

Ian Pollick
Economics Strategist
TD Securities
416-983-7184
ian.pollick@tdsecurities.com

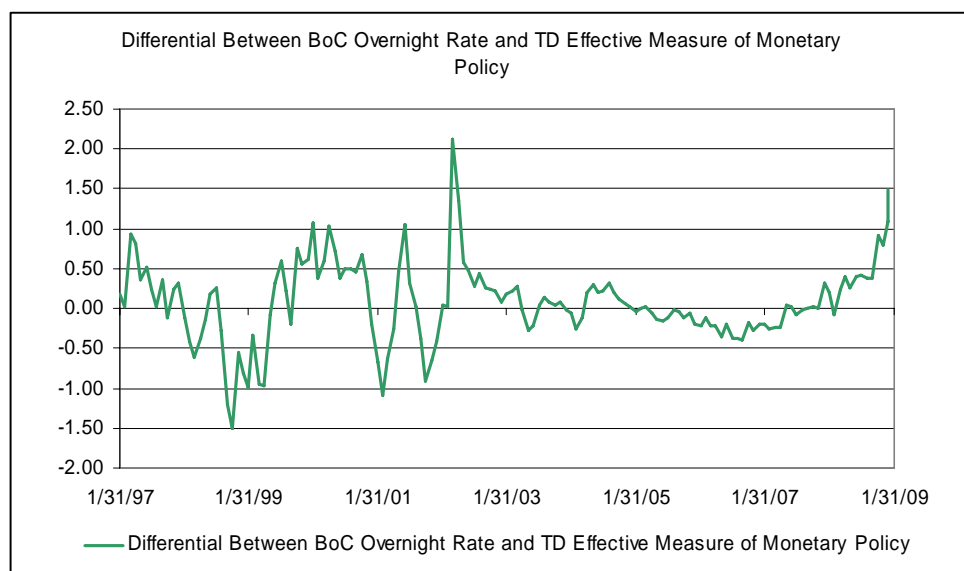
Eric Lascelles
Chief Economics and Rates
Strategist
TD Securities
416-982-8979
eric.lascelles@tdsecurities.com

Introducing The TD Effective Measure of Monetary Policy

The overnight central bank rate is what it is. But when this rate is viewed through the prism of all other borrowing rates in the economy, it does not always reflect the true state of monetary conditions. For any given overnight rate, the overall interest rate structure can be easier or looser depending on a variety of forces. This is because a central bank rate is only directly applicable to banks providing one-day loans amongst themselves. For everyone else, the central bank rate provides only a guidepost for the cost of borrowing, and several other factors can interfere.

In this piece, we account for this phenomenon via the calculation of the TD Effective Measure of Monetary Policy. In order to accomplish this, we identified three factors that account for the slip between the cup and the lip that often occurs relative to the official central bank rate. These are credit spreads, market expectations for the future, and the slope of the yield curve. We do not endeavour to capture every subtle nuance of these three factors, but rather construct a simple methodology that reveals the broad strokes.

Influence	Tightening (+) / Easing (-)
Credit Spreads	+192 bps
Central Bank Expectations	-17 bps
Slope of Yield Curve	-28 bps
Total	+148 bps
Official Overnight Rate	1.00%
TD Effective Measure of Monetary Policy	2.48%



1) Credit Spreads

In this section, we look to generate a metric that will accurately describe how the credit crunch has altered the feeling of the actual Canadian central bank rate. This is particularly important at the present, as the ongoing credit crunch has brought about a massive re-pricing of risk to the upside that has caused a widening of spreads on products ranging from corporate bonds to personal loans. This makes it feel like the overnight rate is higher than it is.

The calculation of this effect can be stylistically broken into a short-dated and long-dated component. The two must be separated as the borrowing products are very

different, and the risk-free borrowing rates against which they are referenced are also different. We then weight each of the borrowing products according to its size outstanding to determine an aggregate credit spread.

