**INVESTMENT PRINCIPLES**
INFORMATION SHEET FOR INVESTORS

INTRODUCTION

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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
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While retirement planning is a daunting task, even for experts, it is of utmost importance. No one wants to be in financial distress during retirement after a lifetime of work. A proper retirement plan can extend for several decades before and after retirement. Furthermore, the process is fraught with uncertainties and difficulties. For example, even if we set specific income goals for retirement, it is difficult to estimate how our savings capabilities will evolve over time and what level of investment returns financial markets will deliver. In addition, there are complexities related to the long-term impact of taxation of investment income, investment fees, inflation, choice of asset allocation, family obligations and so on. Overall, determining how much to save and how to invest is a challenge.

Although there are many factors to consider when designing a proper retirement plan, a small number of key considerations significantly increase the odds of success and account for much of what we need to know as investors. The following documents cover essential investment dimensions that all investors should know about. In the end, making informed decisions and using common sense can increase by a third or more the retirement income that can be expected when the savings horizon is as long as 30 years.

This series of documents is divided into two parts. The first six documents (1 to 6) deal with the mechanical aspects of investing and the role of investment advisors. These six documents cover investment principles that remain true for all investors, whatever their nationality or income bracket. The second series of documents (7 to 12) deals with the art of investing, more specifically how to cope with the many nuances and uncertainties related to retirement planning. On the following page is a list of all twelve topics:

1. THE POWER OF TIME AND RETURNS

2. THE IMPACT OF FEES

3. THE IMPACT OF TAXES

4. THE IMPACT OF INFLATION

5. THE IMPACT OF DIVERSIFICATION AND RISK

6. THE ROLE OF AN ADVISOR

7. THE INVESTOR'S TOLERANCE FOR RISK

8. WHAT DRIVES MARKET RETURNS

9. HOW TO DIVERSIFY

10. BUILDING PORTFOLIOS

11. THE INCOME I CAN EXPECT FROM MY SAVINGS

12. PUTTING IT ALL TOGETHER

To keep matters as simple as possible, we will build on the same initial example, which will become more complex as we progress. By the end of this effort, you may not have become an expert, but you will be able to recognize what is truly relevant to your retirement planning, be in a better position to have a pertinent discussion with your advisor, and hopefully avoid some of the costly mistakes made by so many investors.

We sincerely hope this education effort will improve the quality of asset management for the average investor.

Jacques Lussier, CFA

INVESTMENT PRINCIPLES
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THE POWER OF TIME AND RETURNS
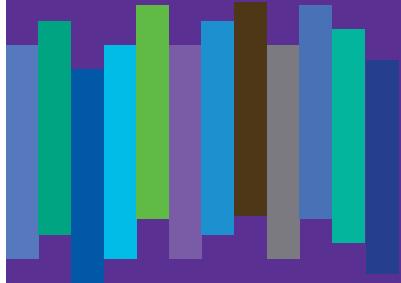
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THE POWER OF TIME AND RETURNS

Saving and investing is about the accumulation of wealth in order to achieve an appropriate standard of living during retirement. This document illustrates the importance of starting to save early and the impact of higher returns. It also illustrates the significant cost of waiting to start saving and of being, perhaps, too conservative, or afraid, as a long-term investor.

A SIMPLE EXAMPLE OF THE IMPACT OF TIME AND INVESTMENT RETURN

Let's consider a single investment of $1,000 at an annual yearly return of either 3% or 6%. What if these returns could be maintained year after year?

	YEARLY RETURN = 3%		YEARLY RETURN = 6%	
Time	Total Wealth	Investment Income	Total Wealth	Investment Income
Now	$1,000		$1,000	
Year # 1	$1,030	$30	$1,060	$60
Year # 2	$1,060.90	$30.90	$1,123.60	$63.30
Year # 3	$1,092.73	$31.83	$1,191.02	$67.42
......				
Year # 30	$2,427.26	$70.70	$5,743.49	$325.10

The investment income grows each year because, with the passage of time, we not only earn income on the initial capital investment of $1,000 but also on the investment income accumulated year after year. For example, under a 3% return scenario, investment income after one year is $30 (or $1,000 x 3%) and total wealth increases to $1,030 (or $1,000 + $30). However, after two years, investment income is $30.90 (or $1,030 x 3%) and total wealth increases to $1,060.90 (or $1,030 + $30.90).

After three years, the total investment income accumulated under a 3% return scenario is $92.73 (or $1,092.73 minus the initial capital investment of $1,000), while it is $191.02 under a 6% scenario. Twice as much return implies more than twice as much investment income. This is what is known as the power of return compounding.

What if the horizon is as long as 30 years? The total cumulated investment income grows to $1,427.26 under a 3% return scenario (or $2,427.26 minus the initial capital investment of $1,000) and to $4,743.49 under a 6% return scenario.

A longer horizon and a higher return amplify the impact of return compounding.

A MORE REALISTIC EXAMPLE OF THE IMPACT OF TIME AND INVESTMENT RETURN

Of course, when preparing for retirement, we do not make just one contribution to our saving effort. We save month after month, year after year. The following chart illustrates what happens to our total wealth after 10 or 30 years when we save $1,000 each year, assuming either a 3% or 6% annual return. For example, in the case of the 30-year horizon and 3% return, the first $1,000 saved is invested at 3% for 30 years, the second $1,000 is invested for 29 years, the third $1,000 for 28 years and so on.

TOTAL WEALTH AS A FUNCTION OF TIME AND RETURN
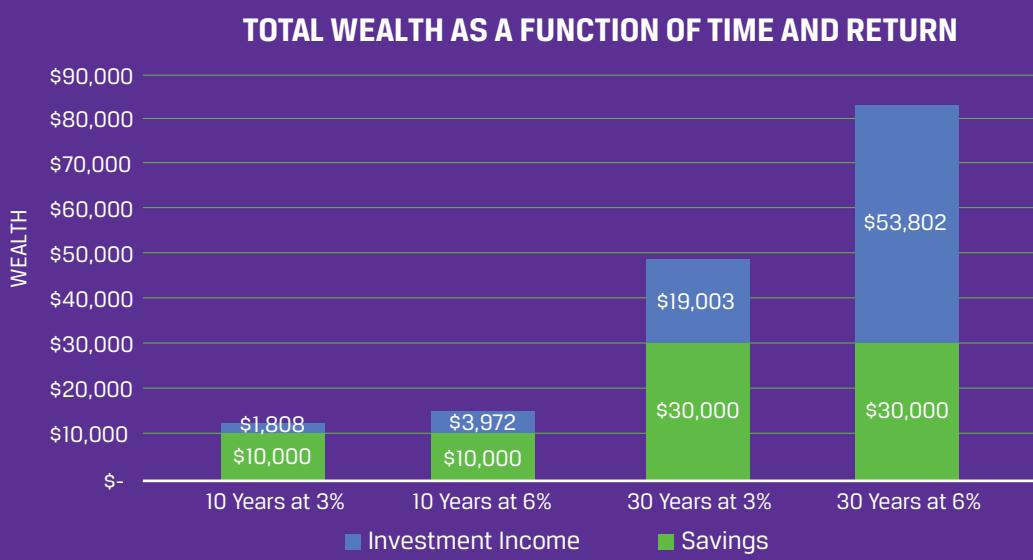
Time and return are two primary determinants of final wealth. Assuming a 30-year horizon, final wealth will be $49,002 under a 3% return scenario ($30,000 from saving $1,000 a year for 30 years and $19,002 from the investment income) and $83,801 under a 6% return scenario ($30,000 from savings and $53,801 from investment income).[1]

Overall, total wealth after 30 years is 71% greater when yearly returns are 6% instead of 3%, which implies that the standard of living at retirement attributed to the accumulated wealth would likely be at least 71% greater! Of course, hoping to make a 6% annual return instead of 3% implies having a riskier portfolio. We will get back to this in Document #10.

THE IMPACT OF WAITING AND TAKING TOO LITTLE RISK

Let's assume your goal is to save $83,802 by the time you retire (as in the example above), but instead of saving $1,000 a year for 30 years at 6% return, you save for 20 years using an investment portfolio that offers a return of only 3%. How much would you need to save annually to achieve the same final wealth? The answer is $3,028, or more than three times as much.

In other words, in the first case, you save $30,000 (30 times $1,000) and generate $53,802 in investment income. In the second case, you save $60,558 (20 times $3,028) and your investment income is only $23,244. Waiting to save and being overly conservative can be costly. The following chart illustrates the two cases.

TWO SCENARIOS OF IDENTICAL FINAL WEALTH
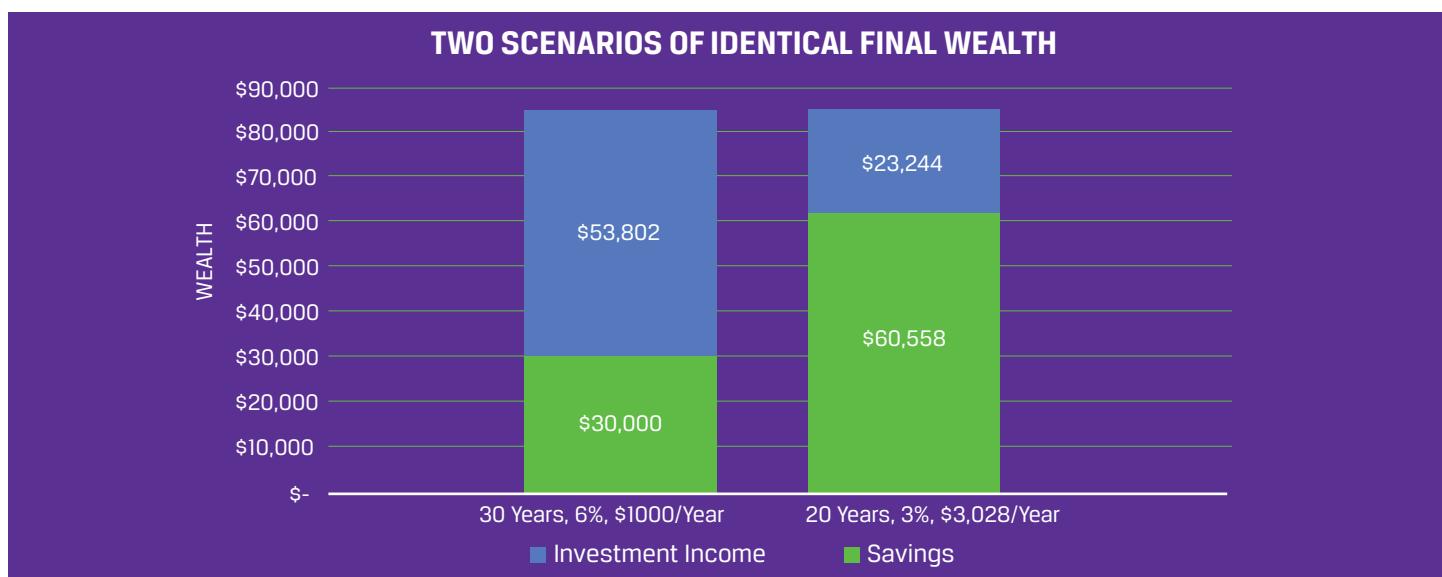
[1] Assuming savings of more than $1,000 a year, the final wealth would simply be proportionally greater. Twice as much in yearly saving contributions implies twice as much final wealth.

SUMMARY AND CONCLUSION

Time, returns and savings discipline are the primary determinants of final wealth. Being patient and dedicated while using a portfolio that can deliver a reasonable average return in the long run, without being overly risky, is paramount to improve your standard of living in retirement. Starting a savings plan late and being too conservative as an investor can be extremely costly. In fact, it may make it financially impossible to achieve the retirement goals that would have been possible if retirement planning had started earlier and if a less conservative portfolio had been adopted.

All other dimensions that will be discussed in the next three documents (fees, taxes, and inflation) are actually hurting final wealth and consequently our standard of living. Hence, it is important to understand the impact of each aspect and to "optimize" them appropriately to reduce their impact as much as possible.

