TRADING IN MONEY MARKET SECURITIES

by

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Why Instruments?

The first question to ask is, why does a money market use securities or, as they are often called, instruments?

- The nature of the transaction is documented in a standard and acceptable format.
- The parties to the transaction and the instrument are certain as to their rights and obligations and as to market practice in respect to negotiability and collection.
- The securities may be pledged as collateral for third party borrowings.
- The most efficient medium for ultimately matching borrowers and lenders within the market place.

The first two points are subjects we do not intend to expand on, as much has been written and presented in other forms for your individual reference. It is the final point that we intend to expand on and discuss today. A number of previous speakers have detailed to you the liquidity flows of the system as a whole and of the individual sectors within that system. As the various participants within the market have cash flows that range from homogeneous to diverse to that of other participants, it would be inefficient to initially attempt to match their ultimate requirements. Any such attempt would result in a higher price for that money together with a number of unsatisfied but willing participants.

To satisfy participants as to term, liquidity, security and the interaction of those three requirements, we look for a medium or vehicle to attempt to reconcile the market's requirements. That vehicle is the instrument.

The growth of instruments as a financing and investing medium has been rapid in recent years in response to the greater complexity of our markets and the Governments' desire to limit money growth but encourage a higher velocity of circulation of that money.

Taking a lead from countries that have a financial history and system similar to that of Australia, we can, with reasonable confidence, predict a continuing rapid growth of money market instruments in the future. However, we will explore some developments as to the future a little later.

Types of Instruments

In attempting to develop this presentation regarding the trading of money market securities, we have decided to concentrate on the factors affecting ultimate return and to some extent, cost. Any discussion of individual trading techniques, strategies and methods cannot be effectively developed without an understanding of the elements of real return. In effect there are only two types of securities, each possessing very different characteristics from the other:—

1. *Coupon (Fixed Interest) Securities*

- Commonwealth Government Treasury Bonds
- Semi and Local Government Securities
- Company Debentures and Unsecured Notes
- Bank Convertible Certificates of Deposit and Transferable Certificates of Deposit.

2. *Discount Securities*

- Commonwealth Government Treasury Notes
- Bills of Exchange, Bank and Prime Commercial
- Bank Negotiable Certificates of Deposit
- Promissory Notes

Coupon Securities tend to be issued for longer term obligation (usually longer than 1 year) whereas Discount Securities tend to be issued for shorter term obligations (shorter than 1 year).

Coupon Securities are designed to provide the investor with a regular flow of interest thus requiring registration of the security, hence a more formal transfer mechanism, whereas discount securities by their very nature of the payment of interest at maturity, allow the market to trade in these instruments in bearer form.

Yield Curves

All Securities have a yield curve. The yield curve plots the yield to maturity against time. This curve is formed (or should be formed) via the market mechanism of supply and demand with the major determinants of supply and demand being to some extent different but inter-related, and these determinants vary with the type of instrument in question. Some major factors:—

1. Shorter term liquidity flows.
2. Expectations as to monetary policy, fiscal policy and as to exchange rate policy.
3. Time and risk.
4. Inflationary expectations.
5. The level of activity in the economy.

Market participants should have well defined objectives outlining their needs. While objectives will vary among participants, the necessary guidelines should centre around four major considerations:—

1. *Liquidity* — Maintain necessary degree of liquidity consistent with regulations and operating requirements. Maintain liquidity in highest yielding, or most strategic short term instrument.
2. *Security of Income and Capital* — Maintain desired level of income consistent with ability to assume risk and absorb loss.
3. *Strategy* — Maintain constant strategic outlook on market so that opportunities to increase profits will be recognised.
4. *Flexibility* — Operate flexibly with changes in market strategy and outlook.
5. *Nature and timing of Liabilities*

Historically, the nearer an investment has been to maturity, the easier it has been to convert to cash with minimum risk. Shorter maturities were therefore more valuable in price from a liquidity standpoint compared with longer maturities. As a general rule, investors have been willing to pay a premium for such liquidity and a reduction in market risk. This resulted in the positive yield curve. The majority of the time our yield curves will be downward sloping — to the left in direction. Flat or inverse yield curves can only be temporary in nature. However, I am sure this point will buy an argument.

Market participants should analyse the yield curve in respect to current opportunities and expected future levels and shapes, while at all times keeping in mind their investment objectives as discussed earlier.

To illustrate further this point, we have taken the most commonly used trading technique "The Yield Curve Ride".

