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Remarks for Bank of Canada Conference on Fixed Income Markets

Thank you for inviting me here today to give a perspective of a practitioners view of the types of research I have had the pleasure of hearing about over the last 2 days. I never fully appreciated the maxim: "A little knowledge is a dangerous thing", until right now standing before a room of scientists, economists, empiricists and mathematicians armed with my first year calculus and second year econometrics courses to speak on the topic of markets research. Most successful market practitioners / traders learn one fact very early in their careers: respect for the market. Put another way, that they are wrong at least as often as they are right.

I stand here before you with a mixture of humility and fear; however, I am somewhat comforted by my trading background, having learned to transform my ignorance into a fearless drive to explore the unknown. All I hope is that in my participation on this panel today, I don't end up as the "control group" on the wise persons panel. Having said all of that, if my esteemed panel members seem so much the wiser by comparison, then so much the better.

Let me tell you a bit about myself. I work for a small Canadian financial institution called BMO Financial Group – also known as Bank of Montreal. BMO is organized into 3 main business groups – Personal & Commercial (branch retail), Private Client (wealth management) and Investment Banking Group (our institutional business). Within IBG is the Capital Markets

Division where all of our sales and trading platforms reside. I co-head the Financial Products group within Capital Markets Division. Our FP business is comprised of all of our derivatives activities – structuring, origination and risk – across equity, interest rate, credit and currency markets. Prior to assuming my role in FP 6 months ago, I was responsible for our domestic rates business including cash and derivative fixed income products.

There could be some discussion of the use of research that would apply to our "retail banking" focused business – for example, we use extensive economic modeling to forecast future growth rates so as to evaluate market opportunities in Canada and abroad as well as to assist in decision making with respect to alternatives in deploying our structural balance sheet resources.

However, my area of specialization is the capital markets and I want to focus my remarks on how economic and market research has been broadly applied to our global trading businesses. I'll then spend a few minutes discussing some areas that I believe would be of interest to, or better said, are in need of closer examination from the type of research I've heard about over the last few days.

APPLIED RESEARCH @ BMO

At first blush one might draw the conclusion that little research is actually applied on the trading floor of BMO. Despite aggressive portrayal to the contrary in the popular media it is true that the bulk of the activity that occurs is truly, for lack of a better term, commercial. We are in the business of providing our clients access to the capital markets (in both a risk mitigating and a risk assumptive capacity). Simply put, "commercially" we endeavour to sell what we buy; buy what we sell and earn a modest living between those prices. For lack of a better term, we try to be "the house". Practically speaking – research is most applicable to us if it helps us make

money. But just as mathematical research is of critical importance to the Bellagio casino, markets-focused research underlies everything we do.

First and foremost, our commercial business would be challenged to operate and certainly couldn't grow without the backbone of an efficient, liquid and well understood capital marketplace. One would have had to have been asleep for the past 2 days not to realize how much effort has gone in to empirically and rationally explaining past performance and functioning of the fixed income markets. This information enables participants to confidently transact and allows the markets 'governors' (or deputy-governors) to look for ways to constantly improve the markets – efficiency, transparency, or just through stronger understanding.

Predictive models (and the mathematical processes utilized therein) also certainly have a place in our trading business. We have a number of proprietary trading activities that look to 'build better mousetraps' to predict future prices. As well, it is an important client service element of our business that we have strong forecast models across various asset classes. Our clients are increasingly shifting away from 'generalist maintenance' type coverage to more value added "idea generation" coverage. We have a CRV practice attached to our fixed income business that is quite analytically focused.

Without a doubt, the most obvious application of quantitative research in our activities would centre around the topic of model-based valuation. As product complexity grows, price is less of an observed function of the market and more of a function of theoretical value. This is particularly true in the derivatives markets in which our FP group operates. Structured Notes have grown tremendously in Canada and globally across a myriad of asset classes. Notes linked to Equity Baskets, rate markets, credit pools and commodities underlyings. Hybrid derivatives – with pay-off profiles linked to multiple asset classes are new and interesting. CDOs and other structured credit products have exhibited strong acceptance and growth in the global market place. Inflation linked securities and derivatives would be another example of a growing focus in the investment world that requires a strong analytical under pinning. None of these 'new' products advances - allowing investors and issuers greater choice in mitigating (or assuming) risk would have been possible without the accompanying research around option pricing, volatility measurement or correlation calculation and observation.

As a financial services firm, we would not have the confidence to structure and distribute new securities or solutions to our clients without the confidence that research brings. Our Risk Management Group (our independent governance function) has two separate control groups – Model Risk and Vetting and Valuation Product Control who have in their mandate to be current with best practices in modeling and valuation. Our MR Oversight function devotes large amounts of research and analytical resources to our main Risk engine – NVaR – which helps us manage our market risk and the associated regulatory capital. Our firm is constantly looking for ways to improve our modeling and valuation practices with respect to our existing product suite and to adopt 'new' techniques when we believe it gives us a better approximation of the valuation of structured product. We have been, for instance, currently examining a new two factor options pricing model. Any 'new' products such as the ones mentioned earlier go through a thorough vetting to ensure our analytics and valuation are well researched and documented and are consistent with the most up to date market (and in many cases theoretical) practice.

