

ANALYSIS  
APRIL 2021

---

**Prepared by**

Abhilasha Singh  
[Abhilasha.Singh@moodys.com](mailto:Abhilasha.Singh@moodys.com)  
Economist

**Contact Us**

Email  
[help@economy.com](mailto:help@economy.com)

U.S./Canada  
+1.866.275.3266

EMEA  
+44.20.7772.5454 (London)  
+420.224.222.929 (Prague)

Asia/Pacific  
+852.3551.3077

All Others  
+1.610.235.5299

Web  
[www.economy.com](http://www.economy.com)  
[www.moodysanalytics.com](http://www.moodysanalytics.com)

# Canada Housing Market: Tight Supply, Higher Costs Ahead

## INTRODUCTION

The Canadian housing market continues to weather the storm from the COVID-19 pandemic much better than originally expected at the start of the crisis. Unemployment remains significantly elevated and a new wave of COVID-19 in the fall has swept across the world. Several businesses are struggling to survive in the wake of the global pandemic and public health restrictions.

Nevertheless, the single-family home market has flourished. Record low mortgage rates and the work-from-anywhere phenomenon have juiced up house prices. However, weakness is evident in the condo apartment market. Condo apartment prices have started to decline in Toronto and have leveled off in Vancouver and Montréal over the past three to four months.

The story has not changed in the first quarter of 2021. The housing market started 2021 with a bang. Existing-home sales rose to a record high. Supply-side conditions remain exceedingly tight with existing-home inventories declining as homebuyers clamor for additional properties.

Though house prices are still rising at a fast pace, the pace of appreciation has slowed recently. Mortgage rates are starting to rise, but homebuilders continue to plow full steam ahead. Single-family housing construction is soaring to high levels.

However, the housing market will confront a multitude of headwinds such as higher mortgage rates and a persistently higher unemployment rate. We expect price growth to moderate late this year as a result.

# Canada Housing Market: Tight Supply, Higher Costs Ahead

BY ABHILASHA SINGH

The Canadian housing market continues to weather the storm from the COVID-19 pandemic much better than originally expected at the start of the crisis. Unemployment remains significantly elevated and a new wave of COVID-19 in the fall has swept across the world. Several businesses are struggling to survive in the wake of the global pandemic and public health restrictions.

Nevertheless, the single-family home market has flourished. Record low mortgage rates and the work-from-anywhere phenomenon have juiced up house prices. However, weakness is evident in the condo apartment market. Condo apartment prices have started to decline in Toronto and have leveled off in Vancouver and Montréal over the past three to four months.

The story has not changed in the first quarter of 2021. The housing market started 2021 with a bang. Existing-home sales rose to a record high. Supply-side conditions remain exceedingly tight with existing-home inventories declining as homebuyers clamor for additional properties.

Though house prices are still rising at a fast pace, the pace of appreciation has slowed recently. Mortgage rates are starting to rise, but homebuilders continue to plow full steam ahead. Single-family housing construction is soaring to high levels.

However, the housing market will confront a multitude of headwinds such as higher mortgage rates and a persistently higher unemployment rate. We expect price growth to moderate late this year as a result.

## Recent Performance

The housing market has been one of the bright spots in the Canadian economy. The RPS 13-metro area transaction-weighted composite house price index rose 8.4% over the course of

2020—its fastest rate since mid-2017—despite the deterioration of economic conditions.

Though house prices are still rising at a fast clip, house price appreciation has moderated, according to the latest data from RPS. In January, the RPS composite house price index rose 0.4% from the previous month and advanced 11.3% year over year. This is a strong year-over-year increase from a historical perspective, but it is the fourth consecutive month in which the index rose less than the month before.

Likewise, existing-home sales rocketed to 783,636 annualized units in February—a whopping 39% above the year-ago levels, according to the latest report from the Canadian Real Estate Association. Home resales growth has been primarily driven by single-family detached homes as opposed to condominiums, which supports the notion that the pandemic is driving more buyers to the suburbs and unshared property spaces.

The strength in the housing market reflects a multitude of supply- and demand-side factors.

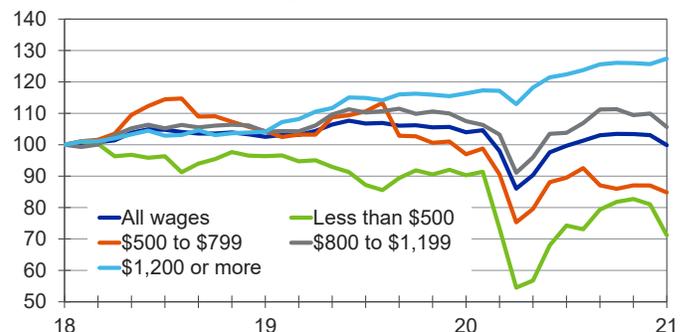
On the demand side, the pandemic has shifted preferences. With expanded

telework options, demand for housing outside of crowded city centers has surged as many formerly office-bound workers have abandoned apartments in and around high-rent, high-tax central business districts for homes in relatively low-cost suburbs and nearby smaller metro areas.