Refer *CHART 1.*

A security is purchased at 10% for 6 months.

A view is taken that the shape and level of that curve will not alter over the life of that security and the investment need is for only 90 days. After 90 days we have a 90 days security which is sold on the yield curve at 9.00% per annum. Our effective yield for the period held is 10.75% per annum. Another example would be that a two month bill is purchased at 8.00% per annum and then sold one month later on the yield curve at 7.00% per annum producing a return on investment of 9.00% per annum which is an equivalent return to that of a 90 day bill held to maturity.

In accordance with our objectives detailed earlier, securities would only be held to maturity for defensive reasons — such as:—

1. For liquidity to cover a particular date.
2. In anticipation of reverse rate movements.

The examples to date of a yield curve have concentrated on short term discount securities and it may be useful to apply a similar concept to the current short end of the Commonwealth Bond Yield Curve.

Refer *CHART 2 (a)—(c)*

As debate rages over the future level and shape of that curve, a quick survey of a few dealers presented us with some alternative views to analyse, again with the concentration being, on achieving, the best assessable return over a given time frame or frames.

What Does Yield Mean?

At this point we will leave our discussion of the yield curve but we will return to it later. However, an understanding of "yield to maturity", the common basis on which securities are traded, may be helpful.

The redemption yield consists of two components, namely "running yield" and "capital gain". For example . . . . . .

YIELD SPLIT-UP

Security:	6½% 4 year Semi-Government
Market Redemption Yield:	11.5%
Capital Value:	84,321
Capital Value in 6 Months (assume same yield)	85.919
Running Yield:	$\frac{3.25}{84.321} = 3.854\%$
Capital Gain:	$\frac{85.919 - 84.321}{84.321} = 1.896\%$
Total Return	5.750%
Annualised Return	11.500%

However, to actually obtain this yield it is necessary to reinvest each and every coupon at that purchase yield, and, the final return based on actual reinvestment rates is then called the Realised Compound Yield. This concept is often referred to as interest on interest.

Let's take an extreme example to illustrate the concept:—

Refer *CHART 3*

As maturity is reduced, the importance of interest on interest declines sharply but can still represent a dealers margin.

Refer *CHART 4*

Applying this concept to short term securities such as bills, we find the principle is still very much valid.

Bills or other short term discount securities may be payable in 90, 180, 270 or 360 days and unless prices are adjusted for the fact that income is received at different intervals, securities which are bought on the same yield to maturity will not in fact give you the same rate of return. In the good old days, discount instruments used to be traded on a discount rate basis rather than a yield to maturity. The difference between the two is not only in the formula for calculation, but also the meaning of a discount rate is simply the present value of the equivalent yield rate.

Of course, as a discount rate assumes that everything is payable at the beginning of the period, it is too harsh a measure and overestimates the value of an earlier cash flow.

For example, we have a market when 90 day bills are trading at 10.25% yield and 180 day bills are trading at 10.50% yield. Their equivalent discount rates are 10.00% and 9.98% if the intention is to hold to maturity and stable conditions are predicted, the 90 day bill rolled over appears to achieve a higher real return, although in actual fact the 180 day bill returns a higher return of approximately 0.1%.

To summarise the concept of yield to maturity, we need to have an understanding of compound interest and present values.

Taxation and Accounting

Individual taxation and accounting policies and treatments also have a major bearing on real return and hence pricing levels of various securities within the market place.

There are many different ways to account for income, capital gains, accruals and so on and companies have adopted the most practical of these in relation to their type of business. However, one has to be careful in applying these same principles to maximising after tax returns from investments, as in many cases, the tax man admits that proper accounting standards differ to his concept of tax standards. These relate mainly to the timing of tax payments which obviously affect one's tax yields. Some of the questions which need to be answered are:—

- What tax is payable on interest, and on capital gains?
- What capital value is assumed on purchase of a security which contains accrued interest. How much tax is then payable on the first coupon received? And if the security is sold, is tax payable on accrued interest?
- How is rebateable interest accounted, on a cash or accrued basis?
- How is underwriting income treated, as a discount or a fee?

You may think that the difference in return is not significant but the following examples may change your mind.

