

Forecasting Market Fundamentals to Estimate Expected Loss for Commercial Real Estate Portfolios

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Speakers



**Sumit Grover – Director, CRE Product Management
Moody's Analytics**

Sumit Grover is a Director in Product Management within the Enterprise Risk Solutions group at Moody's Analytics. He manages CMM™ (Commercial Mortgage Metrics), a platform to assess credit risk in commercial real estate (CRE) loans and portfolios. Sumit also supports other CRE solutions at Moody's Analytics, including spreading, scoring and stress testing products. Sumit holds an undergraduate degree in Information Systems and a MBA from Indiana University Bloomington.



**Megha Watugala – Director, CRE Research
Moody's Analytics**

Megha Watugala joined Moody's Analytics in 2012 and is currently engaged in research and advisory work related to commercial real estate. In addition to modeling various components of CMM, Megha has assisted many clients with internal validation, customization and stress testing projects using CMM. He has many years of experience in the research and consulting industry. Megha obtained his Ph.D. in economics from Texas A&M University. His Bachelor's degrees in Computer Science and Economics are from California Institute of Technology.

AGENDA

- 1. Understanding Challenges in CRE Risk Management**
- 2. Moody's Analytics Modelling Approach for CRE**
- 3. Forecasting CRE Fundamentals for Canada**
- 4. CMM™ (Commercial Mortgage Metrics) at a Glance**
- 5. IFRS 9: Estimating Expected Loss for Your CRE Portfolio**

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Understanding Challenges in CRE Risk Management

Challenges in CRE Risk Management

Updated Property Information



**Valued - \$95M in 2007
Now?**

- Data captured at origination may not be complete for data analysis.
- Data management is important for historical and forward looking analysis

Foresight into Market Fundamentals



- Sound forecast that differentiates between property types and submarkets is important

Default history and modeling expertise



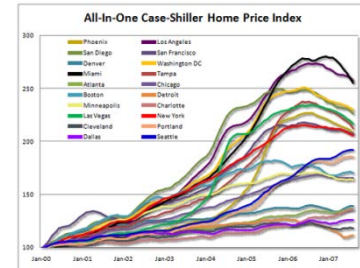
- Default history over multiple credit cycles and from multiple sources is important for sound modeling and CRE data history is not captured

Intuition vs quantitative validation



- Several qualitative factors can impact the analysis and risk measures and integrating quantitative models with intuition can be a challenge

Assessing the impact of macro economy



- Different cities and neighborhoods react differently to an economic recession or expansion

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Moody's Analytics Modelling Approach for CRE

Understanding why CRE credit events occur



Insufficient income (NOI) to make the mortgage payment

- Rising vacancy and loss of rental income during recessions
- Deterioration of certain neighborhoods or properties even during boom years



Perceived inability to sell the property for the loan amount

- LTV comes into play during times of cash-flow distress or at refinancing



Lack of reserves and additional outside resources available to cover cash flow shortfalls

- Both ability and willingness to pay shortfalls decrease during recessions
- Size of shortfall likely to matter: \$1 million >> \$1000

Employing a modeling framework that reflects business practices



Starting with collateral

- Forecasting cash flow under various scenarios
- Property value influences default decision mostly during cash flow stress
- Macro and local market condition matters

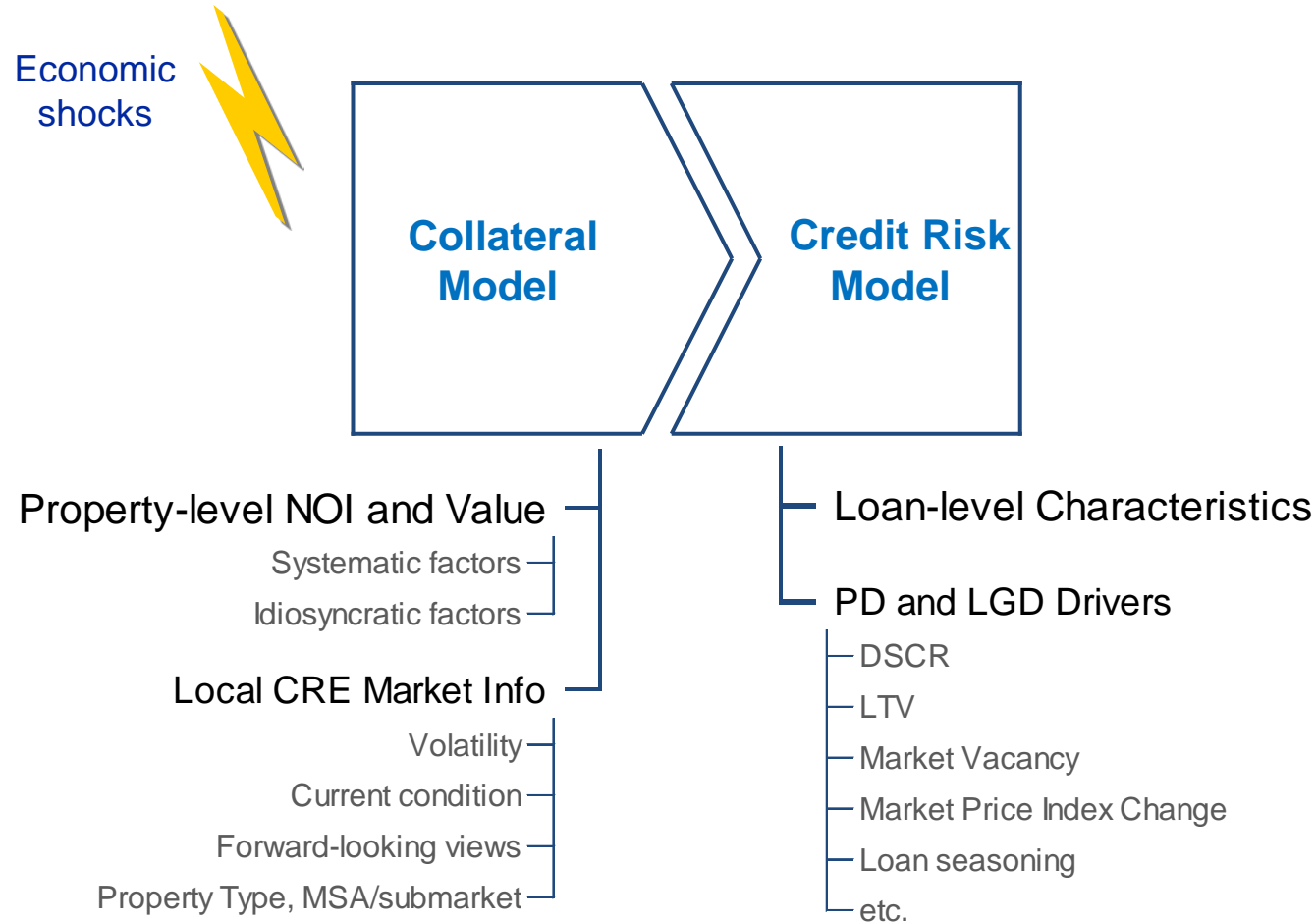
Modeling default behavior

- Option A: Continue payment out of pocket, expecting market recovery
- Option B: Default on loan