In order to keep matters simple, we will continue with the same example of $1,000 annual savings over a period of 30 years to illustrate the impact of fees, taxes, inflation and risk.

THE IMPACT
OF FEES

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THE IMPACT OF FEES

There are two types of fees: investment-related fees (such as those directly related to product management and transaction costs) and advisory fees (such as those related to the support a financial expert can provide). Total fees can be significant, and investors would be wise to ensure they are paying reasonable all-in fees. Investors must assume greater risks in order to hope for greater investment returns, but fees will reduce returns whether the investment strategy is successful or not. While higher returns have a positive compounding impact on final wealth (as illustrated in Document #1), fees have the opposite effect.

WHAT IS A REASONABLE LEVEL OF FEES?

There is no evidence that paying higher investment-related fees leads to higher investment returns before fees. Most studies conclude that the average mutual fund generates a performance before fees equal to that of a standard index product.[1] Furthermore, evidence also shows that fewer than three managers out of 10 outperform the market after fees over horizons of five to 10 years. Identifying a manager that has outperformed in the past is easy, but identifying one that will outperform in the future is a challenge.

The role and benefits of investment advisors will be discussed in Document #6. However, part of their role is to help investors identify cost-efficient investment opportunities. Investment products have become more commoditized in recent years and generally less deserving of higher management fees than previously. Why pay 2% for an investment product that has the same return expectations before fees as another product offered at 0.30%?

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[1] This should not surprise us, since investing is a zero sum game before fees. In other words, since all securities in the market are owned by all investors, for each investor who outperforms the market by $1 before fees, there has to be an investor or several investors who together underperform the market by $1 before fees. It's an accounting reality.

In the US, the average active bond and equity mutual funds charge management fees of respectively 0.65% and 0.89%, while index funds cost as low as 0.11% and 0.12%. Most exchange-traded funds (ETFs) have fees ranging from 0.10% to 0.50%.[2] Mutual funds in Canada have a costlier structure than in the US because, among other reasons, they usually integrate advisory fees. If you do not believe in the ability of active managers to outperform the market in the long term and/or if you do not have expertise and/or the advisory support to identify "performing" strategies or managers, cheaper index funds or ETFs may be more appropriate.

Fees required by advisors vary greatly and are usually charged in excess of investment-related fees in the US (although they are often included in Canada). Some advisors charge a fee based on a percentage of assets under management (usually using a declining scale as assets grow), while others may charge a flat fee or even an hourly rate. However, advisory fees can be as low as 0.5% of assets for large portfolios,

while they can be greater than 1.0% for small portfolios of less than $100,000. Hence, some investors may knowingly or unknowingly pay more than 2% in all-in fees.

Smaller investors can purchase blended portfolio solutions that are well diversified for much less than 1% (such as balanced ETFs, balanced indexed funds and target date funds[3] that incorporate both fixed income and equity), while larger investors in need of more dedicated portfolio solutions can find knowledgeable advisors willing to manage their portfolios for an all-in fee of about 1%. As a rule, investors should resist paying 2% all-in fees for standard portfolio solutions and advice.

The following chart illustrates the impact of all-in fees of 1% and 2% on an investor who is saving $1,000 a year for 30 years, assuming the return before fees is 6%. The base case (no fee) is the same as in Document #1.

TOTAL WEALTH AS A FUNCTION OF FEES
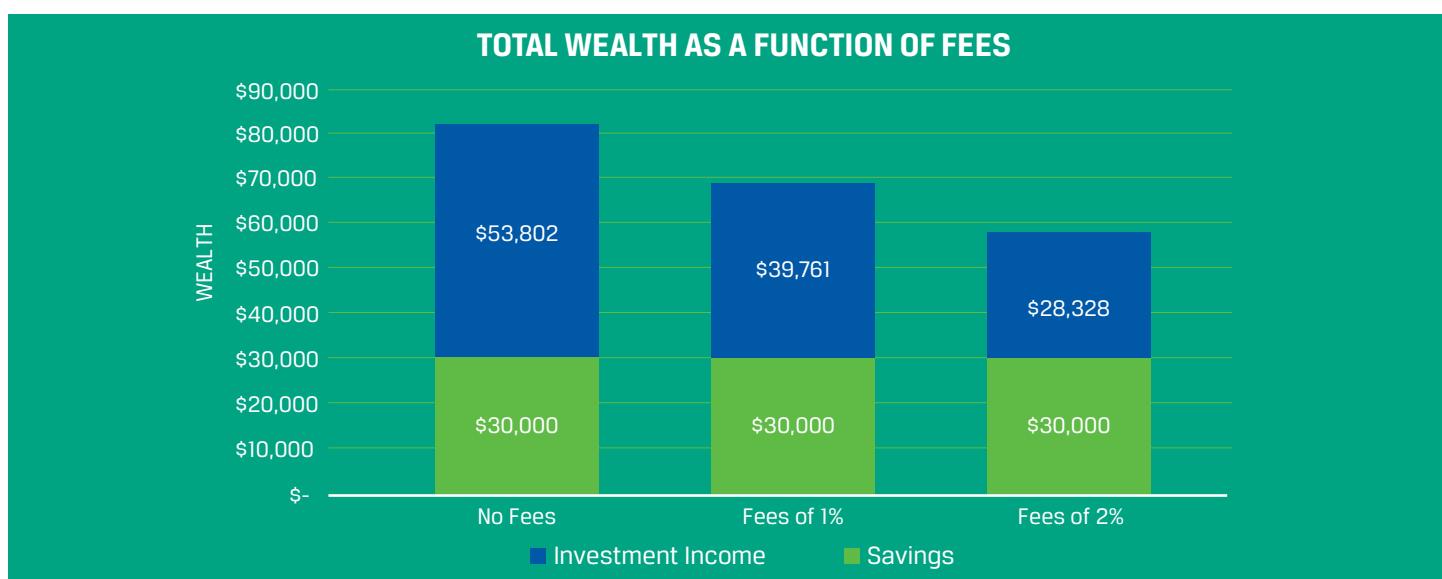
A 1% fee scenario amputates total wealth by 16.8% (from $83,802 to $69,761), while a 2% fee scenario reduces final wealth by 30.4% (to $58,328). Fees matter to your standard of living in retirement.

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[2] Advisory HQ, Financial Advisor Fees – Wealth Managers, Planners, and Fee-Only Advisors
October 11, 2015. http://www.advisoryhq.com/articles/financial-advisor-fees-wealth-managers-planners-and-fee-only-advisors/

[3] A target date fund (TDF) is designed to balance portfolio risk with the expected timing to retirement. For example, assuming we were currently in 2015, a 40-year-old investor planning to retire in 25 years may buy a 2040 TDF. The allocation to equity within the product would be gradually reduced until retirement and in some cases, the allocation would also be adjusted post-retirement. Such products may be appropriate for investors who lack the discipline, expertise, and advisory support to manage on a more discretionary basis. Furthermore, some of these funds are offered inexpensively (however some are expensive), and research has shown that investors who use TDFs or professionally-managed accounts do much better than average investors left to their own devices and who lack a disciplined strategy.

SUMMARY AND CONCLUSION

Investors cannot avoid paying investment-related fees, but such fees can often be reduced without impacting the portfolio's expected return before fees. There is little evidence that higher investment fees lead to higher gross returns on average. A knowledgeable advisor can help achieve a lower cost portfolio solution.

Furthermore, most investors require the support of an advisor. As will be discussed in Document #6, a knowledgeable advisor provides needed expertise in retirement planning and portfolio construction and even helps manage the anxieties that come with investing. As with all professional services, investors must ask for transparency of all fees that are paid and avoid paying more than necessary. From now on, we will be working under the assumption of a 1% all-in fee scenario.

INVESTMENT PRINCIPLES
INFORMATION SHEET FOR INVESTORS

THE IMPACT
OF TAXES
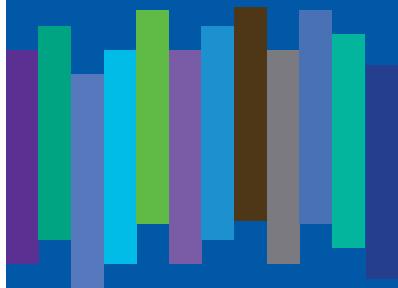
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THE IMPACT OF TAXES

There are two important issues related to taxation. Firstly, several governments have allowed tax-exempt and tax-deferred accounts designed to promote and facilitate wealth accumulation for the purposes of retirement. Secondly, when investment income is taxed, the tax rates may differ according to the sources of investment income. Even foreign governments may tax part of your investment income. Investors must first maximize the use of tax-exempt and tax-deffered accounts and also ask their advisor to explain how to maximize the after-tax efficiency of their portfolio. Taxation significantly complicates the retirement planning process.

This document explains the difference between tax-deffered and tax-exempt accounts, the investment value of such accounts compared to a taxable account, and the importance of properly managing taxes within taxable accounts.

TAX-EXEMPT AND TAX-DEFFERED ACCOUNTS

Roth IRA (in the US) and TFSA (in Canada) are examples of tax-exempt accounts, while 401-K (in the US) and RRSP (in Canada) are examples of tax-deffered accounts. Under specific conditions, both types of accounts can be similarly efficient. In both accounts, investment income accumulates tax-free. For example, assuming a 6% annual return and 1% all-in fees, net return after fees will be 5% in both accounts.

However, each account differs in terms of what happens when a new contribution is made and when cash is withdrawn. In a tax-deffered account, a new contribution is tax deductible, while any withdrawal is taxable.

For example, let's assume an investor makes a $1,000 contribution to a tax-exempt account while making a $1,667 contribution to a tax-deffered account. The marginal tax rate of the investor is currently 40%, and the tax rate is assumed to remain constant. The following table illustrates the final wealth after tax for both accounts, assuming a 5% net (after fees) annual return.

	Tax-Exempt	Tax-Deferred
Initial Contribution	$1,000	$1,667
Tax Refund		$667 (40% of $1,667)
Net Contribution After-Tax	**$1,000**	**$1,000**
Final Value Before Tax	$4,322	$7,203
Final Value After-Tax	**$4,322**	**$4,322 (60% of $7,203)**

In both cases, the net initial saving effort is $1,000, since the investor will benefit from a tax refund for the tax-deferred contribution. Although the amount invested in the tax-deferred account is larger, once withdrawn, its value after-tax 30 years from now will be identical to that of the tax-exempt account. The tax-deferred account is preferable to a tax-exempt account only if we assume the investor's tax rate 30 years from now would be less than today. Since forecasting tax rates 30 years from now is impossible, we will assume both accounts are financially equivalent.

TAX-EXEMPT AND TAXABLE ACCOUNTS

Let's return to our 30-year scenario of investing $1,000 a year at a gross return of 6% while fees are 1%. We will also assume that all fees related to a taxable account are tax-deductible. However, this may not necessarily be the case in all circumstances. As an investor, you should ask your advisor about the deductibility of fees. Let's also assume investment income in the taxable portfolio is taxed at an average rate of 40%. The following figures compare the final wealth assuming no fees and no taxes (our base case), assuming fees and no taxes, and finally assuming fees and taxes.