1. 5% December, 1979 Rebate is purchased to yield at 8.8% per annum by a General Insurance Fund who accounts for the rebate on a cash basis. The Funds adjusted tax return is 13.0% per annum. This yield has three components:—
   1) .90% p.a. for the Rebate
   2) 6.9% for the tax free capital gain
   3) 5.20% for the running yield.
2. An industrial company has the choice of buying a 4 year debenture at a yield of 11.5% per annum with either a 13% coupon or a 6½% coupon. The adjusted yield for the 13% coupon is 10.5% per annum and for the 6½% coupon, 15.2% p.a. The difference is due to the non-taxability of the capital gain and similarly no taxation relief on the capital loss.
3. A Life Office holds 5.4% 5/04 bonds and wishes to switch into 6.0% 7/05 at the same redemption yield of 10.3%. The adjusted sale yield is 8.35% and the adjusted purchase yield is 10.85%, i.e. an adjusted yield spread of 2.5%.

   The two aspects of this example are:—
   1) Immediate tax relief on the loss of sale
   2) Deferral of tax on the purchase.

There are also advantages, depending on how you account, on buying a security full of accrued interest or buying it ex interest.

As most 30/20 investors elect to account for those securities at cost, a realised loss will require that a greater cash equivalent must be reinvested in 30/20 assets — being about 84% of the loss — hence reducing non-30/20 investments. The timing of tax losses and gains improves the cash flow if transacted as close to the balance date as possible.

There will be advantages for pension funds when tax funds realise the advantage of low coupon securities and the disadvantages of high coupon securities in that the redemption yield on high coupon securities will be above those for low coupon securities.

For discount and short term securities about the only technique to keep in mind is that of tax payment timing — hence income timing. For instance, don't have your bills maturing on the 28th June, but the 1st of July, as you will defer tax on these bills by another year, thus improving your cash flow.

Using Coupon Securities

Earlier we discussed some basic approaches of riding the yield curve and assessing the real return of a coupon security in respect of its cash flow and taxation treatment.

It may be helpful to attempt to develop these concepts a little further.

It is well known that for fixed interest securities it is the capital price that adjusts to a given fixed coupon to achieve the yield to maturity. However it is not well understood that the percentage movement in that price can differ yet again effecting the real rate of return. This is called the volatility of security prices.

Volatility

The volatility of a stock is measured by the percentage change in price of a security given a certain yield change. All other things being equal with the same percentage change in yield the volatility of the price of a stock increases as:—

a) maturity lengthens (the longer the stock, the greater the volatility)
b) coupon rates decline (the lower the coupon, the greater the volatility)
c) yield rises (the higher the yield level from which a price fluctuation starts, the greater the volatility).

The increase in bond price volatility with increases in maturity needs very little explanation. The current yield from the stream of coupon payment is increased by the amortisation of a discount or reduced by the amortisation of a premium as was shown previously. Therefore the more years to maturity the larger the premium or discount for a given yield difference away from the coupon rate and, also, the larger the change in the premium or discount when yields change.

The reason why the *increase* in volatility becomes progressively less as maturity lengthens is that the less volatile coupon stream accounts for more and more of a bond's Present Value as maturity lengthens, while the more volatile lump sum payment

accounts for less and less of a bond's Present Value.

The increase in bond price volatility as the coupon rate declines is due to the same factors. The lower the coupon (at the same yield and maturity) the larger part of the total yield is provided by the lump sum payment of the discount; and since the lump sum payment is more distant in time than all but one of the coupon payments its present value is more volatile than that of all the coupon payments.

Finally, the increase in bond price volatility as yields rise (if measured by percentage changes in yield) is explained by the fact that at higher yields there are more basis points in a given percentage change in yields. Since the present value of the lump sum portion of the cash flow fluctuates roughly proportionately to basis point yield change rather than percentage yield change its present value changes much more rapidly in high yield areas than in low yield areas.

What are the practical implications?

Let us say that we want to switch from a 10 year bond into a 5 year bond. The market for a 10 year bond is 9.50% and a five year bond is 9.30%. What happens if we can talk the seller of the five year bond into buying at 9.00% for the 10 year bond and selling at 8.80% for the 5 year bond. It can be seen that the 20 basis point margin has been maintained. However, both switches are not equivalent. From the previous section it can be seen the longer the security the more price volatile it is. Hence the amount we save by dealing 50 basis points below market in a 10 year security far exceeds that amount given up on the 5 year bond and, in fact, the switch is not done on a trice 20 basis points differential, but, in fact, on a 0 basis points difference (save $1.26 which is 20 basis points in yield on a 10 year security).

Or let us say that we think yields are going to fall. In the previous section we saw how to calculate which securities to hold, but with the above theory we can make a pretty good guess which bonds are best, i.e. long low coupon bonds.