Bolstering Canadians' ability to satisfy their newfound preferences, fiscal stimulus programs have boosted disposable income through a multitude of income-assistance programs. Furthermore, Canadians higher up on the income scale—those more likely to purchase homes—have had healthier financial outcomes during the pandemic. Employment in higher-income professions has more than recovered pandemic losses while employment

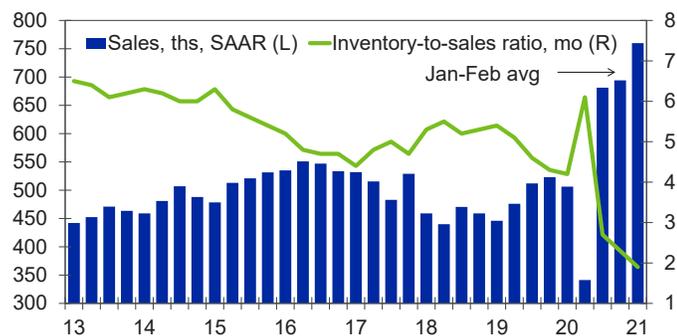
## Chart 1: High-Wage Earners Barely Hit

Employment by weekly wage level, Jan 2018=100, NSA



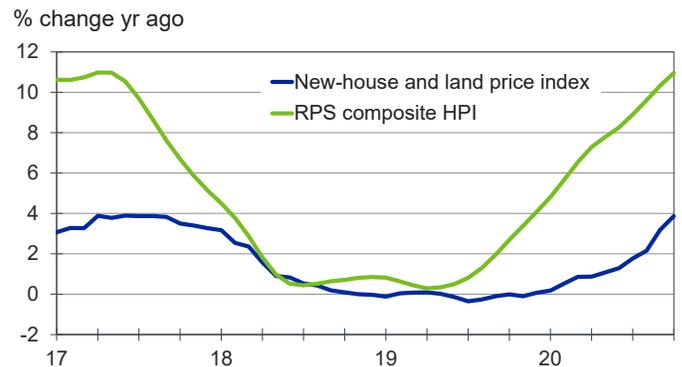
Sources: Statistics Canada, Moody's Analytics

### Chart 2: Sales Soar, Market Tightening...



Sources: CREA, Moody's Analytics

### Chart 3: ...Pushing House Prices Upward



Sources: RPS, Moody's Analytics

in lower-income industries remains down more than 10% (see Chart 1).

In addition, the five-year conventional mortgage rate dropped to 3.5% in September, its lowest rate on record going back to 1951. Though mortgage rates ticked up slightly in January, they continue to hover near all-time lows, bolstering buyers.

Supply-side conditions also remain exceedingly tight. The inventory of existing homes remains slim. Resale activity rebounded from the lows in April and new listings coming onto the market did not keep pace with demand. At the current sales pace, the available inventory amounts to a 1.8-month supply of existing homes, the lowest on record. Consequently, sellers remain firmly in control of the market and have been able to hike prices despite the recent economic downturn (see Charts 2 and 3).

Conditions are no different in the new-home market. The number of completed and unabsorbed new homes is at the lowest

level since late 2007. Builders are hampered by supply-chain issues brought on by the pandemic and public health restrictions. Also, input costs are rising, particularly for lumber. Meanwhile, mortgage deferrals and an eviction moratorium are preventing homeowners from having to deleverage.

High absorption of new homes—particularly single-family homes—is pushing up new-home prices. The national new-house and land price index rose by 1.8% in January on a month-ago basis and by 7% year over year. Elevated house prices are motivating builders to push ahead with new construction at a record pace. In January, the total value of residential building permits surged 21% over the past year to C\$7.1 billion, the highest monthly tally on record (see Chart 4).

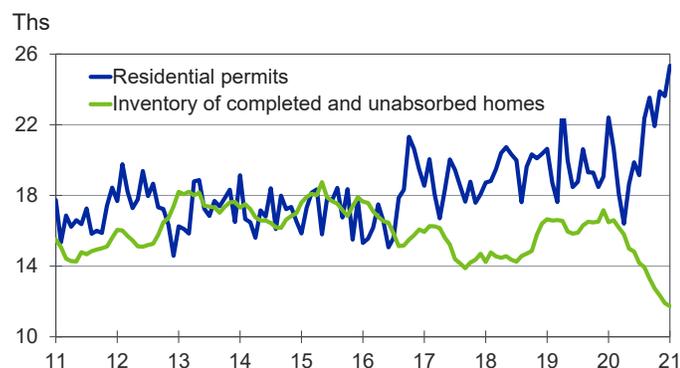
Though house prices surged to record levels in 2020, housing was more affordable than at any time during the previous five years (see Chart 5). The affordability index, which measures the mortgage cost of a me-

dian-priced home relative to median family income, has since dropped below its pre-pandemic level. Rising interest rates will erode affordability over the next year, but this erosion will be countered by an increase in employment and wages. As a result, housing affordability will rise in 2021 but will remain below pre-pandemic levels.

