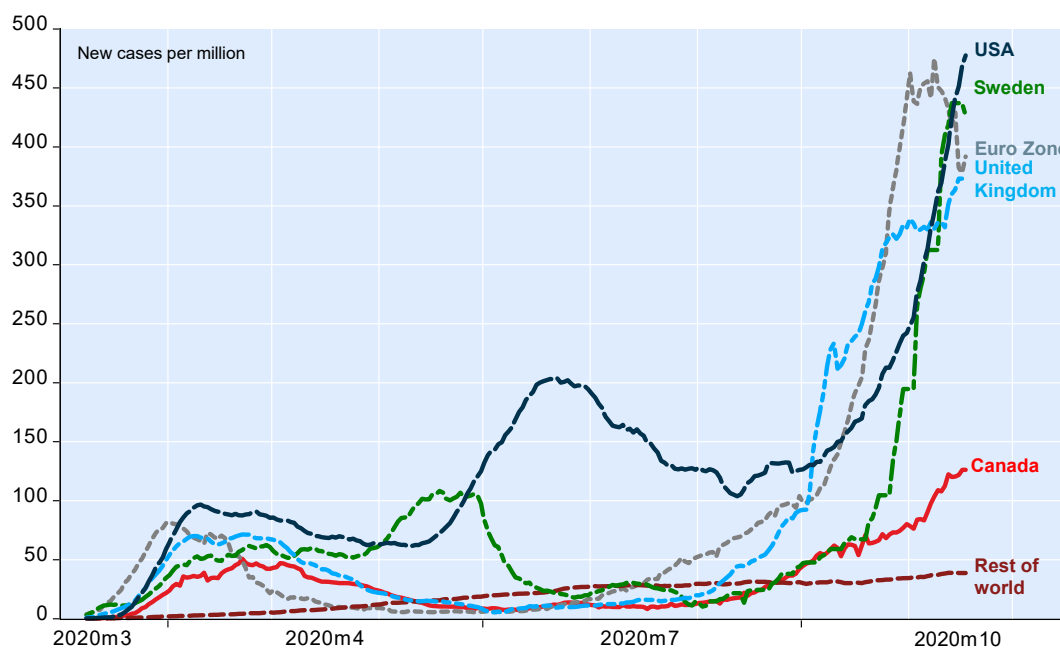


November 20, 2020

This monitor provides daily updates on the evolution of COVID-19 in selected countries using data available as of 8:00am EDT (graphs 1-10). We also compare the death rate of COVID-19 with that of the Spanish flu (graph 11), monitor the reopening of economies (graphs 12-13) and offer an update of our financial conditions index for Canada (graph 14).

1. World: Evolution of the pandemic

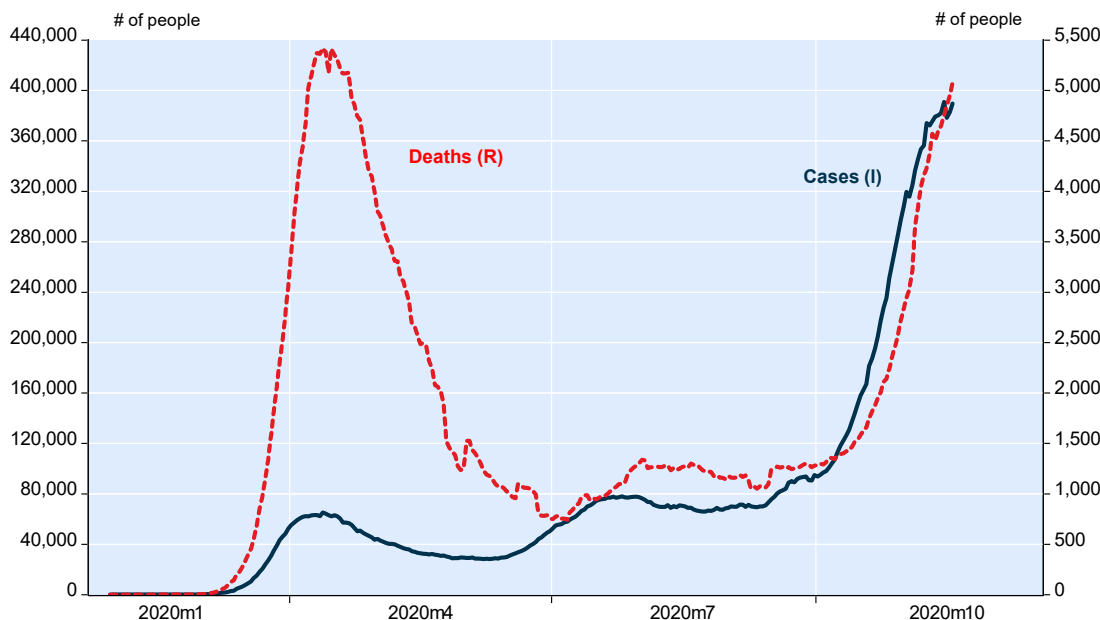
Daily new cases per million population by region, 7-day moving average



NBF Economics and Strategy (data via Johns Hopkins CSSE)

2. Developed countries: Perspective on COVID-19 cases and deaths

New cases and new deaths in Europe and North America, 7-day moving average



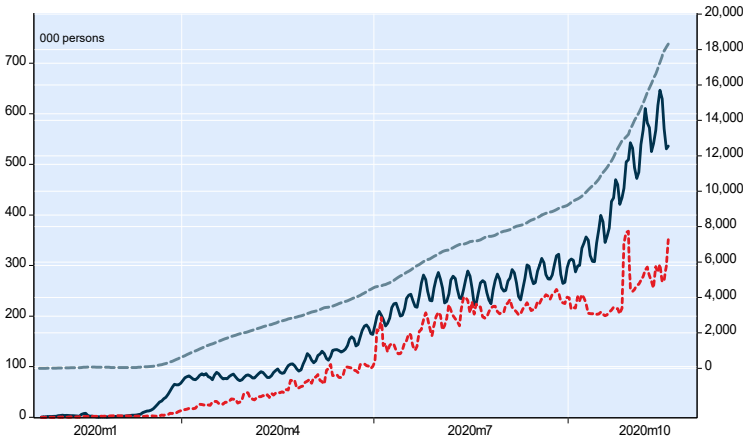
NBF Economics and Strategy (data via Johns Hopkins CSSE)

3. Evolution of the COVID-19 pandemic, selected countries

Daily change in new cases and in total active cases, 3 day moving average (data via Johns Hopkins CSSE)

