



TD Economics

Topic Paper

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THE CORROSIVE IMPACT OF INFLATION ON FINANCIAL RETURNS

Most discussions about portfolio returns focus on the income flows and capital gains provided by investments without consideration of the loss of purchasing power due to inflation. But, this omission presents a distorted picture of the true financial performance. To illustrate, more than one-third of the average annual total returns provided by Canadian equities over the past three decades has been offset by inflation. And, small differences in inflation sustained over time have a large impact on the future value of money. As shown in the accompanying table, if the annual pace of inflation averages 2 per cent over three decades, investments must give a cumulative return of 81 per cent in order to match the increase in prices. If inflation averages 4 per cent, investments need to deliver a total return of 224 per cent in order to preserve purchasing power.

The corrosive impact of inflation on investment income is far from a new insight. Most books on personal finance contain some reference to the subject. However, there are three inflation-related issues that are often glossed over. First, amongst the various measures of inflation, which is

CUMULATIVE PER CENT INCREASE IN PRICES					
Years	Rate of Inflation				
	1%	2%	3%	4%	5%
5	5.1	10.4	15.9	21.7	27.6
10	10.5	21.9	34.4	48.0	62.9
15	16.1	34.6	55.8	80.1	107.9
20	22.0	48.6	80.6	119.1	165.3
25	28.2	64.1	109.4	166.6	238.6
30	34.8	81.1	142.7	224.3	332.2

Source: TD Economics

the most appropriate to use when calculating after-inflation returns? Second, when building a financial plan, what is the best assumption about the future rate of inflation? Third, in light of this outlook for inflation, what are the implications for financial returns and portfolio decisions regarding asset allocation? We will address each in turn.

CPI is the traditional benchmark

The most relevant measure of inflation from a financial planning point of view is the year-over-year change in the Consumer Price Index (CPI). In contrast to many other measures of prices – such as the GDP deflator, to name but one – the CPI has the advantage of being restricted to the goods and services purchased by individuals. It is also the most popular and widely quoted measure of inflation.

However, the CPI does have its drawbacks. The index represents a weighted average of prices for a fixed basket of goods and services, where the weights are based on a survey of family expenditure. However, since the weights are only periodically updated, the CPI can temporarily overstate or understate inflation, as consumers may change

CONSUMER PRICE INDEX WEIGHTS	
Component	Weight (%)
Shelter	28.4
Transportation	19.0
Food	16.4
Recreation, Education And Reading	11.8
Household Operations & Furnishings	10.6
Clothing & Footwear	5.4
Health And Personal Care	4.5
Alcoholic Beverages & Tobacco	3.8
Total	100.0

Source: Statistics Canada

their spending patterns – for example, by substituting cheaper products for more expensive ones. Moreover, the CPI will not reflect the outlays by any specific individual or household. For example, tobacco is a component of the CPI, but the majority of Canadians are non-smokers.

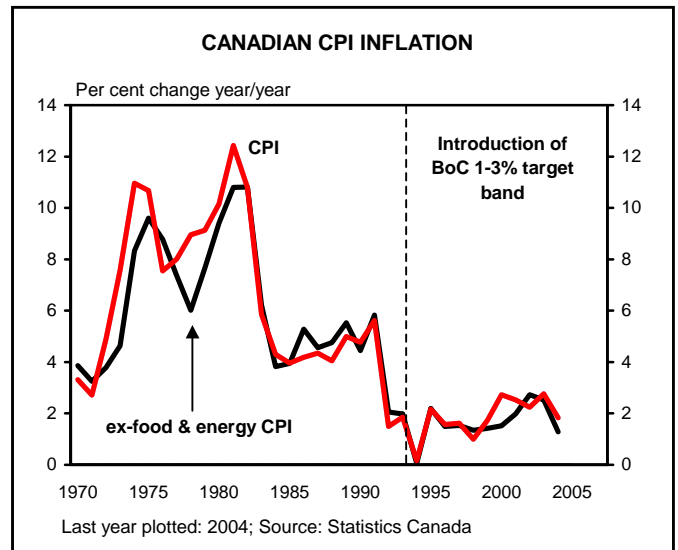
As a result, the year-over-year change in the CPI should be viewed as only a rough guide as to what is happening to the cost of living, but it remains the most practical benchmark when assessing financial returns.