THE IMPACT OF TAXES

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TOTAL WEALTH AS A FUNCTION OF FEES AND TAXES
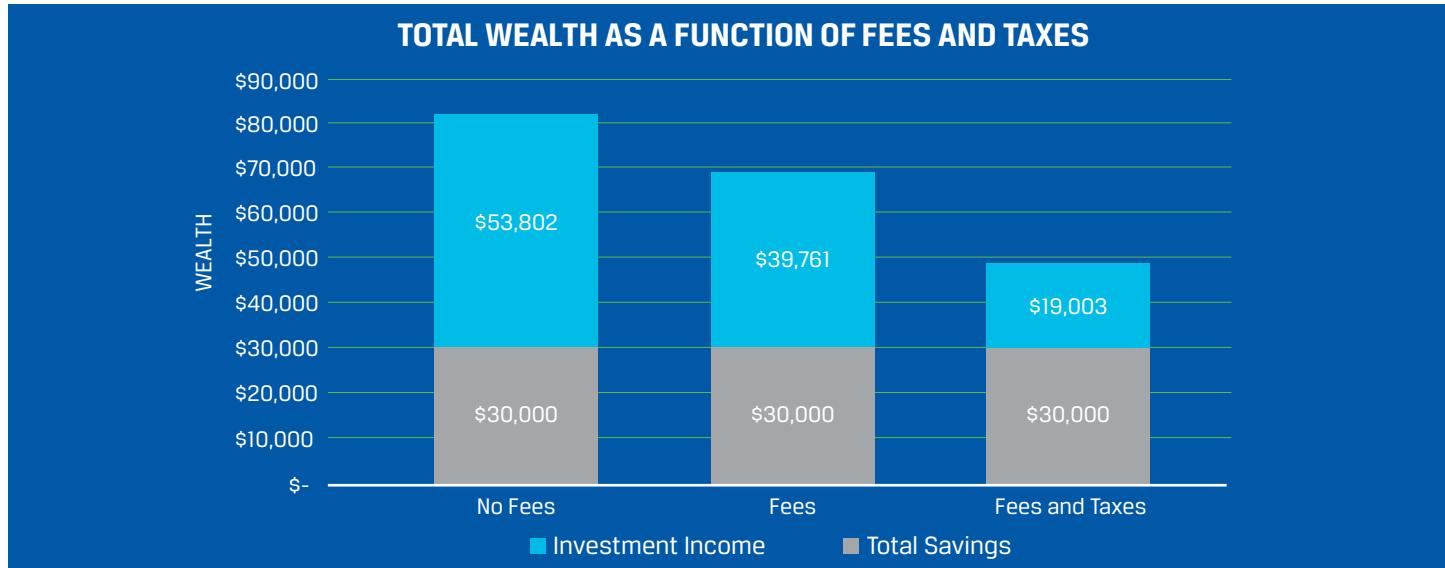
Using a tax-exempt or a tax-deffered account leads to a final wealth (after tax and fees) of $69,761 versus $49,003 in a taxable account or 42.4% more. Therefore, investors should make full use of the capacity available in tax-deffered and tax-exempt accounts before investing in a taxable account.

THE TAXATION OF DIFFERENT SOURCES OF INCOME

Explaining the many subtleties of tax systems is beyond the purpose of this document. However, there are principles that tend to apply to investors in most countries:

- Interest income is taxed at the applicable income tax rate;

- Dividend income from domestic corporations is taxed at a rate lower than the applicable income tax rate;

- Dividend income from foreign corporations is taxed at the applicable income tax rate;

- Dividend income from foreign corporations may also be subject to withholding taxes levied by foreign governments that may or may not be recoverable;

- Capital gains (selling an asset at a higher price than purchased) are taxed at a rate lower than the applicable income tax rate unless, perhaps, securities are traded frequently (within a year in the US), in which case, they would be taxed at the applicable income tax rate. Capital gain taxes are usually levied when realized (when the security is sold).

For the purposes of illustration, let's assume the following scenario. Interest income is 3%, while equity return on both domestic and foreign markets is 7.0%: 2.0% from dividends and 5.0% from capital gains. The income tax rate is 40% and the tax rate applicable to domestic dividends and capital gains is 20%. We will ignore withholding taxes, but this is an aspect that should be investigated by investors and their advisors. They will vary according to the country and investing instrument. It can get very complicated.

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|	Fixed Income	Domestic Equity	Foreign Equity
Interest/Dividend	3.0%	2.0%	2.0%
Capital Gain Assumption	-	5.0%	5.0%
Gross Return	**3.0%**	**7.0%**	**7.0%**
Fees	1.0%	1.0%	1.0%
Net Return	**2.0%**	**6.0%**	**6.0%**
Taxes Paid	0.8%	1.2%	1.4%
Net Return After Tax	**1.2%**	**4.8%**	**4.6%**
Taxes as % of Net Return	**40%**	**20%**	**23%**

The average tax rate on interest income (40%) is usually far greater than on domestic and foreign equity (20% and 23%). Even ignoring the impact of withholding taxes, the average tax rate on foreign equity is greater because of the higher tax rate on foreign dividends. Furthermore, capital gains are usually not fully taxed on a yearly basis, since only a portion of capital gains are usually realized each year. This further reduces the effective tax rate on equity below the level indicated in the table. It also allows the portfolio to generate greater returns, since the cash amount related to unrealized capital gains that have yet to be taxed can remain invested.

SUMMARY AND CONCLUSION

Investors must maximize the use of tax-exempt and tax-deferred accounts. However, once taxable accounts are necessary (for wealthier investors), investment decision become significantly more complex. Asset classes (such as bonds and domestic and foreign equity) must be properly allocated between tax-exempt, tax-deferred and taxable accounts to maximize the long-term after-tax returns of the entire portfolio. Steps must sometimes be taken to manage the realization of capital gains. These are situations where a knowledgeable advisor and reputable financial software are useful. In the next document, we will maintain the assumption of a 40% average tax rate.

THE IMPACT
OF INFLATION

4

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THE IMPACT OF INFLATION

Inflation depreciates the value of wealth and acts as a form of tax on income and wealth. Although there are many discussions among experts concerning the inflation protection provided by specific asset classes, most studies show that it is hard to protect ourselves against the impact of increased inflation. For example, it is far from certain that real estate and gold are effective long-term inflation hedges, despite the rhetoric. At the very least, we can estimate the potential impact of inflation on our standard of living.

INFLATION AND THE REAL VALUE OF WEALTH

Assuming a 2% annual inflation rate, a basket of goods and services currently selling for $1,000 would sell for $1,020 one year later. In 30 years, this basket would cost $1,811. Consequently, $1,000 30 years from now would only have a fraction of its current purchasing power. In fact, it would total about $552.

However, in the presence of inflation we could assume that average investors may be able to increase their annual savings contribution at the rate of inflation (assuming their net income/salary is tracking inflation). For example, if we consider a 30-year scenario starting with an initial saved amount of $1,000, the amount of savings could be increased to $1,020 in year one, $1,040.40 in year two and so on. Hence, over 30 years, the total amount of savings would not be $30,000 but rather $40,568.

We will now introduce the concept of nominal return and real return. The nominal return is simply the gross return paid to you before any consideration for fees or taxes, such as a certificate of deposit that pays you 4% in interest. The real return is simply the nominal return net of the inflation rate. What matters to you is the real return and not the nominal return. For example, if we ignore the effect of taxes, generating a nominal annual return of 4% in the absence of any inflation will maintain the same purchasing power for your savings as generating a nominal return of 6% in the presence of a 2% inflation rate. In both examples, the real return is 4%. In order to increase the purchasing power of our savings, the real return net of fees and taxes must be positive. In other words, the nominal returns net of fees and taxes must be greater than the inflation rate.

Assuming again a 6% nominal yearly return on investment, the following table describes the final wealth using four scenarios:

- **SCENARIO 1 (BASE CASE):** No inflation, fixed annual contribution of $1,000, no fees and no taxes. This is an unrealistic scenario, but it serves to illustrate the impact of inflation on final wealth;

- **SCENARIO 2:** Annual inflation of 2%, inflation adjusted contributions starting with $1,000, no fees and no taxes;

- **SCENARIO 3:** Annual inflation of 2%, inflation adjusted contributions starting with $1,000, fees of 1% and no taxes;

- **SCENARIO 4:** Annual inflation of 2%, inflation adjusted contributions starting with $1,000, fees of 1% and 40% tax on investment income.

	Base Case	Scenario 2	Scenario 3	Scenario 4
Nominal Return (after fees and taxes)	**6.0%**	6.0%	5.0%	3.0%
Real Return (after inflation)	**6.0%**	4.0%	3.0%	1.0%
Total Savings	**$30,000**	$40,568	$40,568	$40,568
Total Investment Income	**$53,802**	$63,633	$47,302	$22,870
Total Nominal Wealth	**$83,802**	$104,201	$87,870	$63,438
Total Real Wealth	**$83,802**	$57,527	$48,511	$35,022

The final wealth is specified in nominal dollars but also in terms of the purchasing power that these nominal dollars will have 30 years from now (in terms of today's purchasing power). For example, let's consider the last scenario, where the nominal return net of fees and taxes is 3.0%. The total savings over 30 years is $40,568, and the investment income on those savings is $22,870 for a total cumulated nominal wealth of $63,438. However, this final wealth has the same purchasing power as $35,022 now.

Furthermore, what if the nominal return after fees and taxes of the investment portfolio was exactly 2% (a real return of 0% in the presence of 2% inflation)? What would the total real wealth be then? When the nominal return net of fees and taxes is equal to the inflation rate, the total real wealth is equal to the total amount of real savings. In this case, it would be $30,000 (or 30 times $1,000). The nominal return on investment would have been just enough to maintain the purchasing power of the savings.

SUMMARY AND CONCLUSION

Inflation acts as a tax on wealth and income. At the very minimum, we need to increase our annual savings by the rate of inflation to mitigate its effects. We also need to generate a return after fees and taxes at least equal to the inflation rate simply to keep inflation from reducing the purchasing power of our wealth. This further reinforces the necessity to make maximum use of tax-exempt and tax-deffered accounts to increase the likelihood of generating a portfolio return that will exceed inflation after fees and taxes.

THE IMPACT OF DIVERSIFICATION AND RISK

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THE IMPACT OF DIVERSIFICATION AND RISK

Until now, we have assumed that returns are stable at 3% or 6% yearly. Of course, investment returns are not stable. Not only is there no guarantee that a portfolio will deliver a return of 3% or 6% on average, realized returns may vary greatly from year to year. Risk is about the likelihood that our return expectations are not met.

This document deals solely with the impact of risk on total wealth. It illustrates that risk amputates total wealth and that a properly diversified portfolio will mitigate its impact. Unfortunately, we will have to use a mathematical formula to fully illustrate our point. It may be the one of the most complicated of this series but also one of the most important.

AVERAGE RETURNS VERSUS COMPOUNDED RETURNS

Which do you prefer?

- A 10% return two years in a row, or

- A return of 20% followed by a return of 0%.

In both cases the average return is 10% [(10% + 10%)/2 and (20% + 0%)/2], but if you invested $1,000, your final wealth will be higher in the first return scenario since:

- $1,000 x (1+10%) x (1+10%) = $1,210 vs

- $1,000 x (1+20%) x (1+0%) = $1,200

In fact, having a return of 20% followed by a return of 0% generates the same final wealth as a stable return of 9.54% since:

- $1,000 x (1+9.54%) x (1+ 9.54%) = $1,200.

The average fixed return that leads to the same final wealth is called the compounded return. In the first scenario, 10% is both the average return and the compounded return. Both are equal in the absence of volatility of returns (risk). In the second scenario, 10% is the average return but the compounded return is 9.54%. Your final wealth is always explained by the compounded return, not by the average return.

This illustrates a simple but important principle of asset management: risk amputates the compounded return and, therefore, final wealth. More specifically:

> **Compounded Return =**
> **Average Return – Impact of Risk**

Therefore, managing and/or reducing risk is tremendously important to your final wealth. It's an unavoidable reality.

HOW TO DEFINE RISK

The most common measure of risk is the standard deviation of return (SDR). SDR is a measure of the amplitude and likelihood that actual returns may differ from expected returns. For example, assuming the expected yearly return of equity is 10% and SDR is 15%, there would be a:

- 68% probability that realized yearly returns would remain within ± one SDR of expected returns (between -5% and +25%);

- 95% probability that realized yearly returns would remain within ± two SDRs of expected returns (between -20% and +40%).

