



TD Economics

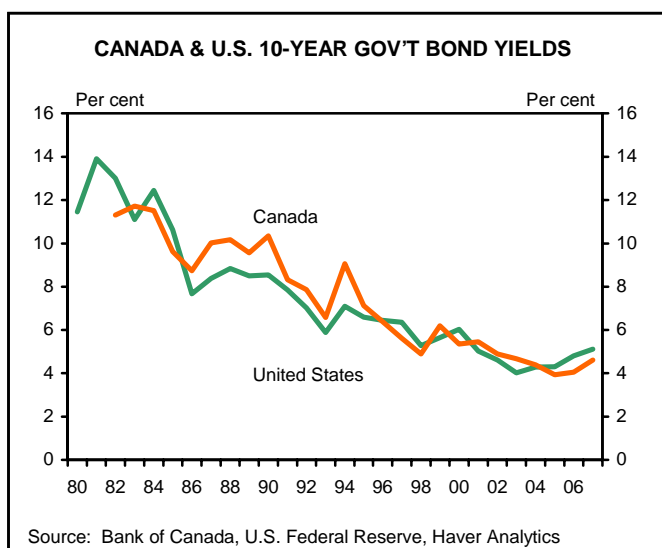
Special Report

June 21, 2007

THE SHAPE OF YIELDS TO COME: AN OUTLOOK FOR U.S. AND CANADIAN INTEREST RATES TO 2020

A dominant financial theme over the past three decades has been the secular decline in interest rates across the industrial world, including in Canada. This downward trend has made forecasting the long-term prospects for money market rates and bond yields challenging. One must identify which factors contributing to the decline are structural and which are cyclical or transitory. It is also necessary to speculate about what new forces might come into play shaping yields in the years ahead.

In the sections that follow, we review the various explanations for the prevailing low interest rate environment and outline three alternative approaches to projecting the average level of yields out to 2020. The primary focus is the outlook for Canadian yields, but the analysis has a major international dimension because Canadian fixed income products trade in the context of a global market, which is dominated by developments in U.S. Treasuries.



HIGHLIGHTS

- **Interest rates will fluctuate over business cycles and in response to changing inflation risks, but the low and relatively stable rate environment will persist in the U.S. and Canada over the long haul.**
- **Aging populations point to a gradual decline in the neutral level of the interest rates in the decades ahead.**
- **From 2007 to 2020, the average level of U.S. short-term rates is expected to be 3.4% to 4.1%, while 10-year Treasuries are projected to average between 3.7% to 5.4%, with both having a bias towards the bottom half of the range over the next 10-15 years.**
- **Canada's superior fiscal outlook and the likelihood of weaker global demand for U.S. dollars and U.S. Treasuries suggest Canadian fixed income markets will outperform. As a result, Canada will lose its traditional country risk premium and modest negative Canada-U.S. interest rate spreads will be the norm.**
- **U.S. and Canadian yield curves will, on average, be positively sloped (i.e. normal), but very flat. Canadian fixed income outperformance could lead to a flatter curve than in the U.S.**
- **Volatility in long-term bond yields will prove limited, with the result that changes in the yield curve will be dominated by adjustments to monetary policy and movements in short-term rates.**

The central conclusions for Canada and the U.S. are that the low and stable interest environment is likely to persist, with nominal yields averaging roughly in a range of 3.4% to 5.4%. There is a bias towards the lower half of the range over time, as demographic factors reduce the neutral level of interest rates in both countries between today and 2020. Yield curves will average a normal upward slope, but with relatively tight spreads between short-term and long-term rates. While Canadian interest rates will be heavily influenced by the path of U.S. yields, the superior Canadian fiscal outlook and the possibility of weaker global demand for U.S. dollars and U.S. Treasuries suggest that the Canadian fixed income market can outperform. Negative Canada-U.S. interest rate spreads should be the norm and Canada is likely have a flatter yield curve than the United States.

Structural decline in interest rates

One of the most dramatic and well known financial trends in recent decades has been a remarkable decline in interest rates. From an annual average peak of 15.52% in 1981, the yield on the long-term Government of Canada bond benchmark tracked by the Bank of Canada fell to 4.02% in 2005. The U.S. experience has been similar, with the yield on 10-year Treasuries dropping from an average of 13.91% to below 4% in 2003. In fact, the decline in long-term interest rates has been experienced across the entire industrialized world, but to differing degrees and at differing rates. The natural question is what has driven this protracted trend?

The experience of the 80s and 90s

Much of the retreat in yields experienced in the 1980s

Key determinants of interest rates

It is worth reviewing the key determinants of long-term interest rates. At the short-end of the yield curve, money market rates are anchored by central bank benchmark short-term rates – the overnight rate in Canada and the fed funds rate in the United States. Over any significant time horizon, one would expect monetary policy to be set, on average, at a neutral stance. The neutral level of rates is one that neither adds stimulus to the economy, nor applies the brakes, and is consistent with economic growth at its long-term trend potential pace. However, the neutral level is not constant.

Nominal short-term rates are influenced by inflation, while the underlying short-term real (after-inflation) rates are a product of a variety of economic factors. From a theoretical point of view, the fundamental level of real rates is determined by the balance between desired savings and desired investment. The savings-investment mix is influenced by marginal productivity of capital, rates of time preference, expected after-tax income, and demographic factors. Real short-term rates are also influenced by the non-inflationary long-term potential growth rate of an economy, which is positively correlated with productivity and is affected by demographics.

Moving from the short-term anchor out along the yield curve, longer-term interest rates are based on current short-term rates plus a variety of risk premia. There is a premium for **inflation risk** (the possibility that inflation will be higher in the future that will erode

purchasing power of the interest and principal of the bonds); **term risk** (the uncertainty about future interest rate changes that will impact the worth of the coupon payments of the bonds); **liquidity risk** (the risk of difficulty selling the fixed income product in the future); and **credit risk** (the risk of default).

When short-term rates are at their neutral level, the various risk premia traditionally result in rising yields on longer term instruments, with the result of a positively, or 'normal', sloped yield curve. However, during periods when monetary policy is particularly restrictive, there can be occurrences of inverted yield curves when short-term rates are higher than long-term rates.

The volatility in long-term rates is associated with alterations in monetary policy, changing market expectations and fluctuating assessments of the various risks. It is worth noting that if capital was perfectly mobile, the equilibrium interest rates would be set in global markets at a world level varying by term. In practice, capital mobility is not perfect and differences in national interest rates do occur. For example, national interest rates can differ significantly if financial markets expect changes in real exchange rates, which will impact the returns that investors receive. Portfolio preferences of various investors can also have an impact by influencing the required various risk premia in national markets. Fiscal balances can influence the presence of a national risk premia, with large deficits lifting term, default and inflation premia.

and 1990s was simply the product of lower inflation, which fell from a double digit rate at the start of the 1980s to an average of 2.5% in the U.S. and an average of 2% in Canada since the mid-90s. This reflected the successful efforts by monetary authorities to reduce inflation and anchor inflation expectations at sustained low levels.

