



CFA Societies  
Canada

## INVESTMENT PRINCIPLES

INFORMATION SHEET FOR CFA PROFESSIONALS

## ISSUES AFFECTING BENEFITS

# THE IMPACT OF FEES



# 4A

## **IMPORTANT NOTICE**

The term "financial advisor" is used here in a general and generic way to refer to any duly authorized person who works in the field of financial services, including the following:

- Investment brokers
- Mutual fund brokers
- Scholarship plan dealers
- Exempt market dealers
- Portfolio managers
- Investment fund managers
- Life insurance agents
- Financial planners (F.Pl.)



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# THE IMPACT OF FEES

While successful investing requires good planning and efficient investment products, we must remain diligent about the level of overall fees paid by investors. The impact of fees on investors' financial well-being can be very significant.

There are at least three forms of fees: product management fees; other product fees (such as transaction and custody costs, which are less transparent to investors); and advisory fees. Sometimes, advisory and product management fees are blended together, such as in Canadian mutual funds.

## THE MATHEMATICS OF FEES

Let's consider a single scenario first. An investor saves \$1,000 a year for 30 years and realizes an annual rate of return of 6%. If we exclude any fees, the final cumulative value of the portfolio will be \$83,802 of which \$30,000 consists of capital contributions (30 x \$1,000) and \$53,802 of compounded income from performance. If total annual fees were 2.5% (some investors knowingly or unknowingly pay as much as 2.5% in total annual fees or even more), the total compounded income would have been only \$23,429. Thus \$30,373 (\$53,802 - \$23,429) or 56.5% of all income earned would have been paid as fees. Some fees are unavoidable but, considering the uncertainty of gross returns and the certainty of fees, investors must avoid paying more than necessary.

Let's now consider several scenarios. A portfolio generates an annual return of 3% or 6% over horizons of 10, 20, or 30 years. The investor invests \$1,000 a year. The total annual fees vary from 0.5% to 2.5%. The following two tables illustrate how much total wealth will be accumulated at the end of the investment period in the absence of fees, how much of this total wealth is attributed to compounded investment income and how much of this income is left after fees depending on the level of the fees (from 0.5% to 2.5%).

LOW RETURN ENVIRONMENT = 3% ANNUAL			EARNED INCOME AFTER FEES OF:				
Horizon	Total Wealth	Earned Income	0.5%	1.0%	1.5%	2.0%	2.5%
10 Years	\$11,808	\$1,808	\$1,483	\$1,169	\$863	\$567	\$279
20 Years	\$27,676	\$7,676	\$6,183	\$4,783	\$3,471	\$2,239	\$1,084
30 Years	\$49,003	\$19,003	\$15,000	\$11,379	\$8,102	\$5,133	\$2,441

HIGH RETURN ENVIRONMENT = 6% ANNUAL			EARNED INCOME AFTER FEES OF:				
Horizon	Total Wealth	Earned Income	0.5%	1.0%	1.5%	2.0%	2.5%
10 Years	\$13,972	\$3,972	\$3,583	\$3,207	\$2,841	\$2,486	\$2,142
20 Years	\$38,993	\$18,993	\$16,786	\$14,719	\$12,783	\$10,969	\$9,269
30 Years	\$83,802	\$53,802	\$46,419	\$39,761	\$33,752	\$28,328	\$23,429

A few obvious conclusions can be drawn from these two tables:

- In a low-return environment, fees can represent a very large proportion of all income earned. For example, assuming a 3% return environment, a 30-year horizon, and 2.5% annual fees, fees would amount to 87% of the gross income earned  $[(\$19,003 - \$2,441)/\$19,003]$ .
- Even if we assume a higher-return environment, such as 6%, fees would still account for more than half (57%) of the gross income earned. Fees reduce the ability of a portfolio to compound returns.

