trust as the preferred shareholders are entitled to all net income until 1987-9 when the preferred shares will be redeemed and the residue paid to the common shareholders who form the remaindermen. The size of American Trust holdings was reported by H. Sauvain (1967) as follows:

<table>
<thead>
<tr>
<th>Trust Department</th>
<th>Asset Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trust Departments of Commercial Banks (1964)</td>
<td>67.3 Billion</td>
</tr>
<tr>
<td>University and College Endowment Funds (1962)</td>
<td>8.0 &quot;</td>
</tr>
<tr>
<td>Charitable Foundations (1962)</td>
<td>14.0 &quot;</td>
</tr>
</tbody>
</table>
5. In the writer's view it is probable that only Canadian common stocks are purchased by most trustees of Canadian income trusts. In British Columbia and Manitoba the broader definition of trustee securities does not extend to foreign common stocks. In other Provinces such as Ontario and New Brunswick and under trusts with a discretionary investment power, foreign dividend paying common stocks are not excluded as trustee investments. However convenience, habit and the tax reduction flowing from the Federal dividend tax credit are factors that could lead trustees to prefer Canadian common stocks.
CHAPTER 2

Legal Duties of the Trustee of an Income Trust

A trust, in jurisdictions based on English Common Law, is the relationship which exists when one person, the trustee, holds the property of another person, the "cestui que trust". If the trustee has active duties to perform, such as investing money in his discretion, then he will normally be left in possession of the trust property as long as he faithfully performs his duties.

A trust is a flexible mechanism whereby rights in the trust property may be shared by many people; the current income from investments or current possession of real property may be given to named individuals for their lifetime, either jointly or in succession and upon the death of the last survivor, the trust property given absolutely to other individuals—the remaindermen.

The flexibility of a trust is one of its great advantages and explains its use in many different situations. In addition, trusts are often used to reduce the liability for income tax and succession duties as property is handed from one generation to another. In the typical case property is given unto a trustee for investment with all income to be paid to a life tenant during his lifetime and thereafter the corpus is to be given to named remaindermen. Here both the life tenant and the remaindermen have legal and enforceable
interests in the trust property, interests which are normally in conflict. The life tenants may wish the largest possible current income and request investment in speculative second mortgages which carry with them the danger of large capital losses. The remaindermen may recommend investments in "growth companies" with small current yield in the hope of future capital appreciation. It is the duty of the trustee to balance these conflicting interests and in so doing, the trustee will purchase a portfolio of securities. As an aid in analysing such a portfolio, it could be considered as a point in an income yield—capital gains (loss) yield space as shown on Graph #1 at page 6. Such an analysis seems more appropriate for an income trust rather than the one-period return—standard deviation of return graphical analysis used in recent capital asset pricing theory.

Prior to World War II, trustees of income trusts normally had very limited discretion in the choice of investments as the applicable Provincial Trustee Act specified a narrow range of first mortgages and government bonds as permitted investments. Settlers and lawyers were satisfied with such a limited discretion and the Courts restrictively interpreted words in wills which could have conferred a wider discretion. In Re Lennox Estate 1949 SCR 446 the Supreme Court of Canada interpreted a direction "that the rest and residue of my estate shall be invested in such securities as my executor may deem advisable..." as conferring a discretion to choose among trustee investments only.
The Courts have a special function in supervising the administration of trusts and will act to replace trustees, regulate their remuneration and may approve on behalf of minors and others, agreements altering the terms of the trust. In the recent case of Re Kiely 1972 IOR 845 a change in the terms of the trust was sought permitting the trustees to invest up to 65 percent of the trust assets in its uncontrolled discretion. The variation was approved as being for the advantage of the infant beneficiaries and as being "an entirely appropriate way in which to meet the challenges presented by inflationary times and eroding monetary values" (p. 848).

Until recently, the basic investments authorized by the Trustee Acts were first mortgages and Government bonds. In times of fluctuating inflation and deflation, such fixed investments preserved the capital of the trust and produced interest income for the life tenant. This balance between preservation of capital and customary interest yields was so accepted that special rules were developed for cases where other assets were held. In Howe vs Earl of Dartmouth (1802) 7 Ves Jun 137, part of an estate was held in stocks yielding higher than the return on Government bonds and the remaindermen successfully sought an order directing payment to him of the excess income. In Re Earl of Chesterfields Trusts 1883 24 Ch.D. 643, the converse situation arose. By force of circumstance certain personal property which produced no income was not realized within the executor's year (the time normally allotted for conversion into trustee securities), but ultimately
was sold for a large sum when its maximum potential had been realized. As the postponement of the getting-in and conversion of the asset was in the interest of both the life tenant and the remainderman, the principle of apportionment as between capital and income was applied. The life tenant received compound interest on the computed value of the asset as of the creation of the trust, the balance being treated as capital.

Wasting assets, such as quarries or coal mines, are enterprises whose capital value is exhausted as it produces income; they are unsuitable as trust assets and are always sold unless the trust instrument specifically directs their retention. These rules of equity can be interpreted as an attempt to balance the interest of life tenants and remaindermen during times of monetary stability.

The equitable rules and statutory arrangements developed in the 19th Century have been outmoded by the onset of secular inflation. During times when price level changes exist only as fluctuations around a horizontal trend, the preservation of monetary capital is the legitimate goal of a prudent trustee. However in times of rapid price inflation the mere avoidance of capital losses penalizes the ultimate remainderman. The writings of Fisher (1930) and Meiselman (1963 and Sargent (1973) present evidence that interest rates adjust to present and anticipated rates of price inflation. The legal definition of income therefore gives to the life tenant both the "true" rate of interest
and as well, the inflationary premium. The balance between the interests of life tenant and remainderman is disrupted as the life tenant gains purchasing power at the expense of the remainderman. In inflationary times, fixed income securities become in effect, wasting assets.

Under the present international monetary system, it is difficult for one country to avoid the effect of a rise of the price of internationally traded commodities if it engages in international trade to a significant extent. Secular inflation can be countered by exchange rate revaluations but as that endangers export industries, it is often easier to permit parallel domestic inflation. Harry G. Johnson (1973) argues that in the recent past, secular inflation has resulted from the use of the American dollar as a reserve currency and the American Government's decision to pursue inflationary policies for reasons of domestic policy.

As the Canadian government is now adjusting tax rates, social and pension benefits to allow for price inflation, it appears that in Canada price stability may now be sought only in a relative sense. In the management of an income trust, secular price inflation should be explicitly considered; strategies designed to preserve the purchasing power of the trust's capital are required.

It has long been apparent to lawyers and trust companies that the narrow range of trustee investments works a hardship on beneficiaries and many wills and trust instruments have given wide investment powers to trustees. It is
easier to confer an absolute discretion on trustees as more limited powers may be held void due to uncertainty. In Re Peczeuk 1964 2 All E.R. 339, the phrase "in the blue chip category" was held to be too uncertain to be enforceable. An often used volume of Will precedents by Sheard and Hall contains the following paragraph at page 26:

"I hereby declare that my Trustee when making investments for my estate shall not be limited to investments authorized by law for trustees but may make any investments which in his uncontrolled discretion he considers advisable and my said Trustee shall not be liable for any loss that may happen to my estate in connection with any such investment made by him in good faith."

In addition to the absolute discretion incorporated in many wills, Provincial Trustee Acts have been amended recently to give a limited right to invest in common stocks. The present range of permitted investments in the Canadian Provinces are summarized on Table 1 at page 18.

It is submitted that the task of balancing the conflicting interests of life tenants and remaindermen through the choice of trustee investments can usefully be studied from the viewpoint of financial theory and the results of various strategies calculated using historical data.

Another legal difficulty lies in the path of a trustee seeking to balance the interests of the beneficiaries, for the type of security purchased will determine the amount of income produced. Normally a corporation declares dividends to shareholders out of its accumulated earnings and only on final dissolution does it distribute its capital. But what is the legal status of redeemable preference shares or of
rights to subscribe for shares at an advantageous price which are sometimes issued to shareholders? These unusual corporate acts do occur and some corporations utilize them to distribute accumulated earnings and to raise additional equity capital.

The Courts have determined who shall benefit from these types of corporate arrangements. In principle, the tenant for life takes all dividends and bonuses declared by a corporation upon its shares during his lifetime. Even extraordinary dividends, such as a distribution in 1946 of pre-1939 undistributed income was held in Re Thomson 1947 OR 469 to be a dividend and therefore payable to the life tenant. However a corporation may by proper procedures convert retained earnings into paid-up shares and distribute these to its shareholders as a stock dividend. The nature of such dividends has been a much litigated issue which was settled in Canadian law by the decision of the Supreme Court of Canada in Re Waters 1956 S.C.R. 889 which held that preferred shares and the proceeds on their redemption are capital in the hands of trustees. This decision may deter a trustee from investing trust assets in companies that customarily distribute retained earnings through the mechanism of redeemable preference shares.

A similar problem occurs with those banks and utilities which have periodically issued rights to their present shareholders to subscribe for additional shares at an advantageous price. If a trustee sells these rights, are the proceeds capital or income? Financial theory would regard the proceeds from the sale of the rights, as compensation for
the dilution suffered by the original shares and therefore rightly considered as capital.

This issue has been litigated in the Courts. In Re Malan, 1894 3 Ch. D. 587 Sterling J. discussed the effect of an issue of rights to all shareholders to subscribe for additional shares as follows:

"If an offer were made to trustees unconnected with the payment of any dividend the option would have to be exercised on behalf of all beneficiaries, and if the instrument creating the trust did not authorize the retention of the shares, it would be the duty of the trustees to sell them and deal with the proceeds of the sale as capital."