FUTURE AREAS FOR CONSIDERATION

I thought I would take you through a few areas of focus that I believe are of current or future importance to market practitioners in the fixed income space.

An obvious area of considerable change is the fixed income market itself. There has been, over the last number of years, a bifurcation of this market to the point where it is now thought of as two distinct markets by practitioners. As opposed to one market for fixed income, most firms globally have split their practices into two – rates and credit. This split has been caused by the growth in liquidity, transparency and product development in the credit derivatives markets and I believe is a fundamentally sound and welcome change in the markets. Single name CDS, Credit Indices, CDOs (notably synthetics), Total return swaps, first to default baskets, recovery rate swap and contingent CDS are techniques that allow market participants to manage their exposure to credit separately from their view on the path of administered rates, the shape of the yield curve and underlying macro economic forces (such as inflation). The backdrop for much of this evolution has been an emerging and changing market for correlation. The CDO market valuation standard over the past year, for example, has moved from simple copula based models to base correlation. I believe that correlation trading and markets in this decade are evolving in very similar fashion to the volatility trading markets in the late 80's and 90's. It is an exciting area that will continue to grow and should be a focus of considerable pure and empirical research. From a purely Canadian perspective, the recent removal of the foreign property rule has caused what is now known as the Maple market to expand vigorously. With this fundamental market change comes a need to also import best global practices and research around credit risk mitigation and assumption techniques as well as more in depth knowledge and research of Credit relative value in a global context.

On the topic of changes to the underlying functioning of the market (liquidity and efficiency) many areas for study exist. Clearly the advent of an emerging China and increased globalization is having a major impact on current and capital flows which has tremendous implication for and relevance to the fixed income markets (not to mention the commodity and current markets!). As well advances in electronic market places – Canada now has functioning electronic B-T-B and B-T-C channels that are increasing in acceptance and in importance - have the potential to alter the way markets function. Enormous amounts of research has been and is still being done relating to market structure, execution order flow, and the concept of best execution in the context of fixed income. And when I think about fundamental change to market structure, I would be remiss not to mention the growing pools of available capital looking to assume market risk – alpha-searching investors that we know better as the hedge funds and 'tactical' real money. Much is (and has been) written about these funds but it has always struck me as being 'opinion-based' as opposed to being particularly scientific or empirical. I believe that these pools of capital are playing an increasingly important role - and I mean that positively - as it relates to promoting efficiency within the markets. These alpha seekers are causing major change in the market – away from old school 'gut feel' to research and analytically driven trade generation. These large capital pools also require (some would say demand) transparency and liquidity and I believe further research about the impact they are having on the fixed income market is still mostly undone.

The final area of study that I would see being pursued I would like to refer to as “Made in Canada”. I remember attending a MPR briefing many years ago where a then deputy-governor indicated that the Bank of Canada had as a goal (perhaps unstated) that the Canadian press and participants move away from seeing Canada as a correlated market to the U.S. – dependent on US monetary policy and economics – and begin viewing the domestic market based on Canadian forces and economics. I surmise, the ideal would have been to open the newspaper and read about how Canadian economic indicators and policies were driving the markets not the latest US economic release or FED governor speech. I believe our Central Bank has done an admirable job accomplishing this goal over the past number of years and it, in my opinion, is certainly one factor that has caused Canada to re-emerge on the radar screen of global relative value players. I believe the same goal is true (and in fact necessary) for Canadian market research. The B.O.C. has an excellent research team – I have been a ‘web enabled’ recipient of B.O.C. research for a number of years and (while I admit I don’t read all of it) have found it to be interesting and of high quality. I think more can be done and learned from specific, “made in Canada” research. I also believe that encouraging global research professionals to look to the Canadian markets as fertile ground for interesting research is not an outrageous or over ambitious goal to pursue.

Thanking you very much for your time and attention. I feel somewhat remiss for not having used any statistics so far in my comments so I would like to finish with a recent true story. I was having a recent discussion with a young empiricist who was labouring under the obvious misconception that a trading room was a vital and exciting place to work. When I asked why she was looking for a change from academics she told me two commonly accepted statistics were weighing on her career planning goals. Apparently only 5% of all research gets actually read and less than 1% finds its way into practice. This prompted two thoughts in my mind <u>if true</u>: Firstly that given all of the research I know that has been applied (from my own limited perspective), the total body of research undertaken must therefore be staggering. Secondly that researches seem to have a much higher success rate than our traders because we put through over 30,000 transactions a day and the number based on 'good ideas' is considerably less than 1%.

Thank you very much for your time and attention.