#### Slowest growth in Prairies

Though house prices are rising at their fastest rate since 2017, this speedy pace is not consistent across regions and will likely stay that way. Table 1 shows a comparison of year-over-year house price appreciation for Canada's metro areas for January 2020, just before the global pandemic, and January 2021. The RPS composite house price index is used to allow for the broadest possible coverage of the housing market. Of the six largest metro areas, Vancouver has had the largest house price appreciation, followed by Montréal, which has one of the tightest

### Chart 4: New Homes Surge Ahead



Sources: Statistics Canada, CMHC, Moody's Analytics

### Chart 5: Housing Is More Affordable



Sources: Bank of Canada, Moody's Analytics

**Table 1: Composite House Price Index Appreciation, 2020 and 2021**

	Jan 2020, % change yr ago	Jan 2021, % change yr ago	Difference
<b>Canada</b>	<b>4.9</b>	<b>11.3</b>	<b>6.4</b>
<b>Alberta</b>	<b>-1.1</b>	<b>2.1</b>	<b>3.2</b>
Calgary, census metropolitan area	-1.3	3.0	4.3
Edmonton, census metropolitan area	-0.9	2.1	3.0
<b>British Columbia</b>	<b>0.9</b>	<b>11.3</b>	<b>10.4</b>
Abbotsford, census metropolitan area	1.3	14.4	13.1
Kelowna, census metropolitan area	3.1	8.8	5.7
Vancouver, census metropolitan area	-0.1	12.7	12.8
Victoria, census metropolitan area	2.4	6.3	3.9
<b>Manitoba</b>	<b>1.9</b>	<b>6.4</b>	<b>4.5</b>
Winnipeg, census metropolitan area	1.6	6.9	5.2
<b>New Brunswick</b>	<b>0.2</b>	<b>4.4</b>	<b>4.3</b>
Moncton, census metropolitan area	-4.2	6.6	10.8
Saint John, census metropolitan area	-3.2	3.4	6.6
<b>Newfoundland and Labrador</b>	<b>1.6</b>	<b>2.3</b>	<b>0.8</b>
St. John's, census metropolitan area	-0.8	2.1	2.8
<b>Nova Scotia</b>	<b>3.0</b>	<b>11.5</b>	<b>8.5</b>
Halifax, census metropolitan area	3.8	12.1	8.4
<b>Ontario</b>	<b>7.7</b>	<b>12.9</b>	<b>5.2</b>
Barrie, census metropolitan area	5.5	18.7	13.2
Brantford, census metropolitan area	11.1	16.4	5.3
Greater Sudbury, census metropolitan area	8.2	12.1	4.0
Guelph, census metropolitan area	7.5	11.1	3.6
Hamilton, census metropolitan area	7.8	16.4	8.7
Kingston, census metropolitan area	6.5	12.6	6.2
Kitchener, census metropolitan area	9.1	13.7	4.7
London, census metropolitan area	10.0	16.9	6.9
Oshawa, census metropolitan area	4.6	15.2	10.5
Ottawa-Gatineau, census metropolitan area	10.7	16.7	6.0
Peterborough, census metropolitan area	5.7	11.0	5.3
St. Catharines-Niagara, census metropolitan area	9.9	15.8	5.9
Thunder Bay, census metropolitan area	2.9	6.1	3.2
Toronto, census metropolitan area	7.2	10.9	3.7
Windsor, census metropolitan area	11.2	20.1	8.9
<b>Prince Edward Island</b>	<b>11.1</b>	<b>12.6</b>	<b>1.5</b>
<b>Québec</b>	<b>6.5</b>	<b>12.0</b>	<b>5.5</b>
Montréal, census metropolitan area	7.5	12.5	5.0
Québec, census metropolitan area	2.0	5.5	3.5
Saguenay, census metropolitan area	7.9	6.5	-1.5
Sherbrooke, census metropolitan area	7.5	5.8	-1.6
Trois-Rivières, census metropolitan area	2.2	12.7	10.6
<b>Saskatchewan</b>	<b>0.1</b>	<b>0.4</b>	<b>0.3</b>
Regina, census metropolitan area	-1.2	1.0	2.2
Saskatoon, census metropolitan area	1.9	0.5	-1.4

Italicized metro areas are part of the RPS 13-metro area composite index.