Or what if we think rates are going to rise? If everyone else thinks the same, we cannot switch shorter. What should we do? The solution is to switch into high coupon securities with the same approximate maturity to minimise capital loss.

Switching

Constantly we are hearing from the market why we should or should not be switching bonds, semis or whatever. However, there are a multitude of reasons for switching and a multitude of complexities in the assessment of a switch.

We have previously discussed a number of factors effecting the real return of a security and it is for this reason that we switch.

Let's briefly look at a number of switches:—

1. Future yield expectation position. This is simply shortening or lengthening maturities to take advantage of the anticipated shape or level of the yield curve. However these switches may be maximised by remembering the points on volatility.
2. Anomaly switches. Reinvest yields where a stock lies above or below its relative spot on the yield curve.
3. Coupon Switches. Coupons on bonds are paid twice per year on either 181 to 185 days in the actual half year. Opportunities may exist to sell long payment coupon and sell the short payment coupon assuming their yield curve positions are relative.
4. Yield curve riding switches. This is allowing the passage of time to improve return as discussed previously.
5. Tax switches. As discussed in the tax section.
6. Security type switches. Where the differential between various types of securities either over or under reacts to market conditions.
7. Non-market yield switches. Such switches occur at current market differentials but not rate levels. Be careful as the effect is very different at different rate levels.

Discount or Non-Coupon Securities

As discussed previously, an investor needs to compare the real returns of a range of securities along the yield curve after adjusting for their cash flow effects. Traders and investors often combine the two earlier

mentioned concepts of real return, the cash flow and the technique of riding the yield curve, to maximise return or gross up the yield as it is often referred to.

The return is further complicated when the funds used to invest are borrowed funds. As market practice tends to be that interest on deposits is paid monthly, the final margin received must be adjusted for the differences in income receipt to payment.

When borrowing against a security position, convert the yield on those securities to a discount and compare that with the cost of borrowing thus giving a truer view of the real margin. As a rule of thumb the difference in cash flow timing will account for about 0.13% per annum of the margin when viewed on a yield basis.

A dealer, in fact, complicates life a little more as he is borrowing funds to support his securities. He is in effect always betting different areas of the yield curve against one another. Consequently he must always be assessing opportunity cost. For example, a 90 day bill can be purchased today at 10% yield per annum. The future outlook for rates must be assessed in relation to anticipated funding costs.

		.% per annum				
Weeks	4	13.16	12.26	11.35	10.45	9.55
	3	12.12	11.52	10.91	10.30	9.70
	2	11.29	10.92	10.55	10.18	9.82
	1	10.59	10.42	10.25	10.08	9.92
Cost of Funds		3	5	7	9	11

Moving to the other side of the balance sheet the borrower also needs to factor in these thoughts when assessing his borrowing alternatives. For example:—

1. Discounting a bill of exchange or borrowing funds when interest is to be paid monthly. This certainly applies to a dealer who is not obsessed with book size when requiring term funds.
2. Most costs of a bill line — except for the interest or discount component — are front end and therefore are at a discount rate, such as Bank Acceptance fees and stamp duty. For example, a Bank Acceptance fee of 1% for 180 days is equal to a yield equivalent of 1.05% per annum.

Switching

As with coupon securities a number of basic switches or trades are common place.

1. *Anomaly Switches* — When near securities lose their yield relevance to each other switching opportunities exist. For example — On 30th May you are holding 30.6.79 maturities and there are buyers at 10% and there are sellers of early July maturities at 10.35% per annum. This indicates the market is anticipating the cost of money from 29/6 to 4/7 to increase to 15.48% per annum. If you do not agree with the market view you then have a switch.
2. *Time Switches/Yield Curve Riding* — Yield curve riding was explored earlier. Time switching is simply taking a view on the future level and share of the yield curve.
3. *Credit/Instrument Switches* — When differential between various similar type of securities appears to be temporarily out of line. For example, Bank NCD's to Bank Bills — as one will tend to rise or fall to a greater extent in yield to the other.

BOOKS RECEIVED

THE MONEY MINERS

Australia's Mining Boom 1969-70 (Trevor Sykes: Wildcat Press, Sydney, 1978.)

Written by the creator of "Pierpont", Trevor Sykes, this book traces the mining boom on Australia's stock markets during 1969-70.

4. *Accommodation Switches/Liquidity* — When volume needs to be accommodated in excess of a principle position.

Bringing together the above, we see that there are three principles of income generation which all interrelate, as a movement in one will affect the other.