Empirical Evidence

- Inability to reach consensus triggers credit events
- Borrowers are more likely to default in a recession than in an economic expansion

Collateral performance and credit risk go hand-in-hand

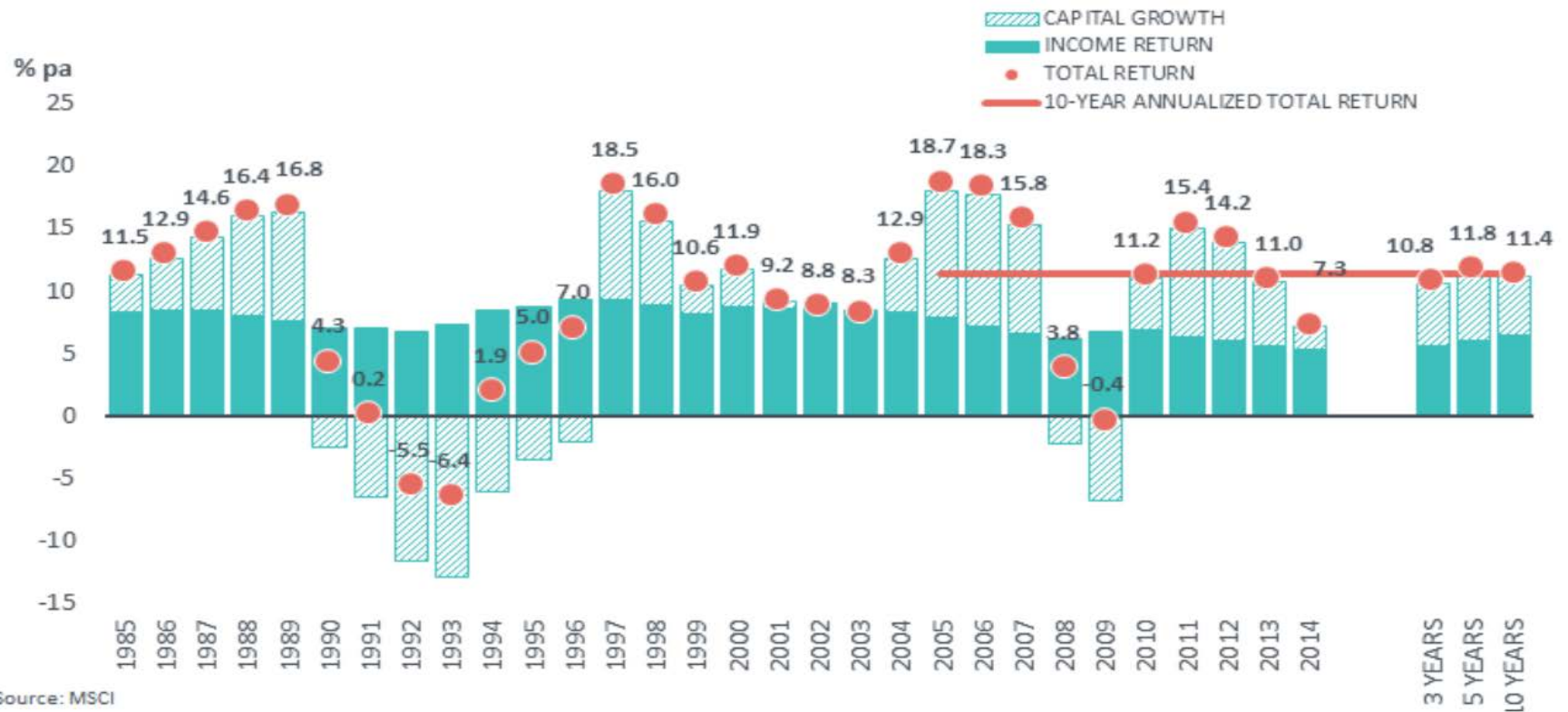


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Forecasting CRE Fundamentals for Canada

Canadian CRE Market Followed Global Cycles, With Some Variations

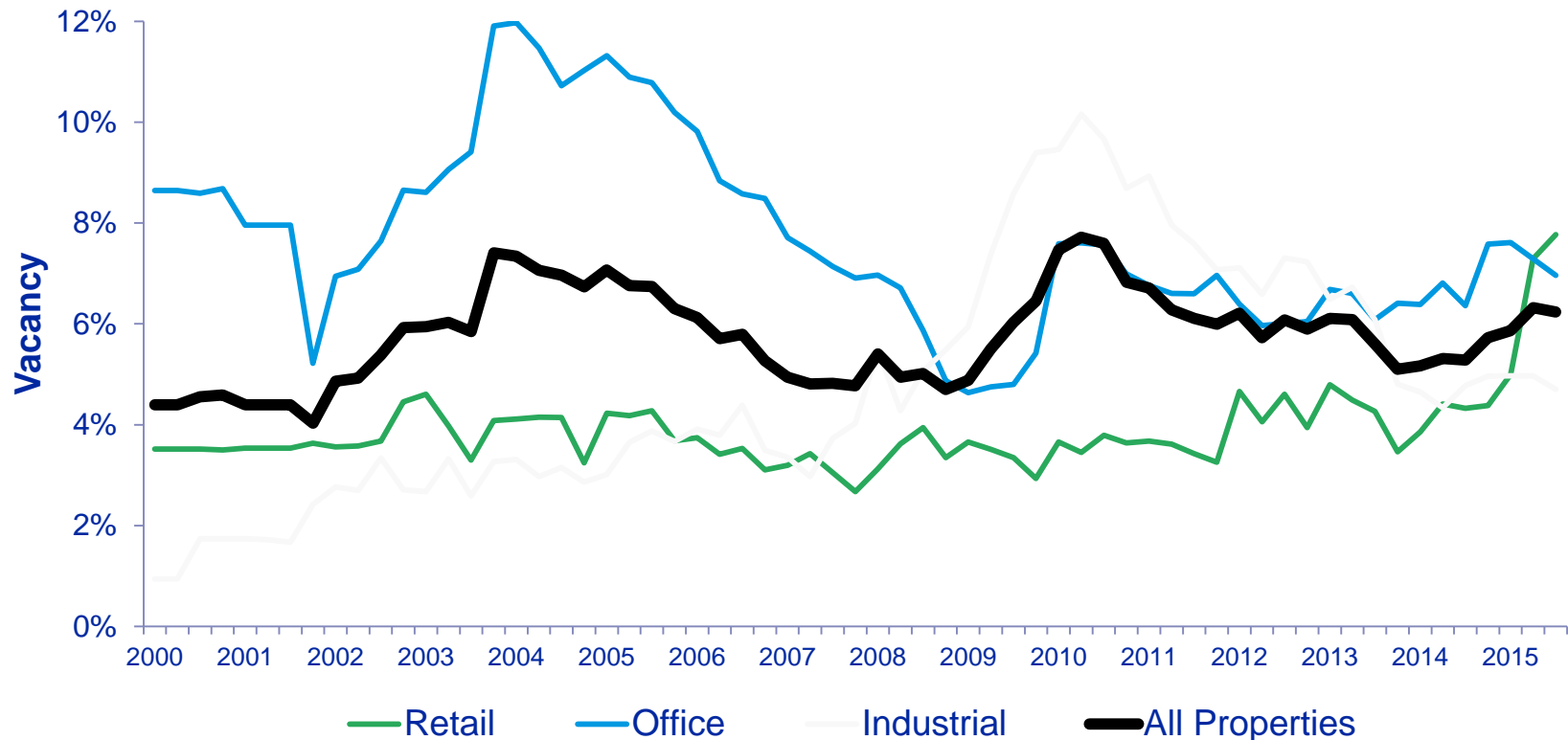
- » Canadian CRE market experienced similar decline as the US in late 1980s through early 1990s, but its downturn in the late 2000s was limited