Short Dated Credit

While attempting to discern the extent to which the central bank rate is being affected by credit spreads, a logical starting place is to delve into the shallow waters of the curve: the money market. For this part of our analysis we look at the following products, which constitute the bulk of short-term borrowing vehicles in the Canadian economy: Banker's Acceptances (BAs), Bearer Deposit Notes (BDNs), Commercial Paper (CP), and Bank Asset-Backed Commercial Paper (Bank ABCP). For simplicity, we pretend that all short-dated borrowing occurs in the three-month space.

We weight each product according to its outstanding balance, and use this fixed weight for all historical calculations as well.

We look not to capture the absolute size of the credit spread presently, but rather the difference between the historically normal credit spread and the one that currently prevails. And short-dated credit spreads are calculated not against the prevailing central bank rate (this would be a mismatch as the two are not on equal footing – credit products are forward looking whereas the current central bank rate is stuck in the present) but rather against central bank expectations three months out. In short, this means that we look at the current borrowing rates on short-dated credit products versus the three-month OIS rate, and then compare present levels against historically normal levels. We have elected not to use 3M T-Bills as these are overly influenced by flight-to-safety factors.

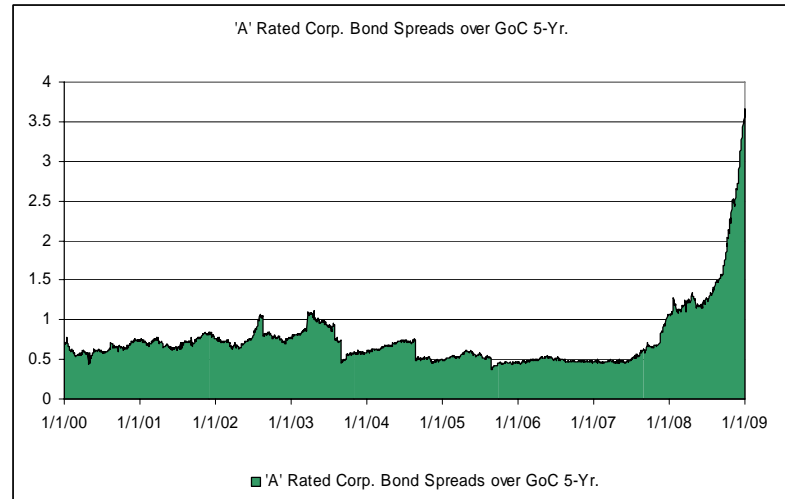
When looked at through this lens, we see the following deviation from historical averages:

Short-Dated Credit Spreads				
Product	Current Spread (bps)	Historical Spreads (bps)	Deviation (bps)	Dollar Value Outstanding (billions)
BA	30	7	23	\$ 63
BDN	30	12	18	\$ 63
CP	56	10	46	\$ 40
Bank ABCP	143	10	133	\$ 58
Weighted Total	64	10	54	\$ 224
Total Implicit Tightening (bps): Short-Dated Credit: 54 bps				

As can be seen in the table, above, the credit crunch has had profound effects in widening out spreads in the short end of the curve, with short-dated borrowing costs up by **54 bps** on average.

Long-Dated Credit

Just as short-dated credit spreads have been affected by the credit crunch, so too has long-dated credit as the market (and banks) have re-priced this. The following chart provides some sense for the remarkable extent to which this has occurred in the corporate bond market.



In the interest of simplicity, we pretend that all longer-dated borrowing occurs in the 5yr space. This is clearly not technically correct, but nor is it egregiously wrong when one considers that the “long-end” can span anywhere from one year up to several decades, and given the preponderance of five-year mortgages in Canada plus the bulk of corporate bond issuance that occurs in that general area.

