January 22, 2018

The Metropolitan Economic Momentum Index (MEMI)

Summary

- We constructed the Metropolitan Economic Momentum Index (MEMI) to gauge the current economic momentum of 20 census metropolitan areas (CMAs) in Canada, with a special emphasis on their fiscal capacity.
- Growth in the index reflects growth in the following six quarterly economic indicators: average employment level in quarter, average unemployment level in quarter, housing starts, number of MLS home sales, investment in non-residential building construction in constant dollars, and the Teranet-National Bank House Price Index™.
- Growth in the MEMI over the past four quarters indicates that Hamilton is the top-performing CMA in this period, though this is due to employment growth reported by Statistics Canada at a hard-to-believe 12.5% and a consequent drop in the unemployment rate of 2.1 percentage points. The wide confidence interval for the employment estimate sets the minimum growth at 3.1%, which still indicates that Hamilton outpaced most of the other CMAs in this regard.
- After Hamilton, St. Catharines–Niagara is the CMA that showed the strongest economic momentum, followed by Kitchener-Cambridge–Waterloo. These two CMAs, like that of Toronto and the others part of the Golden Horseshoe, registered house price growth well in the double digits. Moreover, St. Catharines–Niagara also recorded the sharpest increase in investment in non-residential building construction, while Kitchener-Cambridge–Waterloo recorded the strongest employment growth after Hamilton. Victoria comes in a close fourth in the ranking, followed by Gatineau.
- Where the three largest CMAs in Canada are concerned, Montreal outperformed Toronto and Vancouver in the past year. Montreal topped the other two in terms of employment growth and in investment in non-residential building construction.

Methodology

We constructed the Metropolitan Economic Momentum Index (MEMI) to gauge the current economic momentum of census metropolitan areas (CMA)[1], with a special emphasis on their fiscal capacity. Growth in the index reflects growth in the following six quarterly economic indicators: average employment level in quarter, average unemployment level in quarter, housing starts, number of MLS home sales, investment in non-residential building construction in constant dollars, and the Teranet-National Bank House Price Index[2].

These six indicators were selected for the following reasons:

1. They are available for all the CMAs considered.
2. They are released in very timely fashion (investment in non-residential building construction comes out last but is normally available in the third week after the fact).
3. They are released in seasonally adjusted terms, except for the house price indices, which we seasonally adjust ourselves.
4. None trails far behind the economic cycle.
5. They all cover the period of the last economic recession.

Accordingly, retail sales were not selected as the statistics are available only for the Toronto, Montreal and Vancouver CMAs. Another indicator available but not selected was the number of bankruptcies and proposals to creditors, both consumer and commercial, as the statistics are published two months after the fact, aside from trailing behind the economic cycle. Furthermore, this indicator only covers the period since 2010Q1 and, therefore, was not around at the time of the last recession. We opted for investment in non-residential building construction instead of non-residential building permits because the latter statistics are available later, that is, five to six weeks after the fact. The ratio of full-time employment to total employment and the statistics on the civilian population aged 25 to 54 are not seasonally adjusted.

The index constitutes a weighted average of the symmetrical quarterly growth rate of each indicator. The symmetrical growth rate is given by:

$$G = 200*(X_q-X_{q-1})/(X_q+X_{q-1})$$

where X is an indicator, q is the current quarter, and q-1 is the previous quarter. What is particular about a symmetrical growth rate is that an increase in an indicator (say $X_1-X_0>0$) will generate the same percentage (with inverted sign) as a decrease from X_0 to X_1. Given that change in the unemployment rate is itself a symmetrical change in percentage points, in this case the equation can be expressed as $G = -(X_q-X_{q-1})$, which means that an increase in the unemployment rate makes a negative contribution to the MEMI and vice versa.

The symmetrical growth rate of each indicator is then divided by the standard deviation of the symmetrical growth rate of the aggregate indicator for all the CMAs. Accordingly, for each CMA, the symmetrical growth rate of employment is divided by the standard deviation of the symmetrical growth rate of employment for all of the CMAs considered. We thus obtain a normalized growth rate that is comparable across indicators even if some indicators vary more widely than others.