In other words:

68% Probability				
-20%	**-5%**	**10%**	**25%**	**40%**
-2 SDRs	**-1 SDR**	**Expected Return**	**+1 SDR**	**+2 SDRs**
95% Probability				

Although SDR is not a perfect measure of risk, it is widely used in the industry and can be found in the reports of most investment products. In fact, the relation between average return and compounded return is approximately the following:

> **Compounded Return ≈**
> **Average Return – $SDR^2/2$**

Hence, the expected compounded return in the above example is 8.875%[1] since:

> **8.875% = 10% - $15\%^2/2$**

The 15% volatility drains compounded returns by 1.125% ($15\%^2/2$). The following table illustrates the drain of volatility on compounded returns for different levels of volatility.

Volatility	Performance Drain
1%	0.005%
5%	0.125%
10%	0.500%
15%	1.125%
20%	2.000%
25%	3.125%

Key observers will notice that the volatility drain on compounded returns increases much faster than volatility itself. For example, when volatility doubles from 10% to 20%, the performance drain quadruples from 0.50% to 2.00%. Hence, even if this equation does not appear intuitive to all, it does communicate the importance of reducing and managing volatility in order to maximize final wealth. It also implicitly illustrates the danger of purchasing investment products, such as some ETFs, that use leverage. Leverage amplifies the volatility drain because it amplifies volatility.

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[1] SDR^2 simply means SDR x SDR or in this case 15% x 15%

THE IMPACT OF RISK ON FINAL WEALTH USING REALISTIC EXAMPLES

The following table illustrates the average return, compounded return and risk of an investment in US equity and US bonds between 1990 and 2014. We ignore fees and taxes for the purposes of this illustration.

	Assets		Portfolio
	US Equity	**US Bonds**	**60% Equity / 40% Bonds**
Average Return	11.50%	7.87%	10.05%
Compounded Return	9.82%	7.61%	9.54%
Spread	1.68%	0.26%	0.51%
SDR	18.49%	7.61%	10.63%
SDR^2/2	1.71%	0.29%	0.56%

The difference between the average return and the compounded return for US equity is 1.68% (11.50% vs. 9.82%), while it is only 0.26% (7.87% vs. 7.61%) for bonds. As expected, the spread is greater for equity than bonds, because the volatility (SDR) of equity is much higher. It is no coincidence that the return spread between the average and compounded returns for both equity and fixed income is almost equal to SDR^2/2. It is mathematical, not a forecast.

The level of volatility illustrates the significant risk of owning equity. An SDR of 18.49% combined with an average return of 11.5% indicate a 68% probability that yearly return could fall between -6.99% (Average return -1 SDR) and +29.99% (Average return +1 SDR) over the 1990-2014 period and a 95% probability that the performance will be between -25.48% (-2 SDRs) and +48.48% (+2 SDRs). Equity investing is not for short-term investors. Disastrous performance can occur over short periods and is even more likely if a portfolio is not properly diversified.

The last column illustrates well why it is so important to own diversified portfolios. It presents the performance and volatility of a portfolio invested 60% in US equity and 40% in bonds. Surprisingly, the compounded return on the portfolio is almost as high as that of equity despite a strong bond component. Why?

The lower volatility of the blended portfolio explains this result. Diversification reduces portfolio volatility because good and poor performance among asset classes is often and fortunately not well synchronized. For example, the following table illustrates yearly returns on US equity and US bonds since 1990. In 2008, US equity performed badly while bonds performed well. The reverse occurred in 2013. This imperfect synchronization reduces the volatility of a blended portfolio and its performance drain on compounded returns.

YEARLY RETURNS

THE IMPORTANCE OF REBALANCING

Before going further, let's summarize our findings. What determines final wealth is not the average return but the compounded return. Volatility drains compounded returns and does so at an increasing pace as volatility increases. Hence, the reason why we diversify is not only to reduce the likelihood of poor performance but also because lower volatility helps increase compounded returns. However, there is one important factor we have not mentioned.

> "The impact of lower volatility on compounded return will not occur if the portfolio is not regularly rebalanced."

For example, when a portfolio is designed with a 60/40 allocation target, the actual weights of equity and bonds will constantly deviate from this target, since the return of each asset will be different. Hence, the investor must periodically rebalance the portfolio to bring the portfolio back to this 60/40 target. If equity outperforms bonds, some equity will have to be sold to buy bonds. In our previous example, we assumed that the rebalancing occurs on a monthly basis.

However, although it is essential to rebalance a portfolio to benefit from the effect of lower volatility on compounded returns, the portfolio does not need to be rebalanced on a daily or even a monthly basis. Research shows that rebalancing on a semi-annual basis or even on an annual basis can lead to even better returns than rebalancing on a monthly basis. Your advisor may also present other rebalancing methodologies that are even more efficient. You must rebalance, and there is more than a single approach to rebalancing.

SUMMARY AND CONCLUSION

Diversification across asset classes (such as US bonds and US equity) is often presented as a way to reduce risk. But there is more. Although diversification does reduce portfolio risk, the impact of lower volatility on compounded returns is rarely discussed with investors. Diversification is both about decreasing risk and decreasing the drain on compounded returns. Hence, diversifying and managing risk efficiently reduces the performance drain and increases your expected return for the risk you are taking.

INVESTMENT PRINCIPLES
INFORMATION SHEET FOR INVESTORS

THE ROLE OF
AN ADVISOR
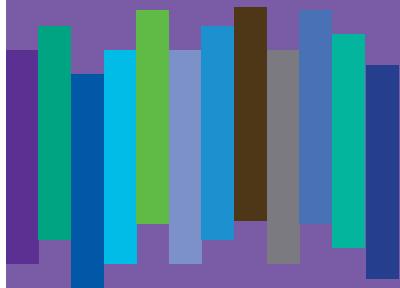
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THE ROLE OF AN ADVISOR

This document covers one of the most important dimensions of the retirement planning process. Most investors will require a knowledgeable advisor to support this process. Contrary to popular belief, it should be understood that the role of an advisor is not to forecast short-term performance and implement short-term market timing strategies. It is to provide expertise on many different dimensions of the retirement planning process, promote discipline and help the investor deal with the anxieties caused by the process itself and by financial market instabilities.

WHAT WE HAVE DISCUSSED THUS FAR

We have covered many of the mechanical aspects that are vital to the investment process. We have communicated the importance of starting to save early and of building a portfolio that will generate a reasonable rate of return in the long run. Starting late to save and investing too conservatively can be tremendously costly over a period of two or three decades. Although fees cannot be avoided, investors should look for investment solutions that have all-in fees much less than 2%, especially when the situation of the investor calls for fairly standard portfolio planning services. Investors should also ask for transparency of fees. Fees are not always fully disclosed. Furthermore, they should make full use of tax-deffered and tax-exempt opportunities and should manage their portfolio allocation in order to maximize after-tax returns. We also showed that inflation is a huge tax on our standard of living and that investors should account for its impact on the amount of periodic savings required over time to provide a reasonable retirement income. Finally, the volatility of returns drains final wealth, and investors must diversify and rebalance their portfolio as efficiently as possible to reduce this drain. These concepts represent the science of investing, and appropriate planning and management over 30 years can improve your standard of living at retirement by a third or more. However, while most investors can master the science aspect of the process, its implementation is far more problematic. Now let's consider the art of the process and the significant role advisors can play.

WHAT MUST STILL BE DISCUSSED

There is still a lot of work to be done to put all of these concepts into action. For example:

- What level of financial risk can an investor sustain?

- What returns can we expect from different asset classes over the long term?

- What portfolio structure (combination of asset classes) will deliver an appropriate level of diversification and an appropriate expected return for the entire portfolio? How should the assets be allocated between tax-exempt, tax-deffered and taxable accounts in order to maximize the after-tax return of the entire portfolio?

- What is the amount of periodic savings required to achieve the retirement goals? How should the investment and savings plan be adapted over time according to the changing situation of the investor?

- How should investors deal with the decumulation/retirement phase, when they will actually need to withdraw funds from their accounts?

Investors are often ill-equipped to answer these questions. The next six documents will cover these important dimensions of the retirement planning process. We also emphasize that the primary role of an advisor is not to forecast short-term returns nor to time the market. Substantial evidence shows that the greatest majority of investors, including experts, are not able to forecast significant events such as economic recessions or financial crises. Of course, there are always investors and managers who have outperformed in the past, but this can be attributed to chance and a single glimmer of genius as much as to anything else. True investment expertise is about structuring portfolio solutions that are appropriate to the needs, risk tolerance and objectives of the investor.

SUMMARY AND CONCLUSION

The previous five documents illustrated the most important mechanical aspects related to investing. However, what remains to be done is more akin to an art, even though we can still benefit from the rational process that will be explained in Documents #7 to #12. A knowledgeable advisor can and should support the investor during the entire process from accumulation (savings) to decumulation (withdrawals).

THE INVESTOR'S TOLERANCE FOR RISK

7

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THE INVESTOR'S TOLERANCE FOR RISK

We often think of risk as the likelihood of sustaining short-term losses, such as losing 20% or more on a portfolio of 60% equity and 40% fixed income in 2008. However, risk is also about not meeting our long-term goals, such as failing to reach a specific level of expected income at retirement. It is a challenge to reconcile both risks. Reducing the likelihood of short-term losses requires running a lower risk portfolio, while achieving higher expected income at retirement requires running a higher risk portfolio. It's a delicate balance.

UNDERSTANDING OUR FEARS

Research has found a high correlation between risk aversion and anxiety. Most individuals are emotionally involved when they invest their own personal savings. Often, investors are asked a few questions to evaluate how much risk they can sustain and which type of portfolio is appropriate to them. These questions usually fall into three categories:

- *Personal and financial situation.* It is generally assumed that younger individuals with higher current income and those with greater wealth have a higher tolerance for risk;

- *Objectives and risk tolerance.* A long-term objective justifies a riskier portfolio. But no matter what your personal and financial situation is and no matter what your goals are, some individuals feel anxious about the possibility of sustaining financial losses. Furthermore, when such losses occur, people may act rashly or unwisely. When asked questions to probe tolerance to losses, the same individual may answer these questions differently if asked during a financial crisis, such as 2008, or during a bull market, such as 2013. Investors may also answer differently depending on how the question is framed. For example, will someone answer similarly if asked: "How do you feel about losing 10% of your assets over 12 months?" vs. "How do you feel about

losing $100,000 over 12 months?" What if these same questions were asked after the market had risen by 20% or declined by 20%?

- *Investment knowledge and experience.* It is important to set appropriate goals and have appropriate expectations. However, there is nothing worse than believing we know more than we actually do. This is often the greatest obstacle to the implementation of a long-term financial plan. For example, some investors believe they can time the market or identify the next Alphabet (better known as the parent company of Google).

Some of these questions refer to the risk capacity of the investor: the level of portfolio risk which is appropriate considering the personal and financial characteristics of the investor and his or her goals. Others refer to how the risk tolerance of the investor may be impacted by other less tangible factors.

Such an approach has not always been successful in helping investors understand their own true tolerance to risk. For example, recent research finds that risk tolerance is better evaluated by considering the past behavior and actions of investors, their career path and sources of social influence (family, friends and colleagues) than by asking hypothetical questions about expected behavior in specific circumstances. It is a challenge to be truly honest with ourselves when asked about our risk tolerance.

EDUCATING INVESTORS

Investors have anxieties because financial security is a deeply felt concern and because most investors have a limited understanding of financial markets. Furthermore, risk-averse individuals are prone to believe, on average, that bad outcomes are more likely to occur and are worse than they really are. How could this not be the case when the average investor is bombarded with news from "experts" forecasting the next doomsday scenario? We tend to have a greater fear of things we don't understand.

There is only one approach to this issue: financial education (which is the goal of these documents) and guidance from your advisor to help manage anxiety. It will not transform a risk-adverse individual into an aggressive speculator (that is certainly not the goal), but it may help the average investor select an appropriate path and remain disciplined.

For example, although history usually does not repeat itself, it is a good teacher of the dynamics of financial markets and the benefits of diversification. Consider the following two graphs. The first illustrates rolling annualized 12, 36 and 60-month returns since 1990 for US equity. For example, the rolling 12-month return as of December 2000 simply represents the realized return between December 1999 and December 2000, while the 36-month return as of the same date represents the annualized compounded return between December 1997 and December 2000 and so on. The second figure presents the same information, but for a 60/40 portfolio of equity and bonds.