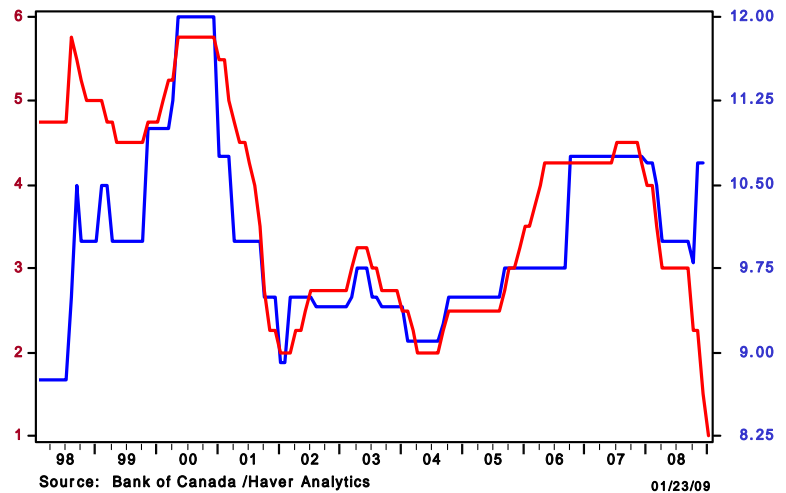
We define the major long-dated borrowing products as ‘A’ rated 5-year corporate bonds, business loans, conventional 5-year mortgage rates, variable rate mortgages and personal loans. Most of these are contrasted against the 5-year Government of Canada bond and then compared with the historically normal spread to determine the amount of abnormal influence that presently exists. Business loans and variable rate mortgages are the exception as they are explicitly pegged to the prime-rate, which in turn is usually explicitly pegged to the overnight rate. As such, the last two products are compared against the overnight rate itself.

Currently, ‘A’ rated 5-year Canadian corporate bonds are trading approximately **320 bps** wider than versus normal conditions (defined as the average spread over the past ten years).

As the Bank of Canada entered the latest easing cycle, the loan products markets had difficulty moving proportionally, which is a function of increased risk aversion coupled with higher funding costs for lenders.

Borrowing Rates Muffle Central Bank Rate Direction

Canada: Overnight Money Market Financing Rate
 Canada: Consumer Loan Rate, Chartered Banks



Long-Dated Credit Spreads				
Product	Current Spread (bps)	Historical Spreads (bps)	Deviation (bps)	Dollar Value Outstanding (billions)
Corp. Bonds	381	61	320	\$ 274
Business Loans	200	173	27	\$ 301
Fixed Mortgages	474	227	247	\$ 316
Variable Rate Mortgages	200	175	25	\$ 170
Personal Loans	869	514	355	\$ 284
Weighted Total	451	236	215	\$ 1,345
Total Implicit Tightening (bps): Long-Dated Credit: 215 bps				

Our findings are highlighted in the table above, and as can be seen there does exist a large degree of widening in these respective products, with long-dated borrowing costs up by **215 bps** on average. The business loan and variable rate mortgage markets have not blown up to the extent of the other products under investigation. The reason for this is likely that business loans and variable rate mortgages are explicitly pegged to the prime rate, which is in turn closely related to the overnight rate.

To clarify, the available data on posted 5yr. mortgage rates (and variable rate mortgages via the assumption that they equal the posted prime rate) come from the Bank of Canada. However, the actual rate charged to many homebuyers often deviates significantly from the posted rate. Until recently, discounts to the posted rate were fairly common. There is anecdotal evidence to suggest that such discounts are no longer as large or as common. In an ideal, world this analysis should be using the actual lending rate, but we lack official data sources. As such, our measure will be biased when discount practices change, as they have arguably done recently.

When examining the degree to which credit spreads have widened relative to their historical average, it becomes apparent that credit products (both short and long) are not enjoying the full measure of the Bank of Canada's easing. To combine the various disparate figures above, we calculate the degree of unusual spread in each product and weight it based on the total amount of debt currently outstanding for each. As an aside, we use this fixed weight for all historical calculations as well. The following table

offers the final results for the credit crunch portion of the analysis. It shows that when short-dated and long-dated credit are taken together, approximately **192 bps** of central bank easing was not passed through to borrowers purely via the credit spread channel.