Falconbridge, C.J. followed the above decision in Re Sinclair 1901 O.L.R. 2, P 349 in holding that the life tenant was not entitled to new stock issued to the trustee below the then market price.

The 1972 Income Tax Act S83 permits "tax free" dividends to shareholders in certain cases and several Canadian Corporations have created "B" common shares to satisfy the statutory provisions. A trustee of an income trust may therefore hold either "A" or "B" shares and in choosing, the effect on all beneficiaries should be considered. If a trustee elects to hold "B" shares and receive dividends free of current income taxes, the life tenant may receive a benefit; but the adjusted cost base of the shares is reduced by the amount of the dividend and the prospective burden of income taxes on future capital gains is increased. It is our view that the equitable principle of even-handed treatment of all beneficiaries is consistent with the life tenant
p民事 normal taxes on his income and therefore only the
"A" shares are suitable trustee investments. 2

The importance of a trustee honestly seeking to keep
an even hand between competing beneficiaries can be seen in
the case of Re Smith 1971 O.R. Vol. 2 541. In this case a
corporate trustee declined to answer the request of the
tenant-for-life that low-yielding Imperial Oil shares be sold
and other higher yielding securities bought. The Court found
that the Trustee was in breach of its duty as a trustee to
maintain an even hand between the life tenant and remainder-
men, removed the trustee and directed it to pay the solicitor
and client costs of the life tenant.

We submit that a trustee should be aware of the
legal consequences associated with the different types of
securities and exercise his discretion to try to preserve
the purchasing power of the capital while producing a reasonable
current income to the life tenant.
Table 1

The Range of Permitted Investments

Prior to recent amendments, the permitted investments of trustees under Provincial legislation were basically limited to the following:

a) Securities issued by or guaranteed by the Government of Canada, U.S.A., Britain, or a Canadian Province.
b) First mortgages on Canadian real estate.

Common and preferred stocks and corporate bonds and debentures of Canadian Corporations are now trustee investments in most Provinces; the date of the legislative amendments and the extent that they are now allowed are shown below:

<table>
<thead>
<tr>
<th>Province</th>
<th>Date Introduced</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>British Columbia</td>
<td>1959 Statutes of B.C.</td>
<td>35%</td>
</tr>
<tr>
<td>Alberta</td>
<td>1966 Statutes of Alberta</td>
<td>35%</td>
</tr>
<tr>
<td>Saskatchewan</td>
<td>1965 Statutes of Saskatchewan</td>
<td>35%</td>
</tr>
<tr>
<td>Manitoba</td>
<td>1965 Statutes of Manitoba</td>
<td>15% common stock 35% preferred stock and corporate debentures</td>
</tr>
<tr>
<td>Ontario</td>
<td>1960 Statutes of Ontario</td>
<td>35%</td>
</tr>
<tr>
<td>Quebec</td>
<td>1967 Statutes of Quebec 15-16 Eliz 11</td>
<td>35%</td>
</tr>
<tr>
<td>Nova Scotia</td>
<td>1957 Statutes of Nova Scotia</td>
<td>30% but common stocks limited to 15%</td>
</tr>
<tr>
<td>P.E.I.</td>
<td>1971 Statutes of P.E.I.</td>
<td>30%</td>
</tr>
<tr>
<td>New Brunswick</td>
<td>1971 Statutes of New Brunswick</td>
<td>100% but subject to the reasonable man rule</td>
</tr>
<tr>
<td>Newfoundland</td>
<td>No change</td>
<td>Nil</td>
</tr>
</tbody>
</table>
Footnotes to Chapter 2

1. Halsbury Laws of England, 3rd. Edition Vol 38 Section 1683. "Except when the instrument creating the trust expressly gives him a discretion as to adopting a course which will benefit one beneficiary at the expense of the others, it is the duty of a trustee to hold an even hand between the parties interested under the trust and to look at the interests of all and not to those of any particular beneficiary or class of beneficiaries."

2. A similar problem was posed by the Nov. 1974 Canada Savings Bond campaign. Holders of earlier C.S.B.'s had the option of holding old issues till Nov. 1979 or maturity to receive a cash premium calculated to make the total yield equivalent to a 10.5% yield, or of rolling them over into the new 1974 issue yielding 9.75%. For tax purposes the Government has said that the bonus when received may be treated by the holder as a capital gain or as ordinary income. However in a trustee's hands the bonus will be either payable to the life tenant as income or will be held by the trustee as capital and litigation may be needed to settle the issue. A prudent trustee might have preferred to purchase the new issue yielding 9.75% in order to avoid this difficult determination.
As a part of economics, modern financial theory has the broad objective of studying and understanding the financial sector of a modern economy. The extensive analysis of the structure of capital asset prices,¹ and studies of the efficiency of existing capital markets,² are in this tradition. Other contributions to recent financial theory deal with problems of interest to an individual investor or investment fund manager. Historic total returns of a wide range of assets have been calculated,³ the effects of differing combinations of securities have been computed and the results of various investment techniques estimated. These range from dollar averaging,⁴ formula planning,⁵ short selling,⁶ and portfolio maintenance strategies⁷ to the minimum size of a diversified portfolio.⁸

Many of these studies use one-period return as a measurement variable and by summing dividends and capital gains, implicitly assume that they are equivalent. In their 1961 article proposing the neutrality of dividend policy, Modigliani and Miller wrote on page 411: "Rational behavior means that investors always prefer more wealth to less and are indifferent as to whether their wealth takes the form of cash payments or an increase in the market value of their
holdings." Myron J. Gordon (1963) has attacked their definition arguing that rational investors may prefer current dividends as they aid in reducing the uncertainty of future returns. Van Horne and McDonald (1971) have mentioned other factors such as transaction costs, flotation costs, differential borrowing and lending rates, and differential income and corporate tax rates that may lead investors to prefer either dividends or capital gains. They wrote on page 508: "Some institutional investors may favour dividends, owing to legal constraints or tax considerations. For example, universities often prefer dividend income to capital gains on endowment investments because of restrictions on expenditures of capital gain."

This writer has sought to establish the crucial difference between dividends and capital gains in the hands of a trustee of an income trust. By law such trustees cannot be indifferent between dividends and capital gains and therefore they cannot accept one of the assumptions implicit in most recent theoretical and empirical work. Propositions derived from that theory are therefore not necessarily applicable to the management of an income trust.

To illustrate some of the difficulties which arise when empirical work using one-period return as a measurement variable is approached from the viewpoint of a trustee of an income trust, the writer proposes to refer to two published papers.
In their 1969 article, Professors Soldofsky and Miller sought to develop the risk premium curve for long term American securities over the period 1950-1966 and for shorter periods. They concluded that Sharpe's hypothesis of a positive linear relationship between risk and return was supported by the least square regression equation reported on page 438:

\[ \text{standard deviation of annual return} = 0.035 + 0.8783 \times \text{geometric mean annual return} \]

for which the coefficient of determination, \( R^2 \), was 0.9099. In interpretation of this equation they wrote on page 435: "During the 1950-1966 period, investors obtained an additional 1.148 per cent annual yield for each 1 per cent increase in standard deviation." What conclusions relevant to the management of an income trust can be drawn from their analysis?

The increase in return from investing in common stocks rather than government or corporate bonds is clear and provides a historical justification for the broadening of trustee investment to include common stocks. However a direct application of their proposition to the selection of common stocks as trustee investments encounters two difficulties. Soldofsky and Miller explicitly use one-period return as a measurement variable; they present no evidence whether the annual dividend return—the variable of primary interest to trustees—also has a positive correlation with risk. In the absence of evidence, one can only note that it is possible that a negative relationship exists between risk and dividend yields.
Table 2

Soldofsky and Miller's Annual Total Returns

1952 - 1966

<table>
<thead>
<tr>
<th>Period</th>
<th>Gov't. Bonds</th>
<th>Corporate AAC</th>
<th>Medium Preferred Stock</th>
<th>Common Stocks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>10</td>
<td>11</td>
<td>12</td>
<td>13</td>
</tr>
<tr>
<td>1952-56</td>
<td>.009</td>
<td>.006</td>
<td>.048</td>
<td>.203</td>
</tr>
<tr>
<td>1957-61</td>
<td>.023</td>
<td>.021</td>
<td>.047</td>
<td>.291</td>
</tr>
<tr>
<td>1962-66</td>
<td>.031</td>
<td>.023</td>
<td>.046</td>
<td>.032</td>
</tr>
</tbody>
</table>
In addition, from a visual inspection of their Charts 1, 2 and 3, it appeared that even when one-period return is measured, the price of risk in the stock market could be negative. To verify this observation, simple regression equations were derived for the 12 five-year periods covered by Soldofsky and Miller's data and they appear on Table 3, page 25. From these equations it appears that during the years 1954 to 1963, conservative common stocks dominated speculative stocks in that they produced a larger one-period return and a smaller standard deviation of return than speculative stocks.

This conclusion is supported by the tests by Blume and Friend (1973) of the capital asset pricing model. They regressed 12 mean returns from portfolios of approximately 80 securities on their respective mean Beta coefficients for three periods, 1955-59, 1960-64 and 1965 to June 1968. While a positive relationship between risk and return was found for the last period, for the 5 year period 1960-64 a negative relationship was revealed between return and risk as interpreted by average Beta coefficients of the portfolios. For the earlier period in their data, risk and return were poorly related, with the slope of the equation being determined by different averaging techniques.