ROLLING EQUITY PERFORMANCE

ROLLING 60/40 PERFORMANCE

The equity figure shows that significant losses do happen when we limit our window of observation to 12 months. But circumstances are not quite as gloomy when longer horizons are considered and/or if the portfolio is diversified with equity and fixed income. Some investors will point to the lost decades of the Japanese equity market, but this is exactly why we must diversify among geographies and asset classes. As long-term investors, we must learn not to be obsessed with the performance of our portfolio on a daily, monthly or even yearly basis. We must also resist the fads that often lead to buying expensive assets. More on this in the next two documents.

SUMMARY AND CONCLUSIONS

Having some anxiety when our portfolio performs badly is natural. Evaluating how much risk an investor can tolerate is also a challenge. Often we may be asked questions to determine how to invest either when markets are calm or when markets are volatile. The answers may be wrong in both cases if such a process is not accompanied by an educational effort designed to help us understand our fears. Education will not make us completely immune to anxiety, but it will help us rationalize that the long-term planning process we have set in motion is based on an understanding of market dynamics. It may help us stay on the correct path.

INVESTMENT PRINCIPLES
INFORMATION SHEET FOR INVESTORS

WHAT DRIVES
MARKET RETURNS
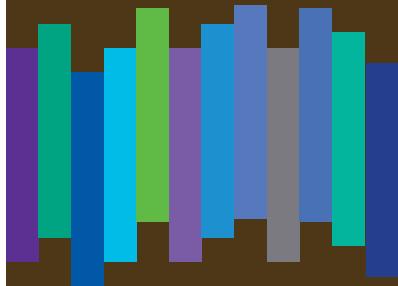
8

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WHAT DRIVES MARKET RETURNS

We've been making the argument that most experts cannot forecast market returns. However, there are some guidelines and principles that may help understand what range of returns investors can reasonably expect. Furthermore, we seek to illustrate that historical performance is unreliable as a source of information on future performance. This is a complex topic, and we will address it in the simplest way possible.

THE MATHEMATICS OF ASSET RETURNS

The following is a useful approximation of the average yearly return on any asset:

[Current Yield + Annualized return attributed to price change]

Let's consider a 20-year bond that pays a $40 annual interest coupon. The bond is purchased for $900 and sold for $1,050 five years later when its remaining maturity is 15 years. The coupon yield at time of purchase is 4.44% (40/900), and the compounded return attributed to the change in price is 3.15% ($[1050/900]^{(1/5)}$-1) for a total return of about 7.59%.

In a sense, we could say that a 4.44% performance is attributed to the interest coupons and the balance, 3.15%, to the increase in price.[1] The figure below illustrates the cash flow dynamic of this investment.

THE PURCHASE PRICE IS KNOWN

WE DO NOT KNOW THE SELL PRICE AHEAD OF TIME

-900

40   40   40   40   40 + 1050

THE LEVEL OF THE PERIODIC INTEREST COUPON IS KNOWN
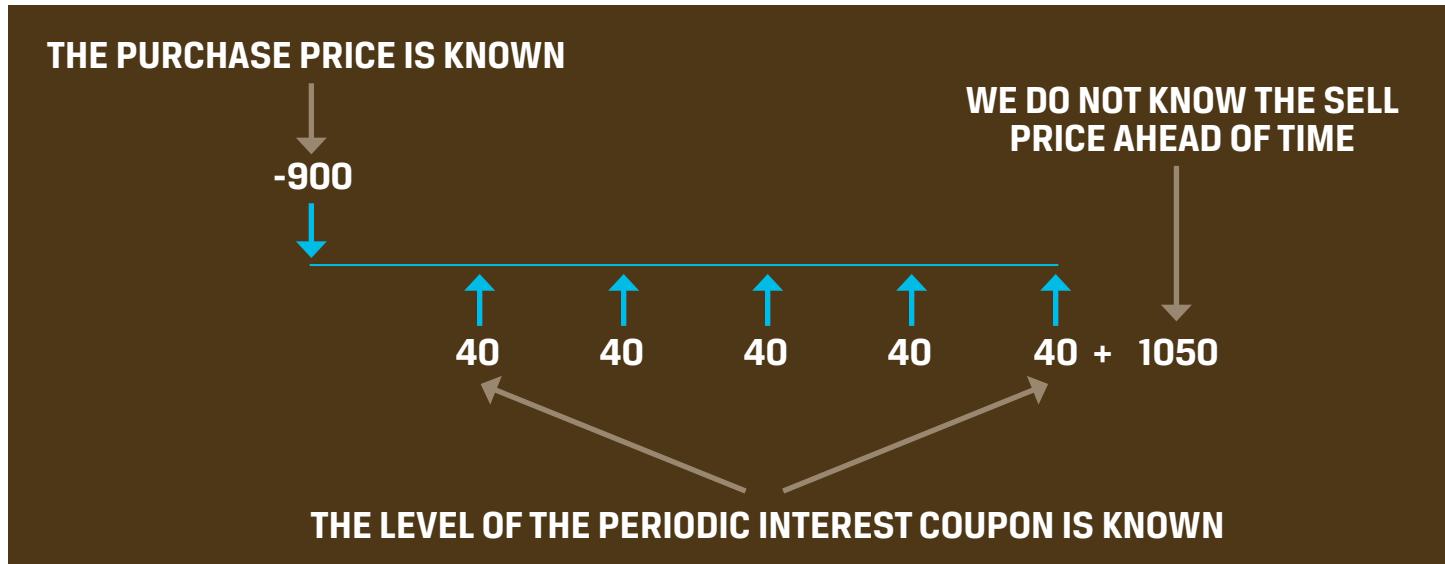
We use this approximation to illustrate that the main source of return uncertainty when we buy financial assets is not the current yield, since we know the current level of interest coupon/dividend as well as the current price, but rather its future sell price. In the case of fixed income instruments, there is less uncertainty as to the possible range of the sell price, but in the case of equity, the uncertainty is much greater. This document seeks to explain the sources of this uncertainty and its materiality in the case of fixed income and equity.

THE CASE FOR BONDS

Bonds are usually transacted on the basis of a yield to maturity (YTM). The YTM of a bond is simply the return an investor will realize if this bond is purchased at its current market price, kept until maturity, and if all coupons and the principal are paid on time. Hence, the most important difference with the previous example is that the principal paid by a bond at maturity (usually $1,000 per bond) is known. If the YTM of a bond is 3%, it means the investor will realize a return of 3.0% if the bond is kept to maturity and all coupon and principal payments are timely. Returns are only uncertain if the bond is

sold prior to maturity (since we do not know the sell price) or if a default occurs.

However, what determines the YTM that investors require on a bond? There are three main components:

- A compensation for inflation;

- A compensation for risk (default);

- A compensation in excess of inflation, often called the real return.

For example, as of the end of 2015, a 10-year US Treasury bond had a YTM of about 2.25%. Assuming investors expected an average inflation rate of 2%, it likely means that the compensation for risk was close to nil (Treasury bonds are considered riskless), while the real return was about 0.25% as of that date. However, if a corporate bond of similar maturity was selling on the basis of a YTM of 3.0% at the same time, we could conclude that the return compensation (risk premium) for the credit risk of that bond is 0.75% (3.00% - 2.25%).

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[1] An accurate calculation would show that the return is in fact 7.32%, but it helps to segment performance as we did to illustrate the two sources of performance.

Let's now consider a simple example to illustrate under what circumstances the realized return of an investor could be different from the yield to maturity. Let's assume an investor acquires a bond that has a maturity of 1 year. It is expected to pay a single coupon of $30 and a payment of principal of $1,000 a year from now. Let's assume the yield to maturity for that bond is 3.0%. Hence, the bond will sell for $1,000 since:

$$\text{Price} = (\$1,000 + \$30) / (1 + 3\%) = \$1,000$$

Let's now assume that right after the bond has been acquired by an investor, an economic report shows that inflation is running at a much higher rate than investors expected. The yield to maturity on the bond immediately climbs from 3.0% to 4.0%, since investors now require greater compensation for the expected inflation. The market price of the same bond will decline since:

$$\text{Price} = (\$1,000 + \$30) / (1 + 4\%) = \$990.39$$

Let's analyze what just happened.

- If the investor bought the bond before the inflation report (when then YTM was 3.0%), a 3% return will be realized if the bond is kept until maturity.

- If the investor bought the bond after the inflation report (when the YTM is 4.0%), a 4% return will be realized if the bond is kept until maturity.

- If the investor bought the bond before the inflation report and sells it prior to maturity when the YTM is now 4.0%, the return will be lower than the original YTM of 3.0%. Return uncertainty occurs when the bond is sold prior to maturity.

However, most investors own bonds through a bond fund or a bond ETF. Furthermore, investors usually invest in bond funds or ETFs that target a specific maturity range (short-term, intermediate and long-term). Hence, as the maturity of existing bonds is reduced by the passage of time, new bonds of longer maturity are acquired by the managers of this bond fund or ETF to remain within this specific range of maturity.

One particularity of such a product is that if an investor purchases a bond fund that targets an average maturity of about "x" years, the return realized by the investor over "x" years will be approximately equal to the average yield to maturity of the bonds observed when the fund is acquired. In other words, if you had acquired at the end of 2015 the Ishares Intermediate Government/Credit Bond ETF that had an average maturity of about 4 years and an average yield to maturity of about 1.75%, and if you kept the ETF for about 4 years (until the end of 2019), your realized return (before fees) will likely be within a fairly narrow range of around 1.75%. Even if interest rates were to rise or decline, any increase or decrease in yield will be compensated by a price loss or price gain attributed to the change in yield. It is mathematical, not a forecast.

Hence, we can conclude the following about bonds (before fees):

- A bond purchased at a YTM of x% and kept to maturity will deliver a return equal to this YTM if no default occurs;

- If the bond is sold prior to maturity, the realized return will be greater than the initial YTM if the current YTM is less or will be lower if it is more;

- If a bond fund or a bond ETF is kept for a period approximately equal to the average maturity of the bonds within the product, the realized return will be similar to the initial YTM of the bond portfolio.

Hence, the current YTM is the best indicator of future returns on a bond fund (or a bond ETF), assuming the holding period is similar to that of the average maturity of the bonds in the fund. If bond funds have performed better in the past, it is simply because the YTMs were greater in the past. Higher YTMs indicate higher future nominal return, while lower YTMs indicate the opposite. Do not be fooled by the historical returns advertised on bond funds or bond ETFs.

THE CASE FOR EQUITY

Equity returns are more difficult to forecast because, in part, equity has no maturity and therefore no known price at a specific future point in time. Hence, we cannot calculate a YTM on equity. However, let's attempt to estimate the long-term return of equity (such as that of the S&P 500) using the same equation we used for bonds:

Yield rate + annualized return attributed to price change

Assuming the dividend yield of the S&P 500 is about 2%, what is the expected price appreciation of equity? To answer this question, let's first introduce the concept of the price-earnings ratio (or PE ratio). Equity prices are often expressed using the following relation:

Equity Price = Earnings x Price/Earnings

Where the Price/Earnings ratio is often simply called the PE ratio

The PE ratio is basically a multiple that reflects how much investors are willing to pay per dollar of corporate earnings to own a single stock or to own an equity index. There are different measurements for earnings and therefore different measurements for PEs, but a standard measurement is to use the earnings of the past 12 months (another common measurement is based on the expected earnings for the next 12 months). For example, the PE ratio of the S&P 500 using 12-month trailing earnings was 21.7 as at December 24, 2015, simply because the level of the S&P 500 was 2060 as of that date and the trailing earnings index of S&P 500 companies was about 94.4.

