

Scotiabank Nowcast

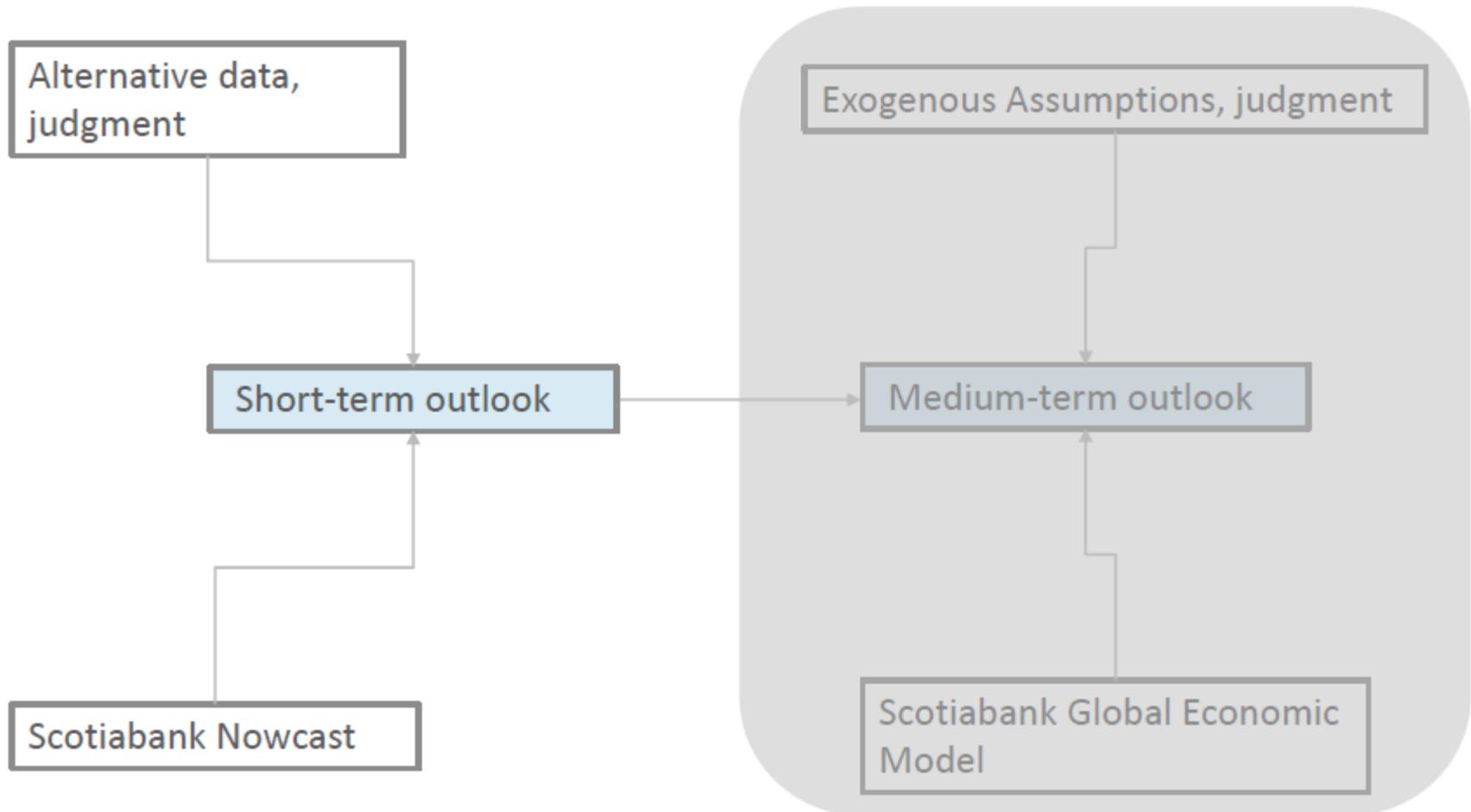
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1. Scotiabank: economic forecasting



2. Scotiabank: short-term outlook

- Short-term (ST) outlook: GDP growth in the current quarter
 - A starting point for medium-term (MT) forecasts
- Conceptual differences between ST and MT outlook
 - ST: most observed indicators inform the current state (daily, weekly, monthly, quarterly)
 - ST: driven by idiosyncratic shocks to a greater extent than MT (e.g. labour strikes, weather events, others)
 - MT: driven by theoretical economic relationships to a greater extent
- Problem when constructing ST outlook (Canada):
 - A large set of timely indicators that provide information on some aspects of economic activity; especially those StatCan itself uses to estimate GDP growth.
 - How do you relate the data flow to the estimate of overall GDP in the quarter?