Empirical tests of the capital asset pricing model as reported by Fama and MacBeth (1973) are interesting as they describe in general terms the characteristics of common stocks listed on the New York Stock Exchange. They sought to
Table 3

Regression Equations of Risk and Return Using Soldofsky and Miller's (1969) Data on Six Classes of Common Stocks

Equation: S.D. of return = a + b Geometric + error Mean Return

<table>
<thead>
<tr>
<th>Period</th>
<th>Equation</th>
<th>R²</th>
</tr>
</thead>
<tbody>
<tr>
<td>1951-55</td>
<td>&quot; = -.04 + .18 &quot;</td>
<td>.06</td>
</tr>
<tr>
<td>1952-56</td>
<td>&quot; = .11 + .45 &quot;</td>
<td>.004</td>
</tr>
<tr>
<td>1953-57</td>
<td>&quot; = .69 - .45 &quot;</td>
<td>.39</td>
</tr>
<tr>
<td>1954-58</td>
<td>&quot; = .77 - .43 &quot;</td>
<td>.44</td>
</tr>
<tr>
<td>1955-59</td>
<td>&quot; = .80 - .49 &quot;</td>
<td>.89</td>
</tr>
<tr>
<td>1956-60</td>
<td>&quot; = .77 - .46 &quot;</td>
<td>.94</td>
</tr>
<tr>
<td>1957-61</td>
<td>&quot; = .74 - .41 &quot;</td>
<td>.95</td>
</tr>
<tr>
<td>1958-62</td>
<td>&quot; = .49 - .18 &quot;</td>
<td>.74</td>
</tr>
<tr>
<td>1959-63</td>
<td>&quot; = .41 - .18 &quot;</td>
<td>.45</td>
</tr>
<tr>
<td>1960-64</td>
<td>&quot; = .35 - .14 &quot;</td>
<td>.16</td>
</tr>
<tr>
<td>1961-65</td>
<td>&quot; = -.25 + .38 &quot;</td>
<td>.16</td>
</tr>
<tr>
<td>1962-66</td>
<td>&quot; = -.46 + .59 &quot;</td>
<td>.11</td>
</tr>
</tbody>
</table>
test three hypotheses—that a linear relationship holds between risk and return, that the Beta coefficient captures all of the systematic risk, and that the relationship between risk and return is positive. The first two hypotheses were not disproved by their results but the third was not uniformly borne out. Over the whole period studied and for five shorter periods, a positive relationship between risk and return was revealed. However for the five year period—1956 to 1960—a negative relationship was indicated.

That risk does not always carry with it a higher return (thought it often may) when measured over as long a period as five years is an important conclusion. Trustees cannot accept without question the often stated hypothesis that risk and return are positively related. These studies may justify a conservative common stock investment strategy in an income trust quite apart from the need for a sufficient dividend income.

A group of financial researchers have experimented with sort-rank routines using current financial information with the objective of maximizing one-period returns over a given time horizon. This technique in a way approximates the mental process of individual investors as they formulate buy and sell decisions based upon recent financial information that they are exposed to through deliberate search or chance. As the measurement variable used in these studies—one-period return—is not appropriate to an income trust, these results cannot be directly applied. However the technique could be
reformulated to coincide with a trustee's goals. For example, a sort-rank routine could select all stocks with a minimum threshold dividend yield, rank these securities according to an investment strategy based upon P/E ratios, rate of change of earnings or beta coefficients and examine the resulting dividend yield and capital gains over the trustee's chosen time horizon.

The results reported by Litzenberger, Joy and Jones (1971) illustrate the difficulties in applying current work with sort-rank routines to the investment situation of a trustee of an income trust. They sought to obtain improved investment returns by employing sort-rank routines based on earnings/price ratios and beta coefficients, to 261 common stocks selected from the 425 common stocks that made up the Standard and Poor's Industrial Index, over the period October 1965 to June 1968. The market strategy of purchasing the 25 securities with the lowest P/E ratios (or the largest E/P ratios to use their terminology) and holding them for six months was evaluated using one-period return. They concluded that the ranking based upon price/earnings ratios was useful as the average reward to variability ratio for all 25 stocks was .68 compared to .28 for the Standard and Poor's 425 Industrial Index. When the 25 stocks with low P/E ratios were ranked according to their systematic risk as measured by their beta coefficients, the ten stocks with smaller beta coefficients outperformed the ten stocks with larger beta coefficients. This article considers what could be an
attractive policy for a trustee—maintaining a stock portfolio of low P/E securities, but in an artificial environment, without brokerage costs and employing overlapping periods.

In an attempt to overcome these difficulties, the author re-calculated their data using two periods, one of six consecutive half-yearly periods and one of five consecutive half-yearly periods, thus removing any overlap; and brokerage commissions at a flat rate of one percent were deducted on each purchase and sale. The terminal value of an initial portfolio investment of $10,000 was calculated using the price relatives given in Table 2 at page 1065 of their report. The resulting final portfolio valuations and geometric mean annual returns appear in Table 4, page 30; they simply confirm the original results of Litzenberger, Joy and Jones that a policy of maintaining an investment in the 25 stocks with the lowest P/E ratios, with portfolio re-establishment every six months, produced a larger return than the Standard and Poor's Industrial Index. However this may not be a fair comparison as the 25 stocks were selected from the 261 stocks that were known to have provided complete data on prices, earnings and dividends during the entire three year period. The average return for this parent population of 261 companies may vary from the average return of the 425 stocks incorporated in the Standard and Poor's Industrial Index. A more appropriate comparison would have been to compare the mean return of the various portfolios of 25 stocks, with the mean return of 261 stocks from which they were selected.
The larger yield associated with the strategy of investing in securities with low P/E ratios may also be due to the pre-screening process. Companies that declared bankruptcy or that were delisted, were eliminated in selecting the parent population of 261 securities. Risk of financial failure is peculiarly acute among stocks with low P/E ratios and therefore pre-screening may be the true source of the higher period return. During this three year span and using these techniques, the low beta securities did outperform the high beta securities; however the short time span makes any evaluation of this result very difficult.

This evaluation of a policy of maintaining a portfolio of securities with low P/E ratios is not directly applicable to the investment problems of a trustee of an income trust because the effect on dividend income is not separately delineated. Overlapping time periods, pre-screening to ensure continuous data, and the assumption of costless trading, all make it difficult to estimate the actual effect of this portfolio policy. Our reworking of their data as recorded in Table 4 incorporates brokerage charges and eliminated the overlapping time periods but could not resolve the basic difficulty of pre-screening or decompose the period return into a dividend yield and a capital gains component.

One submission this thesis seeks to make is that much of recent financial theory and empirical analysis concerning the stock market is difficult to apply to the investment problems of an income trust because the assumption of
Table 4

Recalculation of portfolio values resulting from lowest P/E ratios over the period of 2.5 and 3 years with an initial investment of $10,000

Three year period - March 1966 to March 1969

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Portfolio Valuation after 12 Commission Charges</th>
<th>Geometric Annual Mean Return</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lowest 10 P/E Ratio</td>
<td>$18,383.71</td>
<td>1.129</td>
</tr>
<tr>
<td>Lowest 15-25 P/E Ratio</td>
<td>$17,437.71</td>
<td>1.119</td>
</tr>
<tr>
<td>Highest 10 Beta Coefficients</td>
<td>$15,764.53</td>
<td>1.101</td>
</tr>
<tr>
<td>Lowest 10 Beta Coefficients</td>
<td>$18,304.27</td>
<td>1.128</td>
</tr>
<tr>
<td>Entire 25 Stocks</td>
<td>$17,031.24</td>
<td>1.115</td>
</tr>
<tr>
<td>S &amp; P Industrial Index</td>
<td>$12,025.07</td>
<td>1.058</td>
</tr>
</tbody>
</table>

2.5 Year Period, July 1966 to December 1968

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Portfolio Valuation after 10 Commission Charges</th>
<th>Geometric Annual Mean Return</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lowest 10 P/E Ratio</td>
<td>$17,527.25</td>
<td>1.1415</td>
</tr>
<tr>
<td>Lowest 15-25 P/E Ratios</td>
<td>$17,604.02</td>
<td>1.1425</td>
</tr>
<tr>
<td>Highest 10 Beta Coefficients</td>
<td>$14,798.41</td>
<td>1.1035</td>
</tr>
<tr>
<td>Lowest 10 Beta Coefficients</td>
<td>$20,175.51</td>
<td>1.1741</td>
</tr>
<tr>
<td>Entire 25 Stocks</td>
<td>$17,007.90</td>
<td>1.1346</td>
</tr>
<tr>
<td>S &amp; P Industrial Index</td>
<td>$12,123.10</td>
<td>1.0536</td>
</tr>
</tbody>
</table>

Note: Brokerage commissions on purchases and sales were calculated at a one per cent rate.
indifference between dividends and capital gains no longer applies. One-period return is not a satisfactory measurement variable to such a trustee. A prime objective of such a trustee is to invest the capital of the trust to produce income for the life tenant. If a trustee sought simply to maximize the one-period return from a trust portfolio, an adequate income to the life tenant would not necessarily result. It would be necessary to impose as a constraint, a minimum dividend yield. With this addition an income trust could be handled using the tools devised for portfolio construction and analysis. However the imposition of a minimum dividend yield would be arbitrary if the trade-off between dividends and capital gains were not known when the income constraint was imposed. Using the terminology of linear programming, if the shadow cost of the income constraint was large, a trustee might prefer to relax this constraint and accept a smaller dividend income. More generally in setting an income constraint, it would aid a trustee if he knew the cost of the constraint in terms of the capital gains foregone.