The reverse of the PE ratio is an implicit form of yield measurement called earnings yield or EP. Much like the YTM on bonds, it is influenced by many factors, such as inflation, real return, risk premium and earnings growth expectations. Investors will pay a lower or higher multiple for earnings (PEs) when:

	Lower PEs	Higher PEs
Interest Rates	High	Low
Market Risk	High	Low
Earnings Growth	Low	High

We can now also express the difference between current and future equity price as the following:

Current Price = Current earnings x Current PE

Future Price = Future earnings x Future PE

Therefore, there are two main reasons why we may be significantly wrong about the price appreciation of equity and hence, about equity returns:

• We may be significantly wrong about the growth and pattern of future earnings, as we were in 2008-2009 when earnings collapsed during the financial crisis;

• The future PE ratio can be lower than the current PE, such as happened in the early 2000s when the technology bubble burst and the risk premium required to own equity significantly increased. Higher interest rates can also lead to lower PEs.

Hence, even if investors are right about the expected growth of earnings, they can be significantly wrong about the changes in the PE ratio. For example, it is often assumed that long-term earnings growth tracks long-term expected inflation (such as 2%) plus expected real GDP growth (such as 3%). If we consider a dividend yield of 2%, long-term equity return could be expected to be 7.0% on average (2% + 3% + 2%), but only if the PE ratio remains constant.

However, the PE ratio is not constant. In the early 1980s, it was less than 10, while it was above 30 during the technology bubble. The PE ratio reflects market expectations and market sentiments. In the early 1980s, investors were concerned about high inflation and market risk and were unwilling to pay a high multiple for earnings. In the late 1990s, investors were unconcerned with market risk and, perhaps, overconfident.

Just as a higher YTM indicated higher future bond returns and a lower YTM lower future bond returns, higher future equity returns are usually associated with lower current PEs (and consequently with higher EPs) and lower future equity returns with higher current PEs (and consequently with lower EPs).

Was the level of 21.7 at the end of 2015 appropriate? It is certainly above the historical average of about 16/17, but expected inflation and real return have also never been so low. A PE of 21.7 is certainly not cheap, but is it expensive if inflation and real rates were to remain lower than historically?

SUMMARY AND CONCLUSIONS

The return on any asset is a combination of a yield rate and price appreciation. The uncertainty of return is driven by the uncertainty in the sell price. Bond uncertainty is less, not only because bond cash flows are more certain but also because bonds have a finite maturity and pay a known principal amount at maturity. In the case of equity, there is no finite maturity and the sell price is unknown and impacted more significantly by changes in expected inflation, real return, risk and growth expectations, all of which are difficult to forecast. Investing is complicated, and this is why it is important to diversify and have a long-term plan. The objective of this document was not to turn investors into forecasters but to illustrate that forecasting is difficult even for the experts.

INVESTMENT PRINCIPLES
INFORMATION SHEET FOR INVESTORS

HOW TO
DIVERSIFY
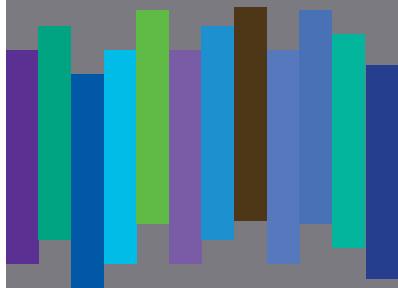
9

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· Financial planners (F.Pl.)

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HOW TO DIVERSIFY

There are many ways to diversify a portfolio. We diversify because we cannot easily forecast expected returns. This document focuses on the basic approach to diversification: across asset classes, styles and geography. Furthermore, we will make the argument that US investors do not need to diversify internationally as much as Canadian investors. Furthermore, US investors need to reduce their exposure to foreign currency while Canadian investors should embrace it.

DIVERSIFYING ACROSS ASSET CLASSES, STYLES, GEOGRAPHY AND ECONOMIC DEVELOPMENT

An asset class is generally defined as a broad group of securities/assets that offer similar characteristics, behave similarly in the market place and are subject to the same laws and regulations. The traditional asset classes are equity, bonds and cash equivalent. Commodities and real estate are also often characterized as asset classes.

An investment style refers to the general portfolio characteristics that are favored by the investment philosophy of the manager. Besides simply indexing (such as replicating a market index like the S&P 500), the best-known styles in equity investing are defined around firm size (small, mid, and large) and fundamental attributes (value, blend, growth and momentum). Value managers are looking to invest in securities that appear attractively priced, while growth managers are looking for firms that are likely to expand quickly. Blend is a mix of the two styles, while managers who favor momentum are trying to ride the wave of securities that have risen in price recently. Each approach has its risks and potential rewards, and their respective expected excess performance against the market in general is imperfectly correlated – a positive attribute.

Geography usually refers to countries but more often to regions, such as the Americas, Europe & Middle East and Asia, or the US and international (non US). Level of economic development refers to developed, emerging and frontier economies and markets. Diversification across geography and economic development seeks to benefit from the imperfect synchronization of economic growth, differences in valuation across financial markets and exposure to different currencies.

An efficient diversification process should minimally incorporate diversification across asset classes and geography. The following table illustrates why it is desirable to diversify across asset classes, styles and regions. The table ranks five specific asset classes as well as a balanced portfolio according to their returns by periods of two years between January 1991 and December 2014. It also presents the average compounded return (in USD) over the entire period. Each asset is color coded, which highlights the fact that no asset dominated each year.

The data for the entire period shows that riskier assets tend to be rewarded in the long run, but there were some unexpected results even considering the full horizon. Among asset classes, emerging markets and US equities dominated performance overall, but fixed income still outperformed international equity and commodities, which were dead last. The strong relative performance by fixed income can be explained by the deflationary environment of the last 15 years and the two equity market crises (2000-2001 and 2008). It is unlikely that fixed income can maintain this strong performance, since low interest rates, as of 2016, make it mathematically impossible that the level of capital gains realized in the past can be sustained. Remember that low yield to maturities are indicative of low future returns. Commodities did not do well, but they could still be considered as a diversifier within a program that rebalances the asset allocation on a regular basis. Finally, the balanced portfolio finished slightly below US equity in spite of its much lower volatility. As we would expect, it never ranks at the top nor at the bottom. Hence, a pre-packaged balanced portfolio is an appropriate approach for risk-averse investors and non-experts.

PERFORMANCE OF ASSET CLASSES IN DECLINING ORDER

TWO YEARS ENDING	1	2	3	4	5	6
Dec-92	33.5%	20.4%	12.9%	12.2%	2.9%	-9.3%
Dec-94	27.3%	19.0%	9.3%	5.2%	4.1%	-0.1%
Dec-96	29.9%	14.5%	14.3%	12.0%	9.1%	0.3%
Dec-98	29.9%	14.7%	10.9%	9.1%	-18.8%	-21.4%
Dec-00	36.2%	9.6%	7.5%	7.2%	5.9%	5.6%
Dec-02	12.2%	-2.4%	-2.7%	-4.2%	-17.2%	-17.9%
Dec-04	40.3%	30.1%	20.3%	17.4%	14.9%	4.4%
Dec-06	33.5%	21.8%	18.2%	13.0%	10.8%	3.1%
Dec-08	15.5%	-4.3%	-10.3%	-18.8%	-18.9%	-19.1%
Dec-10	46.1%	34.5%	22.2%	22.1%	17.9%	2.2%
Dec-12	8.7%	8.1%	5.9%	1.9%	1.2%	-1.5%
Dec-14	22.8%	7.1%	3.9%	1.0%	-2.0%	-19.6%
Average	9.9%	8.6%	8.3%	7.5%	7.0%	4.6%

Balanced portfolio is 20% US Equity, 20% International Equity, 10% Emerging Markets, 10% Commodities and 40% Fixed Income.

■ US Equity   ■ International Equity   ■ Emerging Market Equity   ■ Commodities   ■ Fixed Income   ■ Balanced

US AND CANADIAN INVESTORS HAVE DIFFERENT DIVERSIFICATION NEEDS

US investors live in the most widely diversified economy. Its equity market balances exposure to most sectors and a wide array of potential firms in each sector. Many are global firms with substantial activities in other regions around the world. By comparison, the Canadian economy is less diversified. The financial, energy and material sectors are dominant. In relative terms, Canadian investors have a greater need for diversification in international markets than US investors.

Furthermore, the US currency is a reserve currency that tends to appreciate in bad times and depreciate in good times. The reverse is true of the Canadian dollar and of the currencies of other less diversified economies, such as Australia. For example, during the financial crisis and the 2014-2015 commodity price meltdown, the Canadian and Australian dollar significantly depreciated against the US dollar.

Let's consider a more specific example. In October 2008, large market capitalization stocks in the US and Canada declined by about 17.5% and 16.9% respectively. During the same month, the C$ declined by 12.9% against the US$, while the US$ appreciated by 14.8% against the C$.[1] Thus, a Canadian investor in the US equity market fully exposed to the US dollar would have generated a loss of only 5.3% in Canadian dollars [(1-.175)*(1+.148)-1], while a US investor in the Canadian equity market would have suffered a loss of 27.6% [(1-.169)* (1-.129)-1] in US dollars. Although both equity markets performed similarly in local currency, the performance spread measured in the respective currency of the investors was a significant 22.3%! Hence, Canadian investors have a natural hedge against global market risks, while US investors do not. In essence, Canadian investors benefit from currency risk (hedging or hedging too much is not good for them), while US investors should reduce their overall risk by hedging a significant part of their exposure to foreign currencies when investing internationally. Some investors say that hedging half the currency risk in a portfolio is a neutral compromise, but in fact, the examples of the US and Canada illustrate that hedging 50% is not a neutral decision nor is it a good decision. It all depends on the cyclicality of your home currency.

SUMMARY AND CONCLUSIONS

We diversify across asset classes, styles and regions because most investors cannot accurately forecast. Moreover, not all investors require the same type of diversification. US investors benefit from a diversified domestic equity market, while Canadian investors do not. Canadian investors need more international diversification. However, Canadian investors benefit from the fact that the US dollar tends to strengthened when the global economy is uncertain or commodity prices decline. US investors are hurt by such circumstances and would be better off buying international products that hedge the currency risk.

We did not address the issue of active investing in this document. We already mentioned that less than three managers in 10 outperform their respective benchmarks after fees over the long term. If it is a challenge for expert managers to outperform after fees, imagine the challenge of non-professional investors attempting to identify winning managers. This is an aspect to be discussed with your advisor.

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[1] It is an interesting particularity of currencies that the level of appreciation of currency X against currency Y is not equal to the level of depreciation of currency Y against currency X.

INVESTMENT PRINCIPLES
INFORMATION SHEET FOR INVESTORS

BUILDING PORTFOLIOS
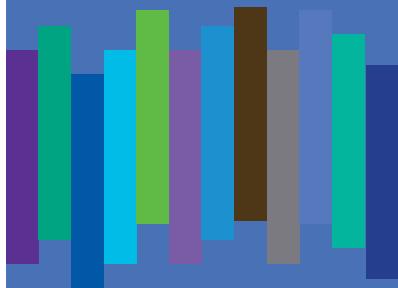
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- · Investment fund managers
- · Life insurance agents
- · Financial planners (F.Pl.)

BUILDING PORTFOLIOS

Since Canadian and US investors have different diversification requirements, we need to build portfolios from both perspectives. Two portfolio allocations are considered: a riskier 70/30 (equity/ fixed income) and a less risky 30/70. For each risk level, there are two portfolio structures: a simple structure with two or three assets and a more comprehensive structure designed to provide greater geographic and style diversification. The US portfolios will be more US centric, since the US equity local market provides substantially more diversification than the Canadian market. In total, there are eight potential portfolios.

ALLOCATIONS FOR CANADIAN AND US INVESTORS

The two following tables present different allocation options.