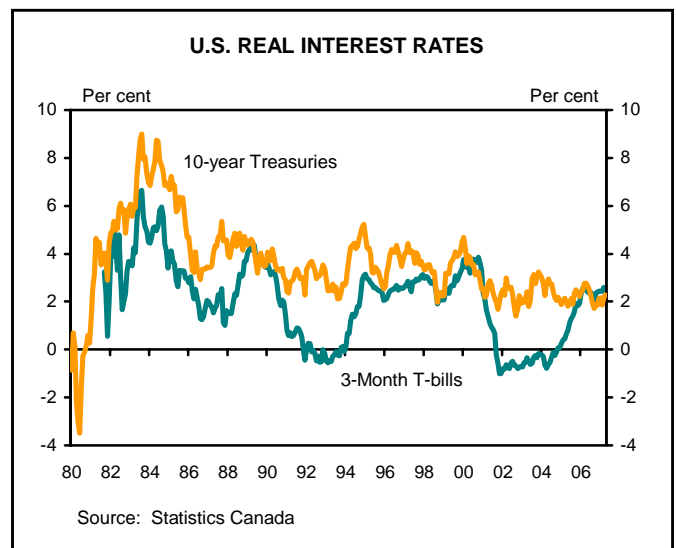
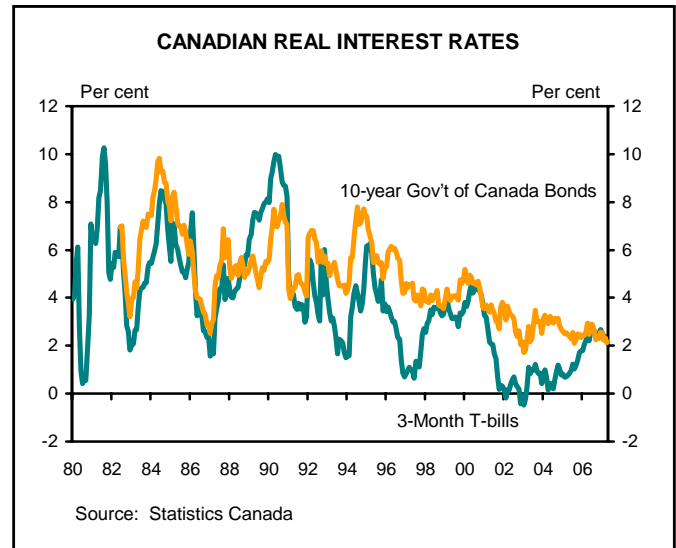
However, there is more to the story than just slowing inflation, as there has been a steady decline in real (after-inflation) interest rates as well. Real long-term U.S. yields – 10-year bonds yields less inflation based on the year-over-year change in the core CPI – went from 8.4% in mid-1984 to an average of 3.3% in the final two years of the 1990s. The real long-term benchmark Canadian bond yield dropped from 8.5% in 1984 to 4.2% in 1999.

Several factors appear to have contributed to the dramatic decline in real long-term rates. First, as shown in the accompanying charts, there was a secular drop in real short-term rates. Similar to the inflation experience, the efforts and increasing credibility of the central banks (including their improved transparency) were the main catalyst for the change in real short-term rates.

The second factor pushing long-term rates lower was a decline in the various risk premia required by investors. Fixed income markets experienced a virtuous circle. The inflation premium fell as markets became confident that the days of high and volatile inflation were in the past. This led to lower and more subdued movements in short-term rates, which also curtailed the term risk premium. As this led to lower and less volatile bond yields, the greater stability of fixed income markets in general contributed to the declining path in yields. The disinflationary trend and the greater stability in interest rates resulted in a more subdued and stable pace of nominal GDP growth. Since nominal GDP is ultimately the source of income from which interest is paid, the trend also contributed to the declining level of interest rates. The lower volatility in economic growth and income also helped to constrain the swings in interest rates that, in turn, tempered risk premia.

Federal governments in both the U.S. and Canada also started to run significant budget surpluses in the second half of the 1990s and experienced declining debt (as a percentage share of GDP and in absolute terms), which added to the attraction of their bonds and helped to lower yields.

It is difficult to empirically observe the decline in the risk premia. Over the 1990s, the spread between real long-term rates and real short-term rates narrowed. However,



the difference in real yields soared in the early part of this decade, but this was due to the aggressive easing in monetary policy following the tech wreck and equity correction at the start of this decade. In other words, the reason the spread increased was due to market expectations that the abnormal low levels of short-term rates would not be sustained indefinitely. The difference in yields then narrowed dramatically when the central banks normalized monetary policy.

For an alternative approach to illustrating the decline in the risk premia, we can subtract an implicit assumption about the ‘neutral’ (i.e. long-term equilibrium level) of short-term rates from the real long-term bond yields. In recent years, many economic papers and analysis (including the Taylor rule for the conduct of monetary policy) have assumed a neutral real fed funds rate of 2%. In the accom-

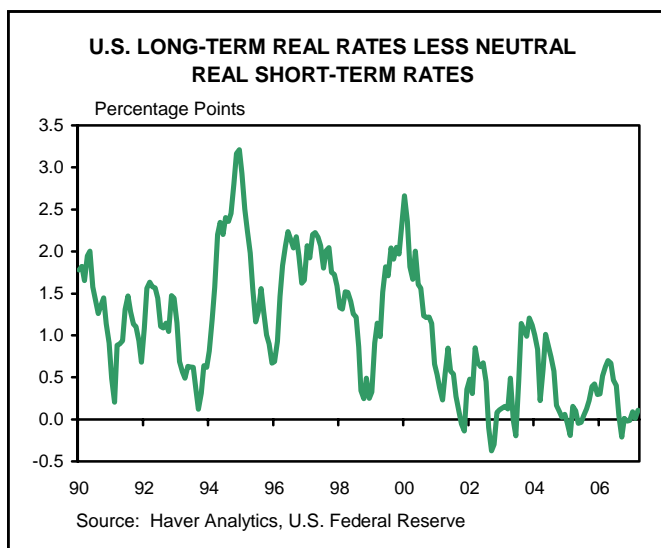
panying chart, we show the extent to which U.S. long-term real bond yields have trended lower relative to this 2% neutral level of real short rates.

Even lower rates in the 2Ks

Interest rates continued to decline in the U.S. and Canada in the early part of the decade. However, a case could be made that the adjustment to the low and stable inflation environment should have been complete by the end of the 1990s. If one looks at the spread between yields on nominal bonds and real return bonds, it is evident that financial market inflation expectations had become well anchored by the end of the last decade. Nevertheless, real interest rates dropped further due to the influence of a number of factors.

Short-term rates fell in the wake of the 2001 tech bubble collapse and a mild U.S. recession. In fact, the central banks were particularly aggressive in easing monetary policy, with the Fed funds rate being lowered to a mere 1.00% and the Bank of Canada overnight rate being reduced to a less extreme 2.25%. However, these cyclically low cash rates were eventually reversed, with fed funds moving to a slightly restrictive 5.25% and the overnight rate returning to 4.25%.

The real surprise was the ability of long-term bond yields to stay low even when the central banks tightened monetary policy, which is often remarked upon as “Greenspan’s conundrum”. While the Fed was hiking short-term rates from a low of 1.00% in May 2004 to 5.25% in June 2006, the yield on 10-year Treasuries only climbed from 4.66% to 5.15%. In other words, short-term rates increased 425



Key Factors Contributing To Low Bond Yields

1. Lower inflation reduced nominal interest rates across the yield curve
2. More stable inflation and economic growth reduced inflation and term risk premia
3. Supply and demand factors created downward pressure on yields. Factors included:
 - Global savings glut
 - Oil shock
 - Demographics and pension demand
 - Corporate saving

basis points, but long-term rates nudged upwards by a mere 49 basis points. In the second half of 2006 and early 2007, 10-year yields gave up their prior increase, falling to 4.56% in February, but then returned to 5.11% in mid-June 2007. At the moment, fixed income markets are fixated on the latest rise in yields, but the reality is that the level of long-term interest rates is still consistent with the ‘conundrum’.

A host of explanations have been offered for the lack of response in bond yields. The most obvious is that during a time of slower economic growth, fixed income markets simply anticipated that inflation would eventually diminish and this would lead to lower short-term rates in the future. However, the cyclical explanation cannot fully explain the failure of tighter monetary policy to boost yields on long duration bonds. This has led to a number of other theories, with the most popular being the presence of a major global savings imbalance.