Source: IPD Canada (2000-2012) and Frank Russell Canada (1985-1999). Chart from IPD presentation.

Cycles Can Differ Across Property Types

- » Different property types can have different cycles due to their unique natures

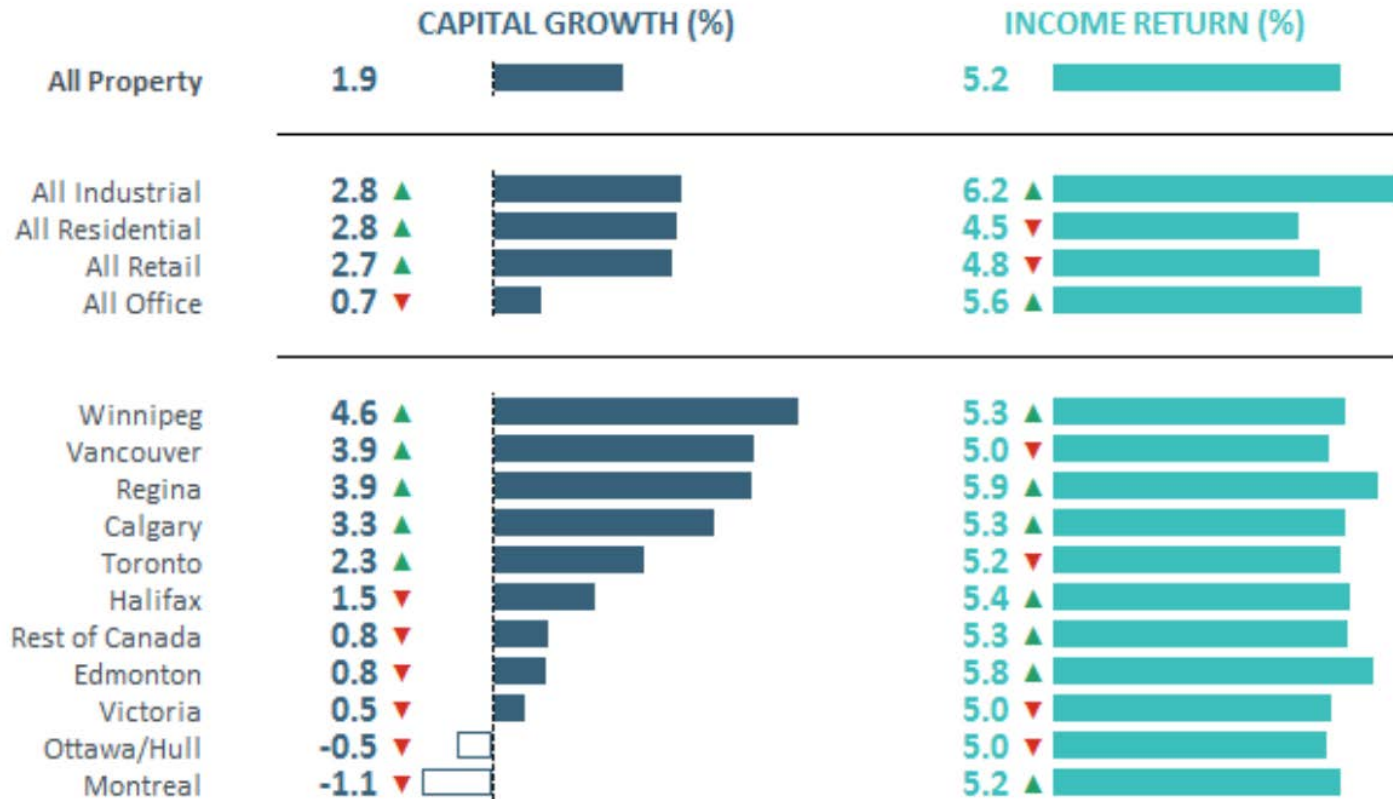


Source: MSCI/IPD

Meaningful Difference Across Property Types and Location

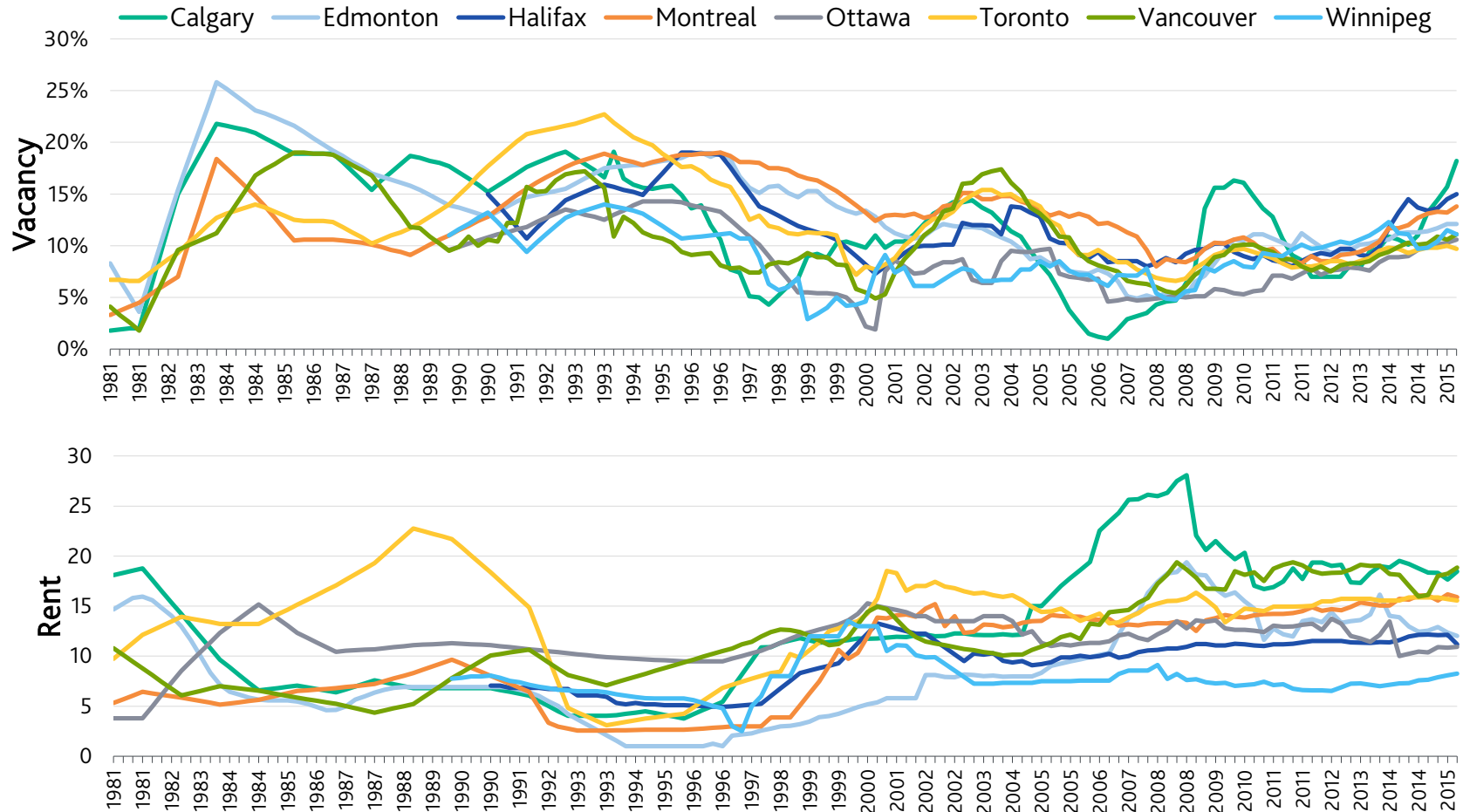
» Office lagging in price appreciation, and Edmonton and Montreal saw price declines too.