US INVESTORS					
		Simple Portfolios		Comprehensive Portfolios	
Asset	**Description**	**Low Risk**	**High Risk**	**Low Risk**	**High Risk**
Russell 1000	**Equity - US Large CAP**	30%	70%		
Russell 1000 Value	**Equity - US Value Style**			10%	20%
Russell 1000 Growth	**Equity - US Growth Style**			10%	20%
Russell 2000	**Equity - US Small CAP**			10%	10%
MSCI EAFE	**Equity - International Large CAP**				15%
MSCI Emerging	**Equity - Emerging Markets**				5%
S&P/TSX	**Equity - Canadian**	-	-	-	-
Treasury 10 Years	**Bonds - Governments**	70%	30%	20%	
Barclays Aggregate Credit	**Bonds - Governments and Corporations**			42.5%	25%
Barclays High Yield	**Bonds - Corporations of Lower Quality**			7.5%	5%

CANADIAN INVESTORS					
		Simple Portfolios		Comprehensive Portfolios	
Asset	**Description**	**Low Risk**	**High Risk**	**Low Risk**	**High Risk**
Russell 1000	**Equity - US Large CAP**	10%	30%		
Russell 1000 Value	**Equity - US Value Style**			5%	12.5%
Russell 1000 Growth	**Equity - US Growth Style**			5%	12.5%
Russell 2000	**Equity - US Small CAP**			5%	5%
MSCI EAFE	**Equity - International Large CAP**				15%
MSCI Emerging	**Equity - Emerging Markets**				5%
S&P/TSX	**Equity - Canadian**	20%	40%	15%	20%
Treasury 10 Years	**Bonds - Governments**	70%	30%	20%	
Barclays Aggregate Credit	**Bonds - Governments and Corporations**			42.5%	25%
Barclays High Yield	**Bonds - Corporations of Lower Quality**			7.5%	5%

The following table presents the performance and some risk statistics for all eight portfolios between August 1992 and October 2015, assuming a monthly rebalancing.[1] The US portfolios are in US$ while the Canadian portfolios are in C$.

Portfolios (% Equity / % Bonds)	Return	Volatility	Maximum Drawdown	Date Maximum Drawdown Ends
US 30/70 Simple	7.4%	5.9%	-10.4%	February 2009
US 30/70 Comprehensive	8.1%	6.6%	-21.0%	February 2009
US 70/30 Simple	8.6%	10.6%	-35.2%	February 2009
US 70/30 Comprehensive	8.6%	11.1%	-42.9%	February 2009
CAN 30/70 Simple	7.6%	5.6%	-7.9%	November 1994
CAN 30/70 Comprehensive	8.3%	5.9%	-16.1%	February 2009
CAN 70/30 Simple	8.8%	8.5%	-24.8%	September 2002
CAN 70/30 Comprehensive	8.8%	8.9%	-32.3%	February 2009

Some results are puzzling but easily explainable.

- First, the CAN portfolios (in C$) have higher performance than US portfolios (in US$). Part of the reason is the fact the C$ depreciated on average against the US dollar over this period.

- CAN portfolios have lower volatility and lower maximum drawdowns[2] than US portfolios. The fact that the C$ tends to depreciate in tough times explains this.

- Riskier portfolios outperformed less risky portfolios. As discussed previously, there will always be exceptions (such as Japanese equity during more than two decades of underperformance), but over very long periods, we should expect well-diversified riskier portfolios to outperform. However, we must accept larger volatility and drawdowns to increase returns.

- The maximum drawdowns did not necessarily occur at the same time in Canada and in the US. For riskier and/or the US centric portfolio, the period of the financial crisis often represents the worst period. However, in the case of Canada, simple portfolios sustained worse performance during other periods.

- What is more disturbing is the fact that the riskier comprehensive portfolios had larger maximum draw-downs and greater volatility than riskier simple portfolios.

Furthermore, they did not generate better returns. However, we must recognize that we are looking at this issue from the point of view of investors located in two countries (US and Canada) whose equity markets outperformed global markets during this period. Again, we do not know what the future holds for us. This why we diversify. Sometimes, even when we rationally diversify globally, our own market could be among those that will perform the best. Hence, it will seem as though it was not worth diversifying, but we only get this result because we are looking in the rear view mirror.

For example, in the case of Canada, the relatively favorable local performance during this period is explained by the strong commodity cycle and the greater resistance of the Canadian financial sector to the 2008 financial crisis. Again, we cannot expect the future to be like the past. The decline of energy and commodity prices in 2014 and 2015 and the resulting impact on the Canadian equity market certainly illustrate that.

THE COST OF BEING AFRAID AND OF INCONSISTENT INVESTMENT BEHAVIOR

Some investors simply want to avoid all risks. It can be costly to be overly conservative. The following table shows the

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[1] As specified in Document #9, rebalancing less frequently, such as every 6 to 12 months, is sufficient, perhaps even more efficient.
[2] The maximum drawdown is the maximum decline from peak to subsequent trough recorded during the period under observation.

cumulative value of an annual investment of $1,000 since 1992 ($24,000 in total) for a US investor using a conservative portfolio of five-year Treasury bonds or any of the four investment options already discussed. Five-Year Treasuries provided a yearly compounded return of about 5% during this period.

	5-Year Treasuries	30/70 Simple	30/70 Comp.	70/30 Simple	70/30 Comp.
Cumulative Value	$40,858	$57,658	$67,109	$63,830	$66,314
Gains in excess of $24K	$16,858	$33,658	$43,109	$39,830	$42,614
Gains in excess of $24K if away from the market for one year (from Dec. 2008 to Nov. 2009)		$27,151	$29,693	$31,425	$27,935
Decline in gains (%)		-19.3%	-25.4%	-27.1%	-34.4%

Even though we have not incorporated fees into the analysis, there is a high price to pay for extreme conservatism even against a low risk 30/70 portfolio. The five-year Treasury portfolio cumulated nearly 28% less wealth than a plain 30/70 portfolio. Furthermore, the nearly 5% return on Treasury bonds was only achieved because of significantly higher interest rates back in the 90s. Such performance is unlikely going forward.

Other investors are not necessarily shying away from investing in equity but are inconsistent. They will invest or take their capital out of the market at the very worst possible time. One way to understand the cost of inconsistency is to recalculate the compounded return of a portfolio simply by eliminating the very best months, one at the time. This illustrates the cost of being away from the market when it is most profitable.

Let's use the example of the US 70/30 simple portfolio. Its annual compounded return over the entire period was 8.6%. If we eliminate the very best months, we are taking away about 0.3% of the total compounded return over this 23-year-period for each such month. For example, the top three months since August 1992 account for nearly 1% of the total performance of 8.6%. Similarly, depending on the portfolio, eliminating the very best 12-month period could wipe out between a fifth and a third of all gains generated over more than 22 years.

THE ROLE OF TARGET DATE FUNDS (TDFs)

We discussed TDFs briefly in Document #2. TDFs have been designed to provide an appropriate asset allocation for participants that are "X" years away from retirement. For example, in 2015, a participant planning to retire in 20 years would buy a 2035 TDF, while another looking to retire in 30 years would look for a 2045 TDF. TDFs are designed to reduce the allocation to riskier assets (such as equity) and increase the allocation to less risky assets (such as bonds) as the participant approaches retirement. The allocation process can even continue post-retirement.

For individuals who need considerable guidance in their investment decisions, TDFs provide an asset allocation that will evolve over time and a rebalancing process. Some are very affordable, while others are much more expensive without necessarily offering a superior strategy. When offered at reasonable fees, this is an acceptable default solution.

There are debates currently as to the pace at which the allocation should be adjusted over time and the types of asset classes that should be included in TDFs. However, notwithstanding this debate, investors who lack a sufficient understanding of investments and react emotionally to what happens in financial markets will find in TDFs a type of product that will enforce greater discipline. It is not a perfect product (what is?), but it is a good alternative in the absence of competent advisory services.

SUMMARY AND CONCLUSIONS

Risk pays off in the long run, assuming we diversify smartly, remain consistent and can stand the volatility and drawdowns. However, it does require substantially more risk to marginally increase returns. Twice as much volatility will not deliver twice the returns. This is why it is important to have a properly diversified portfolio, design a long-term investment plan and pay reasonable fees.

In this document, we continued to work with historical returns to better understand risk, but in the next document we will start using estimates of long-term future returns. Not only forecasts of short-term returns are unreliable, retirement planning must be based on reasonable long-term return and risk expectations. The past is an imperfect guide to future performance, but it does provide clues about risks.

THE INCOME I CAN EXPECT FROM MY SAVINGS

11

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THE INCOME I CAN EXPECT FROM MY SAVINGS

How much must be saved periodically to ensure a comfortable retirement is not a simple question. There are many relevant variables to consider, but it is possible to develop a reasonable estimate that will give an indication of the scope of the savings effort required. Unfortunately, what is required is often much more than most individuals expect, especially in a low real interest rate environment.

THE MOST RELEVANT VARIABLES

How much must be saved to generate specific levels of real (inflation-adjusted) after-tax income at a future point in time depends on current wealth, time to retirement, life expectancy after retirement, anticipated return on investment, inflation, availability of tax-exempt or tax-deffered opportunities and so on. Also, how much income is required and possible during retirement is clearly an issue of lifestyle and circumstances. Can the retiree combine his or her financial resources with those of a partner? Will financial markets deliver surprisingly bad or good returns?

Often advisors will say that an income replacement level of 70% is sufficient for a couple. Assuming the house is paid (there are no rent payments), that there are no more expenses for children's education, and that further savings are no longer required, it may even be possible to live on less than 70% of the previous income. Some research shows that most couples in this situation live comfortably on less than 60% of previous income. However, these are only guidelines. Individuals approaching retirement should evaluate their financial needs based on their own recent experience.

THE LEVEL OF RETIREMENT INCOME MY SAVINGS WILL PROVIDE

Since we cannot adapt this document to every situation, we will concentrate on the following question:

What level of real income at retirement can be expected from each $1,000 of real yearly savings?

Hence, if the investor wants five times more revenue than the answer will provide, it implicitly means that his or her savings would have to increase by about five times as much.

The answer will be adapted to specific assumptions and circumstances such as:

- The number of years of savings prior to retirement;

- The life expectancy after retirement;

- The portfolio's expected return;

- The use of tax-exempt or taxable accounts.

This analysis will help guide reasonable expectations of what is achievable. The main assumptions are provided in the footnote.[1] However, a complete analysis would require an investment planning software that can handle variable contributions (i.e. that can adjust contributions once the mortgage is fully paid or the kids are out of school), that can manage the asset location (in tax-exempt vs. taxable accounts) and asset allocation over time and that considers different income alternatives (at retirement) and risk management features.

The following two tables present the expected real (inflation-adjusted) annual income at retirement from $1,000 of real yearly savings according to the number years of savings and longevity at retirement for both taxable and non-taxable accounts.[2] It is based on a 70/30 asset allocation and it assumes the asset allocation is the same in both accounts.[3] In reality, we could do slightly better by optimizing the allocation across the two accounts in order to minimize total taxes.

The tables present the results for four scenarios of investment duration (20 to 35 years) and four identical scenarios of longevity after retirement. Assuming retirement at 65, a 25-year longevity corresponds to a 90-year life expectancy.[4] Canadians and Americans aged 65 have a life expectancy of approximately 85. However, a large proportion, perhaps 30% of North Americans, will live past the age of 90. Hence, it makes sense to assume we may live longer than average life expectancy may indicate.

Non-Taxable	Longevity				
Years of Savings	20	25	30	35	4% Rule
20	$1,879	$1,607	$1,429	$1,305	$1,113
25	$2,554	$2,184	$1,942	$1,773	$1,513
30	$3,338	$2,854	$2,538	$2,317	$1,977
35	$4,248	$3,633	$3,231	$2,949	$2,517

[1] Tax rates on interest/foreign dividends, domestic dividends and capital gains are respectively 40%, 20% and 20%. Return assumptions are 3% for fixed income and 7% for equity (2% from dividends). Inflation is 2%. The allocation is respectively 30%, 40% and 30% to fixed income, domestic equity and foreign equity before and after retirement. The portfolio could be more diversified, but the principles would remain the same. The equity turnover is 40% yearly. All-in fees are 1%, and the impact of portfolio rebalancing on long-term expected return is 0.25%. The expected return is approximately 5.05% on the tax-exempt portfolio and 3.90% on the taxable portfolio.

[2] In the case of a tax-deffered account, it would actually require $1,667 of real savings per year assuming a 40% tax rate to achieve the same purchasing power as $1,000 of real savings in a non-taxable account.