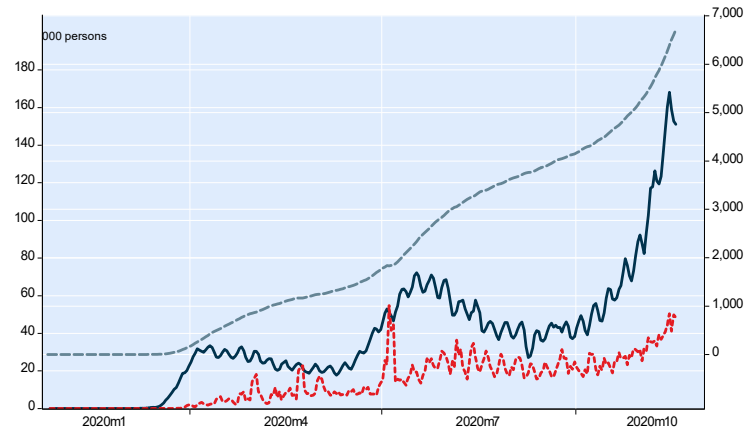
■ New cases (left axis) ■ New recoveries (left axis) ■ Active cases (confirmed – recovered – deaths, right axis)

World



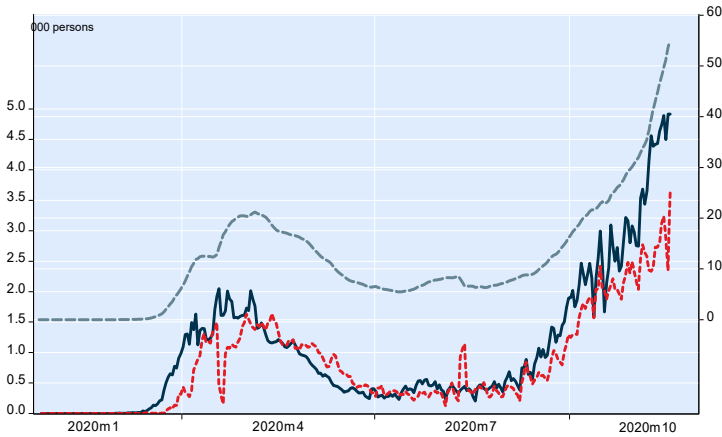
NBF Economics and Strategy

United States



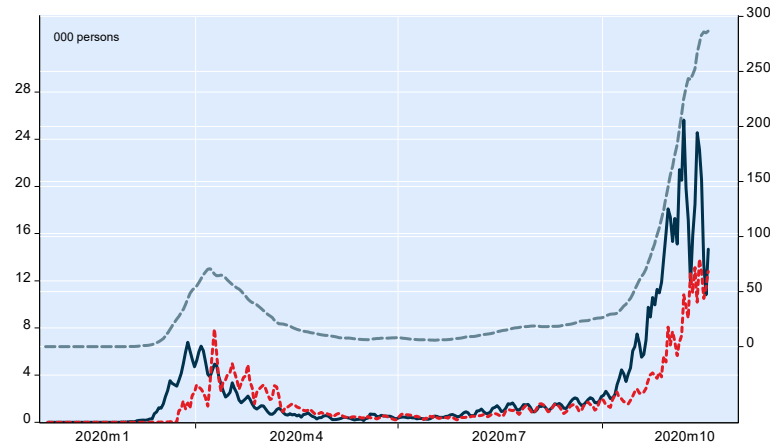
NBF Economics and Strategy

Canada



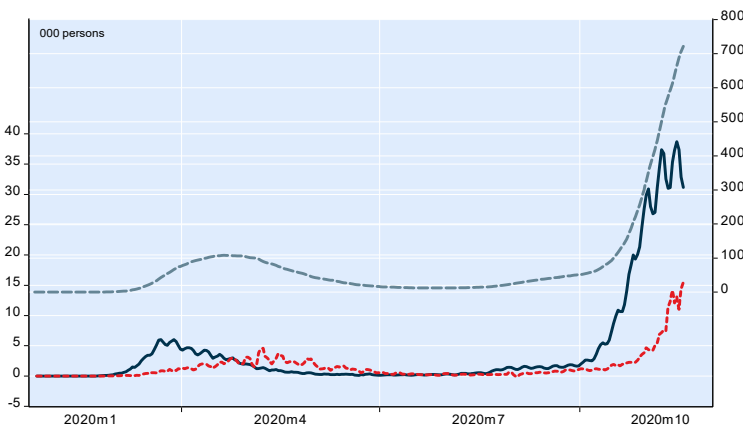
NBF Economics and Strategy (data via Johns Hopkins CSSE, Public Health Canada, INSPQ)

Germany



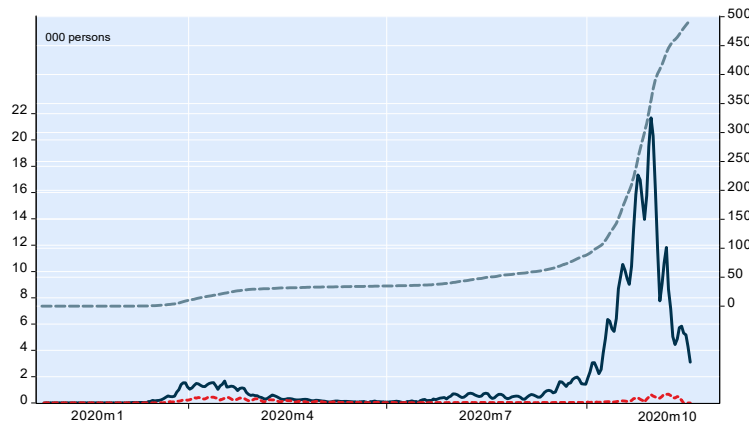
NBF Economics and Strategy

Italy



NBF Economics and Strategy

Belgium



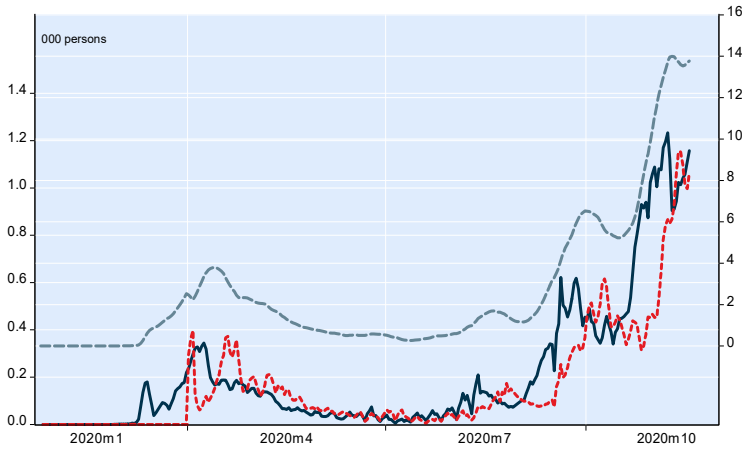
NBF Economics and Strategy

3. Evolution of the COVID-19 pandemic, selected countries (continued)

Daily change in new cases and in total active cases (data via Johns Hopkins CSSE)