Global savings glut

At the most basic level, interest rates are the price of borrowing from savings to make investment. In other words, interest rates equilibrate desired savings with desired investment. In recent years, the pool of global savings has exceeded the desired amount of investment, which has put downward pressure on interest rates around the globe.

Within the industrial world there has been an increase in corporate saving due to rising profitability that reflected the shift to global production and greater access to new low cost labour centres. However, this was more than offset by reduced household saving and – outside of Canada

– significant government deficits. At the same time, with slowly growing workforces and high capital-labour ratios, many industrial countries recorded modest growth in investment, particularly for business capital outlays. The net effect was that even with meagre gains in investment, the constrained savings led to the development of current account deficits in many industrialized countries, particularly the United States and to a lesser extent France, Italy, Spain, Australia, and the UK. Japan and Germany were key exceptions, which in the case of the former is the product of Japan's high savings rate and in the case of the latter has reflected the weak state of the German domestic economy until just recently. Canada's current account surplus also recorded an increase, but this came in the context of the commodity price boom and significant government saving, which added to corporate saving that puz-

zingly has not fuelled robust business investment.

While the industrialized world has been generally dissaving, the developing world has experienced a sharp increase in savings at a time of subdued investment. The result has been significant flows of credit from emerging market economies to the industrialized world.

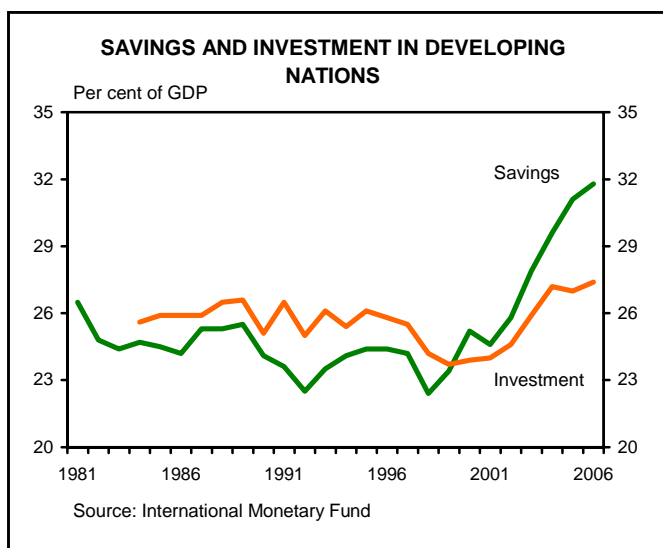
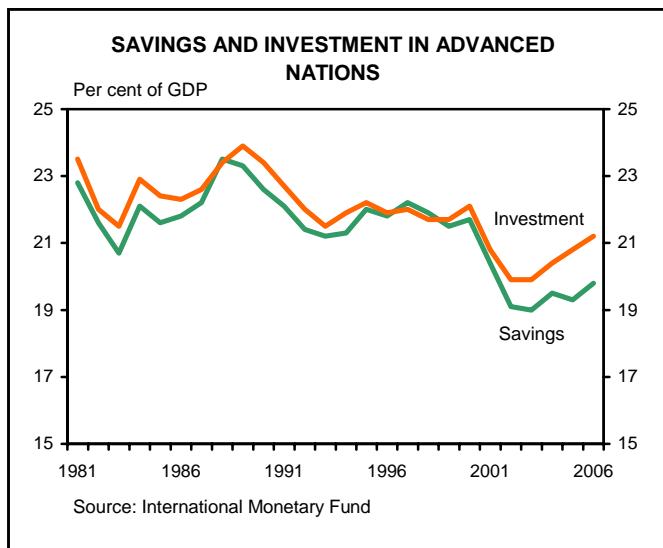
This trend may be partially the legacy of the numerous financial crises that have occurred over the past 13 years, including: Mexico in 1994, East Asia in 1997-98, Russian in 1998, Brazil in 1999, and Argentina in 2002. The financial crises tended to lower investment due to the capital overhang from the prior boom, the resulting weak corporate balance sheets, and the high levels of non-performing loans. The fallout from the financial crises also tended to create a period of protracted weakness in domestic demand that lowered investment.

The experience and lessons from these financial problems motivated many emerging countries to better manage their international capital flows, leading them to shift from being net importers of financial capital to being net exporters. This produced growing current account surpluses and the accumulation of large foreign exchange reserves. In other words, the countries became significant savers.

At the same time, more emerging market economies began to put greater weight on export-led economic growth in an effort to replicate the past successes of some newly industrialized nations. These efforts boosted foreign exchange reserves and pushed current account surpluses even higher. Moreover, there was a focus on reducing the burden of external debt by attempting to pay down those obligations, which was achieved through reduced fiscal deficits, which again contributed to current account surpluses, reduced the overall supply of debt in international markets and led to lower yields.

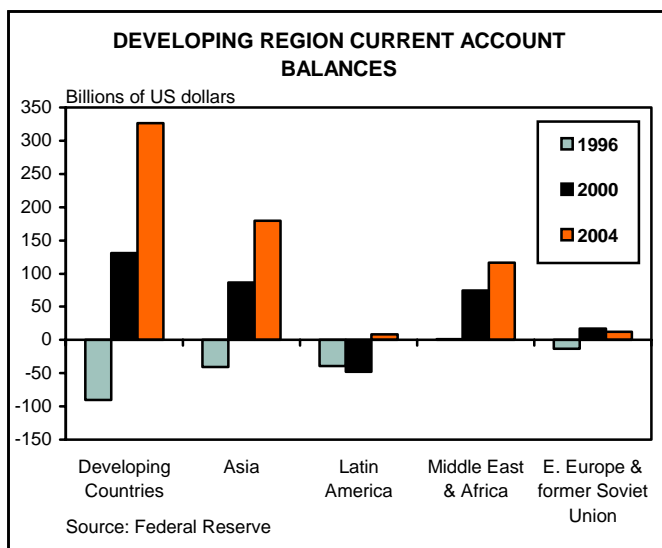
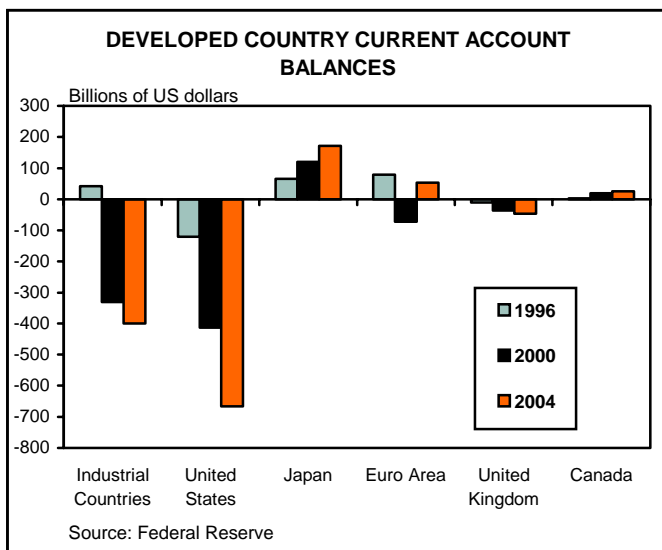
China has been a key exception to the weak investment performance by developing countries. Indeed, China has experienced explosive investment expansion. However, savings have still exceeded investment, with the result that the country has recorded a ballooning current account surplus and a dramatic increase in foreign exchange reserves. The high savings rate is partly explained by the poor social safety net and the limited access of households to credit at a time of great economic change.

The oil price spike in the early part of this decade also contributed to a sharp increase in saving among the major oil exporting countries, the majority of which are found in



the developing world. This is a traditional occurrence when there is a considerable run up in energy prices, as the oil-endowed countries often view the initial increase in prices as temporary and they are slow to deploy the funds for business investment or other purposes. The result is a sharp increase in saving, widening current account surpluses and dramatic foreign exchange reserve accumulation.