The Future

There has been rapid growth in the use of securities by both borrowers and investors thus requiring all of us to better understand the techniques of utilising these securities either to minimise borrowing costs or maximise returns.

We are not always comparing like with like when discussing yields and maybe there is a need for market standardisation. Maybe the various industry groups (the banks, the dealers, etc) may like to think about coming together on this subject.

Very few markets in the world have the multitude of choices when investing short term funds as we have in Australia. One popular view is that the trading bank overdraft system underwrites our markets and as the banks move to negate the use of overdrafts as a receptacle for short term funds, we could speculate on the future of our money markets —

- Liquidity could not be held in loans at call in the non-dealers markets as readily as it is today.
- Borrowers and investors would lose some opportunity costs and options while waiting to time their market entry.
- Instruments would become more highly traded as a source of liquidity

CHART 1 **A CONVENTIONAL YIELD CURVE**

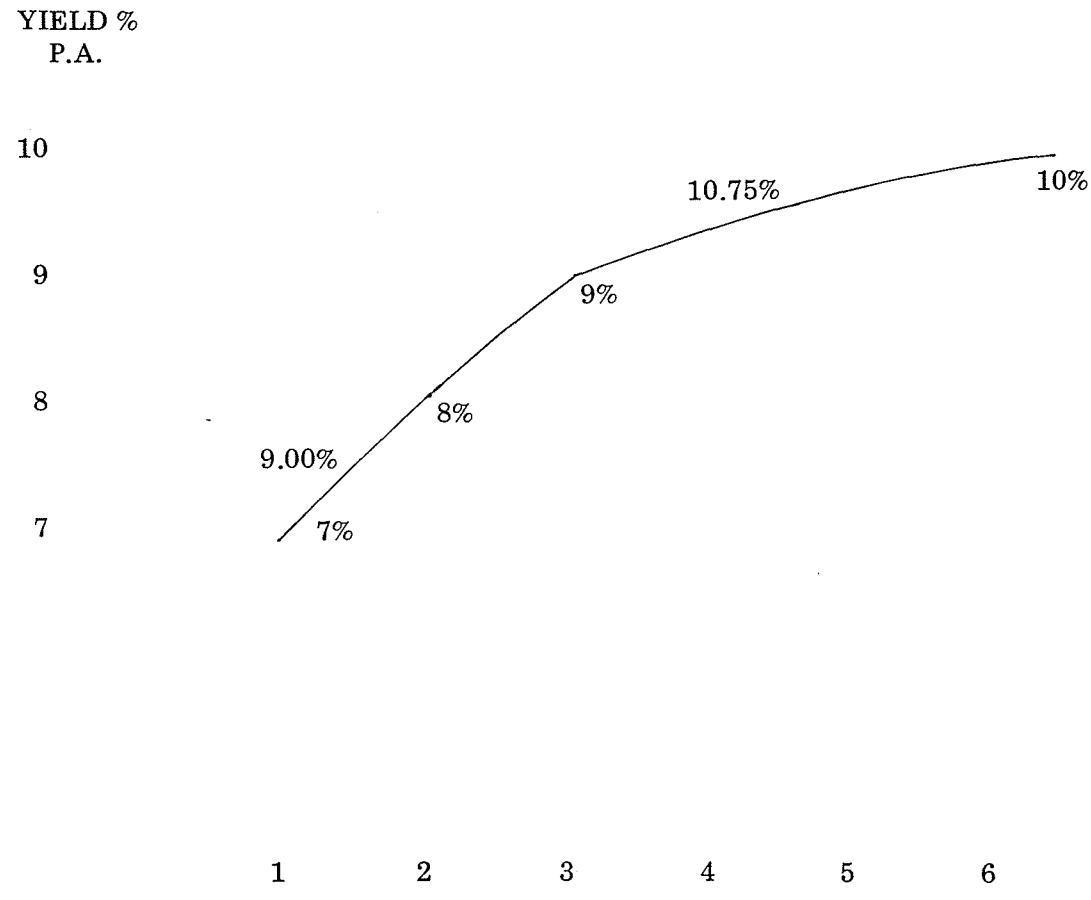

CHART 2 (a) CURRENT AND PROJECTED COMMONWEALTH YIELD CURVES