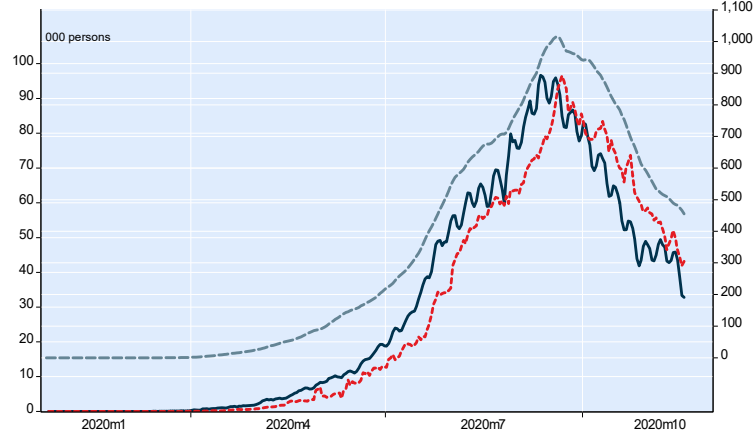
■ New cases (left axis) ■ New recoveries (left axis) ■ Active cases (confirmed – recovered – deaths, right axis)

Denmark



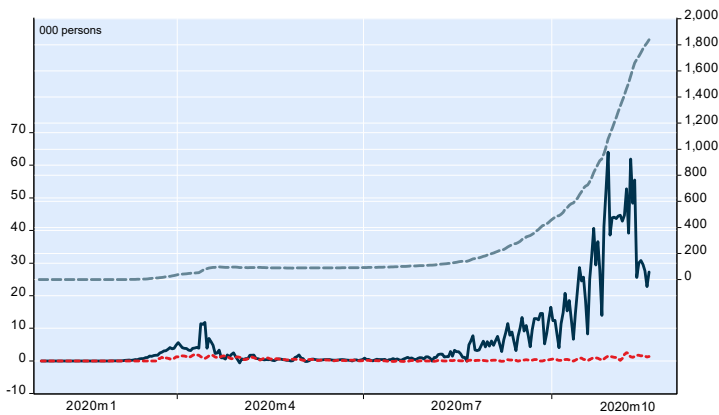
NBF Economics and Strategy

India



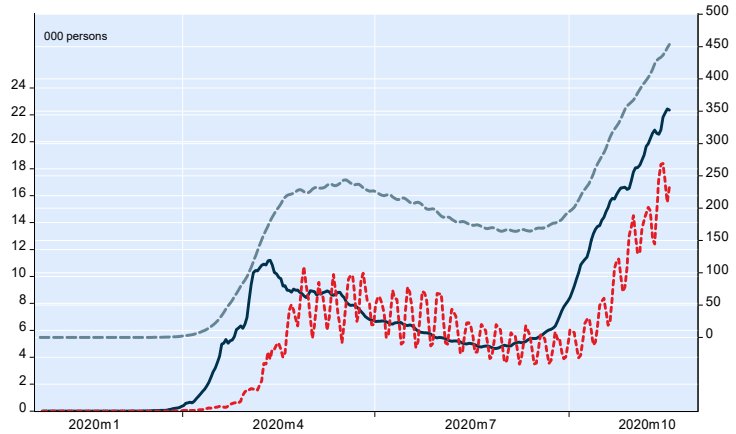
NBF Economics and Strategy

France



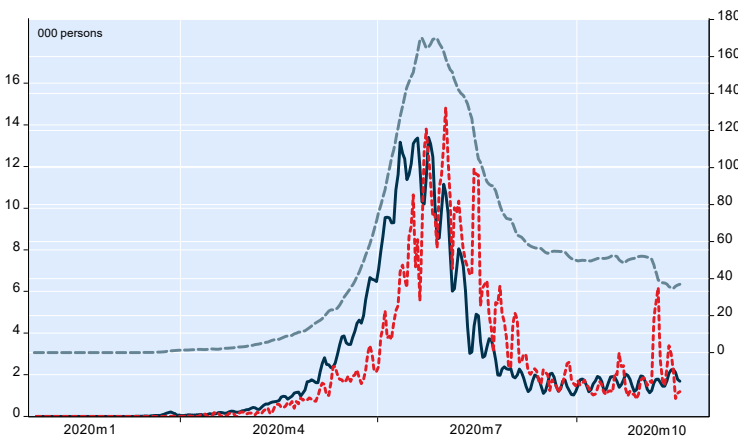
NBF Economics and Strategy

Russia



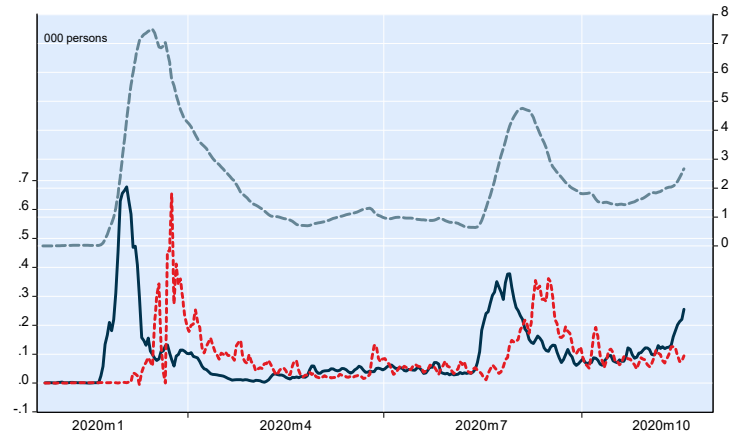
NBF Economics and Strategy

South Africa



NBF Economics and Strategy

South Korea



NBF Economics and Strategy

4. World, cases per million population

	Total cases per million population since start of the pandemic	Average new daily cases per million population					7 days vs 28 days trend
		Q2 2020	Q3 2020	October	Last 28 days	Last 7 days	
Austria	23 163	9.3	32.6	215.3	583.5	788.8	↑
Switzerland	31 194	19.2	27.1	376.3	777.3	649.2	↓
Portugal	22 132	37.4	35.6	208.0	442.7	600.9	↑
Italy	19 945	24.5	13.4	194.5	474.7	573.2	↑
United States	33 980	81.9	152.6	187.0	335.5	477.5	↑
France	30 526	23.9	63.7	393.4	601.3	451.3	↓
Sweden	17 561	68.6	26.8	100.6	304.3	427.2	↑
Belgium	46 410	46.1	53.5	865.0	925.8	408.4	↓
Spain	32 015	36.0	120.9	287.4	398.5	393.6	↓
United Kingdom	20 486	39.7	27.1	265.3	341.0	372.4	↑
Netherlands	26 420	24.2	44.8	433.6	443.1	313.4	↓
Germany	9 758	16.2	12.6	92.0	195.3	218.4	↑
Denmark	10 934	18.8	28.6	102.2	173.7	187.3	↑
Brazil	27 646	72.2	174.3	110.0	107.2	143.0	↑
Canada	8 037	28.3	15.8	64.7	97.3	125.5	↑
Norway	5 245	8.6	10.3	37.5	87.9	111.4	↑
Israel	37 520	25.2	276.6	256.9	79.9	80.5	↑
Finland	3 505	11.5	5.4	35.6	37.4	39.7	↑
Turkey	4 951	24.3	15.3	21.7	29.6	37.4	↑
Mexico	7 899	19.3	44.0	45.9	42.0	36.5	↓
South Africa	12 684	27.8	95.9	27.8	28.9	33.7	↑
India	6 430	4.7	45.1	43.7	32.7	28.7	↓
Japan	945	1.4	5.6	4.5	7.7	12.2	↑
South Korea	566	0.7	2.3	1.7	2.7	4.2	↑
Australia	1 090	1.5	8.2	0.6	0.5	0.6	↑
China	65	0.0	0.0	0.0	0.0	0.0	↓

Data via Johns Hopkins CSSE