For each CMA, the normalized symmetrical growth rates of all six indicators are then summed and this sum is divided by a constant that is the sum of the standard deviations of the symmetrical growth rates of the aggregate indicators. This gives us a growth rate that has the dimension of a quarterly change (symmetrical but not normalized) in a single indicator, regardless of the number of indicators considered. Once converted to a conventional growth rate, this figure becomes the quarterly growth rate of the MEMI for the CMA considered. For example, we apply the result for 2005Q2 to 100 (base level of the index at 2005Q1), and to the index level thus obtained we apply the result for 2005Q3 to obtain the index level for that quarter, and so on. This way, we obtain a historical series for the MEMI for each CMA.

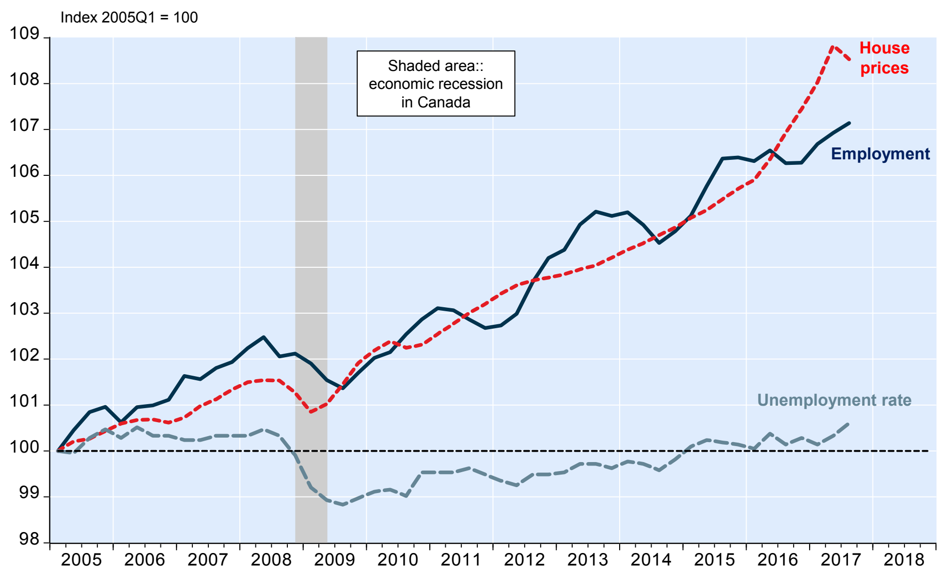
[1] A census metropolitan area (CMA) is formed by one or more adjacent municipalities centred on a population centre referred to as the core. A CMA must have a total population of at least 100,000 of which 50,000 or more must live in the core according to the previous population census. To be included in a CMA, other adjacent municipalities must have a high degree of integration with the core, as measured by commuting flows (journey to work data) derived from previous census place of work data. A CMA remains a CMA even if its total population falls below 100,000 or if its core population falls below 50,000.
[2] As this index is not available for Regina and Saskatoon, we used for these CMAs the Canadian Real Estate Association Index.

MEMI long-term profile

All of the indicators considered have a say in change in the MEMI of a CMA in the short term. However, two of the six indicators considered usually show structural growth. These are employment and house prices. Their structural growth is by far the leading driver of growth in the MEMI over the long term.