Short-Dated & Long-Dated Credit Spreads				
	Current Spread (bps)	Historical Spread (bps)	Deviation (bps)	Dollar Value Outstanding (billions)
Short -Dated Credit	64	10	54	\$ 224
Long-Dated Credit	451	236	215	\$ 1,345
Weighted Total	396	204	192	\$ 1,569
Total Implicit Tightening (bps): Short-Dated and Long-Dated Credit: 192 bps				

2) Central Bank Expectations

Markets are forward looking, and so the most important central bank rate is not so much the current one, but rather what the market expects it to be in the future. When the market expects rate cuts, most borrowing rates become lower to account for this. This acts as a form of implicit easing.

To measure central bank expectations, we look to the OIS market for guidance, specifically the 1yr portion of the OIS curve. We selected the 1yr central bank outlook because it is the longest reliable gauge of central bank expectations, and it serves as an acceptable combined proxy for both the 3M and 5yr sectors, over-estimating one and under-estimating the other. Market based expectations move more quickly than central banks do. If we take a look at what the market has been thinking since the beginning of the credit crunch in the table below, we see a string of consistent rate cut expectations. However, with the most recent 50 bps cut by the Bank of Canada, the gap between expectations and the actual rate naturally sawtooths back together, diminishing the implicit easing.

Note that our calculations also capture any divergence between the target for the overnight rate and the effective overnight rate. At present there is little discernable difference, but recall that in the U.S. there was a substantial gap between the two until recently, and this was a relevant factor



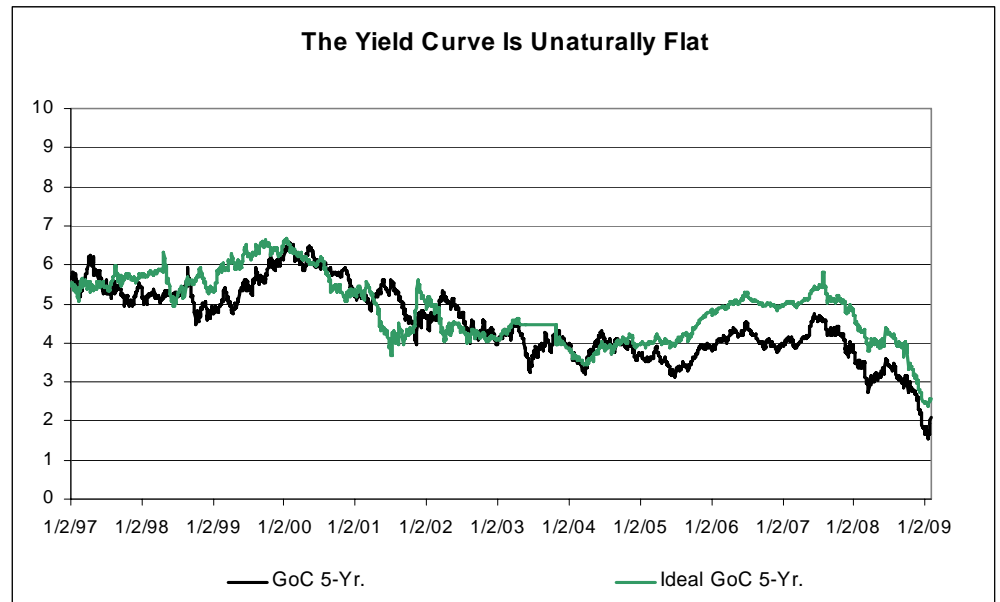
Based on the above graph, we see that the market is currently pricing in **22 bps** of easing (derived by subtracting 1-Year OIS from the central bank rate). However, because business loans and variable rate mortgages tend to be pegged more to the current central bank rate than to the expected one, we only apply this to 70% of the total (as business loans and variable rate mortgages represent 30% of total debt outstanding in our analysis), and thus arrive at **17 bps** of implicit easing based on central bank expectation in terms of the impact on the overall economy.