Sources: RPS, Moody's Analytics

demand-supply conditions. Home sales fell in February despite higher condo sales as many buyers were out of luck because of depleting inventories.

House prices in the Toronto metro area rose by about 10% on a year-ago basis throughout the COVID-19 crisis, and home resales jumped 8% in 2020, largely because of strong sales of low-rise homes. The housing markets were mixed in the Atlantic metro areas. House prices barely increased in Saint John's while prices were up by more than 12% year over year in Prince Edward Island and Halifax.

Strong demand in the fourth quarter also resulted in price stability in Canada's energy provinces. In Calgary and Edmonton, previously plentiful inventories have come down considerably and prices are now rising, after declining during much of the past five years.

Smaller metro areas such as Barrie, London, Hamilton, Ottawa, Windsor near Toronto, and Abbotsford near Vancouver had fairly large price appreciation, which supports the notion that the pandemic is driving more buyers to the suburbs and unshared property spaces.

While rising house prices were somewhat disconnected with the employment and economic outcomes during the pandemic across regions, the change in home values was closely associated with the take-up rate of mortgage deferrals.

That is, markets with higher take-up rates of mortgage deferrals were more likely to see weaker price appreciation (see Chart 6). For example, Calgary, Edmonton, Regina and

Saskatoon had much higher take-up rates of mortgage deferrals in July 2020 and were among the metro areas with the weakest house price appreciation. Meanwhile, Toronto, Vancouver and Montréal had lower take-up rates and experienced strong house price appreciation.

### Condos struggle

The market for condo apartments is usually overshadowed by the single-family market, but there is reason to be cautious for real estate investors in some condo apartment markets (see Chart 7). Condo apartment price growth has slowed to just 2.6% year over year, or a record 9.6 percentage points below the growth in single-detached homes—the widest gap on record. The condo apartment market is being impacted by changing preferences of homebuyers, together with lower immigration and the impact of the pandemic on the labour market, especially for younger workers.

The pace of price appreciation for condo apartments has slowed in Vancouver and Montréal in the last few months. Condo apartment prices in Toronto fell in the last quarter of 2020 as condo listings have surged—bringing some balance to the metro area's condo market in 2020. At the current sales pace, the available inventory amounts to a two-month supply, up from a 1.3-month supply a year ago.

### The demand-supply balance

Even though joblessness in Canada remains elevated in the wake of nationwide

COVID-19 lockdowns and restrictions, house prices are increasing. The current dynamic is unlikely to subside in the short run.

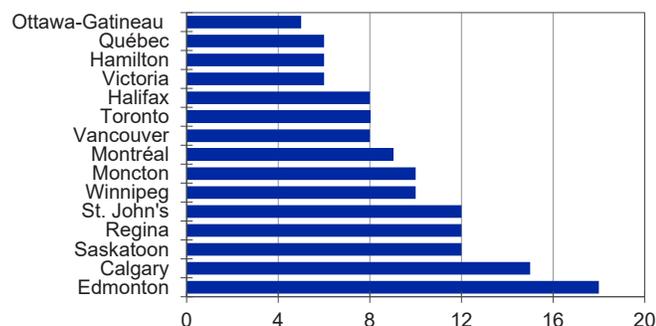
New cases of COVID-19 have eased from January's highs, but the slow pace of vaccine distribution suggests that immediate relief is not imminent. The prolonged duration of the crisis suggests that some of the shift in consumer and business behavior will linger for some time. However, the conditions that have resulted in rapid house price appreciation are unlikely to persist throughout the year.

Primarily, house prices are rising because exceptionally low mortgage rates have boosted demand. As interest rates have fallen, a new pool of potential buyers has joined the market. Lower interest rates have also pulled forward demand. Because of the lower interest rates, homebuyers can afford a larger mortgage than they could a year ago. This extra purchasing power encourages demand, but because the supply of housing is essentially fixed in the short term, prices rise.

Prices are also rising because the housing market is in short supply. Home resales are flirting with multidecade highs, pressuring housing supply. In addition, concerns about being exposed to potentially infectious strangers have clipped the supply of occupied homes during the coronavirus pandemic. Though relatively volatile, housing starts averaged 218,948 annualized units in 2020—a three-year high. Thus far, even the recent boom in single-family construction has failed to relieve overall supply-side pressure on the housing market.