The net result of all of these trends was excessive global savings, a large part of which has flowed into bonds in the developed world, particularly in the United States, and acted to dampen global long-term interest rates even when monetary policies in many jurisdictions have been tightened. This trend has allowed the U.S. to finance its massive current account deficit and explains the dramatic accumulation of U.S. dollar foreign exchange reserves in Asia and by the OPEC nations.

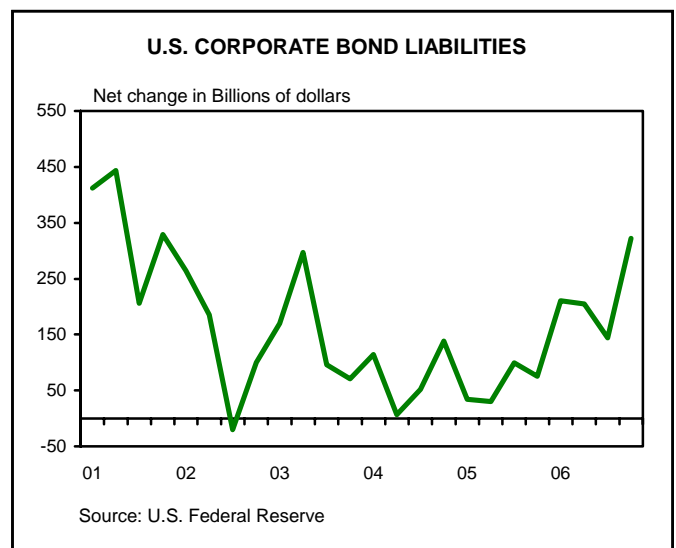


Strong pension demand for long-term debt

Another factor cited as constraining long-term interest rates is increased demand for long-term debt by pension funds. In the wake of the 2001 tech wreck, pension funds were squeezed by two forces. The equity market correction reduced the assets of many pension funds, while falling interest rates boosted the calculations of the discounted present value of the future liabilities. The resulting funding gap subsequently led some pension funds to pay more attention to the asset mix of their portfolios and there was a greater push to match the duration of assets and liabilities. This boosted demand for bonds from the pension fund sector, creating downward pressure on yields.

The impact of robust corporate balance sheets

Shifting from the demand side of the equation to the supply side, the increase in corporate saving in the industrial world may have also helped to limit the rise in long-term government bond yields. As already mentioned, corporate profits have soared since 2001. This reflected the cyclical economic recovery from the 2001 slump, but it was also the product of tapping low cost labour centres in Asia and Eastern Europe, the disinflationary impact of exports from these regions that boosted the profits of importers, and the conservative capital outlays by corporations. All of this led to a sharp improvement in corporate balance sheets from 2001 to 2005, with assets rising and liabilities being reduced. The resulting increase in corporate liquidity diminished the need to issue debt over the early years of this decade, limiting new supply to markets and likely boosting demand for government debt, despite low yields.



Where do rates go from here?

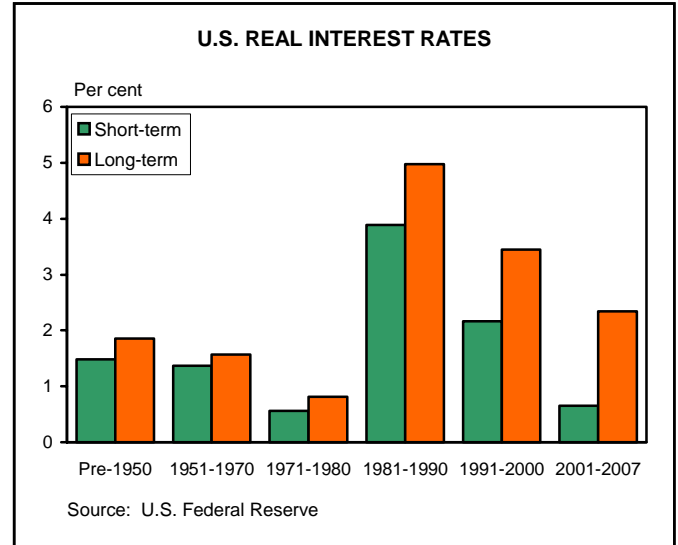
We have outlined how and why interest rates have fallen so dramatically over the past several decades. Attention will now turn to the issue of where yields are headed from here. There are a variety of approaches to tackle this question. First, one can look at history for a guide. Second, we can consider if there is a natural anchor to yields from a fundamental point of view and how that anchor might change in the future. Third, we can look at each of the major factors that have been impacting fixed income markets and consider how they might change.

History suggests low and flat yield curves are normal

Economists are generally uncomfortable with statements suggesting that ‘it is different this time around’. It is rarely a brave new world and history does have a tendency of repeating itself, although the parallels are never exactly the same. There is no question that interest rates have been on a declining path over the last three decades, but a longer time perspective suggests that the increase in rates in the 1970s and the subsequent drop in 1980s and the first half of the 1990s were the aberration.

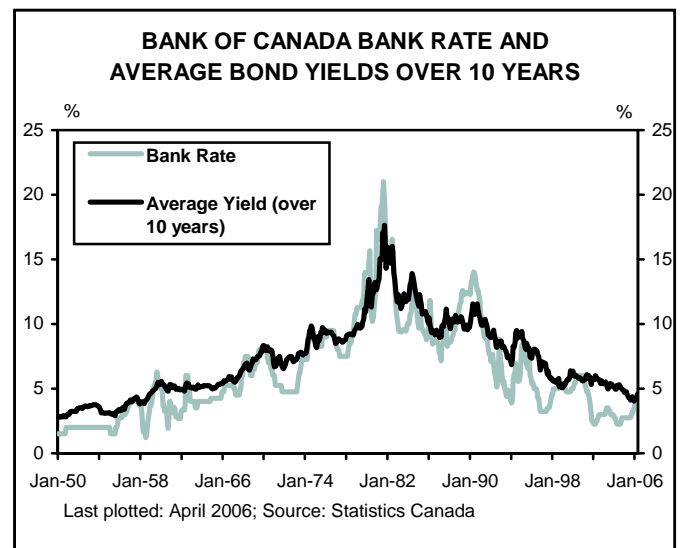
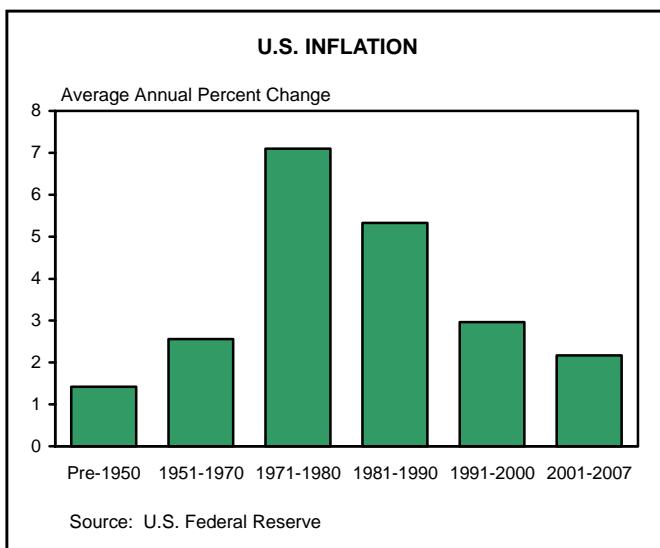
The average U.S. inflation rate from the 1850s to 1970 was roughly 2.5%, similar to the experience over the last decade. Real U.S. short-term interest rates averaged close to 1.5% and real long-term yields averaged 1.7% between 1850 and 1970, implying that nominal yields of close to 4% are not abnormal and the average level of yields corresponds to an extremely flat yield curve.