Do not use the past as a guide to the future

The next issue is what constitutes the best assumption about the future rate of inflation, and a common pitfall is to use history as a guide. Although inflation has been low for more than a decade, the memory of the double-digit and high single-digit inflation in the 1970s and 1980s lingers. This situation is aggravated by the frequent use of statistics showing the average rate of inflation over the last two or three decades, which gives the misleading impression that inflation of 3 to 5 per cent might be a reasonable expectation for the years ahead.

However, due to a change in the conduct of monetary policy by the Bank of Canada, there is good reason to believe that history will not repeat itself. In the 1935 Bank Act, the central bank's objective was identified as "to mitigate by its influence fluctuations in the general level of production, trade, prices and employment...and generally to promote the economic and financial welfare of Canada." However, these myriad and sometimes conflicting objectives posed a serious challenge, which eventually led the Bank to conclude that it could best set the foundation for the achievement of these broad goals by focusing on keeping inflation low and stable. Accordingly, the Government of Canada and the Bank of Canada agreed in 1991 to introduce inflation control targets that would be renewed every five years. Since the end of 1993, the control target band has been set at 1 to 3 per cent as measured by the year-over-year change in the CPI. Operationally, however, the Bank uses a 'core' measure of the CPI that excludes eight of the most volatile items (fruit, vegetables, gasoline, fuel oil, natural gas, mortgage interest, transportation, tobacco products) and indirect taxes, as this provides a more stable reference of inflation.

The inflation targeting regime has been extremely successful. Since the introduction of the 1 to 3 per cent target band, with 2 per cent being the midpoint, inflation has



averaged 1.85 per cent, with the result that the Bank has built up considerable credibility as an inflation fighter. This has led inflation expectations to become firmly rooted at around 2 per cent, which is highly advantageous, as it becomes a partially self-fulfilling prophecy. If businesses and individuals only expect 2 per cent inflation, they will view any deviation as temporary and will not alter their pricing behaviour or wage demands, which could otherwise lead to a vicious inflationary spiral. Furthermore, the Bank of Canada's credibility and ability at keeping inflation under wraps has been helped by the fact that most major industrialized countries' central banks have also established sustained low inflation environments.

Best assumption is for inflation to average 2 per cent

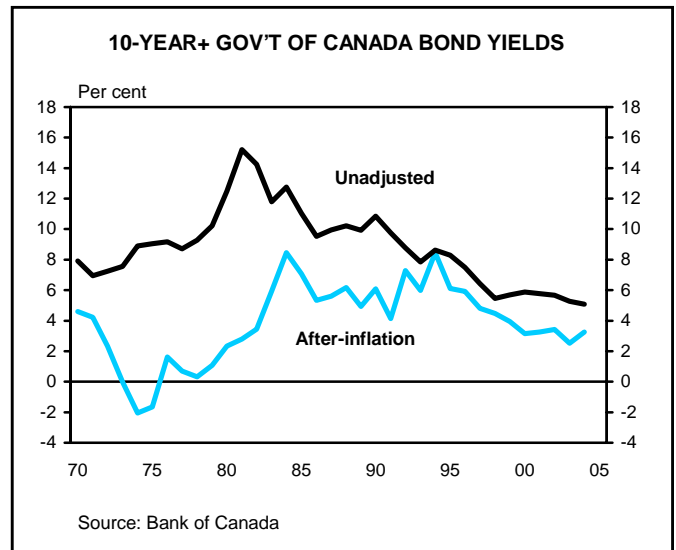
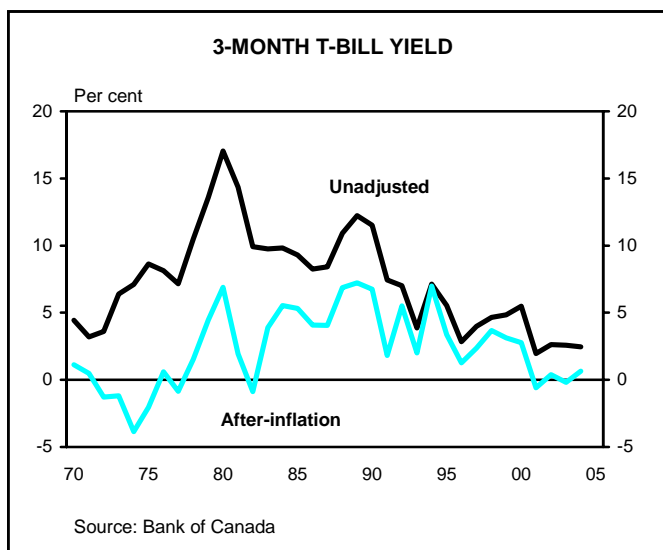
Looking ahead, there is every reason to believe that the Bank will keep inflation at close to 2 per cent. In other words, inflation will fluctuate, but with core inflation remaining within the 1 to 3 per cent band. Price shocks coming from the eight volatile items and changes to indirect taxes could lift or lower overall CPI inflation outside the Bank's target band, but only temporarily.