**Chart 6: Deferral Take-Up High in Prairies**

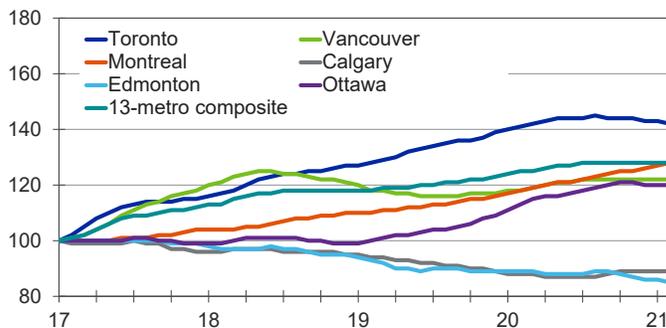
Active deferral, Jul 2020, %



Sources: RPS, Moody's Analytics

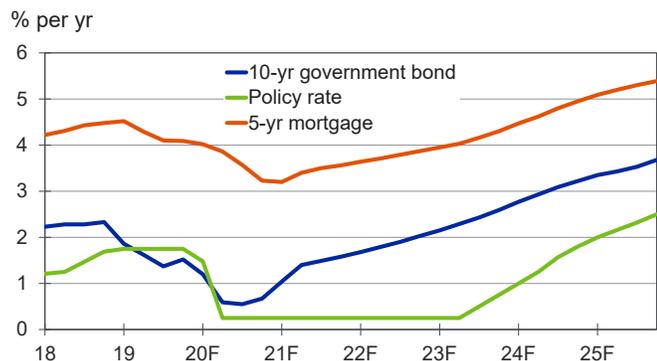
**Chart 7: Condo Market Loses Traction**

RPS condo apartment prices, Jan 2017=100, SA



Sources: RPS, Moody's Analytics

**Chart 8: Mortgage Rates Will Rise...**



Sources: Bank of Canada, Moody's Analytics

**Chart 9: ...And Will Drag Price Appreciation**



Sources: RPS, Moody's Analytics

However, all the factors that aligned in housing's favor last year are set to reverse, spelling trouble for the high-flying market.

Housing demand will moderate from its record pace but remain robust in the coming quarters. Interest rates will rise as the Bank of Canada winds down its asset purchases. Most notably, mortgage rates will pivot and start creeping higher (see Chart 8).

As borrowing costs begin to pick up, the pool of potential buyers will start to dwindle. We anticipate that the pace of housing starts will likely moderate back in line with its pre-pandemic trend by the end of 2021. In addition to interest rates, the persistently high rate of unemployment should weigh on demand.

Supply will increase as the rollout of COVID-19 vaccines encourages more sellers to list their occupied residences. Pent-up supply will be unleashed as homeowners who deferred selling in 2020 out of caution list their properties in 2021 and beyond.

Further supply will come from the expiration of the mortgage payment deferral program, which effectively removed troubled households' need to deleverage.

Nearly 10% of mortgages insured by the Canada Mortgage & Housing Corp. were in deferral at the program's peak in July, but that figure has declined closer to 1%. The large number of households that utilized the deferral program raises significant concerns about their ability to handle rising debt-service obligations once interest rates start increasing.

House price appreciation will extend into 2021, although it will cool somewhat from its breakneck pace in 2020 (see Chart 9). Limited supply of existing homes for sale will support strong house price growth early this year, around 8% to 9% year over year. But as housing financing costs increase, demand will moderate and so too will price gains. Year-over-year growth will slow to 1.6% by year's end.

**Outlook and risks**

Many measures of the housing market's performance over the next year are easy to forecast because the unprecedented events in 2020 have pushed these values to record-shattering levels.

The Bank of Canada will likely hold off on hiking its target for the overnight rate until mid-2023, when the labour market has more fully healed. Mortgage rates are certain to rise in 2021, but the BoC will likely continue shifting its asset purchases toward the longer end of the yield curve to temper the increases in mortgage rates, while leaving the size of its total balance sheet unchanged.

Inventory will rebound from the lowest level on record when existing-home sellers feel comfortable opening their residences to potential buyers. Housing starts will retreat from their elevated levels when rising interest rates and surging inventory dissolve these perfect conditions for homebuilders.

Other elements of the housing market are more difficult to predict because the unprecedented events in 2020 may lead to lasting changes in preferences. Expanded work-from-home options have fueled increased housing demand and higher prices in suburban districts. If expanded telework arrangements are a permanent feature of the labour market, the surge in housing demand could extend to smaller cities and rural areas over the next year.

## About the Author

[Abhilasha Singh](#) is an economist at Moody's Analytics, where she leads model development, validation, and forecasting for global subnational economies. She is responsible for coverage of emerging markets as well as U.S. and metropolitan area economies. She is also a regular contributor to Economic View. Abhilasha completed her PhD in economics at the University of Houston, where she taught microeconomics. She holds a master's degree in finance from Pune University in India.