Some may be uncomfortable going back as far as the U.S. Civil War. As an alternative, one can look at the



experience during the 1950s and 1960s, a period of strong economic growth and a subdued low inflation rate that averaged 2% over the two decades. During this period, nominal U.S. short-term rates averaged 3.6% and long-term rates averaged 3.9%, resulting in real yields modestly below 2%. Again, while the slope of the yield curve fluctuated significantly over the years, the slope based on the average level of yields was remarkably flat.

We can also look at the performance of Canadian fixed income products in the 1950s and 1960s, a period in Canada with subdued inflation averaging roughly 2.5% and with comparative fiscal stability. During this timespan, the Bank Rate averaged 3.71%, while nominal yields for bonds of 10-years and longer duration averaged 4.67%. Removing the trend rate of inflation, the real level of yields was a mere 121 basis points for cash and 2.17% for long bonds.



All of this implies that the recent level of interest rates is far from unique and a historical case could be made that yields could trend lower.

The period of low and stable inflation expectations

An alternative approach is to look at the experience since inflation expectations became well anchored in the mid-1990s. Since 1996, the average rate of U.S. inflation as measured by the CPI has been 2.6%, while core CPI has averaged 2.3%. This fits well with the commonly accepted view that the Fed's tolerance range is 2.0 to 2.5% on this measure. In Canada, headline inflation has averaged 2.0% from January 1996 until April 2007 – bang on the Bank's 2% target.

Given the success of the central banks, one might argue that interest rates over this 11-year period might also provide a guide to the future. In the United States, real short-term rates averaged 1.56% and real 10-year Treasuries averaged 2.87%, resulting in nominal yields of 4.16% and 5.47%, respectively. Canadian real 3-month T-bills averaged 1.94% and 10-year bond yields averaged 3.55%, or nominal rates of 3.94% and 5.55%.

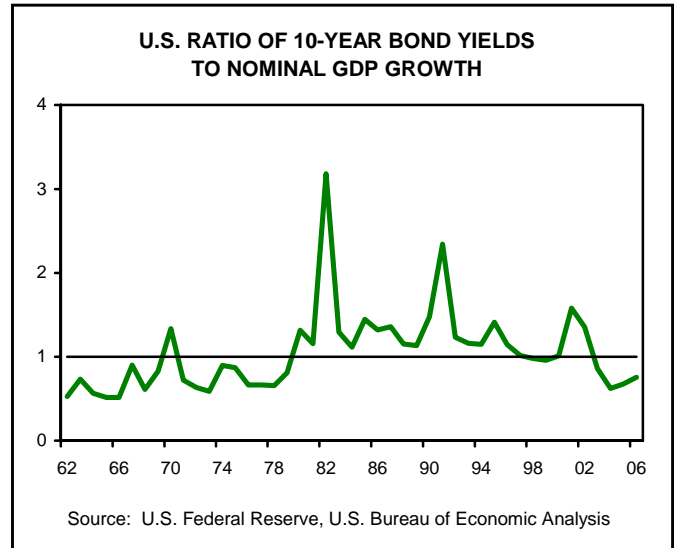
It is interesting to note that the average yields correspond to a fairly steep yield curve in both countries, but this was largely due to significant changes in short-term rates and not major swings in long-term rates – a key theme that we will return to a bit later.

Traditional anchors to interest rates

Theoretical anchors to the level of interest rates provide an alternative to using history as a guide.

At the short end of the yield curve, the 1996-2007 experience seems consistent with estimates of neutrality – a level of short-term interest rates that neither adds stimulus to the economy, nor applies the brakes. An OECD study¹ has suggested that the neutral real fed funds rate trended down to 2% in the early part of this decade from between 2% and 5% since the 1960s, while the euro-area neutral level has come down to around 1.5% to 2.0%.

Looking forward, economic theory suggests that the neutral level of rates may fall further and the impact would likely be felt across the entire yield curve. A Fed study² suggests that there is a 1:1 relationship between changes in potential real GDP growth and the neutral level of rates, which likely reflects the fact that a slower trend rate of economic growth also implies weaker demand for investment. If this relationship holds, the outlook for slowing



economic growth due to an aging population and a moderation in labour force growth implies that short-term rates could trend lower. The long-term sustainable (i.e. potential) rate of U.S. economic growth is projected to fall from the current 3.2% to 2.6% in 2020. This could lower the neutral real fed funds rate by 60 basis points from 2% to 1.4% and, assuming no change in central bank inflation tolerance level of between 2.0 and 2.5%, would lead to a nominal neutral of 3.4 to 3.9%.

TD Economics has traditionally assumed a neutral short-term rate in Canada of roughly 2.5%, or a nominal 4.5%. The 50 basis point spread over the 2% assumption of neutral U.S. real rates was a country risk premium that Canada has historically required. Looking ahead, we don't believe that this risk premium is warranted, given the country's superior fiscal position and economic fundamentals, which would lower the neutral level to 2%. Demographics suggests that the potential pace of economic growth in Canada will slow from an aging population, dropping from 2.8% to 2.2% in 2020, or 60 basis points. By this reasoning, the neutral level of Canadian real short-term rates should fall to 1.4% or a nominal level of 3.4%, assuming 2% inflation.

Moving out to the other end of the yield curve, bond yields tend to be anchored by the pace of nominal GDP growth over the long haul. This relationship is based on the fact that the growth in income in the economy is ultimately the source of demand for funds and the source of payments of interest. Although the assumption is weak in the short-term, the accompanying chart does appear to suggest that bond yields do revert towards the pace of nominal GDP growth eventually over time. If this relationship

holds, the aging of the population will likely knock 60 basis points off of nominal GDP growth in the U.S. and Canada. This would lower nominal GDP growth to 4.6% in U.S. and 4.2% in Canada – implying a similar level of long-term bond yields.

The outlook for recent forces impacting markets

The final approach to projecting the outlook for interest rates is to discuss how the factors that have recently been impacting fixed income markets might change and consider other possible factors that could come into play.

Low and stable inflation/economic growth to persist

Inflation is likely to remain low and stable in the years ahead. It is difficult to imagine that the monetary authorities are going to give up the credibility they have struggled so hard to obtain. In the case of Canada, there is a possibility that inflation might even be lowered. The Bank is currently investigating whether an inflation target of less than 2% would generate significant net economic benefits³. At this point, the Bank's intent is only to raise the issue for discussion and study. However, if the change did occur, there is every reason to believe that the Bank would be successful in meeting the lower target, which would reduce interest rates in Canada across the entire yield curve once the new lower inflation expectations become anchored.

If inflation remains subdued, market expectations that interest rates will remain low and stable are unlikely to be challenged. Similarly, the reduced volatility in economic growth should also persist. As a result, the more modest swings in interest rates associated with the period since the mid-1990s is likely to be maintained.

Unwinding of global savings to create upward pressure on yields

The same cannot be said of the global savings glut. The tide will turn at some point, but the timing is impossible to predict with any precision. The current situation makes little sense from the perspective of economic theory. With their younger and more rapidly growing workforces, the developing world should be experiencing lower savings rates. Part of the current explanation for the savings behaviour may be the limited social safety net available in many countries. However, these should be developed with time, allowing savings rates to decline. Financial system reforms and increasing access to credit in the future may also reduce the savings rates in the developing world.

At the same time, given their relatively low ratios of capital to labour, emerging markets should be able to provide greater returns to capital than those available in the developed world and this should fuel stronger investment in emerging markets.

With time, the oil exporting nations should also start to deploy a greater portion of their savings. After all, there is an implicit economic cost to the accumulation of foreign exchange reserves, since the funds could be deployed to more productive uses.

It is inevitable that some foreign exchange adjustment will eventually occur globally, which will only help to stem the rapid accumulation of foreign exchange reserves by developing countries. Meanwhile, the demographics of aging population should lead industrial countries to save more.