An analysis to delineate the trade-off between dividend income and capital appreciation over recent periods would be of interest to trustees of income trusts. If a trust's portfolio return were analysed in terms of dividend yield and capital gains (loss) yield, in the place of portfolio return and a measure of risk, the concept of an efficient frontier can still be applied and a form of portfolio analysis carried out. Graph 2 at page 35 sketches
such an analysis. The addition of a rate of price inflation to this graphical analysis poses some problems. The rates of price inflation and appreciation through capital gains can be equated as they both measure the rate of change of a stock. A horizontal line can therefore represent the assumed rate of price inflation over the period. A portfolio return located above that line indicates that the corpus of the trust is growing in real terms. However dividend yield measures the rate of flow of income from a stock of capital and so long as that stock of capital is constant or growing in real terms, then the dividend yield is also expressed in real terms. However if the rate of capital appreciation via capital gains does not equal the rate of price inflation, then the nominal dividend yield will be larger than the real dividend yield.15

Any portfolio under consideration would occupy a point in the dividend yield, capital gains yield space and an efficient frontier could be formed by those portfolios having the largest capital yield for a given dividend yield or vice versa. To enrich the analysis other assets such as bonds and mortgages could be represented and as well a market index such as the Toronto Stock Exchange Industrial Share Index. By this means the actual performance of an income trust could be analysed in terms of direct relevance to its beneficiaries and alternative portfolios evaluated.

Considered in these terms, it is submitted that a trustee's objective could be to position his trust at a point
on the efficient frontier. Portfolios which do not form part of the efficient set can be improved to the benefit of one set of beneficiaries without harm to the other. Which point on the efficient frontier the trustee should select is indeterminate in this analysis and must be chosen with regard to other factors such as the need for liquidity, the rate of anticipated inflation, the financial needs of the life tenant and the ability of the portfolio and its trustee to ignore fluctuations in market value.

In this chapter two recent studies have been examined critically, to illustrate some difficulties in applying such studies to the investment management of an income trust. The writer has suggested that an empirical analysis to delineate the trade-off between dividend yield and capital gains yield would be of direct relevance to the management of an income trust. However this idea was developed during the evaluation of the empirical work to be outlined in Chapter 4 and the empirical development of an efficient frontier is beyond the scope of this thesis. We have suggested that analysis in terms of risk and one-period return, though applicable to an individual investor and pension and mutual funds, is not appropriate to an income trust; while analysis in terms of dividend yield and capital gains yield separates the factors relevant to an income trust and facilitates direct consideration of the conflicting interests they represent.

In selecting a financial aspect of a trust portfolio for analysis using these measurement variables, a simple
comparison of two competing policies was desirable. The initial selection of a trust portfolio, involving as it does both individual security analysis and the range of portfolio construction techniques, does not lend itself to a limited analysis. In almost any portfolio over time, some investments will be found to be satisfactory and others not. When the unsatisfactory investments should be sold is a difficult problem for most investors; for trustees the problem is complicated by a legitimate fear that realized capital losses may lead the remainderman to vocal criticism or legal action, and may also jeopardize the trustee's claim for compensation for his time, trouble and expense in managing the trust. However even successful investments may pose problems for a trustee of an income trust as a rising share price may cause the current dividend yield to fall. Should the capital gain be realized and reinvested in a higher yielding security? This last and simplest problem was selected for detailed analysis.
Graph 2

Graphical Analysis of a Trust Portfolio

% Capital Gain

PER ANNUM

% Loss

PER ANNUM

Efficient Frontier

Rate of Consumer Price Inflation

% Dividend

Return PER ANNUM
Footnotes to Chapter 3

1. Page 20. Sharpe (1964) at page 428 assumes that investors view the outcome of any investment in terms of expected value and that value's standard deviation. As no mention is made of when wealth accrues in cash to the investor, an implicit assumption of indifference between dividends and capital gains is made.


3. Page 20. Fisher, L. and Laurie, J.H., Rates of Return on Investments in Common Stocks. Journal of Business, January 1964, p. 1. Dividends were assumed to have been immediately reinvested in the stock that paid them. This is a feasible investment policy only if there is no need for cash dividends and as a consequence, it implicitly assumes indifference between dividends and capital gains.


6. Page 20. MacDonald, J.C. and Baron, D.C., Risk and Return on Short Positions in Common Stocks. J. of Finance, March, 1973, p. 97. The authors do not refer to dividends in their calculation of the returns from short positions. As holders of a short position are charged for any dividends that are declared while their short position is held, their statistic Wi must overstate the mean return from short positions.


9. In "Optimal Investment and Financing Policy," Journal of Finance, May 1963, p. 264. M.J. Gordon has argued that it is possible that the required rate of return employed by rational investors in discounting future dividends increases as the dividend payments are postponed.
10. Page 21. Recognition in financial theory of a preference for cash dividends by some investors—for example trustees of income trusts and conservative individuals living on investment income, while speculatively inclined individuals and those subject to heavy marginal rates of tax on dividend income may prefer capital gains, could lead to explicit recognition of a clientele effect whereby each corporation over time attracts shareholders pleased with its dividend policy. Shareholder's attitude towards dividends could be considered a dimension ranging from an absolute preference for dividends, through indifference to an absolute preference for retained earnings. An attempt to measure a net preference for current dividends or capital gains, may be misdirected as shareholders' preferences may not be stable but shift with the business cycle.

11. Page 21. The danger of drawing investment policies from theoretical economic propositions, has been noted before. Lemont K. Richardson in his article, "Do High Risks Lead to High Returns?", Financial Analysts Journal, March/April 1970, p. 88, argues that risky securities do not necessarily have a high return.

12. Page 22. Richard W. McEnally in his 1972 Comment suggested that this large regression coefficient is more properly explained by the dichotomized nature of the data. Soldofsky and Miller seem to have agreed with him at p. 941 of their Reply (1972).

13. On page 432, the authors define the annual rate of return on a security to be

\[ K_T^+ = \frac{B_T + P_T^* - P_{T-1}}{P_{T-1}} = \frac{B_T + P_T}{P_{T-1}} - 1 \]

where \( K_T \) = the rate of return in the year \( T \)

\( P_T \) = price of a unit of the security at the end of the year

\( P_{T-1} \) = price of a unit of the security at the beginning or initial point of the year

\( B_T \) = is restricted to being the dividend or interest for one year as required by the security being used

*Through a typographical error this was printed as \( B_T \).

14. A shadow cost could be defined as the change in the value of the objective function produced by a one unit change in a binding constraint.

15. Page 32. The impact of inflation on a trust's dividend yield for a period, when the corpus of the trust is decreasing in real terms, would appear to be obtained
by multiplying the nominal dividend yield by a factor obtained by subtracting from one, the difference between the rate of price inflation and the trust's rate of capital appreciation. For example assuming a 12% rate of price inflation, a 10% nominal dividend yield and capital appreciation of 2%, then in real terms the dividend yield would be reduced from 10% to 10% times \(1 - (.12 - .02)\) or 9%.

16. Page 34. The determination of the compensation payable to a trustee for his time, trouble and expense in the management of a trust, in the absence of agreement, will be made by a Judge. In Ontario it has been held in Re Toronto General Trusts and Central Ont. Ry. 6 OWR 350 that the proper things to be considered in fixing the remuneration of trustees are:
   a) the magnitude of the trust,
   b) the care and responsibility springing therefrom,
   c) the time occupied in performing its duties,
   d) the skill and ability displayed,
   e) the success which attended its administration.
The fact that a trustee has realized losses in his administration of the investments of the trust is relevant to the last two factors and can form the factual foundation for a legal argument that the usual care and management fee should be reduced. In addition a trustee in Ontario is normally allowed a 2% commission upon capital receipts and disbursements; however realized losses on investments should be applied to reduce each of these figures and so reduce the compensation payable to the trustee.
An Empirical Evaluation of a Policy of Requiring a Minimum Current Dividend Yield

The eroding effect of inflation on the fixed income produced by bonds and mortgages and the broadening of trustee investments to include common stocks, are two factors which could lead a trustee of an income trust to purchase common stocks. In this chapter it will be assumed that common stocks form part of the investment portfolio of some income trusts and this writer's attention will be directed towards one aspect of their investment management. What approach should be taken to those stocks whose current dividend yield has declined as their market value has increased? They could be retained in anticipation of continuing capital appreciation and future increases in declared dividends; this will be called a Buy and Hold Policy. Alternatively, such stocks could be sold and the proceeds reinvested in another common stock with a larger current dividend yield. As this approach involves a check on the current dividend yield at the end of each quarter, it will be called in this paper an Administrative Policy.

Both of these policies are feasible and in the course of the management of an income trust, both will normally be employed. The choice between them being made in the light of the economic prospects of each particular firm and the
trustee's attitude towards dividend income for an administra-
tive policy has as an immediate objective, increased dividend
income. The empirical research reported herein, had as its
objective the measurement of the average effect of these
competing policies on dividend income and capital appreciation
over two time periods, April 1960 to September 1964 and
January 1965 to June 1969.² No attempt was made to predict
the relative effect of these policies on a priori basis.

The closing price of the last board lot traded at
the end of March, June, September and December, from March
1959 to June 1969 was obtained from the Toronto and Montreal
Stock Exchange monthly publications together with the cash
dividends payable during the preceding three months. This
data was originally obtained on all Canadian common stocks
held by Canadian trusteeed pension funds; however, those
companies that did not have a complete sequence of closing
stock prices were eliminated to avoid a range of apprehended
mathematical and statistical difficulties. Thus companies
that were delisted or went into liquidation were omitted and
the end result of this dual selection process was a list of
108 Canadian companies. The bias introduced by these selec-
tion procedures, though preventing meaningful external
contrasts, should not affect internal comparisons.

Many of these companies had had their stock split
once or several times during this 10 year period, producing
discontinuities in their price and dividend records. Using
a Fortran program prepared by Richard Osborne, these
discontinuities were removed, starting at June 1969 and working backwards in time, to produce a series of 41 quarterly observations on closing prices and quarterly dividend payments for each of the 108 companies.