## About RPS Real Property Solutions



RPS Real Property Solutions is a leading Canadian provider of outsourced appraisal management, mortgage-related services, and real estate business intelligence to financial institutions, real estate professionals, and consumers. The company's expertise in network management and real estate valuation, together with its innovative technologies and services, has established RPS as the trusted source for residential real estate valuation services.

RPS is wholly owned by Brookfield Business Partners L.P., a public company with majority ownership by Brookfield Asset Management Inc. Brookfield Business Partners L.P. is Brookfield's flagship public company for its business services and industrial operations of its private equity group, which is co-listed on the New York and Toronto stock exchanges under the symbol BBU and BBU.UN, respectively. Brookfield Asset Management Inc. is a Canadian company with more than a 100-year history of owning and operating assets with a focus on property, renewable power, infrastructure and private equity. Brookfield is co-listed on the New York, Toronto and Euronext stock exchanges under the symbol BAM, BAM.A and BAMA, respectively. More information is available at [www.rpsrealsolutions.com](http://www.rpsrealsolutions.com).

## About the RPS – Moody's Analytics House Price Forecasts

The RPS – Moody's Analytics House Price Forecasts are based on fully specified regional econometric models that account for both housing supply-demand dynamics and long-term influences on house prices such as unemployment and changes in mortgage rates. Updated monthly and providing a 10-year forward-time horizon, the forecasts are available for the nation overall, its 10 provinces and for 33 metropolitan areas, and cover three property style categories, comprising single-family detached, condominium apartments and aggregate, in a number of scenarios: a baseline house price scenario, reflecting the most likely outcome, and six alternative scenarios.

## About Moody's Analytics

Moody's Analytics provides financial intelligence and analytical tools supporting our clients' growth, efficiency and risk management objectives. The combination of our unparalleled expertise in risk, expansive information resources, and innovative application of technology helps today's business leaders confidently navigate an evolving marketplace. We are recognized for our industry-leading solutions, comprising research, data, software and professional services, assembled to deliver a seamless customer experience. Thousands of organizations worldwide have made us their trusted partner because of our uncompromising commitment to quality, client service, and integrity.

Concise and timely economic research by Moody's Analytics supports firms and policymakers in strategic planning, product and sales forecasting, credit risk and sensitivity management, and investment research. Our economic research publications provide in-depth analysis of the global economy, including the U.S. and all of its state and metropolitan areas, all European countries and their subnational areas, Asia, and the Americas. We track and forecast economic growth and cover specialized topics such as labor markets, housing, consumer spending and credit, output and income, mortgage activity, demographics, central bank behavior, and prices. We also provide real-time monitoring of macroeconomic indicators and analysis on timely topics such as monetary policy and sovereign risk. Our clients include multinational corporations, governments at all levels, central banks, financial regulators, retailers, mutual funds, financial institutions, utilities, residential and commercial real estate firms, insurance companies, and professional investors.

Moody's Analytics added the economic forecasting firm Economy.com to its portfolio in 2005. This unit is based in West Chester PA, a suburb of Philadelphia, with offices in London, Prague and Sydney. More information is available at [www.economy.com](http://www.economy.com).

Moody's Analytics is a subsidiary of Moody's Corporation (NYSE: MCO). Further information is available at [www.moodyanalytics.com](http://www.moodyanalytics.com).

DISCLAIMER: Moody's Analytics, a unit of Moody's Corporation, provides economic analysis, credit risk data and insight, as well as risk management solutions. Research authored by Moody's Analytics does not reflect the opinions of Moody's Investors Service, the credit rating agency. To avoid confusion, please use the full company name "Moody's Analytics", when citing views from Moody's Analytics.

## About Moody's Corporation

Moody's Analytics is a subsidiary of Moody's Corporation (NYSE: MCO). MCO reported revenue of \$4.8 billion in 2019, employs more than 11,000 people worldwide and maintains a presence in more than 40 countries. Further information about Moody's Analytics is available at [www.moodyanalytics.com](http://www.moodyanalytics.com).

© 2021 Moody's Corporation, Moody's Investors Service, Inc., Moody's Analytics, Inc. and/or their licensors and affiliates (collectively, "MOODY'S"). All rights reserved.