A number of studies have tackled the impact of the recent global savings glut on U.S. Treasuries. An OECD paper⁴ suggests that U.S. Treasury yields would increase by almost 1 percentage point if Asian capital inflows returned to more traditional levels. An NBER paper⁵ concludes that without the foreign government capital inflows over the 12 months ending in May 2005 the yield on the 10-year Treasury would have been 90 basis points higher. The U.S. yield curve between 2-year and 10-year Treasury yields would also have been 52 basis points steeper.

These results are particularly interesting since they imply that the U.S. yield curve would have been positively sloped in recent years were it not for the global savings glut.

Although Canada is unlikely to be directly affected by the unwinding of the global savings imbalance, there is still likely to be a significant indirect effect. Fundamentally, Canadian fixed income products trade as spread products off of their U.S. counterparts that have become an international benchmark. Any increase in U.S. yields due to reduced foreign demand would represent an upward shift in the level of world interest rates and that would exert some upward pressure on Canadian yields.

Impact of demographic forces are ambiguous

The outlook for the influence of demographics on fixed income markets is far more problematic and its impact is far more ambiguous.

Pension demand could depress and distort yield curve

There is every reason to expect that pension fund demand for adequately yielding debt will remain robust and

might even intensify. Pension assets will continue to accumulate and the pressure will remain to match duration of assets to that of liabilities. This could have a significant depressing impact on bond yields, particularly if there is any sudden change in the asset mix of pension funds towards fixed income. To illustrate, a Morgan Stanley report⁶ noted that under a specific set of assumptions an abrupt change in pension holdings of U.S. bonds “would temporarily reduce equity prices by 10-15% and flatten the yield curve by 75-150 basis points” while “a gradual rebalancing could temporarily reduce equity prices by 8-12% and flatten the yield curve by 35-60 basis points in the first few months following the implementation.”

There is also a good illustration from the U.K. experience over the past decade of how a sudden and significant change in pension asset holdings towards bonds can really distort a yield curve over a lengthy period of time. In the mid-90s, the U.K. government established the Minimum Funding Requirement (MFR). This was a stringent capital requirement which required that pension fund liabilities be 100% funded. If the pension fund falls below this level the deficit must be remedied within five years. In the case of falling below 90%, this deficit must be remedied within one year.

The impact of the MFR was dramatic. The U.K. government yield curve flattened sharply, with the spread between 30-year bonds and 3-month T-bills dropping from about 135 basis points in January 1997 to zero across the entire curve by September 1997. In October 1997, the yield curve started to develop a negative slope and it has remained inverted in some form ever since. At times the

inversion has exceeded 200bps across the curve, such as in 1999, and currently the inversion is around 100 basis points.

So, it is possible that strong pension demand could constrain U.S. and Canadian bond yields and, at the extreme, they might even cause periods when the yield curve is inverted, or at least times when segments are inverted.

Demand for bonds may increase from older investors

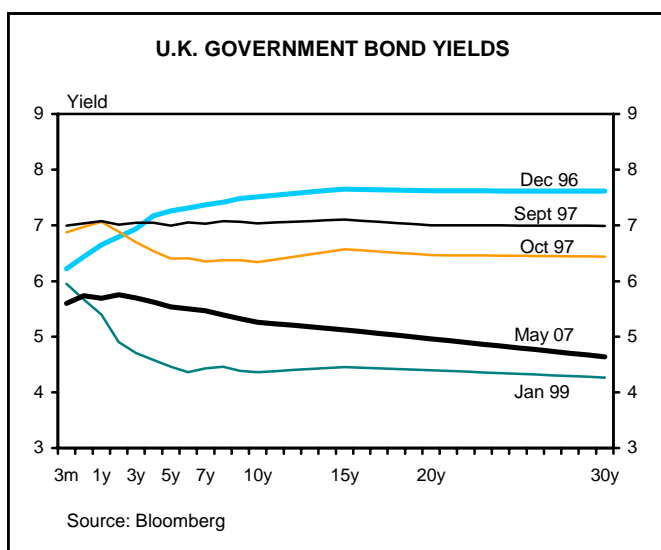
Adding to the demographic pressures of strong demand for bonds from pension funds is speculation that the older individuals across the industrial world might also shift their asset allocation in favor of bonds. This is a traditional financial planning recommendation based on the fact that older investors have less risk tolerance and greater demand for steady income flows from their investments.

Impact of demographics could prove limited

However, there are a couple of factors that might offset the downward pressure on yields from the rising demand by pension funds and investors. First, demand is affected by the level of yields. Yes, pension funds and investors could depress the returns from bonds, but at some point the attraction of fixed income products would be eroded to the point that investor demand drops.

Consider the current rate environment. If an individual bought a 10-year Government of Canada bond in late May 2007, they earned a yield of 4.30%. Assuming the combined Federal-Provincial top marginal tax rate of 46% in Ontario, the after-tax yield is only 2.32%. Taking off the Bank's inflation target of 2%, the after-tax, after-inflation return is almost zero, and might be negative after fees. The implication is that bonds are only providing capital preservation. While that may be acceptable to some older investors, it is unlikely to be appealing to the vast majority. This implies that other income yielding investments will be more attractive, such as high dividend paying stocks that receive a more favourable tax treatment and provide the added attraction of potential capital gains.

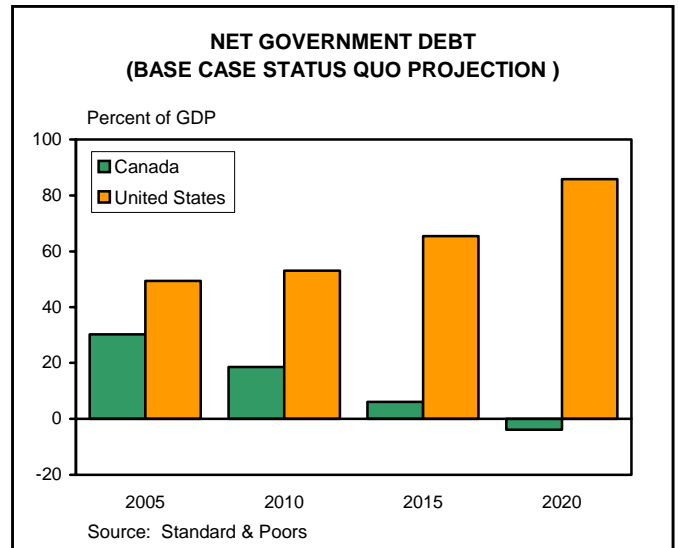
As demand for income generating financial assets increases, it is also reasonable to expect that financial markets will respond with the creation of new financial assets to meet the needs, and these products would act as substitutes to bonds. One also shouldn't underestimate the increase in investor knowledge and sophistication. Although prior generations were strong proponents of fixed income



products, like GICs, the current generation is increasingly savvy equity investors.

The tax exemption of pension funds means that they will receive a greater return than individual investors, but it may still prove inadequate. Most pension funds appear to aim for returns in the high single digits, while bonds will likely provide in the low to mid single digits. This is likely to dampen demand and, even in the current interest rate environment, we can already see this happening. According to a 2007 study by Watson Wyatt Worldwide⁷, the global pension asset allocation to bonds has fallen from 36.5% in 1996 to 31.5% in 2001 and to an estimated 25.5% in 2006. Over this time span, pension funds in the U.S. lowered their allocation from 33% to 21%, while in Canada they fell from 37% to 29%. Although the equity allocation has increased over the ten year period, the greatest shift has been an increase in the ‘other’ category, which is a reflection of the move to alternative investments that could provide a steady income stream that was significantly higher than bonds.