In order to compare the relative merits of differing streams of income, it was desirable to compare them at one point in time, using a present value technique. The commencement of each period was chosen, as it was the point when a choice between the competing investment policies could have usefully been made. A discount rate of 3% compounded quarterly was selected as it approximates the rate of price inflation experienced over the period. The use of this discount rate implies that dividends are recorded in 1959 or 1964 dollars and no preference is expressed for early as against late dividend receipts.

A thousand dollars was applied towards the purchase of each stock on April 1st, 1960 and January 1st, 1965 with brokerage commissions calculated at a flat rate of 1.5% of the purchase price. Fractions of shares were not held, and any surplus monies were simply held uninvested. This was done for computational ease as the sums are necessarily small, less than the price of one share plus commission. As the main objective was to contrast the investment results of the two strategies, the calculation of an interest payment to the life tenant for this small cash balance was omitted.

Under the Buy and Hold Policy, the discounted dividends received from each company over the 4.5 year period
were summed and expressed as an average annual yield based upon the original investment of one thousand dollars.

\[
\text{Buy and Hold Dividend Yield} = \frac{\text{SUM P.V. DIV} \times 100}{\$1000 \times 4.5}
\]

At the end of the period the stock was sold and the present value of the net cash proceeds as of the beginning of the period calculated. The net cash proceeds was the proceeds of the sale less brokerage commission at 1.5% plus uninvested cash. This present value was also expressed as an average annual capital gains yield:

\[
\text{Buy and Hold Capital Gains Yield} = 100 \times \frac{(\text{P.V. Net Cash Proceeds} - 1000)}{\$1000 \times 4.5}
\]

Calculated in this manner, the capital gains yield contains a 3% allowance for inflation; thus a capital gains yield of zero indicates that capital appreciation has off-set the assumed rate of price inflation over the period.

As these yields are all related to the same initial capital investment of one thousand dollars, they can be converted into actual dividend payments and capital gains, and comparisons among different yields statistics can legitimately be made. In addition an averaged yield statistic can be calculated for a group of securities as they all commence with the same initial investment and thus have the same weight.

These buy and hold dividend and capital gains yields have some interest in themselves and averaged yields for different groups of stocks based upon their initial dividend yield appear as Table 5. The summation of dividend yield and capital gains yield is only included for mathematical
completeness for from the peculiar viewpoint of an income trustee, it has been argued in Chapter 3 that this simple summation may hide relevant information.

It can be seen that the general investment result for the higher ranked companies based upon initial dividend yield declined in the second period. Dividend yield declined from 5.7% to 4.1% and capital gains yield fell from 15.9% to -2.9%. In contrast almost no change occurred in the yields associated with the larger group of companies with smaller initial dividend yields.

A trustee of an income trust is legitimately interested in substantial dividend yields and the yields associated with the larger initial dividend yields are separately listed. As there appeared to be a relationship between the initial dividend yields and their associated dividend yield statistics, this relationship was explored through simple regression analysis using the model:

\[
\text{Average Annual B} \& \text{H Dividend} = a + b \text{ Initial Dividend Yield} + \text{term}
\]

These regression equations which appear as Table 6 at page 47, were developed to relate in a rigorous manner a stock's initial dividend yield at the start of a period and a measure of its dividend yield over a 4.5 year period. Over the first period--from April 1960 to September, 1964, the variation in the 108 initial dividend yields could explain 42% of the variation in their associated Buy and Hold Dividend Yield statistics. The positive slope of the regression line
TABLE 5
AVERAGE YIELDS ASSOCIATED WITH A BUY AND HOLD POLICY
PERIOD 1, APRIL 1960 TO SEPTEMBER 1964

<table>
<thead>
<tr>
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<th>67</th>
<th>41</th>
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<tbody>
<tr>
<td>Initial Dividend Yield Range</td>
<td>All Yields</td>
<td>Below 4.0%</td>
<td>Above 4.0%</td>
<td>4.0 to 4.5%</td>
<td>4.5 to 5.0%</td>
<td>5.0 to 5.5%</td>
<td>5.5 to 6.0%</td>
<td>6.0 to 6.5%</td>
<td>6.5 to 7.0%</td>
<td>Above 7.0%</td>
</tr>
<tr>
<td>Average Annual Dividend Yield</td>
<td>3.9</td>
<td>2.9</td>
<td>5.7</td>
<td>4.7</td>
<td>5.8</td>
<td>5.0</td>
<td>5.0</td>
<td>5.7</td>
<td>6.5</td>
<td>9.0</td>
</tr>
<tr>
<td>Average Annual Capital Gains Yield</td>
<td>11.5</td>
<td>8.7</td>
<td>15.9</td>
<td>12.6</td>
<td>20.9</td>
<td>16.8</td>
<td>4.0</td>
<td>6.2</td>
<td>18.6</td>
<td>29.4</td>
</tr>
<tr>
<td>Sum of Yields</td>
<td>15.4</td>
<td>11.6</td>
<td>21.6</td>
<td>17.3</td>
<td>26.7</td>
<td>21.8</td>
<td>9.0</td>
<td>11.9</td>
<td>25.1</td>
<td>38.4</td>
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PERIOD 2, JANUARY 1965 TO JUNE 1969

<table>
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<th>73</th>
<th>35</th>
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<tbody>
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<td>Initial Dividend Yield Range</td>
<td>All Yields</td>
<td>Below 3.5%</td>
<td>Above 3.5%</td>
</tr>
<tr>
<td>Average Annual Dividend Yield</td>
<td>3.2</td>
<td>2.8</td>
<td>4.1</td>
</tr>
<tr>
<td>Average Annual Capital Gains Yield</td>
<td>5.2</td>
<td>9.0</td>
<td>-2.9</td>
</tr>
<tr>
<td>Sum of Yields</td>
<td>8.4</td>
<td>11.8</td>
<td>1.2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>11</th>
<th>9</th>
<th>8</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial Dividend Yield Range</td>
<td>All Yields</td>
<td>Below 4.0%</td>
<td>Above 4.0%</td>
<td>4.0 to 4.5%</td>
</tr>
<tr>
<td>Average Annual Dividend Yield</td>
<td>3.5 to 4.0%</td>
<td>4.0 to 4.5%</td>
<td>4.5 to 5.0%</td>
<td>Above 5.0%</td>
</tr>
<tr>
<td>Average Annual Capital Gains Yield</td>
<td>3.4</td>
<td>3.9</td>
<td>4.7</td>
<td>4.6</td>
</tr>
<tr>
<td>Sum of Yields</td>
<td>-2.8</td>
<td>-4</td>
<td>-3.4</td>
<td>-6.7</td>
</tr>
<tr>
<td></td>
<td>-6</td>
<td>4.3</td>
<td>1.3</td>
<td>-2.1</td>
</tr>
</tbody>
</table>
indicates that larger initial dividend yields are associated with larger Buy and Hold Dividend Yield statistics.

One difficulty with least-square regression analysis is its extreme sensitivity to atypical results. In the first period the omission of two companies, Atlantic Sugar Refining Co. and Gunnar Mines Ltd., made only a slight alteration in the regression equation. However in the second period, January 1965 to June 1969, the omission of Gunnar Mines which had an initial dividend yield of 21.9% and a Buy and Hold Dividend Yield statistic of 1.3%, produced a marked shift in the resulting regression equation based upon 107 companies. Excepting this one company, it appears that during the second period 55% of the variation in the Buy and Hold Dividend Yield statistic can be explained by the variation in the initial dividend yields and the slope of regression line is again positive. If a trustee of an income trust desires substantial dividend payments over time, then a preference for stocks with large current dividend yields is consistent with the positive slope of these regression equations.

As each equation's Durbin-Watson statistic is within the range of insignificant values, from 1.63 to 2.37, it can be concluded that there is no significant evidence of serial correlation between pairs of the residual error terms.

As the coefficients of the regression equations are not stable from period to period, these regression equations cannot be used to predict the Buy and Hold Dividend Yield statistic of a future period based upon the current
dividend yield. Using the selected data, the value of the Y intercept was 2.053 in the first period and 1.08 in the second; the slope of the line changed from .52 to .74. These regression equations are presented solely to measure the strength of the positive relationship between initial dividend yields and a measure of dividend payments over a 4.5 year period.

A separate part of the Fortran program was designed to apply an Administrative Policy to the same 108 companies. As under the Buy and Hold Policy, a thousand dollars was initially invested in each stock, brokerage charges were calculated at a flat rate of 1.5%, fractional shares were not purchased and any cash balance was simply held uninvested. At the end of each quarter, the current annual dividend yield was calculated based upon the sum of dividends received over the past four quarters relative to the market price at the end of that quarter. This current dividend yield was compared with the stock's "sell-low point,"—a percentage yield defined by the lower bound of the stock's initial dividend yield bracket and a "sell-low factor" as illustrated below:

```
Initial Dividend Yield Range of .5%

Sell-low point. If current dividend yield falls below this point a sale could potentially occur
```

```
Initial Annual Dividend Yield of a stock

sell-low factor which was experimentally varied from .1% to 2.7%
```

0%
Table 6

Regression Equations Relating Initial Dividend Yields to Average Annual Buy and Hold Dividend Yield Statistics

<table>
<thead>
<tr>
<th>Period</th>
<th>Number of Companies</th>
<th>Equation</th>
<th>( R^2 )</th>
<th>D.W.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Period 1</strong> - April 1960 to September 1964</td>
<td>108 Companies</td>
<td>B&amp;H Div Y = 1.94 + 0.59(Initial Div Y) + ERROR</td>
<td>0.42</td>
<td>2.07</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(1.87) (0.29) (0.07)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>106 Companies</td>
<td>B&amp;H Div Y = 2.053 + 0.52(Initial Div Y) + ERROR</td>
<td>0.46</td>
<td>2.14</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(1.50) (0.23) (0.05)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Period 2</strong> - January 1965 to June 1969</td>
<td>108 Companies</td>
<td>B&amp;H Div Y = 2.52 + 0.22(Initial Div Y) + ERROR</td>
<td>0.12</td>
<td>1.81</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(1.30) (0.21) (0.06)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>107 Companies</td>
<td>B&amp;H Div Y = 1.08 + 0.74(Initial Div Y) + ERROR</td>
<td>0.55</td>
<td>1.81</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.950) (0.21) (0.07)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: The standard error of each variable is given in brackets beneath it.
If the current dividend yield is below the relevant sell-low point and if the stock's current market price is greater than its cost, then that stock is sold at the closing price for that quarter and the net proceeds are immediately reinvested in another stock which then has the desired current dividend yield.