We must also be realistic. Investors cannot totally avoid paying fees, and most investors require advisory services, an issue we will discuss in 5a. But they should take care not to overpay. Let's consider a 30-year horizon and 6% return. We'll assume the investor pays 1% in total fees instead of 2%. Let's also assume that the gross return (6%) is not affected by the amount of fees paid. As indicated in document 3e, investing is a zero-sum game before fees, and the typical investor will realize a performance similar to that of the market before fees. Thus the most rational hypothetical scenario for the average investor is to assume that the performance gross of fees will be similar to that of the market, no matter what the level of annual fees is. Assuming a gross return of 6% in both fee

scenarios, the investor will have accumulated total capital of \$69,761 at the horizon end if the fees are 1.0% (\$30,000 from capital injections and \$39,761 from compounded income) instead of \$58,328 if the fees are 2.0%, a difference of 19.6%.

How significant is a 19.6% difference? The income investors can draw from their savings at retirement is pretty much proportional to the amount of assets they have accumulated. Therefore, we can conclude that if assets under a 1.0% total fee scenario are 19.6% higher than those under a 2.0% fee scenario, the annual income at retirement could be at least 19.6% higher. And that is significant. Furthermore, during retirement, higher fees will also drain portfolio income, which may amplify the drain on expected income during retirement.

### WHAT IS A REASONABLE LEVEL OF FEES?

The range of fees investors pay varies widely. For example, at the low end, fully automated digital (robot) advisors provide all-in fees of about 0.25% to 0.50% annually. But the investment planning services and guidance provided to investors by such systems are usually limited. At the high end of the fee spectrum, some investors knowingly or unknowingly pay all-in fees of 2.5% or more annually but do not necessarily get superior investment results before fees. Within this range,

there are several possibilities. There are digital, but advisor-assisted, wealth management platforms (mostly in the United States) that provide all-in fees below 1.0% and more complete financial advice and allow for direct investment in single stocks. There are also advisory firms that provide excellent investment planning to high-net-worth investors, sometimes for an all-in fee of less than 1.0%. The main concern is for investors who do not have millions of dollars in assets. Such investors are at risk of paying too much, and many of them still need appropriate guidance.

Studies consistently show that the average investor does poorly when investing on his own, far worse than a balanced portfolio of 60% equities and 40% fixed income rebalanced at fixed intervals. The decisions of average investors, including when to buy and sell, are often driven by emotions. As will be discussed later, an important role of advisors is to help investors manage their own emotions and fears, in order to set an appropriate investment plan and stick to it. There is significant financial value in the guidance and reassurance that can be provided by a good advisor. In fact, in document 5c, we attempt to quantify the value of advisory services by estimating the potential long-term cost to the average investor of investing without the benefit of appropriate advice and guidance.

Investors also deserve transparency concerning all the fees that they pay. Only then can they properly compare the costs and benefits of choosing specific investment vehicles and the value of dedicated financial planning. At a minimum, investors should be informed about:

- the cost of advisory services;
- the cost of asset management services and how they compare with alternatives;
- the total of all other costs affecting financial products (transaction, custody, ticketing, auditing, etc.) and
- any charges for entering or exiting financial products. Such charges should be considered with even more care.

Fees cannot be avoided entirely. According to the literature, there is little evidence that greater portfolio management fees lead to higher gross returns on investments. Furthermore, there are wide discrepancies in fees among financial products, and the cumulative impact of fees on the accumulation of wealth is significant. Therefore, investors should know how much they are paying in product fees and have the ability to compare such fees with alternatives. All else being equal, advisors should find the most cost-effective products for their clients. Investors must also better understand the value and purpose of advisory services (to be discussed in 5a).



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## ISSUES AFFECTING BENEFITS

# THE IMPACT OF TAXES



# 4B

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# THE IMPACT OF TAXES

Much like fees, taxes reduce investors' net returns and accumulated wealth. Different sources of returns, such as interest, domestic (and foreign) dividends, and capital gains, may be taxed differently, which affects the relative attractiveness of financial products. Furthermore, in some countries, income from specific investment vehicles is tax-exempt, such as municipal securities in the United States. The inclusion of financial assets in specific government-sponsored programs can also affect the overall tax burden. For example, several governments have put in place tax-exempt and tax-deferred programs to promote savings for such purposes as children's education and retirement. Taxation affects net returns and risk. Therefore, it affects product selection and asset allocation.