3) Slope of the Yield Curve

The shape of the yield curve is also an important factor in determining how a central bank rate feels, because the central bank rate only affects overnight loans. But the majority of loans have a duration that is significantly longer than this. The degree to which the yield curve is unusually flat or steep affects the pricing of the various products tied to it. Earlier, we established that longer-dated credit has been severely affected by the credit crunch. However, this assumes that the yield curve is behaving normally. For example, given that if corporate bonds are trading **320 bps** wider versus risk-free government bonds than history suggests they should, this only provides true implicit tightening if the government bonds themselves aren't unusually low to begin with. As such, we need to account for this dynamic.

As with our earlier efforts, the key question is not how flat the yield curve is, but rather how flat it is relative to historically normal conditions. In fact, it isn't even that simple. The real question is how flat the yield curve is given historically normal conditions for a particular central bank rate. It is normal for the yield curve to steepen when the central bank rate falls, and we do not wish to count this as implicit tightening. Rather, the question is whether the curve steepened by more or less than normal.

We have devised a simple model to reflect the normal steepening/flattening mechanism as a central bank eases. Simply put, we assume that a "normal" spread between 1yr OIS (a proxy for medium term central bank expectations) and the 5yr government yield is **98 bps** when the central bank rate is at the neutral level of **355 bps** (both of these are the approximate averages over the past decade). We then assume that for every percentage point of central bank easing, the 5yr yield should decline by **70 bps** (a figure that is also roughly in line with the historical norm).



As can be seen in the above chart, the 5-year government bond yield is lower than our “ideal” model suggests it should be. This means that the yield curve is unusually flat given current central bank expectations. Ceteris paribus, when looking at the shape of the yield curve in isolation it becomes apparent that it is a form of implicit easing, making the central bank rate feel lower than it is for borrowers out the curve. When we measure the difference between the actual five year bond and our estimated ‘ideal’ bond, we derive a difference of approximately **-48 bps**. We then temper this figure as it is only pertinent for longer-dated borrowing products. Given the share of total borrowing in this area is 58% of our total (recall that we exclude not just short-dated credit but also business loans and variable rate mortgages as these are linked to short-term rates), this results in **28 bps** of implicit easing for the overall economy given the flatness of the yield curve.

Conclusion

The current central bank rate in Canada does not feel like it looks. This is a result of a delicate waltz between opposing forces: those that make rates feel looser, and those that make rates feel tighter. Credit spreads, market expectations for the future and the slope of the yield curve are all factors currently contributing to this mismatch between touch and taste.

The credit crunch has increased borrowing costs both in the short and long end of the yield curve. Quite simply, the price of credit has been revamped to account for the higher levels of risk (for both businesses and individuals), which in turn has pushed out spreads to levels much higher than ever previously witnessed. This has reduced the efficacy of Bank of Canada interest rate movements, resulting in a form of implicit tightening that we estimate to be in the range of **192 bps**.

However, on the other side of the equation (and generally much less discussed of late), we have demonstrated that market-based expectations about future central bank decisions are relevant to many borrowing rates. This is the equivalent of **17 bps** of implicit easing.

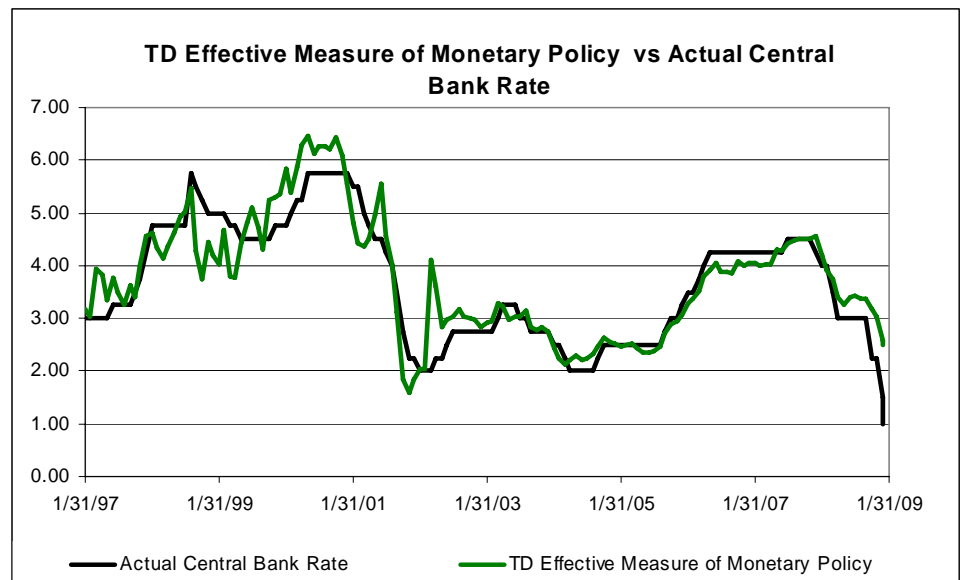
Moreover, the shape of the yield curve in the 5-year sector has been unusually flat, suggesting to us that the transmission mechanism whereby central bank rate decisions