5. World, deaths per million population

	Total deaths per million population since start of the pandemic	Average new daily deaths per million population					
		Q2 2020	Q3 2020	October	Last 28 days	Last 7 days	7 days vs 28 days trend
Belgium	1261	8.6	0.3	4.5	13.4	15.8	↑
Switzerland	409	1.9	0.1	0.8	6.3	10.7	↑
Italy	756	4.1	0.2	1.5	5.8	9.8	↑
France	685	4.4	0.3	2.3	6.7	8.9	↑
Portugal	341	1.5	0.4	1.7	4.7	7.5	↑
Spain	882	4.7	0.8	2.8	5.7	7.2	↑
Austria	210	0.7	0.1	1.1	4.1	7.1	↑
United Kingdom	768	6.1	0.3	2.1	4.6	6.3	↑
Netherlands	498	3.3	0.2	1.9	3.8	4.0	↑
Mexico	774	2.4	4.2	3.6	3.4	3.6	↑
United States	750	4.1	2.6	2.3	2.9	3.5	↑
Brazil	781	3.1	4.3	2.4	2.0	2.6	↑
Sweden	610	5.6	0.4	0.3	1.1	2.4	↑
Germany	153	1.1	0.1	0.4	1.4	2.3	↑
Canada	291	2.5	0.2	0.7	1.2	1.7	↑
South Africa	343	0.5	2.6	1.4	1.1	1.2	↑
Turkey	138	0.6	0.4	0.8	1.0	1.1	↑
Israel	316	0.4	1.6	3.6	1.9	0.9	↓
Denmark	132	1.0	0.1	0.4	0.5	0.4	↓
India	95	0.1	0.6	0.5	0.4	0.4	↓
Norway	54	0.4	0.0	0.0	0.1	0.3	↑
Finland	67	0.6	0.0	0.1	0.1	0.2	↑
Japan	15	0.1	0.1	0.0	0.1	0.1	↑
South Korea	10	0.0	0.0	0.0	0.0	0.0	↓
Australia	36	0.0	0.3	0.0	0.0	0.0	↓
China	3	0.0	0.0	0.0	0.0	0.0	↓

Data via Johns Hopkins CSSE

6. Canada, cases per million population

	Total cases per million population since start of the pandemic	Average new daily cases per million population					7 days vs 28 days trend
		Q2 2020	Q3 2020	October	Last 28 days	Last 7 days	
Manitoba	8 221	1.8	13.2	87.2	210.2	282.8	↑
Alberta	9 089	18.5	24.5	70.0	145.1	196.7	↑
Quebec	14 586	66.0	24.0	119.4	128.4	148.3	↑
Saskatchewan	4 396	5.6	10.4	33.7	90.4	146.4	↑
British Columbia	4 457	4.1	13.2	32.9	81.9	122.7	↑
Ontario	6 704	26.1	12.6	53.6	76.7	96.8	↑
New Brunswick	480	1.3	0.5	5.9	3.0	4.4	↑
Nova Scotia	1 170	10.3	0.3	0.7	2.0	2.8	↑
Newfoundland	580	2.3	0.3	1.1	1.2	2.2	↑
Prince Edward Island	426	0.4	2.2	1.0	0.9	0.9	↑

Data via Johns Hopkins CSSE

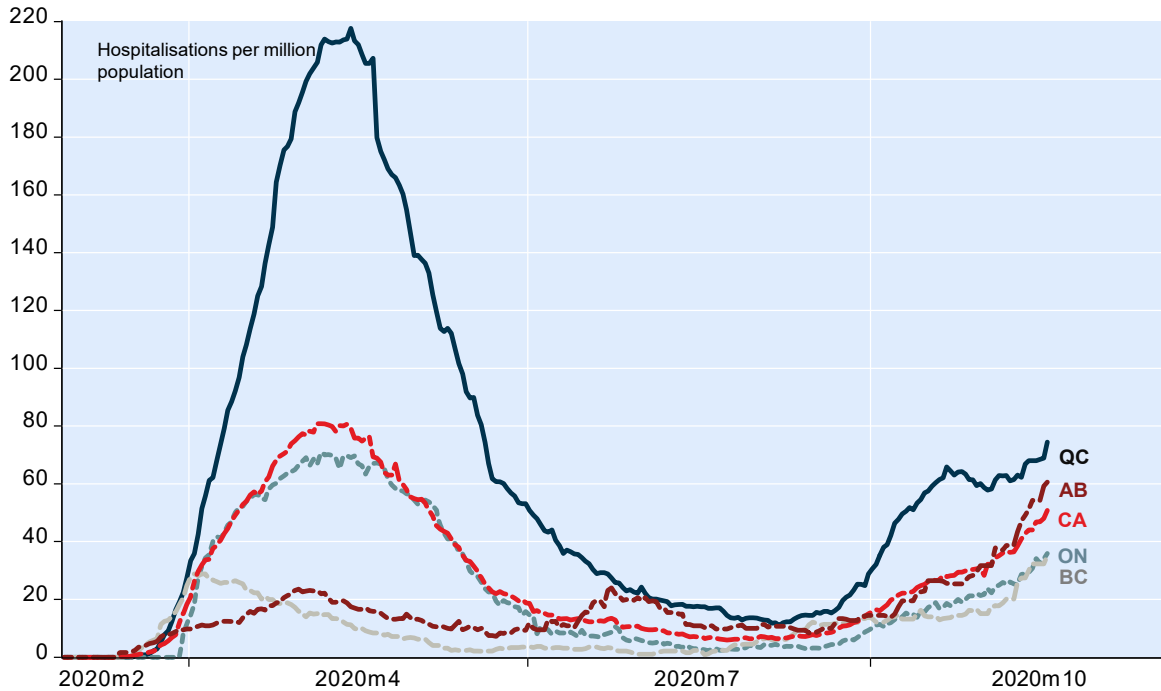
7. United States, cases per million population