## GENERAL IMPACT OF TAXES

### AND FEES ON RETURNS

Let's consider a fixed-income investment yielding 3.0% before management fees and taxes. We initially ignore the possibility of capital gains or losses. Let's also consider two scenarios of asset management fees (0.30% and 1%) and two tax scenarios (non-taxable and taxable at 40%). The following table shows the average yearly returns after taxes and fees and the cumulative value of a \$1,000 yearly investment over 10, 20, and 30 years.



	TOTAL CAPITAL			
	FEES = 0.30%		FEES = 1.00%	
	Non-Taxable	Taxable	Non-Taxable	Taxable
<b>Net Return</b>	<b>2.70%</b>	<b>1.62%</b>	<b>2.00%</b>	<b>1.20%</b>
<b>10 Years</b>	<b>\$11,612</b>	<b>\$10,936</b>	<b>\$11,169</b>	<b>\$10,684</b>
<b>20 Years</b>	<b>\$26,769</b>	<b>\$23,778</b>	<b>\$24,783</b>	<b>\$22,722</b>
<b>30 Years</b>	<b>\$46,553</b>	<b>\$38,859</b>	<b>\$41,379</b>	<b>\$36,285</b>

Taxes further decrease the accumulation of capital. But taxes also reduce the net impact of fees, assuming all fees are tax-deductible. For example, although the difference between the 0.30% and 1.00% fee scenarios is 0.70% on a before-tax basis, it is only 0.42% on an after-tax basis ( $0.70\% \times (1-40\%)$ ).

Furthermore, this example shows the importance of managing both taxes and fees. The earned income of a lower-fee, tax-exempt scenario is much greater than that of a higher-fee, taxable scenario. For example, in the 30-year case, the earned income is \$16,553 ( $\$46,553 - (30 \times \$1,000)$ ) for the most favourable scenario, whereas it is only \$6,285 under the least favourable scenario.

## SOURCES OF INCOME AND IMPACT OF TAXES

Most countries tax sources of investment returns differently. We will use examples from the U.S. and Canadian tax codes to illustrate. Canadian and U.S. tax policies have some common elements but there are also differences. Obviously, the reality can be quite complex.

SOURCE OF INCOME	UNITED STATES	CANADA
<b>Interest</b>	Taxed at ordinary tax rate except municipal securities which are untaxed.	Taxed at ordinary tax rate.
<b>Eligible Domestic Dividends</b>	Lower tax rate than interest income.	Lower tax rate through a tax credit designed to manage the impact of double taxation (corporate and individuals).
<b>Foreign Dividends</b>	Taxed at ordinary tax rate.	Taxed at ordinary tax rate.
<b>Capital Gains</b>	Taxed at ordinary tax rate if realized within one year but at a lower tax rate beyond one year.	Taxed at 50% of ordinary tax rate. No restriction on timing unless trading is unusually high.
<b>Capital Losses</b>	Can be used against current and forward gains and limited current income.	Can be used against current gains, forward gains and gains realized three years back.

Withholding taxes are another important consideration. Many countries levy a tax on dividends paid to foreign investors. Under the Canada-U.S. Tax Treaty, the withholding tax rate applicable to dividends is 15% in both countries. In principle if the dividend yield is 2%, a 15% levy would account for a loss of about 0.30% of returns. But investors can often recover withholding taxes by claiming a tax credit to offset foreign taxes in a taxable account or such taxes may not apply in some circumstances if countries have a tax treaty covering these situations. But it can get very complicated, even confusing. The net amount of withholding taxes on foreign securities may differ according to the type of instrument (such as direct investment in securities, locally listed ETFs or mutual funds that own the securities directly, foreign-listed ETFs, locally listed ETFs that may invest in foreign-listed ETFs, foreign-listed ETFs that may invest in foreign securities, etc.), and the location of the assets (in taxable, tax-deferred, or tax-exempt accounts). As a rule, it is preferable to avoid buying local ETFs that invest in foreign-listed ETFs that hold international securities. In such cases, some withholding taxes may not be recoverable or avoided. But, surprisingly, it is very difficult to find comprehensive literature on this issue.