The current inflation target is scheduled to expire in 2006 and there is likely to be a healthy debate at that time about the appropriateness of the existing target band, but the odds greatly favour it being renewed. Thus, the best assumption is that inflation will float in a 1 to 3 per cent range in the short term and will average 2 per cent over the medium to long term.

Yields to remain historically low

The inflation outlook has a number of investment implications. It suggests that the unadjusted return on fixed income instruments will remain low by historical standards in the years ahead. Included in the yield on money market investments (like T-bills and GICs) and bonds is a premium for the expected rate of inflation over the lifetime of the assets to compensate for the future loss of purchasing power. And, since inflation fluctuates, an additional premium is required for the uncertainty about the future path of inflation. However, as inflation has trended lower and become less volatile over the past two decades, so too have the inflation premiums. The drop in inflation from an average of 6.5 per cent in the 1980s to 1.8 per cent in the mid-to-late 1990s and the corresponding decline in the volatility of inflation explain the majority of the retreat in the yield on 3-month T-bills from an average of 11 per cent in the 1980s to 4.4 per cent in the second half of the 1990s. The retreat in inflation premiums also accounts for the bulk of the decline in yields on long-term (*i.e.* 10-years or more) federal government bonds from almost 12 per cent in the 1980s to below 6 per cent in the late 1990s.

Although this decline in yields has reduced the interest income from bonds over the past two decades, the drop in yields also corresponded to a significant increase in the prices of bonds, creating considerable capital gains for holders of fixed-income products that were issued when inflation expectations were higher. And, the declining interest payments on federal government debt increased demand for alternative fixed-income products offering rela-



tively higher cash flows, reducing the interest premium provided by provincial, municipal and corporate debt relative to their federal government counterparts. These trends created a powerful bull market over the last decade that produced double-digit and high-single digit returns on bonds in the 1980s and 1990s. However, the adjustment to the lower inflation environment is now over, limiting the prospects for inflation-driven capital gains going forward.

This is not to say that yields will remain stable. Fixed-income markets will respond to changes in monetary policy, and it can be argued that the pursuit of the low and stable inflation environment will force the Bank of Canada to make frequent adjustments to its overnight rate. The supply of government and corporate bonds will also continue to impact yields, as will developments in the credit-worthiness of issuers. Moreover, inflation is likely to cycle between 1 and 3 per cent, which will lead to alterations in the inflation premium demanded by investors. For example, there will be times when investors may worry about disinflationary pressures (such as in 2001) and times when investors will speculate that the Bank could make a policy error allowing inflation to rise above the target band – but, these concerns will prove temporary and will only add to the short-term volatility in yields.