Chart 1

Toronto: Contribution of selected indicators to growth in MEMI



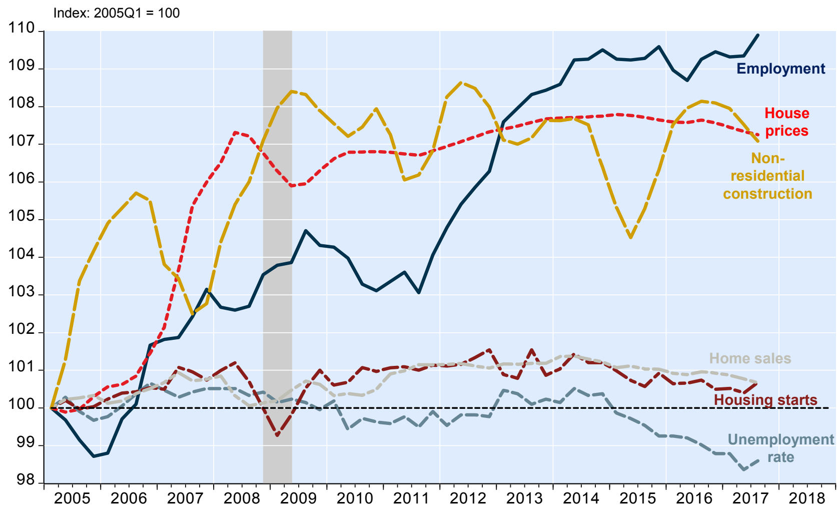
NBF Economics and Strategy (NBF calculations)

Chart 1 renders the phenomenon all too manifest. It depicts the two indicators' contribution to Toronto's MEMI level, compared to that of the unemployment rate. If we add up the contribution to the MEMI level of the two indicators with structural growth, we can explain nearly all of the 17.8% growth in Toronto's MEMI from 2005Q1 to 2017Q3. By comparison, the unemployment rate's contribution over the long term is negligible, even if it has been dominant over short time spans, such as during the recession. The long-term contribution of the other indicators (housing starts, home sales and investment in non-residential building construction) is typically to that of the unemployment rate.

The pattern in Toronto regarding the relative contribution of each indicator to the MEMI's growth over the long term is the same observed in all of the CMAs considered, except one. In Saskatoon, investment in non-residential building construction grew sharply from 2007Q3 to 2009Q2 and never really let up since, so much so that this indicator has contributed to growth in this CMA's MEMI to the same extent as house prices over the entire period covered by the index.

Chart 2

Saskatoon: Contribution of indicators to growth in MEMI



NBF Economics and Strategy (NBF calculations)

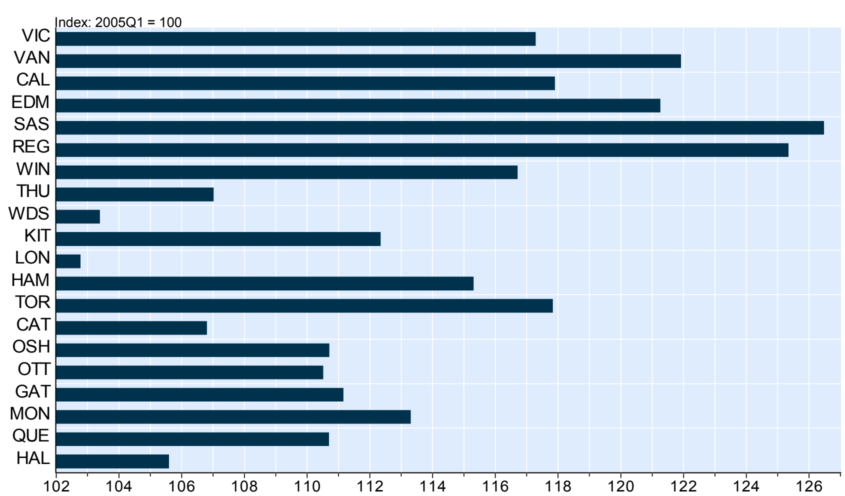
The fact that, in all CMAs but one, growth in only two of the six indicators prevailed over the long run is not counter intuitive. This merely reflects the fact that, over the long term, demographic growth (particularly the capacity of a CMA's labour market to retain workers and to attract others from elsewhere) and the value of the housing stock are the key drivers that grow a CMA's fiscal capacity in the long run.

Historical profile of MEMI for each CMA

We calculated the MEMI from 2005 to 2017Q3 for 20 CMAs. Over this period, the strongest advance was registered in Saskatoon (SAS; 26.5%), followed by Regina (REG; 25.3%), Vancouver (VAN; 21.9%), Edmonton (EDM; 21.2%), Calgary (CAL; 17.9%), and Toronto (TOR; 17.8%).