Finally, there is the issue of the deduction of fees for tax purposes (in taxable accounts). Again, it can get somewhat complicated. For our purpose, we will assume that fees reduce the taxable cash distribution of interest and dividend income in mutual funds and ETFs, and that there is sufficient income distribution to cover these expenses.<sup>1</sup>

Now let's consider the following scenario: the ordinary tax rate is 40% and the tax rates on eligible domestic dividends and capital gains are both 20%. Let's also assume that the yearly expected return on fixed income and on equities (domestic and international) are, respectively, 3.0% and 7.0% (2.0% from dividends and 5.0% from capital gains). What would the net return be in all possible contexts? For now, we assume that capital gains are realized and taxed on a yearly basis. This assumption will be relaxed later on. Fees on financial products vary widely but with the advent of ETFs, equity products do not necessarily have higher fees than fixed-income products. In fact, they are often lower. We also assume total fees of 1.00% in all cases.

	FIXED INCOME	DOMESTIC EQUITIES	FOREIGN EQUITIES
Interest/Dividend	3.00%	2.00%	2.00%
Capital Gain Assumption	-	5.00%	5.00%
Gross Return	3.00%	7.00%	7.00%
Fees	1.00%	1.00%	1.00%
Net Return	2.00%	6.00%	6.00%
Taxes Paid	0.80%	1.20%	1.40%
Net Return After Tax	1.20%	4.80%	4.60%
Taxes as % of Net Return	40%	20%	23%

Despite lower tax rates on domestic dividends and capital gains, the taxes expected to be paid on domestic equities are higher than those paid on interest income because of the higher expected return. Of course, different return assumptions and tax rates could lead to a different conclusion.

<sup>1</sup> In the United States, investment management fees paid outside a fund are deductible but only beyond a 2% threshold of adjusted gross income of the miscellaneous itemized deductions in schedule A. In Canada, there is no such threshold but the level of fees must be reasonable.

## TAXES AND ASSET LOCATION

Financial assets can be held in taxable accounts, tax-exempt accounts (Roth IRAs in the United States and TFSAs in Canada), or tax-deferred accounts (401-K in the United States and RRSPs in Canada). A tax-exempt account allows for the accumulation and eventual withdrawal of accumulated capital without any tax implications. A tax-deferred account implies that any tax contribution is deductible at the ordinary current tax rate and any withdrawal is taxed at the ordinary tax rate prevailing at that time. The return on investment accumulates free of taxes. Thus, in both tax-exempt and tax-deferred accounts, the return on investment accumulates tax-free. What differs is what happens when a capital

contribution is made and when capital is withdrawn. Let's again assume a stable 40% tax rate and a \$1,000 annual contribution for 30 years to a tax-exempt account allocated to a domestic equity portfolio as above.

In this case, the \$1,000 contribution every year will cost the investor only \$600 after tax because he will receive a tax refund of \$400. Let's assume the investor has a choice between allocating \$1,000 to the tax-deferred account or \$600 to the tax-exempt account, because the net cost to the individual is essentially the same. After 30 years, assuming a 6.0% net return and unchanged tax rates, the accumulated capital in both accounts will be as follows:

	TAX-DEFERRED	TAX-EXEMPT
Yearly Investment	\$1,000 before tax refund	\$600
Value in 30 Years at 6.0%	\$83,803	\$50,281
Value After Tax in 30 years	\$50,281	\$50,281

The capital accumulated before tax is substantially higher in a tax-deferred account than in a tax-exempt account. But assuming the tax rate in 30 years is the same as it is now, both accounts will have the same purchasing power because if you withdraw capital from your tax-deferred account, it will be taxed at 40%. Thus we can conclude that both are usually equivalent if you assume your tax rate at retirement will be similar.

Furthermore, both options are preferable to a taxable account. For example, assuming the net return after tax is 4.8%, we could show that it would require an annual investment of \$747.30 to achieve the same after-tax value after 30 years. That amount is \$147.30 more than what would be required from a tax-deferred or tax-exempt account. In other words, you achieve the same standard of living while investing 19.7% less each year! It is very worthwhile for an investor to maximize the use of tax-exempt or tax-deferred accounts before investing through a taxable account.<sup>2</sup>

## THE IMPLICATIONS

Investors should first maximize the use of tax-exempt or tax-deferred accounts. An investor who avoids taxes can reach the same final wealth with much less risk, or much greater wealth with the same level of risk.