Subdued inflation is a constraint on profits growth

The low inflation environment will also constrain corporate profits growth, which, in turn, will affect equity prices. To illustrate, real GDP measures the increase in the volume of economic activity. When inflation is added, nominal GDP is an estimate of national income, which is

divided between the various levels of government, individuals and corporations – with the bulk of the latter representing profits. Over time, corporate profits will fluctuate, but there is no reason for them to rise steadily as a share of national income over the long term. In other words, profits are constrained by nominal GDP growth, which will be slower in a low inflation environment.

It is after-inflation returns that matter

At this point, some readers may have the impression that low inflation is undesirable, as it hampers returns from both fixed-income and equity markets. But, lower unadjusted returns are not the relevant benchmark. It is after-inflation returns that matter. To illustrate, investors should be indifferent between an investment paying 6 per cent when inflation is 4 per cent and an investment paying 4 per cent when inflation is 2 per cent, as the after-inflation return of 2 per cent is the same.

However, the sustained low inflation environment may indeed constrain after-inflation returns due to the reduction in the premium required to compensate investors for the volatility in inflation. Remember, the inflation premium has two components: the first being compensation for the expected rate of inflation, and the second being compensation for uncertainty over swings in inflation. The lower inflation environment will reduce the first premium and leave real returns unchanged. However, a reduction in the second premium may lower after-inflation returns because investment returns are a reflection of risk and the risk is lower in a more stable price environment.

As a partial offset, there is a tax advantage to the low

CANADIAN INTEREST RATES					
	Neutral Real Rate (%)	BoC Inflation Target (%)	Neutral Nominal Rate (%)	Current Nominal Rate*	Implied Change (ppts^)
Bank of Canada Overnight Rate	2.75	2.0	4.75	2.50	2.25
3-month T-bill	2.60	2.0	4.60	2.44	2.16
2-yr Govt. Bond	3.25	2.0	5.25	2.95	2.30
10-yr Govt. Bond	4.00	2.0	6.00	4.24	1.76

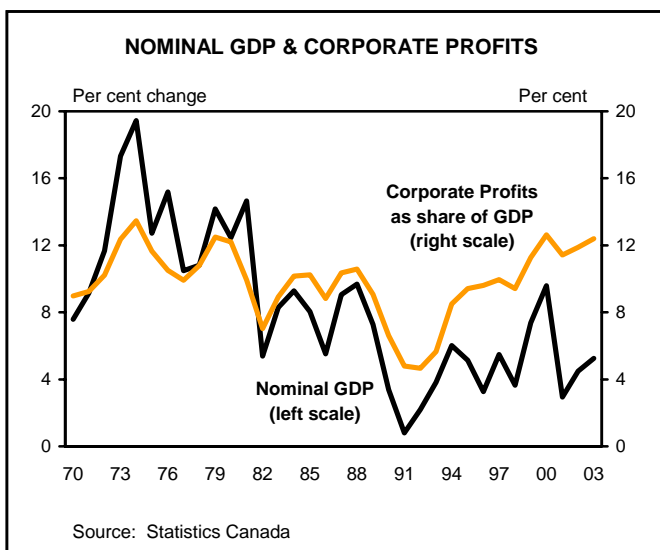
* as at February 18, 2005; ^ percentage points

inflation environment. Since taxes are paid on the unadjusted income and capital gains, the same after-inflation return will produce lower tax payments at the same tax bracket when inflation is more subdued.

However, while after-inflation returns may be modestly lower, a case can be made that investors are still better off with a low and stable inflation, as it reduces the uncertainty about the future purchasing power of investment income. And, the economy is clearly better off in a subdued inflation environment. Indeed, the economy is deeply and adversely affected when inflation is high and volatile, as it leads to the mispricing of real and financial assets and creates extreme volatility in interest rates. This is precisely what happened in the 1970s and 1980s and it is what many emerging markets struggle with today. By creating a sustained subdued inflation backdrop, the Bank of Canada has engineered a low interest rate environment that helps to foster economic growth and engenders greater prosperity, all of which makes for a superior investment climate.