This procedure enables a group of stocks which fall within a particular initial dividend yield range, to be treated uniformly as they all have the same sell-low point and their replacements will all be within the same dividend yield range. The requirement that the sale of a stock produce a capital gain, is useful as it limits an Administrative policy to satisfactory holdings.

The sell-low factor is the key concept in an Administrative Policy as it is designed to reflect a trustee's concern with current dividend yields. This factor should be set to equal the decline in current dividend yield that a trustee considers significant. For example, with stocks in the initial dividend range of 5.0% to 5.5%, if a trustee felt that they should be sold when the current dividend yield declined below 3.5%, then this would be achieved by setting the sell-low factor at 1.5%. The absolute size of the sell-low factor will determine the extent to which an Administrative Policy promotes active trading. With a sell-low factor of 0.3%, then declines in current dividend yields of this magnitude will often occur and an Administrative Policy with this sell-low factor would produce a pattern of active trading.
If the sell-low factor were set at a large figure, for example 2.7%, then declines in yield of this magnitude would rarely occur and cannot occur with stocks yielding less than 2.7%.

An Administrative Policy necessarily has two aspects—a policy that directs the sale of certain investments, and a policy that directs the proceeds into new investments. The writer's objective was to compare an Administrative Policy keyed to current dividend yield with a Buy and Hold Policy. It was desirable to find a neutral reinvestment policy in order to prevent the effect of the 'selling' policy being confounded with the results of the reinvestment policy. Therefore the reinvestment policy was designed through reference to only one factor—the current dividend yield. If a stock was sold, its replacement was selected at random from among those stocks which at the end of the quarter had a current dividend yield in the desired dividend yield range. If no such stocks were available, a selection was made from the next higher range.

Three definitions of the desired dividend yield range were employed to define in effect three alternative 'buying' policies. In each case the initial dividend yield at the start of a 4.5 year period defined the initial dividend yield range for that stock. For example, an initial dividend yield of 4.47% would fall into the dividend yield range from 4.0% to 4.49%. One policy was simply to choose, using a random number generator, another stock whose current
dividend yield was then within the same dividend yield range. Simple variants of this policy were to select investments from the next lower dividend yield range, 3.5% to 3.9% in the above example and thus to lower the required current dividend yield when reinvesting, or alternatively to select investments from the next higher dividend yield range, 4.5% to 4.9% in the above example and increase the required current dividend yield on all new investments.

At the end of each 4.5 year period all stocks were sold and the sum of discounted dividends was expressed as a yield based upon the initial investment of $1,000.00 to produce an administrative annual dividend yield statistic. In a similar manner an administrative annual capital gains yield statistic was generated.

At an early stage in this project an Administrative Policy with a sell-low factor of 1.1% and a "buying" policy directing repurchases into the next lower initial dividend yield bracket, was applied to all 108 companies over the period April 1960 to September 1964. The results appear in Table 7, page 54, classified by initial dividend yield ranges. This table indicates that the 67 stocks with initial dividend yields below 4.0% basically were not affected by an Administrative Policy. Their average annual dividend yield statistic only declined from 2.9% to 2.8%, while their average annual capital gains yield statistic only increased from 8.7% to 9.0%. In contrast an Administrative Policy had a clear impact on the average yields of the 41 companies with larger dividend
yields. Their annual dividend yield statistic increased from 5.7% to 6.45% while their annual capital gains yield statistic declined from 15.9% to 9.9%.

The subdivision by initial dividend yield ranges of the 41 higher yielding stocks did not appear to be useful. An Administrative Policy increased the dividend yield statistic in 6 out of 7 categories but no consistent pattern could be identified. As the writer's object was to identify the average impact of an Administrative Policy, arithmetic averages of individual yield statistics were employed in subsequent work.

A trustee interested in substantial dividend income for a life tenant would normally concentrate his common stock purchases in high yielding companies, and as an Administrative Policy had been shown to have a minimal impact on lower yielding stocks, it appeared appropriate to apply it only to higher yielding stocks. Consequently in the first period an Administrative Policy was applied to the 41 firms with initial dividend yields above 4.0% as of April 1960. When an Administrative Policy was subsequently applied in a second period, there were only 24 firms with initial dividend yields above 4.0%. To obtain a sample more comparable to that employed in the first period, an Administrative Policy was applied to the 35 firms with initial dividend yields above 3.5%.

In order to understand the impact of various sell-low factors on an Administrative Policy, sell-low factors ranging from .3% to 2.7% were applied to the 41 higher yielding firms over the first period, with reinvestments selected
from the yield category below that of the initial dividend yield; the results appear on Graph 3, page 53. From this analysis it appears that the dividend yield and capital gains yield statistics are affected by the sell-low factor and it therefore is a relevant variable in an Administrative Policy. In subsequent work three sell-low factors were employed—.7%, 1.1% and 1.5%, to simplify the analysis and in the hope that these three could indicate the basic impact of the sell-low factor on an Administrative Policy. These three sell-low factors combined with the three reinvestment policies mentioned earlier produced 9 alternative operational definitions of an Administrative Policy.

The random selection of new investments, which was adopted to highlight the effects of allowing a decline in current dividend yields to initiate sales, made it probable that the investment results would vary, particularly with regard to capital gains. It was found that the results of a single application of a given operational Administrative Policy could not be reliably duplicated. To obtain a stable measure, each operational Administrative Policy was applied 20 times to the same data and grand means were calculated from the individual average annual dividend and capital gains yield statistics.  

In this empirical work, to simplify computations, brokerage commissions were calculated at a flat rate of 1.5% of the market price, rather than at the graduated rates actually employed by the Canadian stock exchanges during
Graph 3

Average Discounted Annual Yields, 41 Stocks
With Initial Dividend Yields Above 4.0%, April 1960 to Sept. 1964, Reinvestment in the Lower Dividend Yield Range.

- 16% - Average Buy and Hold Capital Yield 15.9%
- 15%
- 14%
- 13%
- 12%
- 11%
- 10%
- 9%
- 8%
- 7%
- 6%
- 5%
- 4%

Average Administrative Capital Gains Yield

Average Administrative Dividend Yield

Average Buy and Hold Dividend Yield 5.7%

Sell-Low Factors in Per Cent
TABLE 7
A COMPARISON OF AVERAGED ANNUAL YIELDS FOR
PERIOD 1, APRIL 1960 TO SEPTEMBER 1964.

<table>
<thead>
<tr>
<th>No of Companies</th>
<th>108</th>
<th>67</th>
<th>41</th>
<th>11</th>
<th>5</th>
<th>8</th>
<th>4</th>
<th>3</th>
<th>5</th>
<th>5</th>
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<tbody>
<tr>
<td>Average</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Administrative Policy</td>
<td>4.2</td>
<td>2.8</td>
<td>6.45</td>
<td>5.0</td>
<td>5.7</td>
<td>5.5</td>
<td>6.3</td>
<td>5.9</td>
<td>9.1</td>
<td>9.7</td>
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<tr>
<td>Annual</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Buy + Hold Policy</td>
<td>3.9</td>
<td>2.9</td>
<td>5.7</td>
<td>4.7</td>
<td>5.8</td>
<td>5.0</td>
<td>5.0</td>
<td>5.7</td>
<td>6.5</td>
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<td>Dividend</td>
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<tr>
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<td>-.1</td>
<td>.75</td>
<td>.3</td>
<td>-.1</td>
<td>.5</td>
<td>1.3</td>
<td>.2</td>
<td>2.6</td>
<td>.7</td>
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<tr>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Administrative Policy</td>
<td>9.6</td>
<td>9.0</td>
<td>9.9</td>
<td>14.8</td>
<td>10.7</td>
<td>7.5</td>
<td>15.9</td>
<td>10.7</td>
<td>7.1</td>
<td>-0.3</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Buy + Hold Policy</td>
<td>11.5</td>
<td>8.7</td>
<td>15.9</td>
<td>12.6</td>
<td>20.9</td>
<td>16.8</td>
<td>4.0</td>
<td>6.2</td>
<td>18.6</td>
<td>29.4</td>
</tr>
<tr>
<td>Capital Gains</td>
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<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Difference</td>
<td>-1.9</td>
<td>.3</td>
<td>-6.0</td>
<td>2.2</td>
<td>-10.2</td>
<td>-9.3</td>
<td>11.9</td>
<td>4.5</td>
<td>-11.5</td>
<td>-29.7</td>
</tr>
</tbody>
</table>

Note: The administrative policy used to produce the above results employed a 1.1% sell-low factor with reinvestment in the next lower initial yield category.
these periods. Due to the need to adjust market prices for stock splits in order to obtain a consistent price record, it is difficult to calculate the actual commissions that would have been charged. The only actual prices used in this study were those of June 1969 when the average market price of the 108 companies was $30.69. The Toronto Stock Exchange commission on a purchase or sale of a stock at that price would have been .3867 cents per share or an effective rate of 1.26%. Thus in this empirical work, it appears that the effect of broker's commissions has been overstated.