Assuming investors hold a diversified portfolio of fixed income, domestic equities, and foreign equities, we should not be indifferent to the location of our financial assets. The traditional advice has often been to place fixed income in non-taxable accounts first (tax-deferred or tax-exempt) because of the higher tax rate on interest income. But the exact answer is related to:

- the relative level of income and capital gains expected on different asset classes and products;
- the specific tax rates that apply to each investor on different sources of income;

<sup>2</sup> The actual amount would be slightly less because capital gains would not fully be taxed on a yearly basis.

- the investment instruments used, the location of the instruments (taxable versus untaxed versus tax-deferred accounts), and how these factors affect the withholding taxes on foreign assets; and
- the expected annual turnover of the different portfolios (namely how fast capital gains will be taxed).

For example, contrary to conventional wisdom, in an environment of very low interest rates, an investor could be better-off putting local equities in a non-taxable account for two reasons:

- First, the amount of total taxes paid per dollar of assets may still be greater on equities because of higher expected returns even though the tax rates are lower on domestic dividends and capital gains than on interest income;
- Second, we should remember that the compounding effect of periodic returns is proportionally more powerful when the expected return (tax-adjusted) is higher. For example, on a portfolio allocated 50% to equities and 50% to fixed income, it is preferable to compound returns at 6% on equities and at 2% in fixed income than to compound returns at 5% on equities and 3% on fixed income. The argument to hold equities first in the non-taxable account may also apply to foreign equities even though we may be unable to obtain a tax credit for withholding taxes or benefit from an exemption. The main reason is that the tax rate on foreign dividends is higher than on domestic dividends if the securities are held in a taxable account. Thus, in a non-taxable account, investors may be subject to withholding taxes but will avoid the more significant tax rate on dividends.

To illustrate further the importance of asset location, let's assume our target asset allocation is 30% fixed income, 40% domestic equities, and 30% foreign equities. Asset returns,

fees and tax rates are as specified earlier in this document. Let's also assume that 30% of our yearly savings may be placed in a non-taxable account. The portfolio is rebalanced on a yearly basis to maintain the target allocation. Four options are considered:

- All assets are placed in a taxable account and all capital gains are realized on a yearly basis (implying a 100% portfolio turnover).<sup>3</sup> This is a worst-case scenario.
- Assets are invested evenly in the non-taxable and taxable accounts, and all capital gains in the taxable account are realized on a yearly basis.
- Fixed-income assets are invested first in the non-taxable account. Because fixed income compounds at a lower rate than equities, the weighting of the non-taxable account will tend to fall below 30%. Thus it will be necessary to invest in fixed income in the taxable account as well. Two scenarios of portfolio turnover within the equity portfolios are considered, 100% and 30% (in parentheses). A lower turnover allows the portfolio to postpone taxation related to capital gains and consequently to compound asset returns on a larger investment base. The tax implications of the turnover required to rebalance the portfolio are fully recognized annually. But new contributions facilitate the rebalancing and mitigate the tax implications.
- Domestic equities are invested first in the non-taxable account. Initially, it will be necessary to invest in domestic equities in the taxable account as well to complete the 40% target allocation. But because untaxed equities will compound at a faster rate than taxed fixed-income securities and taxed foreign equities, it is eventually possible that all domestic equities could be in the non-taxable account. The same scenarios of portfolio turnover are considered as above.

Assuming, as before, \$1,000 saved each year for 30 years, we obtain the following results:

	Taxable	Allocated Evenly	Fixed Income in Tax-Exempt Account First	Equity in Tax-Exempt Account First
<b>Final Value After Tax</b>	<b>\$54,943</b>	<b>\$58,645</b>	<b>\$56,904 (\$57,350)</b>	<b>\$59,384 (\$59,601)</b>
<b>Gains in Excess of Yearly Contributions</b>	<b>\$24,943</b>	<b>\$28,645</b>	<b>\$26,904 (\$27,350)</b>	<b>\$29,384 (\$29,601)</b>
<b>Average Nominal Return</b>	<b>3.66%</b>	<b>4.03%</b>	<b>3.86% (3.90%)</b>	<b>4.10% (4.12%)</b>

<sup>3</sup> We assume that capital gains, if in the United States, will retain the tax status of long-term capital gains (securities held for more than one year).