	Total cases per million population since start of the pandemic	Average new daily cases per million population					7 days vs 28 days trend
		Q2 2020	Q3 2020	October	Last 28 days	Last 7 days	
Wisconsin	57 461	51.4	174.8	640.4	946.6	1186.1	↑
Illinois	46 185	119.0	130.8	307.6	686.0	977.0	↑
Indiana	38 137	70.9	120.2	284.3	591.7	909.7	↑
Missouri	40 524	36.3	185.8	311.6	537.1	778.2	↑
Michigan	28 933	69.1	73.2	191.8	467.9	737.9	↑
Tennessee	46 695	66.2	242.9	304.8	455.8	648.1	↑
Ohio	26 124	46.6	95.0	170.3	387.4	622.8	↑
Pennsylvania	21 499	74.0	61.9	122.7	253.8	411.9	↑
New Jersey	31 692	189.3	41.1	118.4	254.6	403.5	↑
Massachusetts	27 630	150.7	43.6	123.8	246.1	374.8	↑
Texas	36 796	60.4	228.7	177.2	266.8	337.5	↑
Arizona	38 044	117.7	208.0	121.6	230.4	329.0	↑
Maryland	27 732	119.8	102.8	109.7	195.3	309.5	↑
Florida	41 432	74.5	280.4	144.2	227.7	300.3	↑
Virginia	28 012	82.8	125.1	156.9	225.2	298.9	↑
North Carolina	29 958	68.8	148.6	196.9	234.1	273.1	↑
Washington	17 273	39.5	78.1	84.6	164.0	264.7	↑
Georgia	40 145	80.1	242.4	129.9	296.5	254.6	↓
New York	28 976	179.4	36.4	81.1	151.1	239.6	↑
California	26 364	62.1	161.7	92.3	152.3	227.2	↑

Data via Johns Hopkins CSSE

8. Canada: Current hospitalisations related to COVID-19

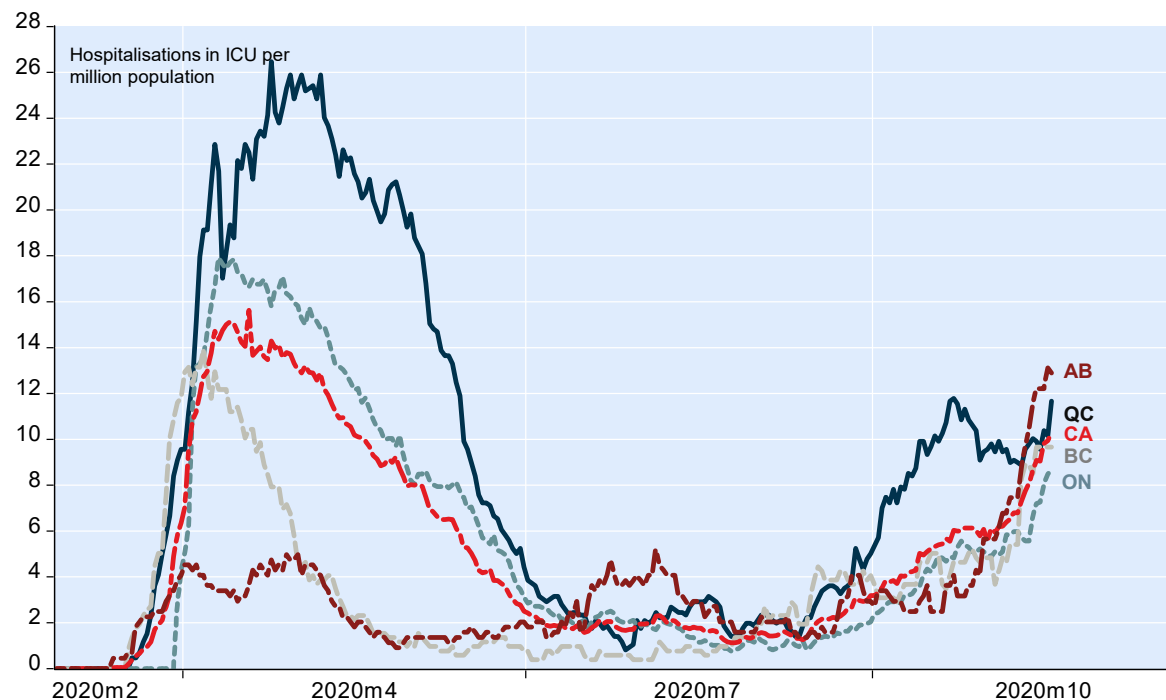
Hospitalisations per million population



NBF Economics and Strategy (data via INSPQ, Radio Canada <https://ici.radio-canada.ca/info/2020/coronavirus-covid-19-pandemie-cas-carte-maladie-symptomes-propagation/>)

9. Canada: Current hospitalisations in ICU related to COVID-19

Hospitalisations in ICU per million population



NBF Economics and Strategy (data via INSPQ, Radio Canada <https://ici.radio-canada.ca/info/2020/coronavirus-covid-19-pandemie-cas-carte-maladie-symptomes-propagation/>)

10. How do the COVID-19 vaccine clinical trials evolve?

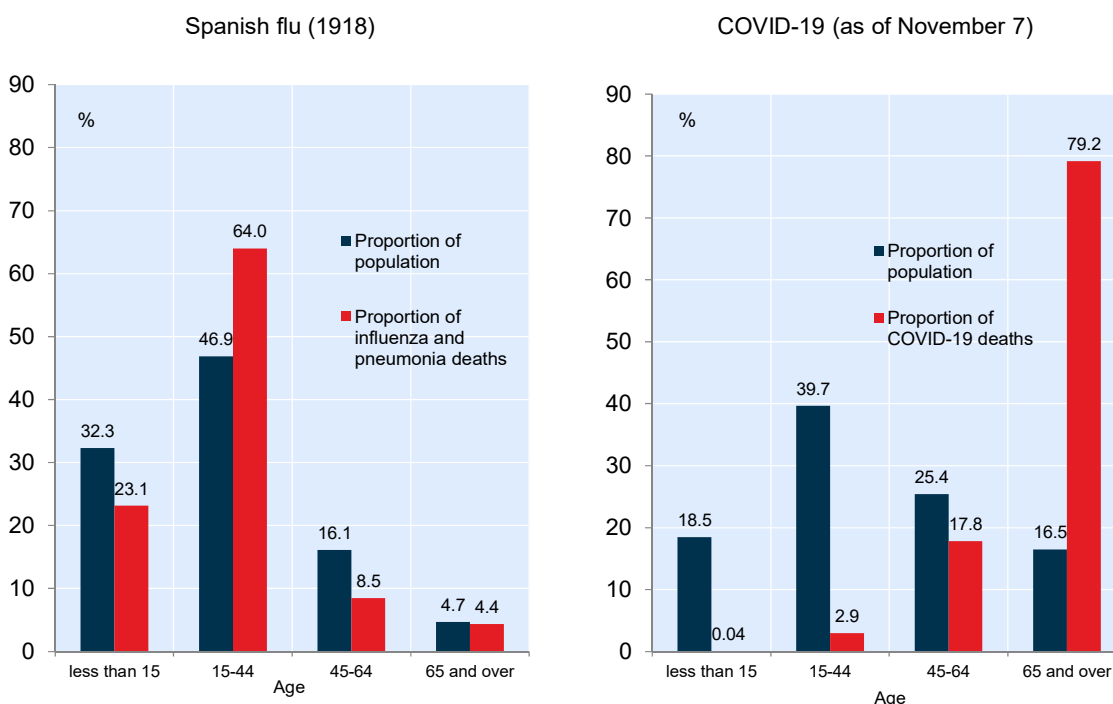
Candidate vaccines in clinical trials, organizations that have entered phase 3