BY PROPERTY SECTOR AND GEOGRAPHIC SEGMENT



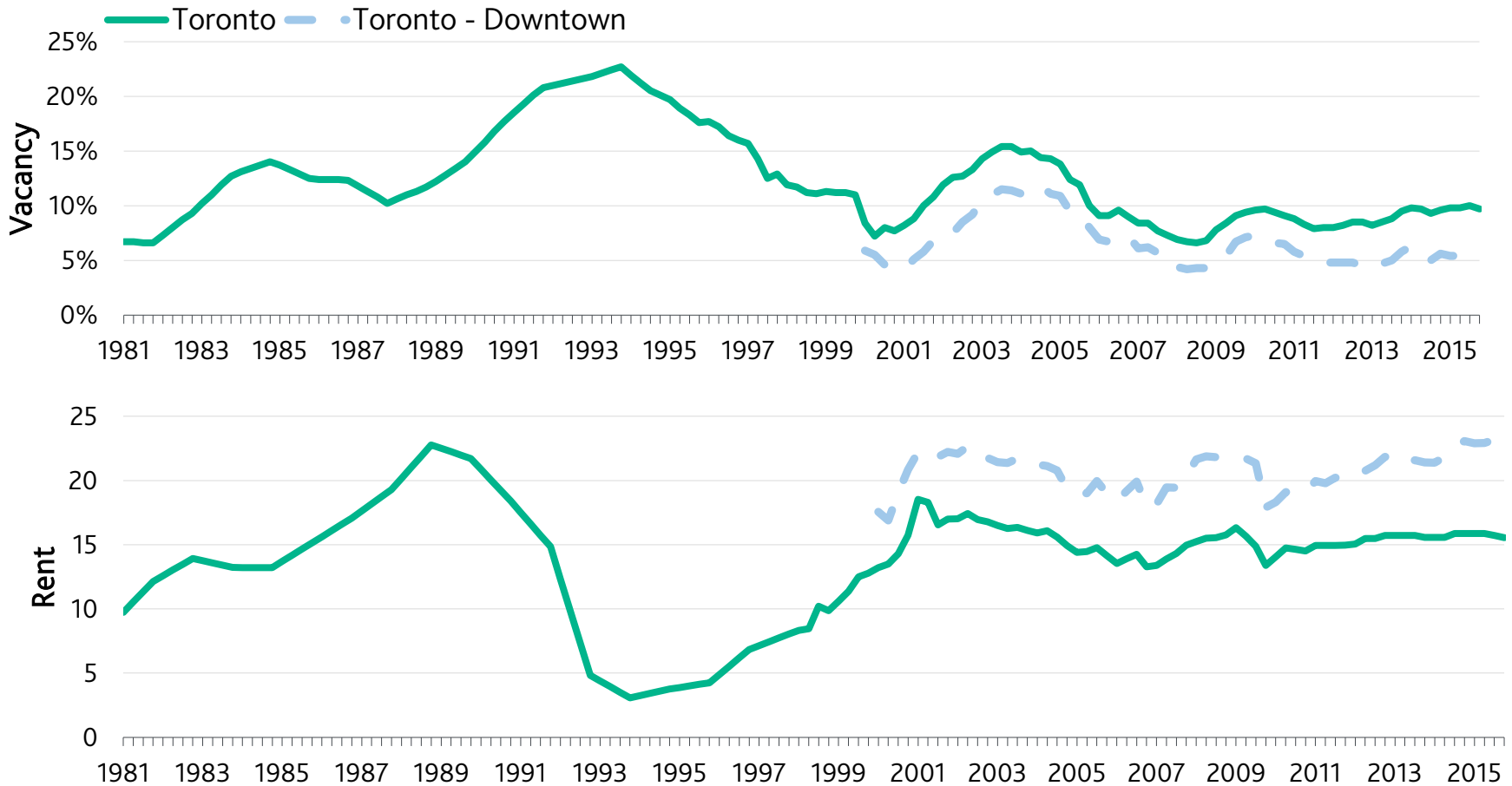
Source: IPD. Data reflective of 2014 annual performance.

Location, Location, Location: Office Market Performance



Source: CB Richard Ellis Econometric Advisors (CBRE EA)