Chart 3

MEMI levels at 2017Q3 for 20 CMAs*

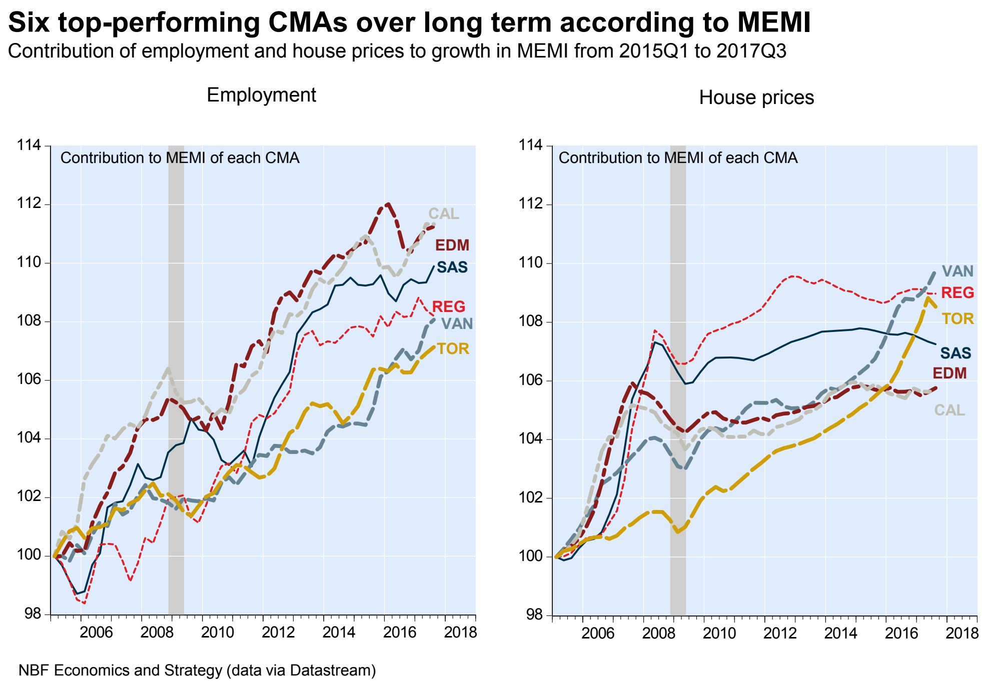


* See annex for list of CMAs corresponding to abbreviations used in charts.

NBF Economics and Strategy (NBF calculations)

As we have seen, Saskatoon owes its top ranking to investment in non-residential building construction, which contributed decisively to the MEMI's growth, whereas in all the other CMAs, this indicator made no more than a light contribution at best. For the other top-performing CMAs, the MEMI's level in 2017Q3 can be explained, as we saw above, by growth in employment and in house prices.

Chart 4



Accordingly, Regina's second place in the ranking and Vancouver's third place are attributable above all to growth in house prices, whereas Edmonton's fourth place and Calgary's fifth place are attributable primarily to growth in employment.

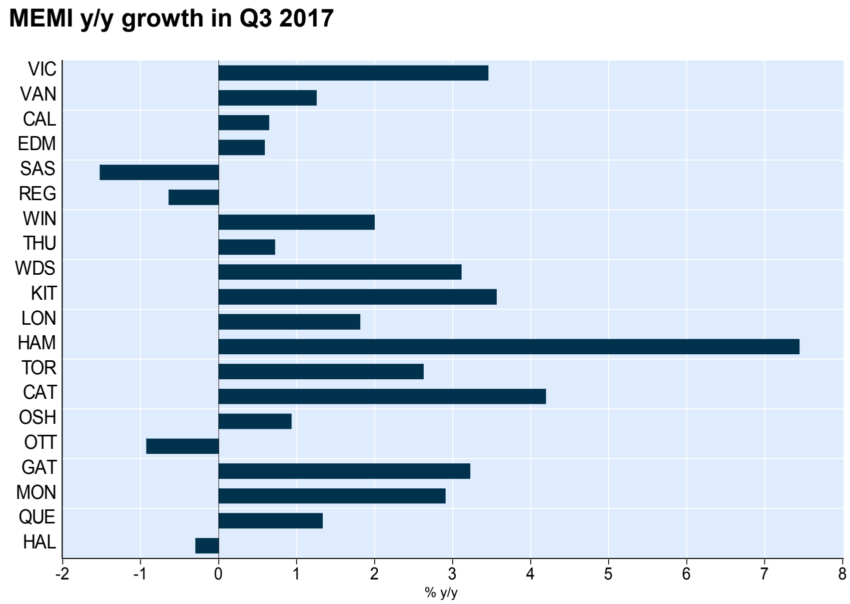
In the case of Windsor-Essex, the MEMI's weak growth can be explained by meagre growth in employment and in house prices over the entire period. In the case of London, employment actually retreated.