CREDIT RATINGS ISSUED BY MOODY'S CREDIT RATINGS AFFILIATES ARE THEIR CURRENT OPINIONS OF THE RELATIVE FUTURE CREDIT RISK OF ENTITIES, CREDIT COMMITMENTS, OR DEBT OR DEBT-LIKE SECURITIES, AND MATERIALS, PRODUCTS, SERVICES AND INFORMATION PUBLISHED BY MOODY'S (COLLECTIVELY, "PUBLICATIONS") MAY INCLUDE SUCH CURRENT OPINIONS. MOODY'S DEFINES CREDIT RISK AS THE RISK THAT AN ENTITY MAY NOT MEET ITS CONTRACTUAL FINANCIAL OBLIGATIONS AS THEY COME DUE AND ANY ESTIMATED FINANCIAL LOSS IN THE EVENT OF DEFAULT OR IMPAIRMENT. SEE APPLICABLE MOODY'S RATING SYMBOLS AND DEFINITIONS PUBLICATION FOR INFORMATION ON THE TYPES OF CONTRACTUAL FINANCIAL OBLIGATIONS ADDRESSED BY MOODY'S CREDIT RATINGS. CREDIT RATINGS DO NOT ADDRESS ANY OTHER RISK, INCLUDING BUT NOT LIMITED TO: LIQUIDITY RISK, MARKET VALUE RISK, OR PRICE VOLATILITY. CREDIT RATINGS, NON-CREDIT ASSESSMENTS ("ASSESSMENTS"), AND OTHER OPINIONS INCLUDED IN MOODY'S PUBLICATIONS ARE NOT STATEMENTS OF CURRENT OR HISTORICAL FACT. MOODY'S PUBLICATIONS MAY ALSO INCLUDE QUANTITATIVE MODEL-BASED ESTIMATES OF CREDIT RISK AND RELATED OPINIONS OR COMMENTARY PUBLISHED BY MOODY'S ANALYTICS, INC. AND/OR ITS AFFILIATES. MOODY'S CREDIT RATINGS, ASSESSMENTS, OTHER OPINIONS AND PUBLICATIONS DO NOT CONSTITUTE OR PROVIDE INVESTMENT OR FINANCIAL ADVICE, AND MOODY'S CREDIT RATINGS, ASSESSMENTS, OTHER OPINIONS AND PUBLICATIONS ARE NOT AND DO NOT PROVIDE RECOMMENDATIONS TO PURCHASE, SELL, OR HOLD PARTICULAR SECURITIES. MOODY'S CREDIT RATINGS, ASSESSMENTS, OTHER OPINIONS AND PUBLICATIONS DO NOT COMMENT ON THE SUITABILITY OF AN INVESTMENT FOR ANY PARTICULAR INVESTOR. MOODY'S ISSUES ITS CREDIT RATINGS, ASSESSMENTS AND OTHER OPINIONS AND PUBLISHES ITS PUBLICATIONS WITH THE EXPECTATION AND UNDERSTANDING THAT EACH INVESTOR WILL, WITH DUE CARE, MAKE ITS OWN STUDY AND EVALUATION OF EACH SECURITY THAT IS UNDER CONSIDERATION FOR PURCHASE, HOLDING, OR SALE.

MOODY'S CREDIT RATINGS, ASSESSMENTS, OTHER OPINIONS, AND PUBLICATIONS ARE NOT INTENDED FOR USE BY RETAIL INVESTORS AND IT WOULD BE RECKLESS AND INAPPROPRIATE FOR RETAIL INVESTORS TO USE MOODY'S CREDIT RATINGS, ASSESSMENTS, OTHER OPINIONS OR PUBLICATIONS WHEN MAKING AN INVESTMENT DECISION. IF IN DOUBT YOU SHOULD CONTACT YOUR FINANCIAL OR OTHER PROFESSIONAL ADVISER.

ALL INFORMATION CONTAINED HEREIN IS PROTECTED BY LAW, INCLUDING BUT NOT LIMITED TO, COPYRIGHT LAW, AND NONE OF SUCH INFORMATION MAY BE COPIED OR OTHERWISE REPRODUCED, REPACKAGED, FURTHER TRANSMITTED, TRANSFERRED, DISSEMINATED, REDISTRIBUTED OR RESOLD, OR STORED FOR SUBSEQUENT USE FOR ANY SUCH PURPOSE, IN WHOLE OR IN PART, IN ANY FORM OR MANNER OR BY ANY MEANS WHATSOEVER, BY ANY PERSON WITHOUT MOODY'S PRIOR WRITTEN CONSENT.

MOODY'S CREDIT RATINGS, ASSESSMENTS, OTHER OPINIONS AND PUBLICATIONS ARE NOT INTENDED FOR USE BY ANY PERSON AS A BENCHMARK AS THAT TERM IS DEFINED FOR REGULATORY PURPOSES AND MUST NOT BE USED IN ANY WAY THAT COULD RESULT IN THEM BEING CONSIDERED A BENCHMARK.

All information contained herein is obtained by MOODY'S from sources believed by it to be accurate and reliable. Because of the possibility of human or mechanical error as well as other factors, however, all information contained herein is provided "AS IS" without warranty of any kind. MOODY'S adopts all necessary measures so that the information it uses in assigning a credit rating is of sufficient quality and from sources MOODY'S considers to be reliable including, when appropriate, independent third-party sources. However, MOODY'S is not an auditor and cannot in every instance independently verify or validate information received in the rating process or in preparing its Publications.