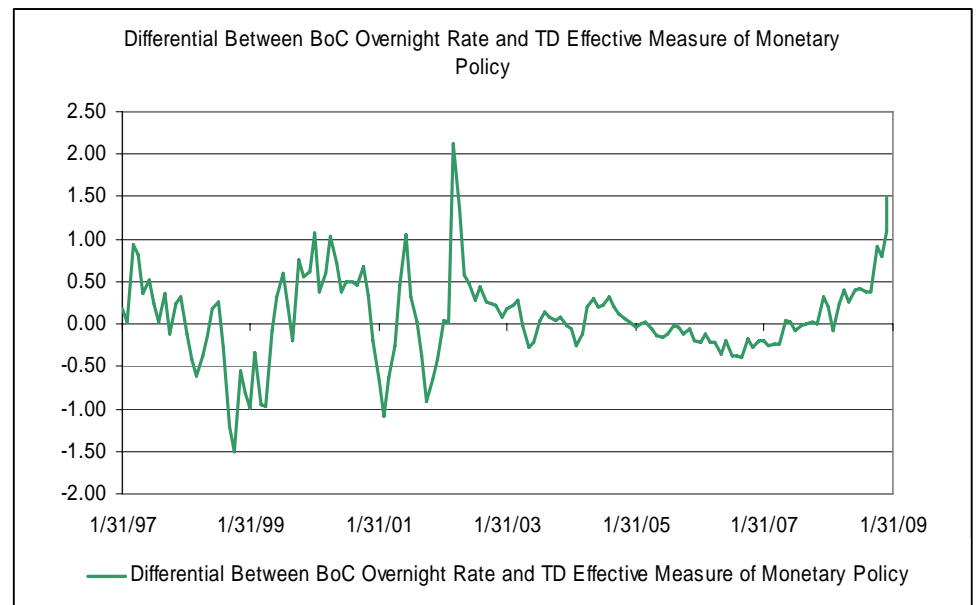
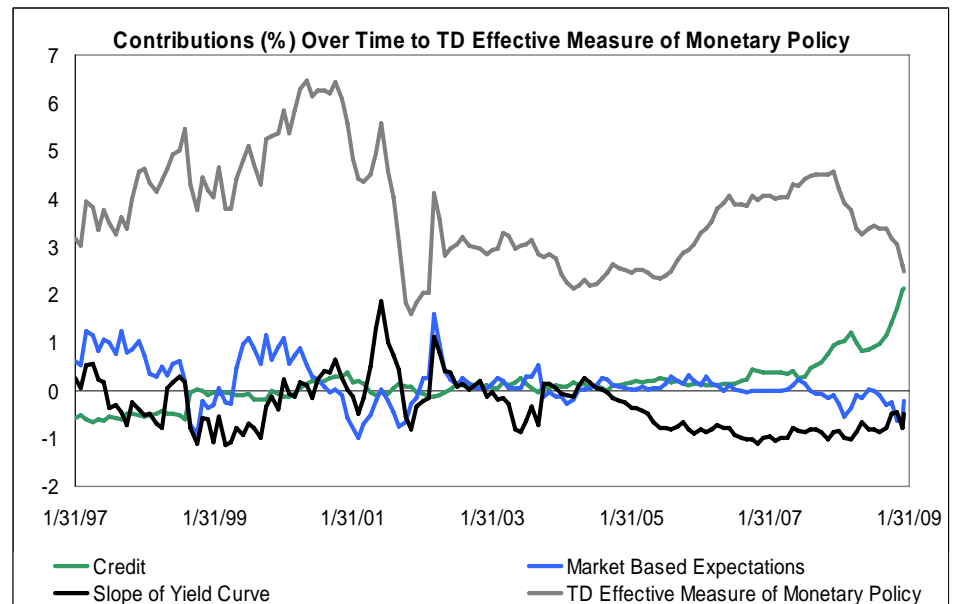
are disseminated out the curve has actually helped to make conditions feel looser. The unusually flat yield curve is the equivalent to **28 bps** of implicit easing.