Using these particular parameters, fixed income should not be placed in the tax-exempt account first. Although the increase in final value may not appear impressive, we have to remember that \$30,000 of the final wealth is accounted for by the yearly savings. Thus, in the taxable scenario, the net investment gains are \$24,943 whereas they are \$29,601 under the most favourable option, a difference of nearly 20%.

Relaxing the turnover assumption does increase the final wealth but the impact is obviously more mitigated if domestic equities are placed in the non-taxable account. Furthermore, the impact of a low turnover is not necessarily as significant as often advertised. For example, the tax benefits on total wealth of portfolio turnovers ranging from 0% (capital gains fully taxable at the end of the 30 years – a theoretical scenario) to 100% (capital gains fully taxable annually) were evaluated. The analysis shows that the tax benefits of a turnover lowered from 100% to 40% are less than those resulting from reducing turnover from 40% to 20%, a level of turnover that few active or passive products are able to deliver.<sup>4</sup> Thus the benefits of a lower portfolio turnover are mitigated when the turnover is already above 30% or 40%.

In specific circumstances, locating some equities in the tax-exempt account may also simplify the process of rebalancing. Investors often hesitate to rebalance because of the cash-flow implications of generating taxable capital gains. If the amount of capital invested in tax-exempt and/or tax-deferred accounts is relatively significant in relation to the size of the taxable account, it may be possible to structure the portfolio in order to realize most of the rebalancing outside the taxable account. Furthermore, we have to consider that if we hesitate to rebalance for tax reasons, we may lose part of the rebalancing premium discussed in document 3f.

Taxes significantly complicate the investment process, and there are many issues we have not covered, such the impact of taxes on risk. For example, although taxes reduce investors' returns they also affect risk by lowering the volatility of net returns. While a capital gain will be reduced by taxes, a capital loss will also be reduced net of taxes if the capital loss can be used against a capital gain. Finally, it is always financially preferable to make maximum use of non-taxable accounts. But determining which financial assets should be placed in taxable versus non-taxable accounts requires customized planning efforts. In a low-rate environment, we cannot assume that the traditional advice of allocating fixed income to tax-exempt or tax-deferred accounts is necessarily the right one. But because there is very little consensus on this issue, we simply recommend that advisors remain wary of conclusions that are based on traditional beliefs and analyze this aspect in the context of each investor.

<sup>4</sup> These calculations ignore the possibility of tax-loss harvesting.



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# THE IMPACT OF INFLATION



# 4C

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- Financial planners (F.Pl.)



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# THE IMPACT OF INFLATION

Investors' returns are reduced by fees and taxes. In addition, inflation reduces their standard of living by depreciating the quantity of goods and services that they can purchase with a given amount of nominal investment income. For example, assuming a 2% annual rate of inflation, \$1,000 of income would purchase \$1,000 of goods and services today; but to acquire the same amount of goods and services one year from now \$1,020 would be required. In two years, it would be \$1,040.40. Therefore, the projection of our final wealth 10, 20, or 30 years from now is best represented by the value of goods and services that this wealth will allow us to purchase in the future.

## BASIC IMPLICATIONS OF INFLATION

Let's consider a single fixed-income investment of \$1,000 invested for four years at an annual rate of 3%. Fees are 1.00% annually and the tax rate of interest income is 40%. Let's also assume that inflation is running at an annual rate of 2%. The following table illustrates how the value of the investment increases after each year in a tax-exempt account and in a taxable account. It also illustrates the cost of purchasing a basket of goods and services, now worth \$1,000, as time passes.