Each of the nine operational definitions of an Administrative Policy were applied 20 times over the period April 1960 to September 1964 to the 41 firms with initial dividend yields greater than 4.0% as of April 1960, and the grand mean annual dividend yield statistics and annual capital gains yield statistics are recorded in Appendix A. In visual form these results appear on Graph 4, page 57, along with a point representing the investment results of a Buy and Hold Policy. Graph 4 portrays the results produced by alternative investment policies as represented by the present value of the dividends received and realized capital gains or losses, expressed as an annualized yield based upon the capital originally invested. Thus while an Administrative Policy concerns itself with current dividend yield—a relative measure, the results of this policy are recorded in an absolute form in order that comparisons with the results of a Buy and Hold Policy can legitimately be made.
From Graph 4 it appears that, in this first period, any Administrative Policy with a deliberately neutral reinvestment policy had the effect of increasing the dividend yield statistic while reducing the capital gains yield statistic. A broad hypothesis was therefore formed that in a subsequent time period all 9 operational Administrative Policies would increase the mean annual dividend yield statistic over that produced by a Buy and Hold Policy.

From Graph 4 it can also be seen that the resulting yield statistics, associated with the policy of reinvesting in a higher yield bracket, symbolized by @, dominate alternative reinvestment strategies represented by × and ® when the sell-low factor is held constant at 1.1% or .7%. When the sell-low factor was 1.5%, no particular reinvestment strategy was dominant. It was therefore proposed as a hypothesis that reinvesting in the next higher yield category would tend to dominate alternative reinvestment strategies.

With regard to 'selling' policies, it appears that the results associated with the 1.1% sell-low factor dominates other sell-low factors when a fixed reinvestment policy of investing in the same or a higher yield bracket is maintained as symbolized by @ or @. However the policy of reinvesting in the lower yield category, symbolized by ×, did not produce a dominant sell-low factor. A third hypothesis can therefore be formed that a sell-low factor of 1.1% will tend to dominate alternative 'selling' strategies. These three hypotheses were the only relevant ones that the writer was able to form based
GRAPH 4  GRAND MEANS OF DISCOUNTED ANNUAL DIVIDEND AND CAPITAL GAINS YIELDS, 41 FIRMS, OVER PERIOD APRIL 1960 TO SEPT 1964.

ANNUAL CAPITAL GAINS YIELD

\[ \text{SLF} = 1.1\% \text{ (Buy + Hold)} \]

\[ \text{SLF} = 1.5\% \]

\[ \text{SLF} = -7\% \text{ (Reinvestment in a lower yield category)} \]

\[ \text{SLF} = -7\% \text{ (Same yield category)} \]

\[ \text{SLF} = 1.1\% \text{ (Higher yield category)} \]

\[ \text{SLF} = -7\% \]

\[ \text{SLF} = 1.5\% \]

\[ \text{SLF} = 5.76\% \text{ (Dividend yield)} \]

\[ \text{SLF} = 15.75\% \text{ (Capital gain yield)} \]

\% = reinvestment in a lower yield category
\( \circ \) = " " the same yield category
\( \odot \) = " " a higher yield category.
upon the first period's results; the 2nd and 3rd hypotheses taken together imply that the combination of a 1.1% sell-low factor and a policy of reinvesting in the next higher yield category, should dominate all other Administrative Policies.

All nine operational forms of an Administrative Policy were applied over a second non-overlapping period, January 1965 to June 1969, to 35 firms with initial dividend yields above 3.5% as of January 1965, and the results appear in Appendix B and in a visual form on Graph 5, page 59. In this second period the impact of an Administrative Policy was reduced as the proportion of firms affected by an Administrative Policy declined.

Table 8

Proportion of Firms Affected by an Administrative Policy in Period 1 and Period 2

<table>
<thead>
<tr>
<th>Period</th>
<th>SLF .7%</th>
<th>SLF 1.1%</th>
<th>SLF 1.5%</th>
</tr>
</thead>
<tbody>
<tr>
<td>April 1960-Sept. 1964</td>
<td>85.3%</td>
<td>75.6%</td>
<td>58.7%</td>
</tr>
<tr>
<td>Jan. 1965-June 1969</td>
<td>31.4%</td>
<td>20.0%</td>
<td>14.3%</td>
</tr>
</tbody>
</table>

From Table 8 it can be seen that in both periods as the sell-low factor was increased, the impact of an Administrative Policy was reduced. However it is also clear that in the second period the dual constraints built into any Administrative Policy were satisfied less frequently.
Graph 5  Grand Means of Discounted Dividend and Capital Gains Yields of 35 Firms, over Period Jan. 1965 to June 1969

Annual Capital
Gains
Yields

-5%
-3%
-2.5%
-2%
-1.5%
-1%

SLF 1.5%
SLF 1.5%
SLF 1.5%
SLF 1.1%
SLF 1.1%
SLF 1.1%
SLF 1.7%
SLF 1.7%
SLF 1.7%

+ Buy and Hold Div. Y. 4.08% Cap. G. Y. -2.89%

* = reinvestment in a lower yield category.
@ = reinvestment in the same yield category.
○ = reinvestment in a higher yield category.
From Graph 5 it can be seen that in this second period all 9 operational definitions of an Administrative Policy produced a larger mean annual dividend yield statistic than the Buy and Hold Policy. The broad hypothesis formulated earlier is not disproved by this one trial and this will be discussed further in Chapter 5 as it is the basic conclusion to be derived from this empirical investigation into the average effects of an Administrative Policy relative to a Buy and Hold Policy.

The effect of an Administrative Policy upon capital gains is doubly obscured. In the first period an Administrative Policy produced a significant drop in the capital gains yield statistic while in the second period its effect was to decrease capital losses relative to the Buy and Hold Policy. To these conflicting results must be added the realization that a random reinvestment policy was deliberately adopted to enable the current dividend yield to control both sales and purchases. It is at least possible that a more sophisticated reinvestment policy employing current dividend yield and a range of other corporate and industrial factors, would permit an Administrative Policy to maintain an increased dividend yield and yet improve its capital gains yield.

The second hypothesis that a policy of reinvesting in the next higher dividend yield bracket would tend to dominate other reinvestment strategies, was contradicted by the second period's results. In this period no one reinvestment policy is dominant when a sell-low factor is held
constant. The third hypothesis, that a 1.1% sell-low factor would tend to dominate other 'selling' policies, is also disproved. In this period there was a tendency for the .7% sell-low factor to dominate other 'selling' policies when the reinvestment policy is held constant. It must be concluded that this simple attempt to define an optimum Administrative Policy based upon its results over the period April 1960 to September 1964, has failed.
1. Whether common stocks are a hedge against inflation is a well-argued question. With regard to an income trust, the relevant fact about the issue may be that it exists. With common stocks, a trustee can hope that the real dividend income and the real purchasing power of the corpus will both remain constant; with bonds and mortgages, it is clear that the real purchasing power of the corpus must decline.

2. The discontinuity between the ending of the first period in Sept. 1964 and the start of the second period in Jan. 1965, is due to the data base that was originally available. Data was collected on the closing prices and dividends declared during the 41 quarters between April 1959 and June 1969. Data on the first four quarters was employed to calculate the initial annual dividend yields leaving data on 37 quarters available for subsequent analysis. Having decided to employ two equal non-overlapping periods, data on the three months of October, November and December, 1964, was surplus and was not used in formulating or testing hypotheses.

3. To check that 20 trials was a sufficient number of trials to produce a stable mean, 60 trials were made and a T-test was conducted to test the hypotheses that the mean of 20 repetitions was not significantly different from that produced by 60 repetitions. The resulting T probabilities of .661 and .741 indicate that the hypothesis of identical means cannot be rejected at the 5% significance level.

The grand means associated with 20 trials and 60 trials, based upon a sell-low factor of 1.1% and with reinvestment in the next higher dividend yield bracket were:

<table>
<thead>
<tr>
<th>Trials</th>
<th>Grand Mean Dividend Yield Statistic</th>
<th>Standard Deviation</th>
<th>Grand Mean Capital Gains Yield Statistic</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>6.82841</td>
<td>.14812</td>
<td>12.2173</td>
<td>1.45402</td>
</tr>
<tr>
<td>60</td>
<td>6.84481</td>
<td>.1407</td>
<td>12.1156</td>
<td>1.1857</td>
</tr>
</tbody>
</table>
CHAPTER 5

The Integration of These Empirical Results With Financial Theory

In the empirical work reported in Chapter 4, any administrative procedure based on a quarterly monitoring of prices and dividends, produced a larger dividend yield over a 4.5 year period than a simple buy and hold policy. That similar results were produced in a second period is only slight support for the proposition that an administrative policy will increase dividend yield in other periods. In this chapter we seek to relate these results to some of the American and British literature on dividend policy and the valuation of common shares.

It is basic to recent financial theory that share prices are related to expected future dividends and earnings; while studies of dividend payments have indicated that increases in corporate earnings are not immediately reflected in increased dividend payments. If share prices rise in anticipation of increased corporate earnings while dividend payments lag behind the increased earnings when they do occur, then there would be a significant time lag between a rise in a share's price and an increase in that share's cash dividend. During this interval the current dividend yield would fall below its initial level, to rise only when dividend increases are subsequently made. In an income trust, if a large
dividend yield is desirable, it could be a feasible policy to realize capital gains when the current dividend yield falls and re-invest to secure the desired yield immediately rather than waiting patiently for larger corporate earnings and ultimately for larger dividends. The success of the Administrative Policy in increasing dividend yield over that of a buy and hold policy can be rationalized in terms of these two financial propositions.