Organisation	Phase of clinical trials started			
	Phase 1	Phase 2	Phase 3	Approved
Beijing Institute of Biological Products/Sinopharm	X	X	X	
Sinovac	X	X	X	
CanSino Biologics/Beijing Institute of Biotechnology	X	X	X	
University of Oxford/AstraZeneca	X	X	X	
Gamaleya Research Institute*	X	X	X	X
Wuhan Institute of Biological Products/Sinopharm	X	X	X	
BioNTech/Fosun Pharma/Pfizer	X	X	X	
Moderna/NIAID	X	X	X	
Novavax	X	X	X	
Janseen (Johnson & Johnson)	X	X	X	
Vector Institute*	X	X		X

* Russia approved 2 vaccines without completing all of the tests

NBF Economics and Strategy (data via Radio Canada <https://ici.radio-canada.ca/info/2020/07/vaccin-developpement-covid19-immunite-anticorps/>, various news sites)

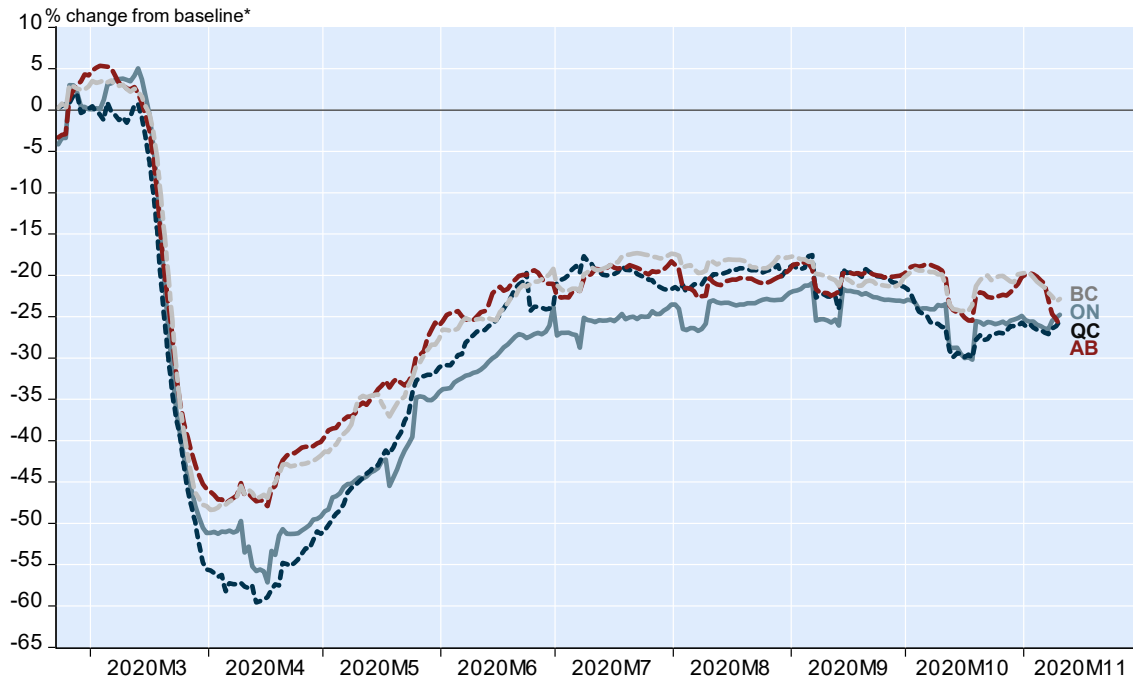
11. United States: Perspective on pandemic related deaths



NBF Economy and Strategy (data via CDC: https://www.cdc.gov/nchs/data/vsushistorical/morttable_1918.pdf, https://www.cdc.gov/nchs/nvss/vsrr/covid_weekly/index.htm, Census Bureau)

12. Canada: Back to normal index

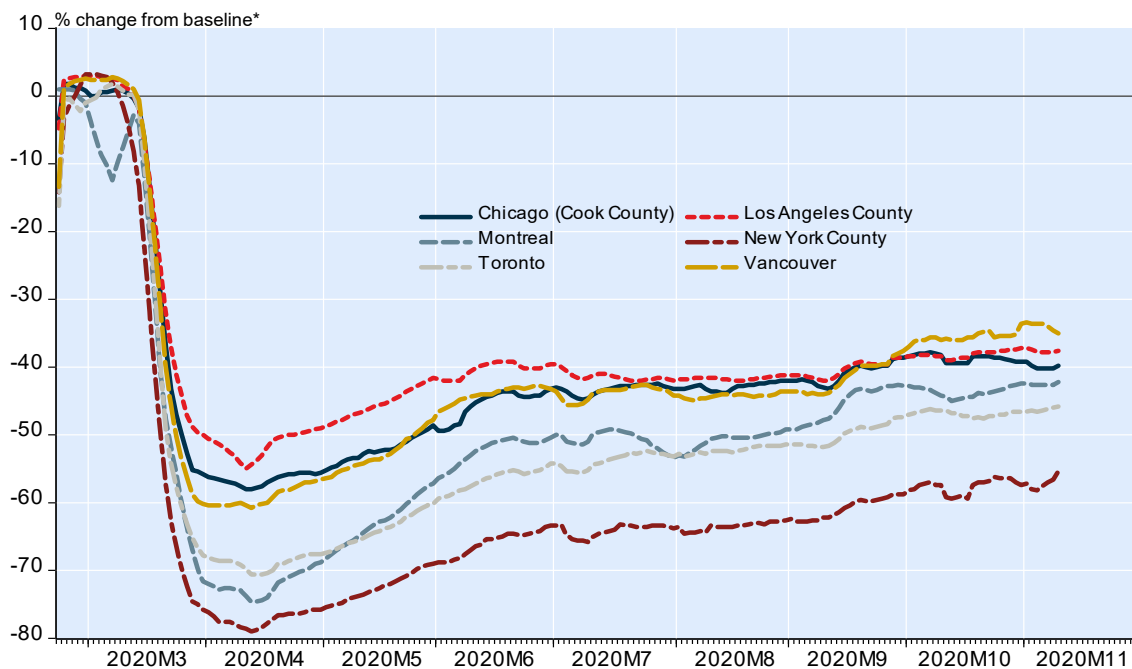
Google mobility data for retail & recreation, grocery & pharmacy, transit and workplaces, 7-day mov. average