Taking the three all together, and as can be seen in the below tables, there is more implicit tightening in the Canadian market than easing. Empirically, we estimate there is **148 bps** of implicit tightening in the market right now. Currently, the central bank rate 'feels' more like the TD Effective Measure of Monetary Policy rate of **2.48%** than the official target rate of **1.00%**.

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As a side note, our TD Effective Measure of Monetary Policy has ranged from extremes of **212 bps** over the official overnight rate to **150 bps** below, when looked at over the past decade. Until the onset of the crunch, credit conditions have tended to be a footnote, while central bank expectations and the slope of the yield curve have been the more dominant factors. What makes this current environment of implicit tightening different than the others is that credit conditions are the main contribution, which has never happened to such an extent before in Canada. In total, the Bank of Canada has slashed the overnight rate by **350 bps** since December 2007 to present, which is an incredible amount of monetary easing. However, our central point is that the overall position of rates do not suggest things are as easy as the central bank rate looks. As we have demonstrated throughout this paper, there are considerable headwinds brewing right now. As such, one interpretation is that the overnight rate has needed to be cut so deeply to offset the same forces we sought to quantify in this paper.





Note, that the spike seen in the above graph during March 2002 is a function of a very steep yield curve coupled with extremely hawkish market based expectations on rates. In that instance, credit actually contributed easing to the TD Effective Measure of Monetary Policy, while market based expectations and the slope of the yield curve both contributed a high degree of implicit tightening (with market based expectations contributing the largest tightening influence); a role reversal of sorts from the situation we find ourselves in today.

Caveats

Finally, we must acknowledge that despite our best efforts, the TD Effective Measure of Monetary Policy rate almost certainly understates the degree of implicit tightening in the Canadian market right now. Our figure should be viewed as a lower bound. There are four reasons for the lingering mismatch.

First, credit rationing by lenders has not been captured in the model, and this likely represents additional implicit tightening.

Second, some borrowing rates from banks are traditionally discounted off of the posted rates that we use, whereas it appears that some of these discounts (though hard to quantify) have likely diminished. This includes both variable and fixed mortgage rates, which anecdotally have tightened by more than 100 bps in some instances. To give an idea of the sensitivity, a shift from a 100 bps discount to a zero discount for the variable rate mortgage would end up increasing the credit spread influence to the central bank rate by approximately **10 bps**, increasing the level of implicit tightening we calculate.

Third, our choice of the 5-year area of the curve for a proxy of longer-dated borrowing conditions – while generally a good one – is at present arguably understating the degree of implicit tightening because Canada's government 5yr bond is currently rather rich relative to adjacent bonds due to the large Government of Canada mortgage-backed securities purchase program. This is suggesting a yield curve that is flatter than it truly is across the entire curve. Though it may simultaneously overstate credit spreads and thus be a wash.

Fourth, to the degree that lower rated companies have been disproportionately affected by widening credit spreads, our focus on 'A'-rated borrowers likely understates the true degree of implicit tightening.

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