Recent MEMI performance

In the future releases of the MEMI, we will focus mostly on its more recent progression, by means of charts 5 and 6.

Chart 5 evidences outsized growth in the MEMI for Hamilton (HAM) over the past four quarters. The top panels of Chart 6 tell us why. According to Statistics Canada, employment growth in the Hamilton CMA was 12.5% from 2016Q3 to 2017Q3, bringing the number of workers from 383,900 to 431,800. During the period, the unemployment rate fell from 6.3% to 4.2%. This speaks to the risk of using CMA data when the confidence interval can be very wide. For example, in the case of Hamilton, at a 95% confidence level, the employment estimate for 2016Q3 runs from 364,700 to 403,100. For 2017Q3, it runs from 415,000 to 448,600. By using the minima and the maxima of these intervals, the employment change over this period could be as low as 3.1% (2016Q3 upper limit and 2017Q3 lower limit) or as high as 23% (2016Q3 lower limit and 2017Q3 upper limit). Though this confidence interval is very wide, we can estimate with only a 5% chance of being wrong that employment growth was indeed very strong in Hamilton over the past four quarters (minimum of 3.1%) and that Hamilton would in any event be among the top CMAs in this regard.

Chart 5



NBF Economics and Strategy (Calculations from data published by Statistics Canada, CMHC, CREA and Teranet-National Bank HPI)

The St. Catharines–Niagara (CAT) CMA comes in second in terms of MEMI growth over the four quarters ending Q3 2017. This performance is due to house prices, which according to the Teranet-National Bank Index rose nearly 28% over this period, and to investment in non-residential building construction, which jumped 30.6% in real terms. Third place goes to Kitchener–Cambridge–Waterloo (KIT), which stood out for having registered the second strongest employment growth after Hamilton, the strongest house price growth after St. Catharines–Niagara, and among the strongest growth in terms of MLS home sales. Victoria (VIC) comes in a close fourth, having distinguished itself by registering an unusually high level of housing starts in 2017Q3 and a vigorous advance in house prices, which largely compensated for a decline in existing home sales.

The Gatineau (GAT) CMA comes in fifth thanks to an abnormally high level of housing starts in the last quarter and to the second largest drop in the unemployment rate after Hamilton. It is followed by Windsor (WDS) and then Montreal (MON), which means that, of the three largest CMAs in Canada, it is the one that performed best over the past year. In this regard, Montreal topped Toronto and Vancouver in terms of growth in employment and in investment in non-residential building construction.