*The baseline is the median value of the corresponding day of the week during the 5 week period from January 3 to February 6
NBF Economics and Strategy (data via Google)

13. Canada and United States: Return to workplaces

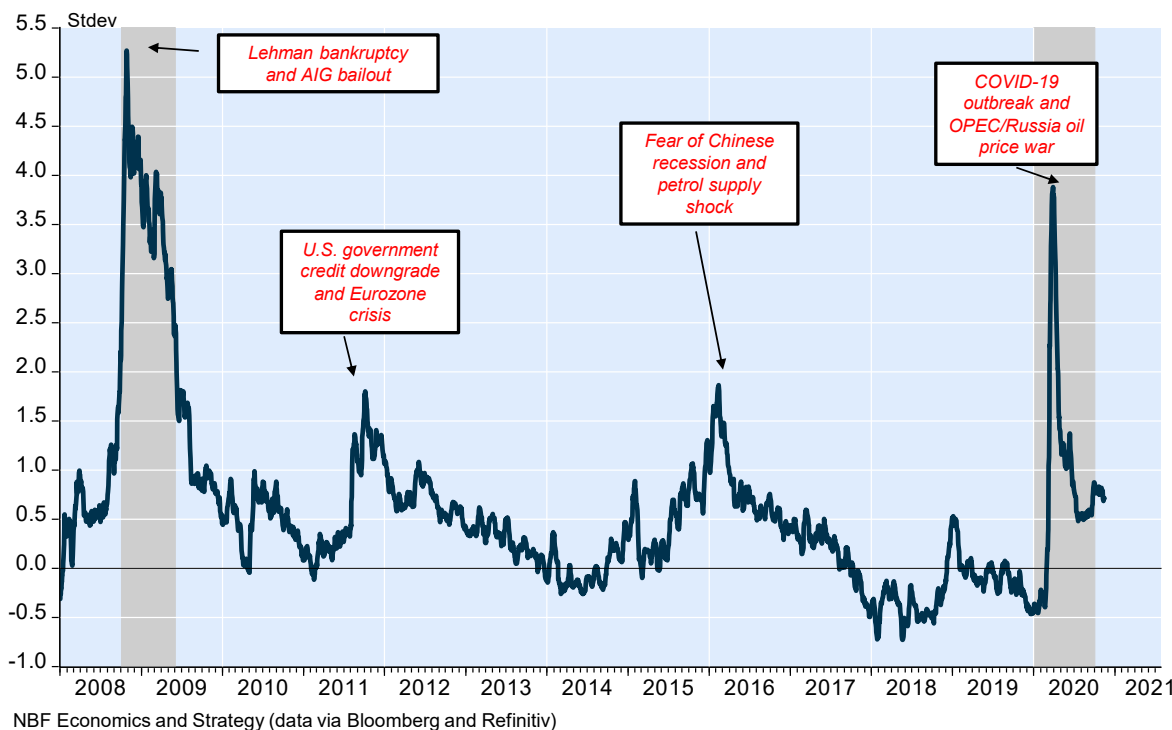
Google mobility data for workplaces, 5 day mov. av. (workdays only), 3 largest CMA's of Canada and the U.S.



*The baseline is the median value of the corresponding day of the week during the 5 week period from January 3 to February 6
NBF Economics and Strategy (data via Google)

14. Canada: Perspective on financial stress

NBF financial stress index



Our Canadian financial stress index (FSI) covers several asset classes. It emphasizes the financial sector, given its role in allocating capital to households and businesses. Our composite index is constructed based on a factor analysis model detecting common variations of normalized indicators. See below the variables included in the FSI.

NBF Financial Stress Index for Canada

Variables	Estimation
Beta S&P/TSX financials	$\beta = \text{cov}(r,m)/\text{var}(m)$ calculated daily over a rolling 1- year time horizon, where r = daily percentage change in the S&P/TSX Financials Total Returns Index. m = daily percentage change in the S&P/TSX Total Returns Index.
Financials bond yield spread	Approximated by the AA-rated long-term corporate bond yield, of which most constituents are financial issuers, minus the 10-year Canadian government bond yield.
S&P/TSX equity risk premium proxy	The S&P/TSX 12-month forward earnings divided by the price of the index minus the 10-year Canadian government bond yield.
S&P/TSX historical 1-month volatility	1-month historical volatility of the S&P/TSX.
USD/CAD historical 1-month volatility	1-month historical volatility of the USD/CAD exchange rate.
BBB rated corporate bond yield spread	BBB rated long-term corporate bond yield minus the 10-year Canadian government bond yield.
Provincial spread	Long-term provincial government bond yield minus the 10-year Canadian government bond yield.

Source: NBF Economics and Strategy (data via Bloomberg and Refinitiv)

Economics and Strategy

Montreal Office

514-879-2529

Stéfane Marion

Chief Economist and Strategist
stefane.marion@nbc.ca

Matthieu Arseneau

Deputy Chief Economist
matthieu.arseneau@nbc.ca

Paul-André Pinsonnault

Senior Economist
paulandre.pinsonnault@nbc.ca

Marc Pinsonneault

Senior Economist
marc.pinsonneault@nbc.ca

Angelo Katsoras

Geopolitical Analyst
angelo.katsoras@nbc.ca

Kyle Dahms

Economist
kyle.dahms@nbc.ca

Jocelyn Paquet

Economist
jocelyn.paquet@nbc.ca

Alexandra Ducharme

Intern Economist
alexandra.ducharme@nbc.ca

Toronto Office

416-869-8598

Warren Lovely

Chief Rate Strategist, Economics and Strategy
warren.lovely@nbc.ca

Taylor Schleich

Associate, Rates Strategist, Economics and Strategy
taylor.schleich@nbc.ca

General

This Report was prepared by National Bank Financial, Inc. (NBF), (a Canadian investment dealer, member of IIROC), an indirect wholly owned subsidiary of National Bank of Canada. National Bank of Canada is a public company listed on the Toronto Stock Exchange.