Asset allocation implications

The inflation outlook also has asset allocation implications. First, over the next decade, the subdued inflation outlook sets the stage for short-term cash investments, like 3-month T-bills, to average an annual return of roughly 4.60 per cent, or 2.60 per cent after inflation. This is higher than today, as current rates are abnormally low due to a very stimulative stance of monetary policy. At some point, the Bank of Canada will have to rebalance policy, raising the overnight rate to a more neutral stance, which we estimate is around 4.75 per cent. Regardless, the expected 2.60 per cent after-inflation return suggests that, while cash may play an important role in portfolios as a means of



protecting the value of savings, it will provide only meagre wealth creation.

Second, bonds will provide higher interest income than cash investments, with a diversified basket of bonds expected to yield an annual average of 5.75 per cent over the next decade, or 3.75 per cent after inflation. Again, this yield is higher than today, reflecting expectations for a future increase in interest rates in response to a rebalancing of monetary policy. However, the after-inflation return on bonds will be lower than in past decades because the premium for inflation volatility will be lower and the capital gains created by the adjustment to a low inflation environment will not be replicated. Nevertheless, bonds will return more than cash, and the compound gain from that higher return suggests that bonds should be included in most well diversified portfolios.

Third, Canadian equities are expected to deliver an annual average return of 7.75 per cent, or 5.75 per cent after inflation, over the next decade. Again, the after-inflation return is lower than in the past, partly due to slower corporate profits growth and the lower risk of lost purchasing power from the volatility in inflation. Nevertheless, the return is significantly higher than cash or bonds. Furthermore, outside of tax sheltered plans, equities benefit from a more favourable tax treatment than fixed income investments. As a result of their superior after-inflation, after-tax performance, equities may make sense for most portfolios, with the amount of the exposure dependant upon an individual investor's risk tolerance and investment time horizon.

PORTFOLIO EXPECTED RETURNS						
Portfolio	Asset % share of portfolio					Rate of Return (%)
	Cash	Income	Cdn. Equity	U.S. Equity	Int'l Equity	
Income	20	50	9	12	9	6.3
Income & Moderate Growth	10	45	12	19	14	6.8
Balanced Growth	5	35	15	26	19	7.2
Aggressive Growth	0	20	19	35	26	7.8
Maximum Equity Growth	0	0	22	44	34	8.3

Source: TD Economics, TD Waterhouse Financial Planning

AVERAGE ANNUAL HISTORICAL & FORECAST RETURNS			
	Unadjusted Returns* (Per cent)		
	Cash	Bonds	Equities
1970-79	7.28	n.a.	12.09
1980-89	11.00	13.49	13.09
1990-99	5.89	10.39	11.61
2000-04	3.02	8.11	4.72
2005-2015f	4.60	5.75	7.75
	After-inflation Returns* (Per cent)		
	Cash	Bonds	Equities
1970-79	-0.10	n.a.	4.71
1980-89	4.49	6.98	6.58
1990-99	3.69	8.19	9.41
2000-04	0.60	5.69	2.30
2005-2015f	2.60	3.75	5.75

* Cash is 3-mth T-bills, Bonds is SCM Bond Index
Equities is the total return on S&P/TSX
f: forecast by TD Economics
Source: Global Insight, TD Economics

Even low inflation will erode purchasing power

Finally, it should be stressed that while the future increase in overall consumer prices will remain modest, the impact of inflation still needs to be considered when building financial plans and forming expectations for financial returns. Based on the above financial forecasts, we believe that a well-diversified portfolio including cash, bonds and equities should deliver a total unadjusted return of 6 to 8 per cent over the next decade. On average, inflation will reduce the purchasing power of that return by 2 percentage points, with the implication that approximately one-quarter to one-third of the purchasing power of the portfolio returns will be offset by the future rise in consumer prices. Lastly, while the CPI is the benchmark for judging inflation adjusted returns, individuals may want to make allowances for higher or lower inflation than 2 per cent when building their financial plans, as the composition of their outlays may differ from the CPI index.

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