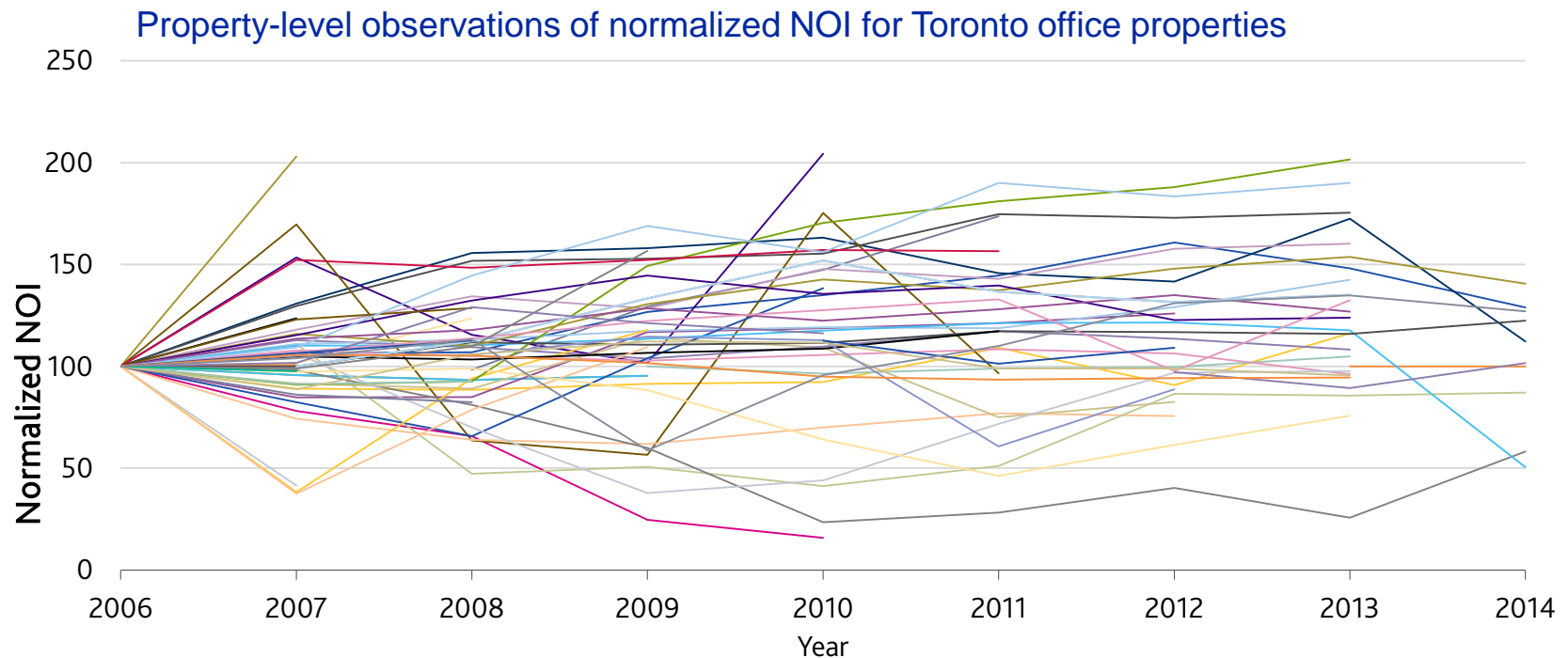
Submarkets Can Make A Big Difference Too: Another Aspect of Location



Source: CB Richard Ellis Econometric Advisors (CBRE EA)

Never Underestimate the “Power” of Idiosyncratic Risk

- » Individual properties can perform worse than the market average: idiosyncratic risks!
 - In a generally healthy Toronto office market, some properties' financial performance still got distressed.



Source: Trepp

Regional Economic Data/Forecast Offers Essential Context

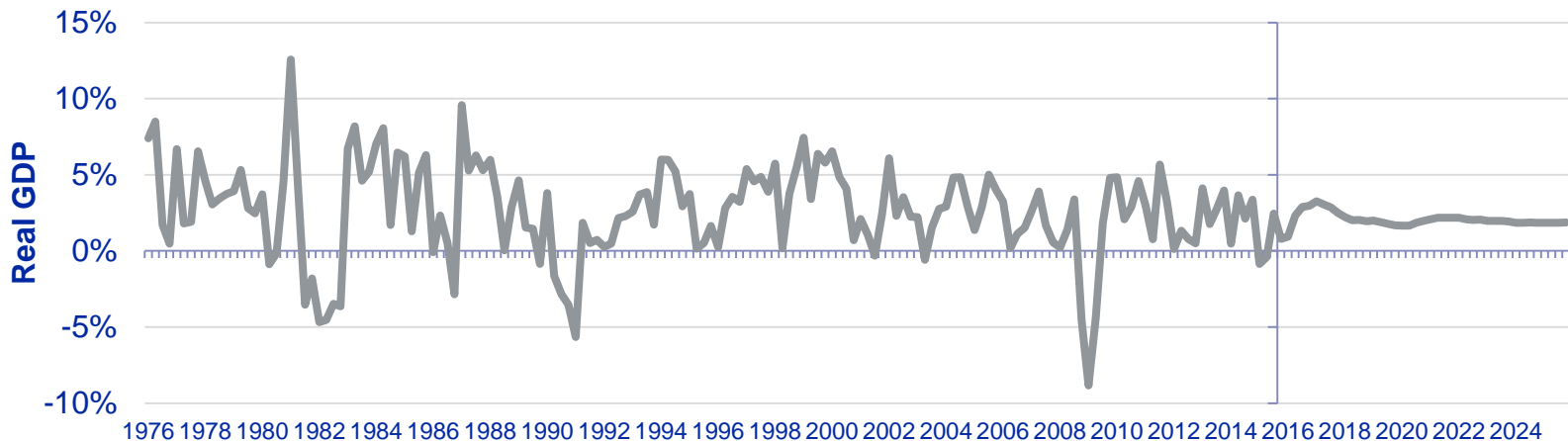
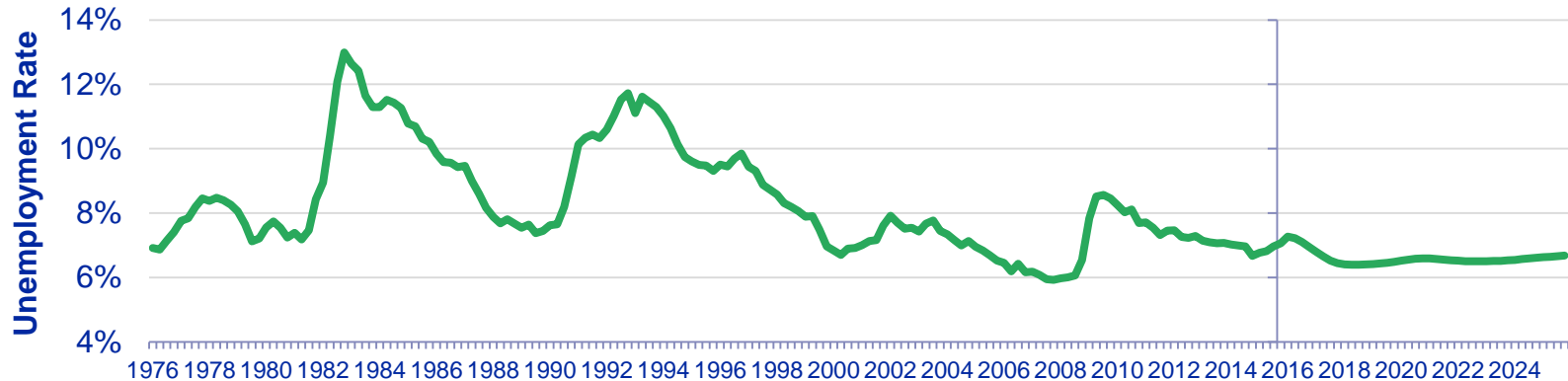
- » CMAs with macroeconomic variables from Moody's Analytics
- » Start date varies from 1971 to 1986
- » CMM Canada uses market (property type and location) specific CRE forecasts from CBRE and Moody's Analytics in deriving PD/LGD