[3] We could illustrate that investors allocating their entire portfolio to fixed income during the accumulation and decumulation periods would, under the same scenarios as above, extract a yearly income that would only be 35% to 55% of the income stated above. Furthermore, a 70% allocation to equity is likely too high for most investors, especially during the retirement period, but it will illustrate the scope of the challenge.

[4] For information on life expectancy see: http://www.worldlifeexpectancy.com/your-life-expectancy-by-age

Taxable	Longevity				
Years of Savings	20	25	30	35	4% Rule
20	$1,484	$1,240	$1,079	$964	$980
25	$1,950	$1,630	$1,418	$1,268	$1,288
30	$2,463	$2,058	$1,790	$1,601	$1,619
35	$3,025	$2,528	$2,199	$1,969	$1,999

The last column presents the annual income resulting from applying the 4% income rule. The 4% rule is a simple rule of thumb used by some advisors to guide people planning for retirement: withdraw 4 percent of the initial capital balance each year (adjusted for inflation) and you have excellent odds of having enough money for 30 golden years. For example, if you have accumulated $1 million at retirement, you could withdraw $40,000 in the first year and then adjust this amount annually to inflation.

The 4% rule has been criticized in recent years as being too generous in a low interest rate environment. The 4% rule was designed when returns on Treasury bonds were as much as 2.6% above inflation. They are much lower than this currently. Nevertheless, the examples we provide indicate that the income level for the 35-year horizon (assuming a taxable portfolio) are very similar to those resulting from the 4% rule. However, this analysis assumes stable returns. Hence, it does not incorporate the uncertainty of future returns. Finally, the comparison between taxable and non-taxable accounts illustrates that there is tremendous value in fully using non-taxable accounts.

THE EFFECT OF UNCERTAINTY

It is relatively easy to build a retirement program on the assumption that real portfolio returns will be stable. The reality is somewhat more complex. The level of income investors can expect from their accumulated wealth during retirement can be less than expected for at least two reasons. First, the real return on the portfolio (the return in excess of inflation) may be less than expected. Second, the pattern of returns can be unfavorable even if we are right about the average return. This aspect is often neglected in simple retirement calculators that assume a stable return.

Consider the following situation. An investor has accumulated $1 million towards retirement. However, two scenarios of returns are considered. In both scenarios the compounded return over 30 years is 4.5%, but in the first scenario a financial crisis leading to a negative performance of -25% occurs during the first year. Assuming an inflation rate of 2.0%, we could demonstrate that the sustainable level of retirement income is 17.4% less in the first scenario.

	Scenario 1	Scenario 2
Nominal Return Year 1	-25%	4.5%
Nominal Return Years 2-30	5.7%	4.5%
Compounded Return over 30 Years	4.5%	4.5%
Sustainable Real Annual Income	$39,207	$47,466

The real issue for retirees is to determine the probability that their income assumptions will not be met, either because they are wrong about the expected return assumption or because the pattern of return is unfavorable. To illustrate this issue we have evaluated the likelihood of achieving the targeted real income specified in scenario 2 (slightly above $47,000), assuming a growth portfolio (70/30 allocation) that has an expected return after fees and taxes of about 4.5%, as in the example above, but we took into account the risk usually associated with such a portfolio. Hence, more than 10,000 scenarios of returns over 30 years were considered.[5]

Unsurprisingly, the analysis shows that there is approximately a 50% probability that the level of real income that can be supported may be less than expected (and 50% that it would be greater). The range of possible income is also fairly wide. For example, there is approximately a 25% likelihood that the sustainable income would be less than 80% of the targeted level.

Furthermore, the scenarios that lead to a lower income than desired are not necessarily explained by a low portfolio performance achieved over the period. In fact, we have determined that 60% of the scenarios of lower income are explained by an unfavorable pattern of returns and not by lower average returns. One such example is having poor performance in the first five years of retirement even if the long-term average performance is appropriate.

DEALING WITH UNCERTAINTY

Investors have a few options when it comes to uncertainty. Some are not pleasant, but this is where common sense must play a role. Here are three examples:

- Budget (if possible) an expense level at about 80% of the investment income that is expected when a stable return environment is assumed. This may reduce your likelihood of exceeding your sustainable income from about 50% to 25%. It is not necessarily an easy option, but you can always revaluate after a few years if performance in financial markets is favorable.

- Consider other income alternatives for a portion of your income than solely an investment portfolio. For example, your advisor could analyze the possibility of buying a single or joint life Single Premium Immediate Annuity (SPIA) from an insurer. An SPIA will pay a fixed amount for as long as you live (single SPIA) or for as long as you or your spouse live (couple SPIA). Obviously, the annuity amount is less in the latter case. An SPIA will offer you a stable income, although usually unadjusted for inflation. However, the annual payout rate is likely to be higher than what would normally be advised to withdraw from an investment portfolio. The drawback is that an annuity leaves no legacy wealth once the beneficiaries are deceased. However, it may make sense in some circumstances to use part of your wealth to purchase an annuity.

- There are risk management approaches that can help manage the risk related to unfavorable patterns of returns, especially during the few years preceding or following the planned retirement date. A popular approach consists of using target date funds (TDFs). Such funds lower the level of risk of the investment portfolio over time (as the investor ages), but unfortunately, they also lower the level of expected returns. Nevertheless, the risk of significant losses remains even with TDFs. More sophisticated approaches may actually manage the allocation according to the forecasted level of market risk, reducing the equity exposure when volatility is high and increasing it when volatility is low. However, such an approach is not widely used currently, and target date funds have the advantage of simplicity.

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[5] We assumed that 50% of the assets are in taxable accounts and 50% in tax-exempt accounts. The return of 4.5% is coherent with such an allocation.

SUMMARY AND CONCLUSIONS

Planning for retirement is complex and involves integrating many variables into the analysis. This document concentrated on some of these variables but many more must normally be considered. For example, we have ignored the potential access to other sources of retirement income, the possibility of receiving an inheritance and of pooling financial resources with a partner, the existence of a current pool of savings and more effective tax management. An actual portfolio should also have more style diversification in order to better balance risks and increase the effectiveness of the rebalancing process. Finally, financial market uncertainties complicate the entire process. Retirees must plan for the possibility that portfolio returns may be unfavorable. It may require them to plan for an income buffer even before they retire or to purchase insurance-related products that will provide greater income certainty.

In the last document of this series, we will present all that we have learned in a coherent framework.

INVESTMENT PRINCIPLES

INFORMATION SHEET FOR INVESTORS

PUTTING IT ALL TOGETHER
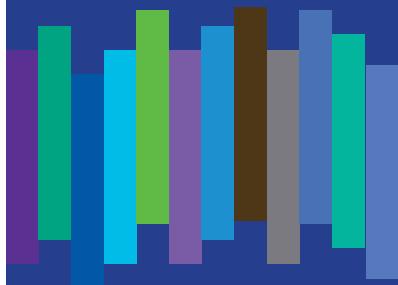
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PUTTING IT ALL TOGETHER

We have covered a significant amount of material in the previous documents. It may seem overwhelming, but the main dimensions of the retirement process can in fact be easily summarized. This last document in this educational series seeks to present the main dimensions of the investment process in a clear framework.

THE RETIREMENT FRAMEWORK

ADVISORY AND SUPPORT TOOL (#6)

This chart summarizes the many dimensions of the retirement planning process. The number in parentheses refer to document that covers this aspect.

DETERMINANTS OF ALLOCATION

Objectives & Risk Tolerance (#7)

Horizon

Diversity of your own market and status of your currency (#9)

WHAT BUILDS REAL RETURN

Proper Allocation (#10)

Risk Management & Rebalancing (#5)

Tax Management (#3)

ACCUMULATING WEALTH (25 to 35 years)

Amount of Savings

Time (#1)

Net Real Return (#1 & #8)

Pattern of Return (#11)

WHAT DRAINS REAL RETURN

Fees (#2)

Taxes (#3)

Inflation (#4)

TURNING WEALTH INTO REAL INCOME (#11) (20 to 30 years)

Longevity

Net Real Return

Pattern of Return

Choice of Income Vehicles

WEALTH ACCUMULATION

There are four dimensions that will determine the amount of wealth accumulated from private savings at retirement. Obviously, there is how much you have saved over time, how long you have been saving (Document #1), what net real return you have obtained from your investment portfolio (Documents #1 and #8), and what pattern of return occurred during your savings period (Document #11). If you are lucky enough to benefit from a strong return environment after you had already accumulated a significant amount of savings (for example, in the last 10 years of your accumulation period), your overall wealth will significantly benefit.

WHAT DRAINS REAL RETURN

Whatever real return you were hoping to realize, it will have been reduced by the amount of all-in fees that you paid (Document #2), by taxes in the case of your taxable account (Document #3), and by inflation if inflation was greater than you expected (Document #4). It is important to pay reasonable fees.

WHAT BUILDS REAL RETURN

The real return you will achieve is, in a large part, a function of appropriate investment planning and consistency of execution. Document #10 discusses the process of building a diversified portfolio. As indicated, performance is strongly influenced by the rebalancing and risk management strategy (Document #5). An appropriate rebalancing strategy will help reduce the performance drain resulting from higher portfolio volatility. Finally, making full use of tax-exempt or tax-deffered accounts and properly allocating your asset classes between taxable and non-taxable accounts in order to minimize the total amount of taxes is essential to long-term performance (Document #3). While taxes drain wealth accumulation, their effect can be mitigated.

DETERMINANTS OF ALLOCATION

Knowing how to build a diversified portfolio is essential, but which portfolio risk/structure is appropriate to each investor? Of course, how much risk we can take depends on our investment horizon (a longer horizon can support greater

risk), but in the end, it is a function of the objective and risk tolerance of the investor. Greater income at retirement justifies taking more risk, but the anxieties of some investors related to poor performance may justify taking less risk. It is a delicate balance and is discussed in Document #7. Finally, the structure of a portfolio (its allocation to different asset classes) is strongly influenced by the diversity offered by the home equity market of the investor and by the nature of its currency. Is it a currency that tends to appreciate in good times and depreciate in bad times or is it the reverse (Document #9)?

TURNING WEALTH INTO REAL INCOME

Many factors relevant to the accumulation of wealth also apply during the decumulation process. However, return uncertainty can have greater consequences as we approach the decumulation phase, because the wealth we have accumulated becomes our main source of income. We can no longer expect a salary. There is uncertainty in terms of the net real return the investment portfolio may generate but also uncertainty related to the pattern of returns. Document #11 explains how much income can be expected from our savings and the impact on retirement income of unfavorable performance that occurs soon after retirement.

ADVISORY AND SUPPORT TOOL

Finally, for most individuals, the complexity of the entire process requires the support of a trusted advisor (Document #6). There is also an added consideration that we did not address. Research shows that our ability to benefit from learned skills and knowledge declines in our 60s, while our ability to solve new problems starts declining even before, in our 20s. To the question: "If five people all have the winning numbers in the lottery and the prize is two million dollars, how much will each winner receive slightly more than 50% of individuals in their 50s had the right answer but less than 10% of individuals in their 90s did.[1] The level of cognitive impairment, excluding dementia, reaches nearly 30% for individuals in their 80s and 40% for those in their 90s. Cognitive changes explain why basic financial literacy skills decline, on average, in our 60s, and this process worsens gradually in our 70s, 80s and 90s. As we age, we are less likely to make rational and informed decisions and, unfortunately, we are more prone to be taken advantage of.

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[1] Agarwal, Sumit; Driscoll, John C.; Gabaix, Xavier; and David Laibson (2009), The Age of Reason: Financial Decisions over the Life Cycle and Implications for Regulations, Brookings Papers on Economic Activity.

All of this makes the role of a trusted, accredited advisor
and the need for proper planning even more important as we age.

Like in most human endeavor, the difficult part is to get going.
These documents provide sufficient knowledge to get you
started. The road to financial comfort is difficult, but you
are now better equipped to reach your objectives.