	Value of Invested Capital (Non-Taxable)	Value of Invested Capital (Taxable)	Cost of a Basket of Goods and Services
Now	\$1,000.00	\$1,000.00	\$1,000.00
Year One	\$1,020.00	\$1,012.00	\$1,020.00
Year Two	\$1,040.40	\$1,024.14	\$1,040.40
Year Three	\$1,061.21	\$1,036.43	\$1,061.21
Year Four	\$1,082.43	\$1,048.87	\$1,082.43

In this example, in the absence of taxes, the investment grows at the same pace as the cost of living but, in the presence of taxes, it grows much more slowly. Simply to maintain the current purchasing power requires a return after fees and taxes equal to that of the inflation rate. Thus the investor's purchasing power goes down over time. In 3b, we explained that the fixed-income yield is compensation for inflation, real return, and liquidity and credit risk. This example illustrates that governments unfortunately tax investment returns indiscriminately, whether the return is compensation for inflation or for credit risk. This illustrates even more the importance of reasonable fees and efficient tax management.

Another implication is the importance of adjusting the level of savings periodically to match the inflation rate. Otherwise, the significance of the saving effort declines over time.

### A SIMPLE CASE STUDY INVOLVING FEES,

### INFLATION, TAXES, AND TAXABLE AND

### NON-TAXABLE ACCOUNTS

Let's assume a similar example as in document 4b. An investor invests \$1,000 annually over 30 years in real-dollar terms. This means that, if inflation is 2.0%, her annual yearly contribution will increase by 2% a year to match the inflation rate. Thus the total nominal amount of all contributions is \$40,568 whereas it is simply \$30,000 in terms of current purchasing power (30 x \$1,000). The investor's portfolio is allocated 40% to domestic equities, 30% to foreign equities, and 30% to fixed income. It is rebalanced annually. The investor is also allowed to place a maximum of 30% of her annual savings in the non-taxable account. The asset returns, fees, and tax rates are identical to those specified in document 4b.

The following table illustrates the final wealth under the four scenarios of asset location: fully allocating to a taxable

account; allocating all three asset classes evenly within both the taxable and non-taxable accounts; allocating fixed-income first to the non-taxable account; and allocating domestic equities first to the non-taxable account. In the first two scenarios, we assume that all capital gains are fully realized yearly whereas, in the last two, we consider two levels of portfolio turnover, 100% and 30%.

The final wealth is expressed in nominal and real terms. For example, under the taxable scenario, final nominal wealth of \$70,474 would be accumulated. But this wealth is the equivalent of \$38,907 in terms of current purchasing power (at current prices of goods and services). In essence, the investment effort has increased the purchasing power of the yearly financial contributions from \$30,000 in real terms to \$38,907, an increase of \$8,907. But appropriate use of the non-taxable account can lead to an increase of as much as \$11,926.

	Taxable	Allocated Evenly	Fixed Income in Tax Exempt Account First	Equity in Tax Exempt Account First
<b>Final value after tax</b>	<b>\$70,474</b>	<b>\$74,824</b>	<b>\$72,806</b> <b>(\$73,324)</b>	<b>\$75,681</b> <b>(\$75,944)</b>
<b>Purchasing Power</b>	<b>\$38,907</b>	<b>\$41,308</b>	<b>\$40,194</b> <b>(\$40,480)</b>	<b>\$41,781</b> <b>(\$41,926)</b>
<b>Average Nominal Return</b>	<b>3.66%</b>	<b>4.03%</b>	<b>3.86% (3.90%)</b>	<b>4.10% (4.12%)</b>

This example unsurprisingly confirms the necessity of making maximum use of the non-taxable account. But it also illustrates the challenge of accumulating sufficient wealth for a comfortable retirement when we consider the impact of inflation. All portfolios have performances ranging from 1.66% (3.66% - 2.00%) to 2.03% (4.03% - 2.00%) above the inflation rate and this difference is what allows our standard of living to improve. But, in the presence of fees and taxes, it is unlikely that the investor can generate a net return greater than the inflation rate in the long run unless her portfolio is exposed to credit and/or equity risk.

Inflation substantially reduces the purchasing power of our savings, and governments are implicitly taxing the portion of portfolio return that is compensation for inflation. Generating a performance after fees and taxes that will reasonably outperform inflation requires careful long-term planning. Thus it is even more important to make efficient use of government programs that allow for the accumulation of tax-free returns.