The particulars contained herein were obtained from sources which we believe to be reliable but are not guaranteed by us and may be incomplete and may be subject to change without notice. The information is current as of the date of this document. Neither the author nor NBF assumes any obligation to update the information or advise on further developments relating to the topics or securities discussed. The opinions expressed are based upon the author(s) analysis and interpretation of these particulars and are not to be construed as a solicitation or offer to buy or sell the securities mentioned herein, and nothing in this Report constitutes a representation that any investment strategy or recommendation contained herein is suitable or appropriate to a recipient's individual circumstances. In all cases, investors should conduct their own investigation and analysis of such information before taking or omitting to take any action in relation to securities or markets that are analyzed in this Report. The Report alone is not intended to form the basis for an investment decision, or to replace any due diligence or analytical work required by you in making an investment decision.

This Report is for distribution only under such circumstances as may be permitted by applicable law. This Report is not directed at you if NBF or any affiliate distributing this Report is prohibited or restricted by any legislation or regulation in any jurisdiction from making it available to you. You should satisfy yourself before reading it that NBF is permitted to provide this Report to you under relevant legislation and regulations.

National Bank of Canada Financial Markets is a trade name used by National Bank Financial and National Bank of Canada Financial Inc.

Canadian Residents

NBF or its affiliates may engage in any trading strategies described herein for their own account or on a discretionary basis on behalf of certain clients and as market conditions change, may amend or change investment strategy including full and complete divestment. The trading interests of NBF and its affiliates may also be contrary to any opinions expressed in this Report.

NBF or its affiliates often act as financial advisor, agent or underwriter for certain issuers mentioned herein and may receive remuneration for its services. As well NBF and its affiliates and/or their officers, directors, representatives, associates, may have a position in the securities mentioned herein and may make purchases and/or sales of these securities from time to time in the open market or otherwise. NBF and its affiliates may make a market in securities mentioned in this Report. This Report may not be independent of the proprietary interests of NBF and its affiliates.

This Report is not considered a research product under Canadian law and regulation, and consequently is not governed by Canadian rules applicable to the publication and distribution of research Reports, including relevant restrictions or disclosures required to be included in research Reports.

UK Residents

This Report is a marketing document. This Report has not been prepared in accordance with EU legal requirements designed to promote the independence of investment research and it is not subject to any prohibition on dealing ahead of the dissemination of investment research. In respect of the distribution of this Report to UK residents, NBF has approved the contents (including, where necessary, for the purposes of Section 21(1) of the Financial Services and Markets Act 2000). This Report is for information purposes only and does not constitute a personal recommendation, or investment, legal or tax advice. NBF and/or its parent and/or any companies within or affiliates of the National Bank of Canada group and/or any of their directors, officers and employees may have or may have had interests or long or short positions in, and may at any time make purchases and/or sales as principal or agent, or may act or may have acted as market maker in the relevant investments or related investments discussed in this Report, or may act or have acted as investment and/or commercial banker with respect hereto. The value of investments, and the income derived from them, can go down as well as up and you may not get back the amount invested. Past performance is not a guide to future performance. If an investment is denominated in a foreign currency, rates of exchange may have an adverse effect on the value of the investment. Investments which are illiquid may be difficult to sell or realise; it may also be difficult to obtain reliable information about their value or the extent of the risks to which they are exposed. Certain transactions, including those involving futures, swaps, and other derivatives, give rise to substantial risk and are not suitable for all investors. The investments contained in this Report are not available to retail customers and this Report is not for distribution to retail clients (within the meaning of the rules of the Financial Conduct Authority). Persons who are retail clients should not act or rely upon the information in this Report. This Report does not constitute or form part of any offer for sale or subscription of or solicitation of any offer to buy or subscribe for the securities described herein nor shall it or any part of it form the basis of or be relied on in connection with any contract or commitment whatsoever.

This information is only for distribution to Eligible Counterparties and Professional Clients in the United Kingdom within the meaning of the rules of the Financial Conduct Authority. NBF is authorised and regulated by the Financial Conduct Authority and has its registered office at 71 Fenchurch Street, London, EC3M 4HD.

NBF is not authorised by the Prudential Regulation Authority and the Financial Conduct Authority to accept deposits in the United Kingdom.

U.S. Residents

With respect to the distribution of this report in the United States of America, National Bank of Canada Financial Inc. ("NBCFI") which is regulated by the Financial Industry Regulatory Authority (FINRA) and a member of the Securities Investor Protection Corporation (SIPC), an affiliate of NBF, accepts responsibility for its contents, subject to any terms set out above. To make further inquiry related to this report, or to effect any transaction, United States residents should contact their NBCFI registered representative.

This report is not a research report and is intended for Major U.S. Institutional Investors only.

This report is not subject to U.S. independence and disclosure standards applicable to research reports.

HK Residents

With respect to the distribution of this report in Hong Kong by NBC Financial Markets Asia Limited ("NBCFMA") which is licensed by the Securities and Futures Commission ("SFC") to conduct Type 1 (dealing in securities) and Type 3 (leveraged foreign exchange trading) regulated activities, the contents of this report are solely for informational purposes. It has not been approved by, reviewed by, verified by or filed with any regulator in Hong Kong. Nothing herein is a recommendation, advice, offer or solicitation to buy or sell a product or service, nor an official confirmation of any transaction. None of the products issuers, NBCFMA or its affiliates or other persons or entities named herein are obliged to notify you of changes to any information and none of the foregoing assume any loss suffered by you in reliance of such information.

The content of this report may contain information about investment products which are not authorized by SFC for offering to the public in Hong Kong and such information will only be available to, those persons who are Professional Investors (as defined in the Securities and Futures Ordinance of Hong Kong ("SFO")). If you are in any doubt as to your status you should consult a financial adviser or contact us. This material is not meant to be marketing materials and is not intended for public distribution. Please note that neither this material nor the product referred to is authorized for sale by SFC. Please refer to product prospectus for full details.

There may be conflicts of interest relating to NBCFMA or its affiliates' businesses. These activities and interests include potential multiple advisory, transactional and financial and other interests in securities and instruments that may be purchased or sold by NBCFMA or its affiliates, or in other investment vehicles which are managed by NBCFMA or its affiliates that may purchase or sell such securities and instruments.

No other entity within the National Bank of Canada group, including National Bank of Canada and National Bank Financial Inc, is licensed or registered with the SFC. Accordingly, such entities and their employees are not permitted and do not intend to: (i) carry on a business in any regulated activity in Hong Kong; (ii) hold themselves out as carrying on a business in any regulated activity in Hong Kong; or (iii) actively market their services to the Hong Kong public.

Copyright

This Report may not be reproduced in whole or in part, or further distributed or published or referred to in any manner whatsoever, nor may the information, opinions or conclusions contained in it be referred to without in each case the prior express written consent of NBF.