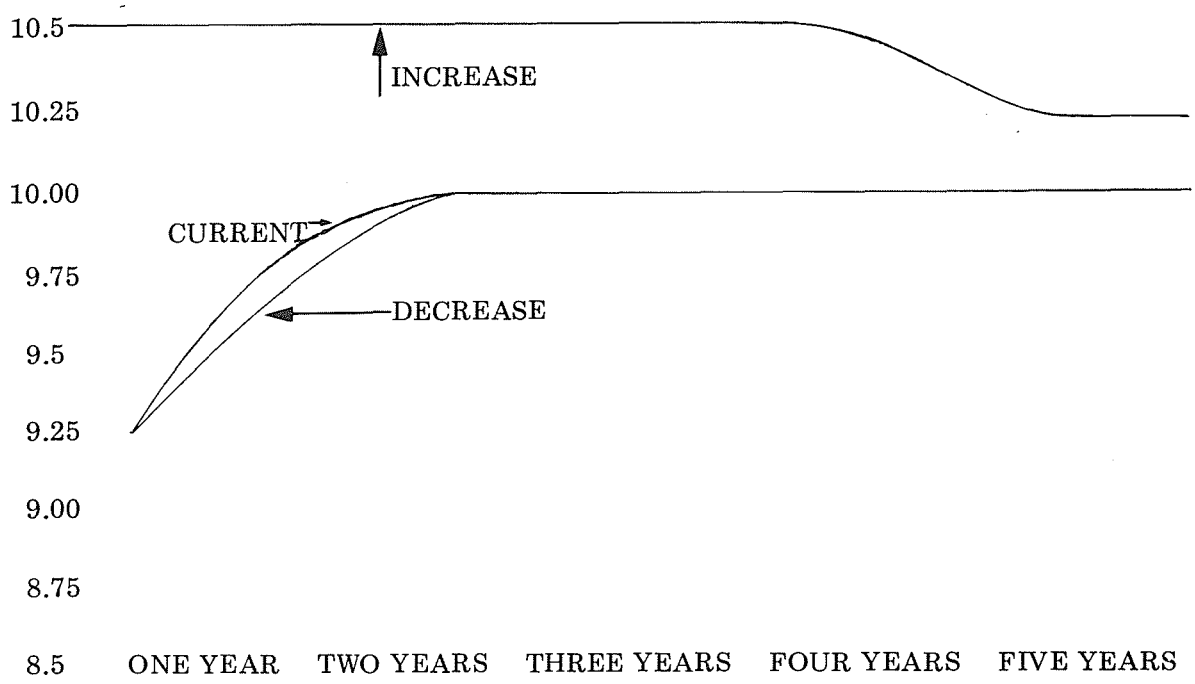

CHART 2 (b) RIDING THE CURRENT COMMONWEALTH YIELD CURVE

	15/6	15/9		15/12	
Series	Yield	Yield	Annualised Return	Yield	Annualised Return
9.0% 5/80	9.75	9.57	10.11	9.35	9.95
8.9% 9/80	9.87	9.77	10.09	9.65	10.13
9.5% 11/80	9.92	9.85	10.10	9.75	10.16
10.2% 11/81	10.0	9.99	10.04	9.97	10.05
10.0% 7/82	10.03	10.01	10.06	10.0	10.04

CHART 2 (c) SIX MONTH HOLD

Series	No Movement	Rate Increase	Rate Decrease
9.0% 5/80	9.95	9.05	10.31
8.9% 9/80	10.13	8.94	10.70
9.5% 11/80	10.16	8.54	10.79
10.2% 11/81	10.05	8.26	10.63
10.0% 7/82	10.04	7.90	10.37

CHART 3 AN 8% 20-YEAR BOND BOUGHT AT 100 TO YIELD 8%

INTEREST-ON-INTEREST

Re-Investment Rate	% of Total Return	Amount	Coupon Income	Discount	Total Return	Total Realized Compound Yield
0%	0%	$ 0	$1,600	0	$1,600	4.84%
5	41	1,096	1,600	0	2,696	6.64
6	47	1,416	1,600	0	3,016	7.07
7	53	1,782	1,600	0	3,382	7.53
8	58	2,201	1,600	0	3,801	8.00
9	63	2,681	1,600	0	4,281	8.50
10	67	3,232	1,600	0	4,832	9.01

CHART 4

EFFECT OF MATURITY ON THE IMPORTANCE OF INTEREST-ON-INTEREST

(Assuming Reinvestment at Yield Rate)

% of Total Represented by Interest-on-Interest

Maturity	8% Bonds Bought at 100 to Yield 8%	4% Bonds Bought at 100 to Yield 4%
1 year	2%	1%
5 years	17	9
10 years	33	18
20 years	58	34
30 years	75	47
40 years	86	59