Abbotsford	Halifax	Oshawa	St. Catharines-Niagara
Alma	Hamilton	Ottawa	St. John's
Barrie	Joliette	Owen Sound	Stratford
Bathurst	Kamloops	Peterborough	Swift Current
Calgary	Kawartha Lakes	Port Alberni	Thetford Mines
Campbell River	Kelowna	Portage la Prairie	Thompson
Cape Breton	Kenora	Prince George	Thunder Bay
Chatham-Kent	Kingston	Quebec	Tillsonburg
Collingwood	Kitchener	Red Deer	Timmins
Cornwall	Lachute	Regina	Toronto
Cowansville	Lethbridge	Riviere-du-Loup	Trois-Rivieres
Dawson Creek	London	Roberval	Truro
Drummondville	Matane	Saguenay	Val-d'Or
Edmonton	Medicine Hat	Saint John	Vancouver
Edmunston	Midland	Saint-Georges	Vernon
Elliot Lake	Moncton	Saint-Jean-sur-Richelieu	Victoria
Estevan	Montmagny	Salaberry-de-Valleyfield	Victoriaville
Fort St. John	Montreal	Sarnia	Wetaskiwin
Fredericton	Moose Jaw	Saskatoon	Williams Lake
Gaspe	Nanaimo	Sault Ste. Marie	Windsor
Gatineau	New Glasgow	Sept-iles	Winnipeg
Granby	North Battleford	Shawinigan	Wood Buffalo
Greater Sudbury	North Bay	Sherbrooke	Woodstock
Guelph	Orillia	Sorel-Tracy	

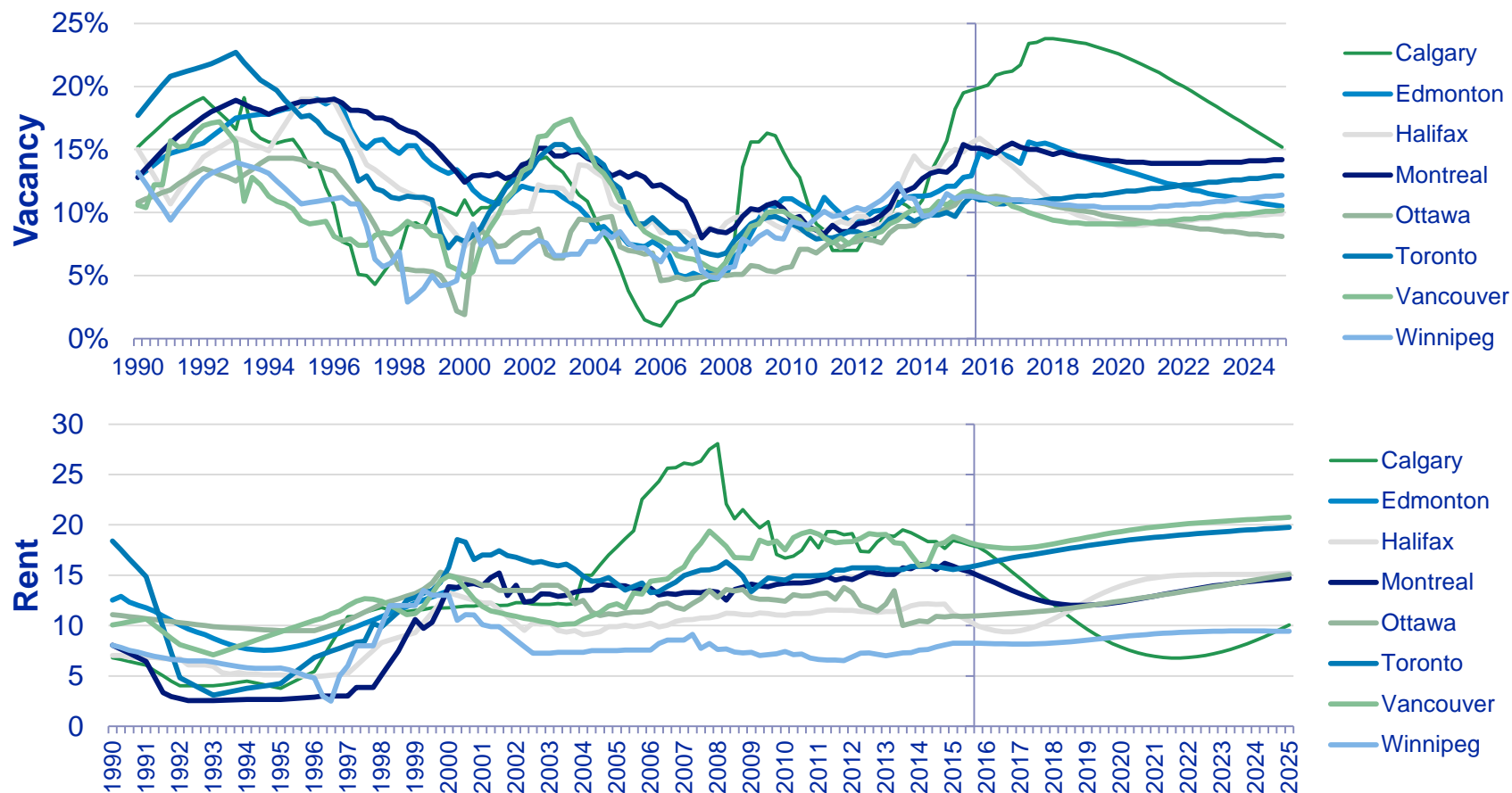
Source: Moody's Analytics

Risk Assessment Is About Future, Not Past

» Moody's Forecasts Regional Economic Performance: An example of Toronto CMA



CRE Markets React to Macroeconomic Conditions in the Supply Constraints of the Local Markets



Source: CB Richard Ellis Econometric Advisors (CBRE EA)

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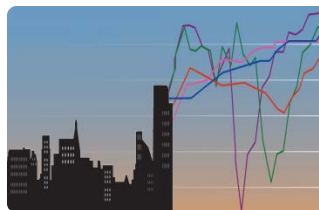
CMM™ (Commercial Mortgage Metrics) at a Glance

CMM™ (Commercial Mortgage Metrics) capabilities at a glance

- » Report risk measures at **portfolio and loan level**; also integrated with our spreading, loan origination and stress testing solutions
- » Supports **back-testing** by allowing historical analysis on a portfolio
- » Supports **regulatory review**, by enabling you to generate risk measures under various macroeconomic scenarios into CRE specific forecast and determine related losses on your portfolio
- » Provides flexible framework that is **adjustable** to your default experience



Save your CRE portfolio on the **Cloud** and access from **anywhere**



Combine your CRE portfolio and macro forecast and **instantly** see the impact on risk measures