It is also unreasonable to expect a sudden shift in the asset allocation to bonds, as pension funds are very cognizant that this would depress yields. Any change in the asset mix is likely to occur over a multi-year period. It is interesting to note that the same Morgan Stanley report that highlighted how a dramatic change in asset mix could have a major impact on yields also stressed that, “If the reallocation and duration extension were phased over a multi-year period, the market impact of even such a large portfolio rebalancing move ... likely would be swamped by more fundamental factors, such as inflation, growth, and monetary policy. The so-called ‘technical’ factors of



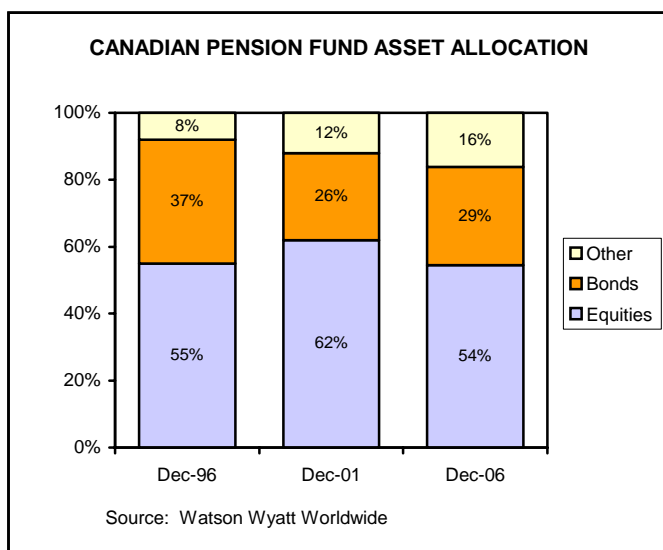
supply and demand typically magnify, but do not overwhelm, those fundamentals”⁸.

Finally, a strong case can be made that pension funds will have to lower their financial return targets in the future, since high single digit performance will likely be unattainable, but the outlook is still that bonds will provide meagre returns that fall short of the pension fund objectives.

Global bond supply may also surprise on the upside

The pension and household demand for debt is also only one side of the demographic equation. There is a general perception that given the large scale assets of pension funds, which exceed the total outstanding issuance of debt by the G10 industrialized nations, there may not be enough supply of government bonds in the future to meet demand. In the case of the Canadian fixed income market, this position has a lot of appeal. The federal government is consistently running budgetary surpluses, reducing the need to issue long-term debt at the same time that domestic pension funds have an almost insatiable appetite. And, it is worth noting that even if the pension asset allocation of bonds is falling, this could still depress yields if the absolute total demand still exceeds available supply.

However, the outlook changes when one moves from the Canadian market to the global market. There does not appear to be adequate attention to the fiscal pressures that are likely to come from the aging population across the industrialized world. In 2006, Standard & Poors released a series of reports on the impact of demographic changes and the potential implication on sovereign credit ratings⁹. The results were shocking.



In the status quo base case, where the governments meet all of their current public policy commitments on health care and social security, U.S. net debt soars from 49.2% in 2005 to 85.8 % of GDP in 2020. The U.S. general government balance deteriorates from a deficit of 3.9% of GDP in 2005 to 9% of GDP in 2020. The outcomes for Japan and Europe are far worse.

In truth, the S&P base case projections are extreme. The credit rating on U.S. Treasuries drops to BBB status by 2020. Obviously, the U.S. government would not allow this to occur. Benefits would be scaled back, taxes would be increased, or other government expenditures would be reduced. However, all of these solutions are extremely painful. This leads to the conclusion that while something will give, the odds still favour a significant increase in government deficits and government debt issuance.

Just to give a flavour of the impact that could occur, a U.S. Federal Reserve report by Thomas Laubach estimates that a 1 percentage point increase in the deficit-to-GDP ratio raises long-term interest rates by 25 basis point¹⁰. The implication is that a significant fiscal deterioration could boost long-term yields by more than a full percentage point and if governments in the U.S., Europe and Japan were all in the same boat, the impact would be to lift the world level of long-term interest rates.

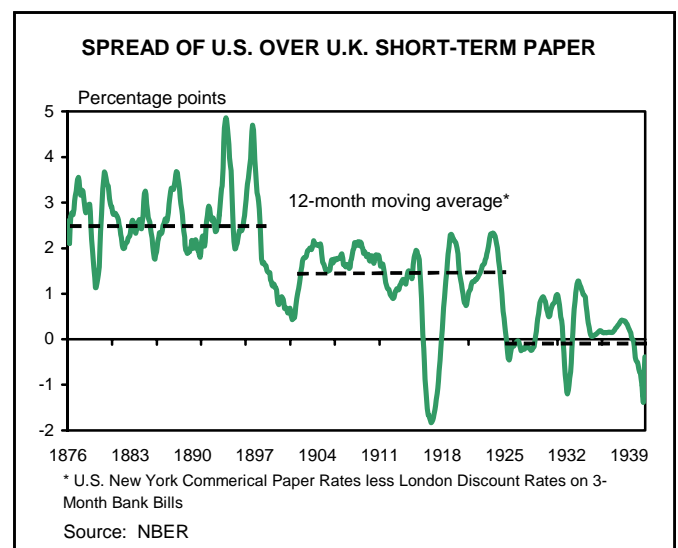
This also raises a fundamental question about the outlook to inflation and the conduct of monetary policy. In an earlier section, we stressed that the monetary authorities are unlikely to give up their credibility as inflation fighters. However, their resolve could be tested. Governments with excessive spending can elect to reduce the cost of financing their fiscal burden by allowing a higher rate of inflation. In our opinion, the risk of this happening is low. The central banks in the industrialized world have a considerable amount of independence and they all recognize that the best policy objective they can pursue is price stability, which was the primary lesson learnt during the 1970s and 1980s experience. Nevertheless, one needs to acknowledge the risks that fiscal pressures could challenge the maintenance of the prevailing low inflation period.

It is interesting to note that Canada does remarkably well under the S&P base case projection. The Canadian general government balance remains at a 2% of GDP surplus to 2020 and net general government debt drops from 30.2% of GDP to -3.9% by 2020. This reflects the fully funded state of the Canadian Pension Plan and the solid

condition of federal and provincial fiscal balances that are expected to cope with the future health care expenses. The implication is that Canadian pension fund demand for bonds may significantly exceed government supply, which, all else equal, would likely depress yields going forward.

However, everything else is not equal. Canadian fixed income markets would be impacted by any rise in world interest rates. It is also possible that there would be a supply response by corporations and foreign issuers. In the case of the former, debt financing could become more attractive to business. In the case of the latter, more foreign debt issuers could tap the Canadian market directly. In other words, the Maple bond market in Canada might experience dramatic growth. Finally, if Canadian yields were depressed significantly relative to foreign yields, Canadian pension funds could elect to buy foreign bonds and hedge the currency risk. In other words, global supply and global yields could reduce, or fully offset, the excess demand for Canadian government bonds.

One final consideration is a specific risk to the U.S. treasury market. U.S. bonds have benefited from the status of the U.S. dollar as a reserve currency. However, on a projection of interest rates going out to 2020, one might wonder if the days of U.S. dollar dominance might recede to some extent. As illustrated in the accompanying chart, U.S. interest rates did fall significantly relative to U.K. rates as America surpassed the economic influence of the British Empire in the early part of the last century. Over the next two decades, it does not seem unreasonable that the economic might of the United States might be increasingly challenged by Asia or Europe, which would put up-



ward pressure on Treasury yields as global funds shifted to alternative reserve currencies.

Low and stable interest rate environment likely to stay

So, what conclusions can be reached about the long-term outlook for interest rates?

Based on historical experience and outlook for the traditional anchors to interest rates, our assessment is that the average level of real short-term rates in the U.S. should be in a range of 1.4% to 1.6% over the period of 2007 to 2020. 10-year Treasuries are expected to average real yields of 1.7% to 2.9%. In nominal terms, assuming the Fed remains comfortable with CPI inflation in a range of 2.0% to 2.5%, the average level of nominal cash rates would be 3.4% to 4.1%, while long-term rates would be 3.7% to 5.4%.