Lintner (1956) attempted to crystallize the dividend policy of corporate executives into an explanatory regression equation which has been a point of departure for many subsequent studies. In field studies 28 American corporations were studied and interviewed with a view to determining the factors that entered most actively into each firm's dividend policy. It was found that the primary question in all but two cases was whether the existing dividend payment should be changed; the amount of the change was a secondary issue. The practice of making only a partial adjustment to any change in earnings in any one year tended to stabilize dividends and provide a consistency in the pattern of dividend changes. All companies were found to be reluctant to reduce regular dividend rates once established and were therefore conservative in raising regular rates. Based on data from 1947 to 1953, Lintner estimated that the average propensity to pay dividends was 69% while the short run propensity to change current dividends relative to a change in earnings was only 21%.
Subsequent studies using other data and stressing other variables have largely confirmed that the marginal propensity to pay dividends out of increased earnings is much lower than the long run average propensity to distribute net profits. Darling (1957) reported that the long run average propensity to pay dividends was 37 to 48 per cent, while the short run marginal propensity ranged between 13 and 30 per cent. Brittain (1966) also found a difference between the average and the marginal propensity to pay dividends. He reported that the average propensity was 63 per cent while the short run marginal propensity to pay dividends was 28 per cent. Despite these variations from study to study, all agree that corporations are normally slow to reflect increased earnings in their dividend policy.

Financial theory has yet to produce a truly adequate theory to explain changes in the market prices of individual shares.¹ Stock markets could be considered as ongoing auctions in which a fluctuating number of individuals and firms participate, each motivated by rational or irrational beliefs, and each exposed to varying amounts of information which itself may be true or false. Participants in the market, whether as brokers or investors often need a theoretical framework to guide their thinking. Financial theory, following John B. Williams (1938) has suggested that the value of a share is the present value of the stream of dividends that it will generate. As a firm's dividend is often systematically related to its net income, this formulation can be restated in terms
of net income per share. Much of the financial literature dealing with the problems of the cost of capital and the optimum dividend rate is based upon this fundamental notion that a share's market price is a function of anticipated future corporate earnings and the dividends to be declared therefrom.²

Latane and Tuttle (1967) investigated a range of historical variables to determine which had the highest correlation with stock price changes as expressed as a price ratio. They reported for the period 1950-1963, future price change \((P_{t+1}/P_t)\) is best correlated with future earnings \((E_{t+1}/P_t)\) and future dividends \((D_{t+1}/P_t)\), rather than present or past earnings or dividends. Also the earnings ratio generally had a higher simple correlation coefficient than the dividend ratio.

One rational explanation for a rise in the price of a common share is that investors anticipate larger earnings and dividends in the future. The work by Latane and Tuttle is some empirical evidence that movements in stock prices anticipate changes in earnings. In our empirical work we investigated the discounted dividend yield and capital gains yield resulting from either holding, or selling a common stock when its current dividend yield has fallen, provided its sale would realize a capital gain. As the current dividend yield is the ratio of current annual dividends to the current share price, a reduction in the dividend or an increase in the share price or a combination of both could cause the current dividend...
yield to fall. While it is possible that some sales were initiated by reductions in dividends, inspection of the computer output has indicate that this rarely occurred. The requirement that all sales realize a capital gain prevented many dividend reductions from triggering sales. It is therefore probable that most of the sale signals produced by an administrative policy were initiated by rising stock prices. An administrative policy may have produced a larger dividend income than a buy and hold policy because it refused to hold a stock during the interval between the stock market's anticipation of increased earnings (which raised its price and reduced its current dividend yield) and the time when the improved earnings were realized and fully reflected in augmented dividend payments.

The random selection of a stock for reinvestment based solely on current dividend yield is not recommended as a proper investment policy for a trustee; however in this study it had a methodological advantage. While it would be attractive to select shares for purchase based on a ranking system using current dividend yield and another variable such as a five year growth rate in earnings, the results would then be a combination of the 'selling' policy founded on current yield and a 'buying' policy based on yield and another variable. The effects of one policy would be confounded with the other. The arbitrary technique employed in this thesis enables the policy of maintaining a minimum dividend yield on profitable stocks to be viewed in isolation.
Some other assumptions and limitations inherent in our research design should be noted. Our data base of 108 companies were pre-screened to ensure complete data on prices and dividend payments. The risk of delisting or bankruptcy were effectively removed. This artificial financial environment, however, should not have a material effect on the validity of internal comparisons though it prevents meaningful external comparisons.

The computer program which produced the dividend yield and capital gains yield statistics, did not calculate them net of Canadian income tax. Very few empirical studies attempt to present their results in such a form as the tax status of investors and the applicable tax rates can vary widely. As a capital gains tax was not levied in Canada during the period 1959-1969, our results which do not make any provision for taxes on realized capital gains, have the virtue of historical consistency.

However it should be pointed out that under Canada's present capital gains tax, an Administrative Policy which involves the realization of capital gains, will expose the trust to income tax liabilities. Under Section 104 (2) of the Income Tax Act, a trust is taxed as a separate tax payer with regard to any income received by it and not paid to a beneficiary. Sections 40 (1), 38 and 3 (b) provide that one half of net realized capital gains constitute taxable income. As a trust is normally not obliged or permitted to pay capital gains to a beneficiary, any taxes on realized capital gains
must be paid out of the corpus. If a trust sold an asset for $10,000 with $5,000 being capital gains, then the trust's taxable income would be $2,500 and Federal and Provincial taxes would be approximately $550. The sum available for permanent reinvestment would be only $9,450. Neglecting transaction costs, if the asset had previously yielded 3% per annum and the proceeds were reinvested to yield 4% per annum, without a capital gains tax the annual income would have risen from $300 to $400 but with a capital gains tax it would only rise to $378. A capital gains tax probably reduces the ability of any Administrative Policy to increase dividend income. The extent of the reduction could best be determined by a replication of this study using market data generated since 1972. Our results could still be of relevance to trustees who attempt to balance capital gains with capital losses and so keep the trust's tax liability to a minimum, or to trustees of charitable trusts or endowments whose income is not subject to income tax.
Footnotes to Chapter 5

1. Michael Keenan (1970) reviewed the general results of attempts to develop models of share price valuation based on historic accounting and financial data. He concluded that the artificiality of the data and the restrictions inherent in the regression methodology used, explain the inability of any of the models to develop stable estimates of the magnitude and sign of the various parameters.

2. Many of the major articles on the cost of capital and the relevance of dividends are based on an equation that relates share prices to future earnings. Reference may be made to articles by Modigliani and Miller (1958) and 1961), Myron J. Gordon (1962), and J. Lintner (1962) and (1964).

3. Assuming that $2,500 constitutes all the income of the trust not paid to beneficiaries then under Section 117 (4) (d) of the Income Tax Act, the Federal Tax would be $425 in 1975 and Provincial tax levied as 30.5% of the Federal Tax, would be $129.62. Total Federal and Provincial Taxes arising out of the Trust's realization of a net capital gain of $5,000 would be $554.62.

4. Under Section 149 (1) (h) of the Income Tax Act, no tax is payable on the income of a trust, all the property of which is held absolutely in trust exclusively for charitable purposes.
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## Appendix A

Grand Means and Standard Deviations Produced by 20 Trials of Each Operational Administrative Policy, With the Discounted Annual Average Dividend Yields and Capital Gains Yields Obtained from 41 Companies Over the Period April 1960 to September 1964

<table>
<thead>
<tr>
<th>BUYING POLICIES</th>
<th>REPURCHASES IN LOWER YIELD</th>
<th>REPURCHASES IN SAME YIELD</th>
<th>REPURCHASES IN HIGHER YIELD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>DIV Y</td>
<td>CAP Y</td>
<td>DIV Y</td>
</tr>
<tr>
<td>SLF .7%</td>
<td>6.36</td>
<td>9.14</td>
<td>6.53</td>
</tr>
<tr>
<td>Standard Dev</td>
<td>.18</td>
<td>1.64</td>
<td>.16</td>
</tr>
<tr>
<td>SLF 1.1%</td>
<td>6.34</td>
<td>9.34</td>
<td>6.59</td>
</tr>
<tr>
<td>Standard Dev</td>
<td>.17</td>
<td>1.12</td>
<td>.17</td>
</tr>
<tr>
<td>SLF 1.5%</td>
<td>6.25</td>
<td>12.24</td>
<td>6.28</td>
</tr>
<tr>
<td>Standard Dev</td>
<td>.15</td>
<td>1.05</td>
<td>.14</td>
</tr>
</tbody>
</table>
Appendix B

Grand Means and Standard Deviations Produced by 20 Trials of Each Operation Administrative Policy, With the Discounted Annual Average Dividend Yields and Capital Gains Yields Obtained From 35 Companies Over the Period January 1965 to June 1969

<table>
<thead>
<tr>
<th>BUYING POLICIES</th>
<th>REPURCHASES IN LOWER YIELD</th>
<th>REPURCHASES IN SAME YIELD</th>
<th>REPURCHASES IN HIGHER YIELD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>DIV Y</td>
<td>CAP Y</td>
<td>DIV Y</td>
</tr>
<tr>
<td>SLF .7%</td>
<td>4.37</td>
<td>-1.53</td>
<td>4.44</td>
</tr>
<tr>
<td>Standard Dev</td>
<td>.12</td>
<td>1.56</td>
<td>.15</td>
</tr>
<tr>
<td>SLF 1.1%</td>
<td>4.29</td>
<td>-2.35</td>
<td>4.29</td>
</tr>
<tr>
<td>Standard Dev</td>
<td>.09</td>
<td>1.25</td>
<td>.11</td>
</tr>
<tr>
<td>SLF 1.5%</td>
<td>4.22</td>
<td>-1.56</td>
<td>4.28</td>
</tr>
<tr>
<td>Standard Dev</td>
<td>.03</td>
<td>.83</td>
<td>.09</td>
</tr>
</tbody>
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