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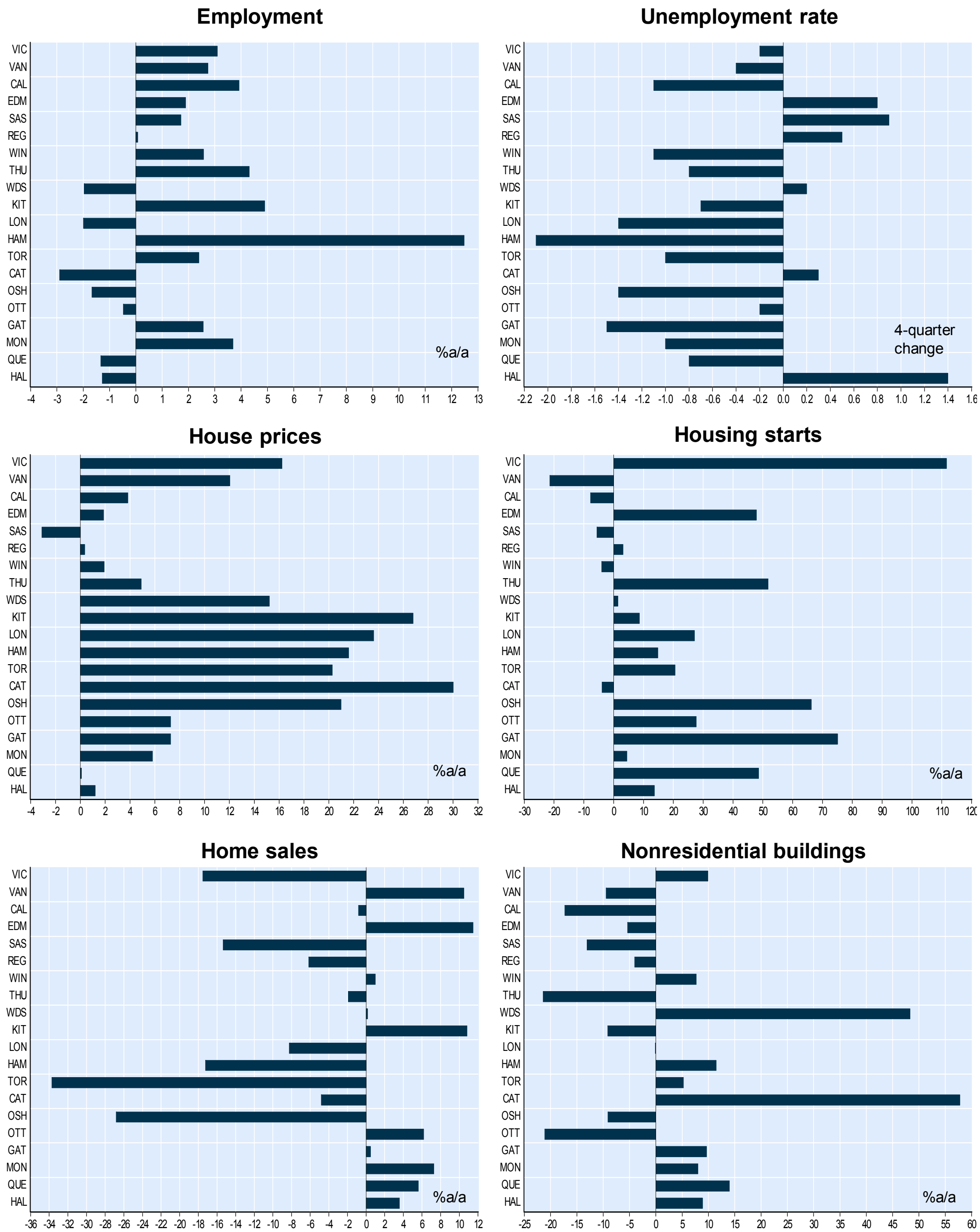
Chart 6

4-quarter change of indicators comprised in the MEMI
Last observation: Q3 2017



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Annex -

Abbreviations for CMAs used in charts

CMA (province)	Abb.	CMA (province)	Abb.
Victoria (B.C.)	VIC	Kitchener-Cambridge-Waterloo (Ont.)	KIT
Vancouver (B.C.)	VAN	St. Catharines-Niagara (Ont.)	CAT
Edmonton (Alb.)	EDM	Hamilton (Ont.)	HAM
Calgary (Alb.)	CAL	Toronto (Ont.)	TOR
Saskatoon (Sask.)	SAS	Oshawa (Ont.)	OSH
Regina (Sask.)	REG	Ottawa (Ont.)	OTT
Winnipeg (Man.)	WIN	Gatineau (Qué.)	GAT
Thunder Bay (Ont.)	THU	Montreal (Qué.)	MON
Windsor (Ont.)	WDS	Quebec City (Qué.)	QUE
London (Ont.)	LON	Halifax (N.S.)	HAL

Special Report

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Special Report

NATIONAL BANK OF CANADA FINANCIAL MARKETS

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