Many of the recent factors supporting the sustained low and stable U.S. interest rate environment are structural, but some will abate. The most likely scenario is that inflation will remain at a low single digit pace, but the level of yields will be impacted by any change in the Fed's inflation tolerance levels. At the moment, there are no signs that the Fed will alter their implicit inflation objectives, but the Fed could entertain a lower or higher path for inflation in the future.

An aging population, increased pension demand for long-term debt and greater savings as well as demand for fixed income products from older investors could all create some downward pressure on yields. However, there will be an offset from an eventual unwinding of the global saving glut and a waning of the petrodollar capital flows from the current oil shock, which would tend to raise yields. Corporations are also unlikely to remain net savers. The fiscal cost associated with health care and social security commitments may also raise federal debt issuance and yields, while a declining importance of the U.S. dollar as a reserve currency could also lift the long-term equilibrium level of long-term interest rates. As a result, the net effect of the factors are ambiguous.

In Canada, history and traditional anchors point to real short-term rates of 1.4% to 1.9% and real long-term rates of 2.2% to 3.6%. With a 2% inflation target, nominal rates would be 3.4% to 3.9% at the short end of the yield curve, and 4.2% to 5.6% at the long end. These outcomes are not materially different than those for the U.S., but the outlook for many of the recent factors impacting yields

OUTLOOK FOR U.S. AND CANADIAN INTEREST RATES: 2007-2020				
Historical Real Interest Rates				
	U.S.		Canada	
	Short Term	Long Term	Short Term	Long Term
1850s-1970	1.5	1.7	--	--
1950s-1960s	1.6	1.9	1.2	2.2
1996-current	1.6	2.9	1.9	3.6

Central Bank Inflation Tolerance Levels		
	U.S.	Canada
Yr/Yr % Change in CPI	2.0-2.5	2.0

Implied Nominal Rates				
	U.S.		Canada	
	Short Term	Long Term	Short Term	Long Term
Historical Real + Inflation	3.5-4.1	3.7-5.4	2.2-3.9	3.3-5.6

Neutral Real Short-term rates			
	U.S.		Canada
	Short Term	Long Term	Short Term
Nominal Assumption	4.5		4.5
Implied Real Assumption	2.0		2.5
Ex. Canada country risk premium	--		-0.5
Less impact of aging pop	-0.6		-0.6
Real Short-term rates 2020	1.4		1.4
Nominal Short-term rates 2020	3.4-3.9		3.4

Long-term Nominal Bond Yields Anchored by Nominal GDP			
	U.S.		Canada
	Long Term	Long Term	Long Term
Expected trend rate 2020	4.6		4.2
Implied real long-term rates	2.6-2.1		2.2

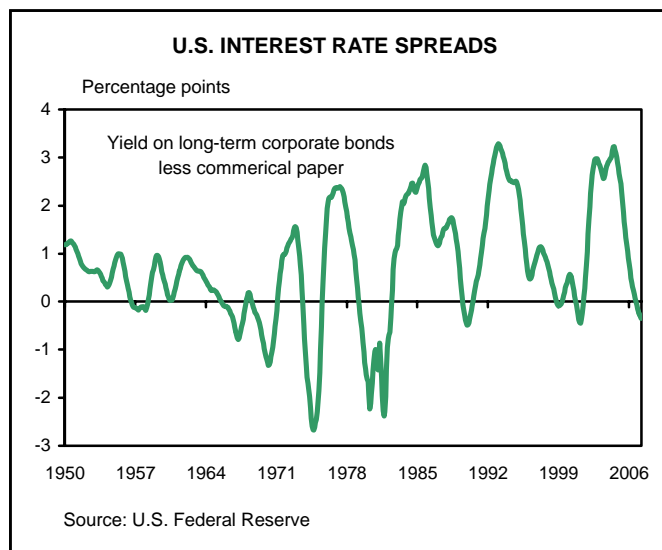
Expected Range for Average Level of Yields 2007-2020				
	U.S.		Canada	
	Short Term	Long Term	Short Term	Long Term
Real	1.4-1.6	1.7-2.9	1.4-1.9	2.2-3.6
Nominal	3.4-4.1	3.7-5.4	3.4-3.9	4.2-5.6

Source: TD Economics

suggests that Canadian fixed income market will outperform. Negative Canada-U.S. interest rate spreads are likely to be the norm and the average slope to the Canadian yield curve is expected to be flatter.

It is not clear how the profile for inflation will impact Canadian fixed income markets. Although a higher inflation environment cannot be ruled out, it is clear that the odds favour a continuation of the current target, or a reduction to the inflation objective. Canadian fixed income markets would be indirectly affected if U.S. yields rise as the global savings glut unwinds or if demand for U.S. dollars wanes, but the increase in Canadian yields would be less – implying Canadian market outperformance. The fiscal pressure from an aging population should prove minimal in Canada, which is a positive for the relative outturn of Canadian debt products versus their U.S. peers. And, the demographic fallout from slower population growth and strong pension and personal demand should provide support to long-term Canadian debt, which is likely to experience less available supply than in the U.S. – pointing to a flatter yield curve in Canada.

It is possible that the Canadian yield curve could experience periods of inversion due to demographic demand and tight debt supply. However, as noted above, unless



FACTORS IMPACTING FUTURE LEVEL OF INTEREST RATES		
Factor	Direction of impact on yields	
	U.S.	Canada - U.S. Spread
Inflation	?	?
Global Savings Glut	▲	▼
Oil Shock	▲	▼
Aging Population	▼	No Change
Pension Demand and Private Saving	▼	No Change
Demographic Fiscal Pressures	▲	▼
Reduced importance of U.S. reserve currency	▲	▼
Assessment	Ambiguous	▼

Source: TD Economics

there is a new regulatory requirement imposed to hold a specific asset weighting in bonds, the distortion of the yield curve would likely prove temporary. The historical data suggests that the slope of the Canadian yield curve should be in the range of 20 to 150 basis points, but the top half of this outcome seems extremely high and we would anticipate that the average yield spread between 3-month T-bills and 10-year bonds will be 20 to 80 basis points.

Finally, although the average slope of the yield curves in Canada and the United States are likely to be relatively flat, business cycles will still occur and this will lead to periods when yield curve slopes become quite steep or inverted. Due to the sustained low and stable inflation environment, it is likely that the volatility in long-term yields will prove modest. Indeed, the change in the slope of the yield curve will be dominated by adjustments to monetary policy and to the resulting change in short-term rates. Since inflation is now anchored at relatively low levels, central banks have become very active in adjusting policy to small changes in inflation. This increasing importance of movements in short rates in driving yield curve changes has been evident in recent years and, unless central banks become less vigilant on inflation, this is likely to remain a dominant theme in the decades ahead.

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ENDNOTES

- ¹ Ahrend, R., Catte, P., and R. Price, “Factors Behind Low Long-term Interest Rates”, OECD Economic Department Working Papers No. 490.
- ² Laubach, Thomas, “Measuring the Natural Rate of Interest”, Board of Governors of the Federal Reserve System, November 2001.
- ³ Bank of Canada, “Renewal of the Inflation-Control Target”, Bank of Canada, November 2006.
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- ⁵ Warnock, F., and V. Cacadac, “International Capital Flows and U.S. Interest Rates”, NBER, October 2006.
- ⁶ Morgan Stanley, “Pension Missiles: Is the Cure Worse than the Disease?”, Morgan Stanley, January 21, 2004.
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- ¹⁰ Laubach, T., “New Evidence on the Interest Rate Effects of Budget Deficits and Debt”, Board of Governors of the Federal Reserve System, May 2003.