Default Drivers Can Be Identified and Quantified from Empirical Data

» Financial ratios

- Debt-service-coverage ratio (DSCR)
- Loan-to-value ratio (LTV)
- Collateral size

» Market cycle factors

- Space market (vacancy rate)
- Capital market (market price changes)
- Origination quality

» Behavioral factors

- Loan seasoning
- Guarantee

» Property Type

- Core vs. non-core

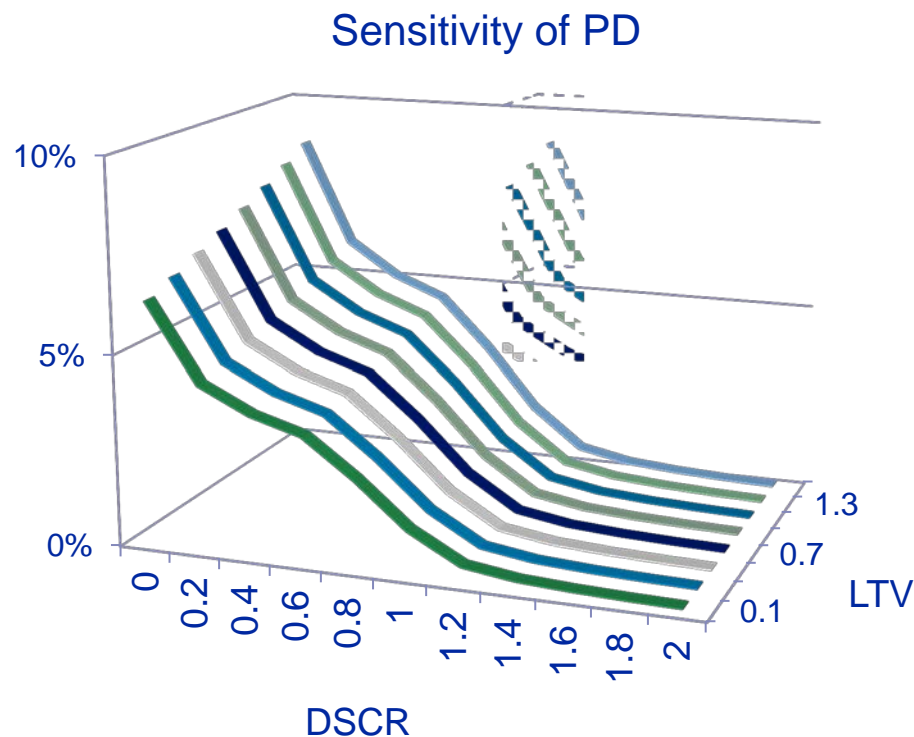
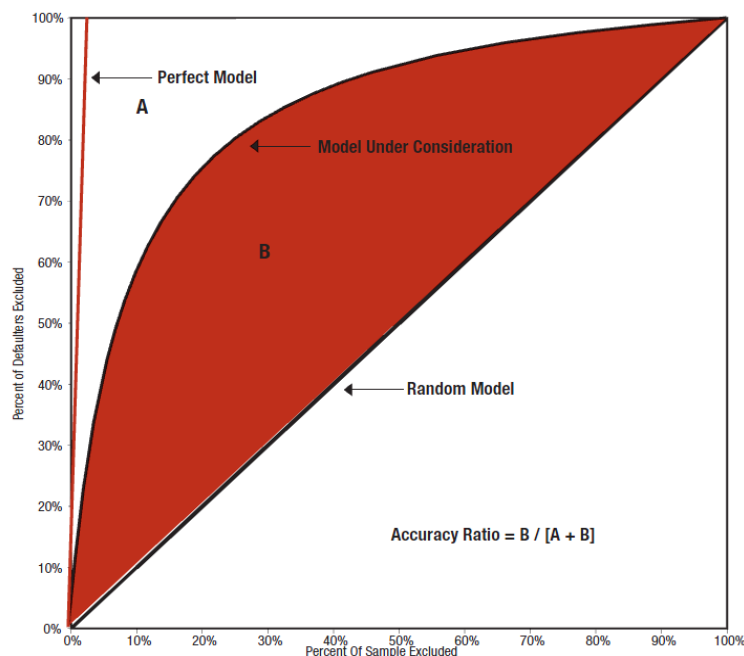
A Robust Default Risk Model Can Be Developed

- » A very robust and comprehensive credit risk model can be built upon all the datasets discussed: from CRE markets to loan credit performance history

CMM (Commercial Mortgage Metrics)

Canada accuracy: **56%**

Model quantifies risk by key ratios

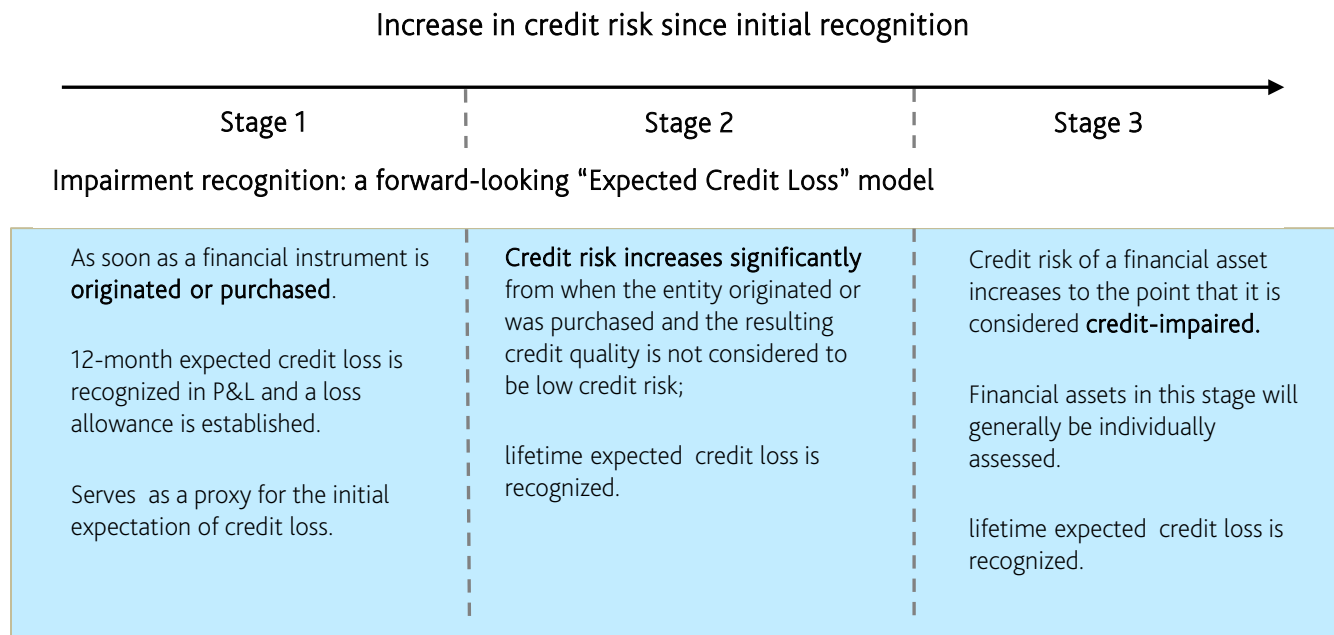


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IFRS 9: Estimating Expected Loss for Your CRE Portfolio

IFRS 9 – The Basics

- » As part of the response to the last financial crisis, the International Accounting Standards Board (IASB) recently issued IFRS 9, which moves from an “incurred loss” model to an “expected loss model”, with a mandatory effective date of January 1, 2018.
- » Canada’s Domestic Systemically Important Banks (D-SIBs) will early adopt IFRS 9 for annual periods beginning November 1, 2017 to align with global peers.
- » IFRS 9 provides a general “three-bucket” approach for regular financial instruments.