To the extent permitted by law, MOODY'S and its directors, officers, employees, agents, representatives, licensors and suppliers disclaim liability to any person or entity for any indirect, special, consequential, or incidental losses or damages whatsoever arising from or in connection with the information contained herein or the use of or inability to use any such information, even if MOODY'S or any of its directors, officers, employees, agents, representatives, licensors or suppliers is advised in advance of the possibility of such losses or damages, including but not limited to: (a) any loss of present or prospective profits or (b) any loss or damage arising where the relevant financial instrument is not the subject of a particular credit rating assigned by MOODY'S.

To the extent permitted by law, MOODY'S and its directors, officers, employees, agents, representatives, licensors and suppliers disclaim liability for any direct or compensatory losses or damages caused to any person or entity, including but not limited to by any negligence (but excluding fraud, willful misconduct or any other type of liability that, for the avoidance of doubt, by law cannot be excluded) on the part of, or any contingency within or beyond the control of, MOODY'S or any of its directors, officers, employees, agents, representatives, licensors or suppliers, arising from or in connection with the information contained herein or the use of or inability to use any such information.

NO WARRANTY, EXPRESS OR IMPLIED, AS TO THE ACCURACY, TIMELINESS, COMPLETENESS, MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE OF ANY CREDIT RATING, ASSESSMENT, OTHER OPINION OR INFORMATION IS GIVEN OR MADE BY MOODY'S IN ANY FORM OR MANNER WHATSOEVER.

Moody's Investors Service, Inc., a wholly-owned credit rating agency subsidiary of Moody's Corporation ("MCO"), hereby discloses that most issuers of debt securities (including corporate and municipal bonds, debentures, notes and commercial paper) and preferred stock rated by Moody's Investors Service, Inc. have, prior to assignment of any credit rating, agreed to pay to Moody's Investors Service, Inc. for credit ratings opinions and services rendered by it fees ranging from \$1,000 to approximately \$5,000,000. MCO and Moody's Investors Service also maintain policies and procedures to address the independence of Moody's Investors Service credit ratings and credit rating processes. Information regarding certain affiliations that may exist between directors of MCO and rated entities, and between entities who hold credit ratings from Moody's Investors Service and have also publicly reported to the SEC an ownership interest in MCO of more than 5%, is posted annually at [www.moody.com](http://www.moody.com) under the heading "Investor Relations — Corporate Governance — Director and Shareholder Affiliation Policy."

Additional terms for Australia only: Any publication into Australia of this document is pursuant to the Australian Financial Services License of MOODY'S affiliate, Moody's Investors Service Pty Limited ABN 61 003 399 657AFSL 336969 and/or Moody's Analytics Australia Pty Ltd ABN 94 105 136 972 AFSL 383569 (as applicable). This document is intended to be provided only to "wholesale clients" within the meaning of section 761G of the Corporations Act 2001. By continuing to access this document from within Australia, you represent to MOODY'S that you are, or are accessing the document as a representative of, a "wholesale client" and that neither you nor the entity you represent will directly or indirectly disseminate this document or its contents to "retail clients" within the meaning of section 761G of the Corporations Act 2001. MOODY'S credit rating is an opinion as to the creditworthiness of a debt obligation of the issuer, not on the equity securities of the issuer or any form of security that is available to retail investors.

Additional terms for Japan only: Moody's Japan K.K. ("MJKK") is a wholly-owned credit rating agency subsidiary of Moody's Group Japan G.K., which is wholly-owned by Moody's Overseas Holdings Inc., a wholly-owned subsidiary of MCO. Moody's SF Japan K.K. ("MSFJ") is a wholly-owned credit rating agency subsidiary of MJKK. MSFJ is not a Nationally Recognized Statistical Rating Organization ("NRSRO"). Therefore, credit ratings assigned by MSFJ are Non-NRSRO Credit Ratings. Non-NRSRO Credit Ratings are assigned by an entity that is not a NRSRO and, consequently, the rated obligation will not qualify for certain types of treatment under U.S. laws. MJKK and MSFJ are credit rating agencies registered with the Japan Financial Services Agency and their registration numbers are FSA Commissioner (Ratings) No. 2 and 3 respectively.

MJKK or MSFJ (as applicable) hereby disclose that most issuers of debt securities (including corporate and municipal bonds, debentures, notes and commercial paper) and preferred stock rated by MJKK or MSFJ (as applicable) have, prior to assignment of any credit rating, agreed to pay to MJKK or MSFJ (as applicable) for credit ratings opinions and services rendered by it fees ranging from JPY125,000 to approximately JPY550,000,000.

MJKK and MSFJ also maintain policies and procedures to address Japanese regulatory requirements.