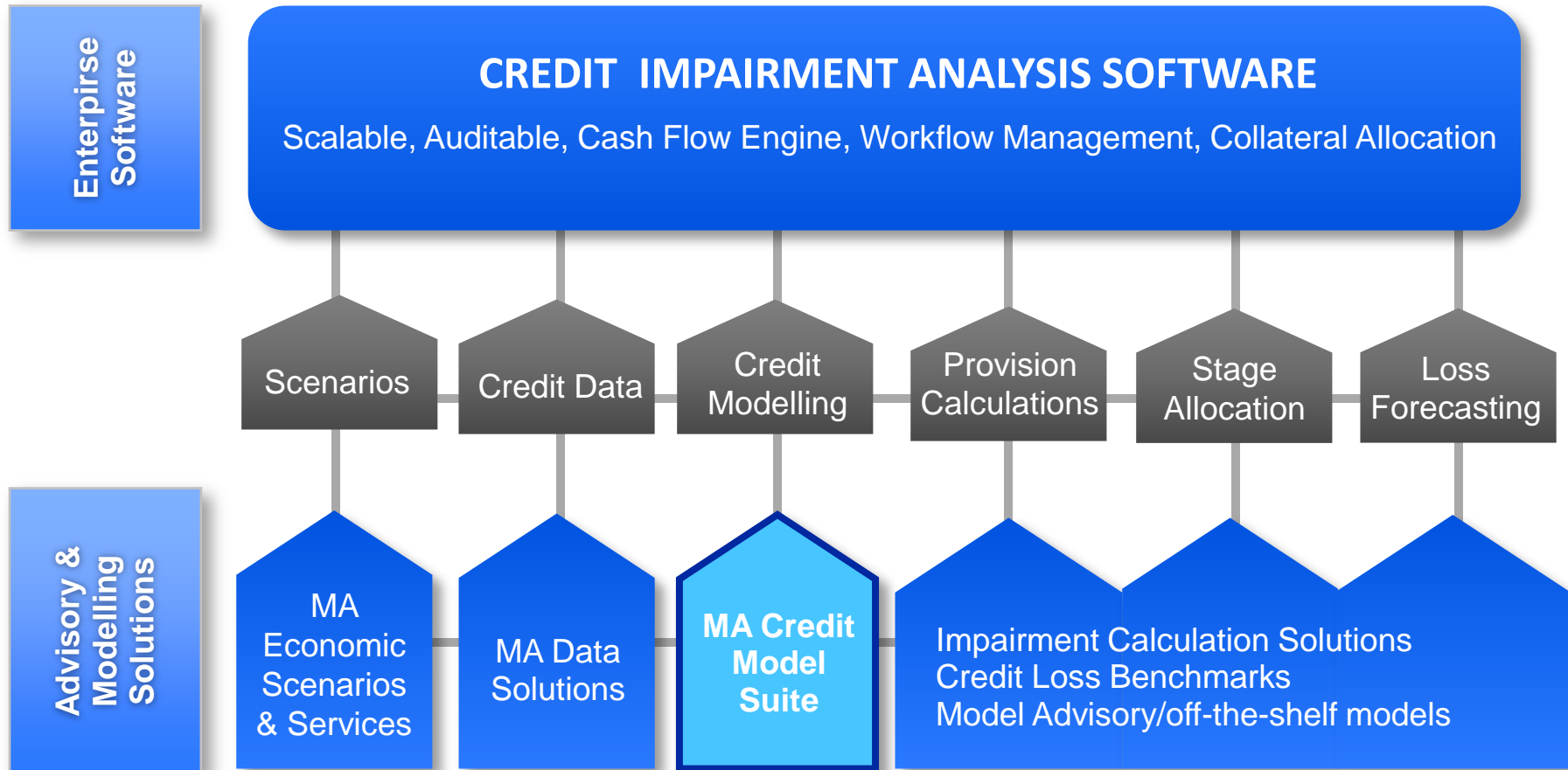
IFRS 9 Requirements and Potential Solutions

IFRS 9 REQUIREMENTS		SOLUTION/ IMPLEMENTATION
1	Apply Definition of Default consistent with internal credit practices	<ul style="list-style-type: none"> » The standard default definition is 90 days or more past due. » Align PD with an internal default definition that may be broader than the 90 days-past-due definition.
2	Reflect a Probability-Weighted expected credit loss	<ul style="list-style-type: none"> » Use multiple scenarios and weigh them to arrive at probability weighted outcome. » Simulate different NOI and property value growth paths. The final PD and EL are the probability-weighted average across all simulation paths.
3	Calculate both 12-Month and Lifetime Expected Credit Loss	<ul style="list-style-type: none"> » Term PD/EL to capture the risk of payment default during the loan term. » Maturity PD/EL to capture the refinance risk associated with a typically large balloon payment at loan maturity.
4	Incorporate information from Past Events	<ul style="list-style-type: none"> » Use historical CRE loan and market data in model development
5	Incorporate Current Market Condition	<ul style="list-style-type: none"> » Update property Income & value using current CRE market conditions, and use the most recent loan attributes to estimate risk metrics.
6	Incorporate Forecast Information	<ul style="list-style-type: none"> » Incorporate forecasts of market conditions i.e. risk drivers such as DSC and LTV should be driven based on market forecast » Loan payments maybe driven by interest rate forecast.
7	Calculate Expected Credit Losses considering the collateral and other credit enhancements.	<ul style="list-style-type: none"> » Use Loss models which incorporates cash flows from the sale of collateral and from expenses incurred during the liquidation process. » Incorporate liquidation expense based on historical experience and internal policy (including discount rate).

Using CMM for IFRS 9

- ✓ Provides annual **PD, LGD, EAD and EL** loss measures for lifetime of the CRE Loans
- ✓ **Calibrated to historical default** and CRE market data
- ✓ Market information **updated quarterly** capturing changes in market conditions
- ✓ Provides various **forward-looking scenarios** that move the loan metrics such as DSC and LTV based on market conditions
- ✓ CMM LGD **incorporates cash flows** from the sale of collateral and from expenses incurred in the liquidation process
- ✓ **Consistent definition of default**, along with ability to easily **customize** the model

Moody's Analytics Credit Loss and Impairment Analysis Suite



Q & A

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