3. Scotiabank: Nowcast Model

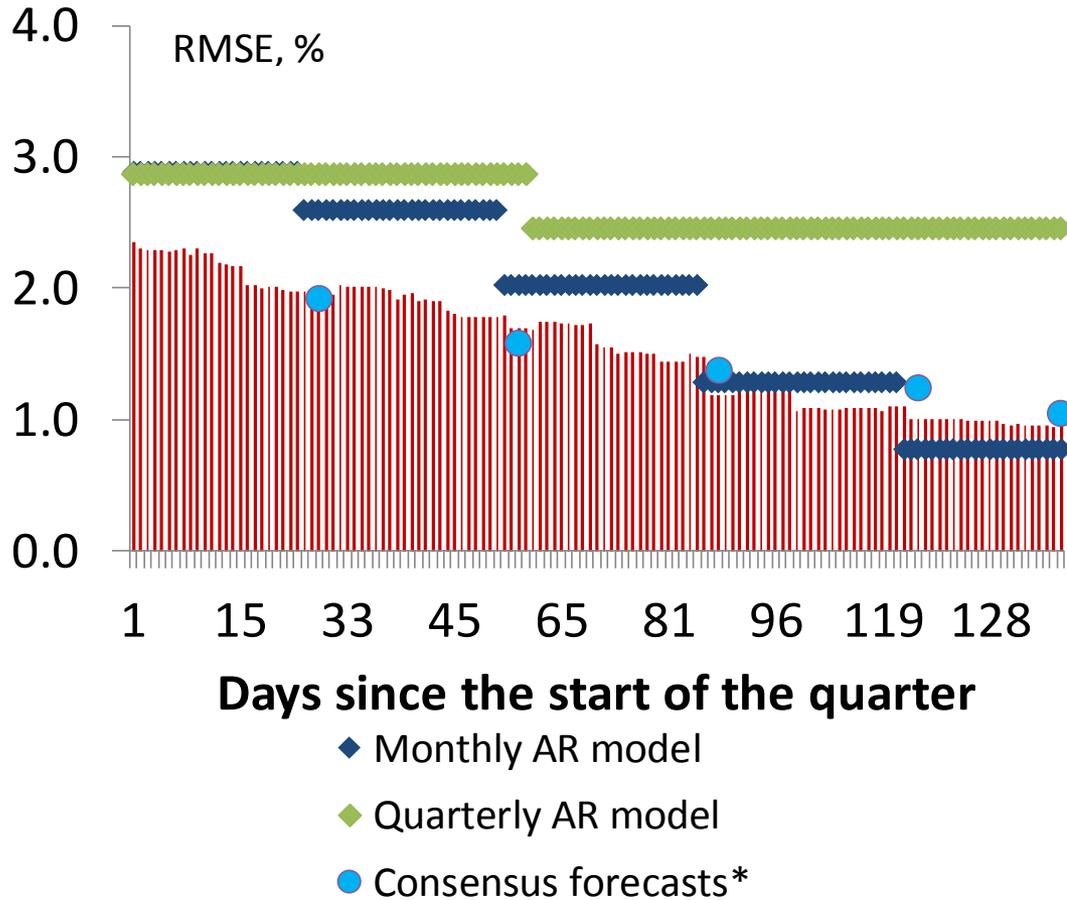
- What is Scotiabank Nowcast?
 - High degree of **correlation** among series, usually need 1-3 series (factors) depending on the size/composition of the data panel to capture **correlation**;
 - Dynamic factor model (see [here](#));
 - Works with missing data/publication lags/different frequencies;
 - Directly forecasts GDP, not components;

Table: Example of the data used in the nowcast

	Canada: Gross Domestic Product at Market Prices (SAAR, Mil.Chn.2012.C\$)	Canada: GDP: All Industries (SAAR, Mil.Chn.2012.C\$)	US, all Employees: Total Nonfarm (SA, Thous)	Canada: Employment: Both Sexes, 15 Years and Over (SA, Thous)	Canada: Real Shipments: All Manufacturing Industries (SA, Mil.2012.C\$)
2021-Jan	#N/A	1949240	142736	18272.0	51224
2021-Feb	#N/A	1954529	143272	18531.2	49510
2021-Mar	2077183	1979062	144057	18834.3	51354
2021-Apr	#N/A	1962120	144326	18627.2	49336
2021-May	#N/A	1951864	144940	18559.2	48127
2021-Jun	2071190	1964201	145902	18789.9	50020
2021-Jul	#N/A	1962988	146993	18883.9	49295
2021-Aug	#N/A	#N/A	147359	18974.1	49613
2021-Sep	#N/A	#N/A	147553	19131.2	#N/A

3. Scotiabank: Nowcast Model

Chart: Canadian GDP Nowcast accuracy, pre-COVID

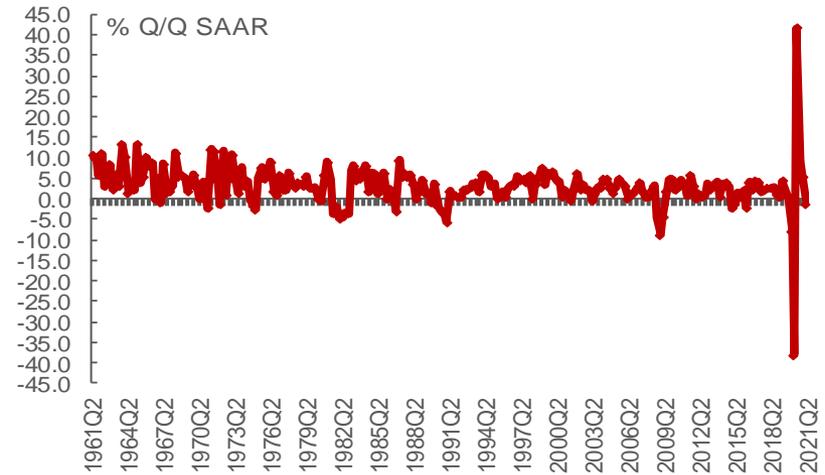


4. Scotiabank: nowcasting through 2020-21

Unusual features of the pandemic shock:

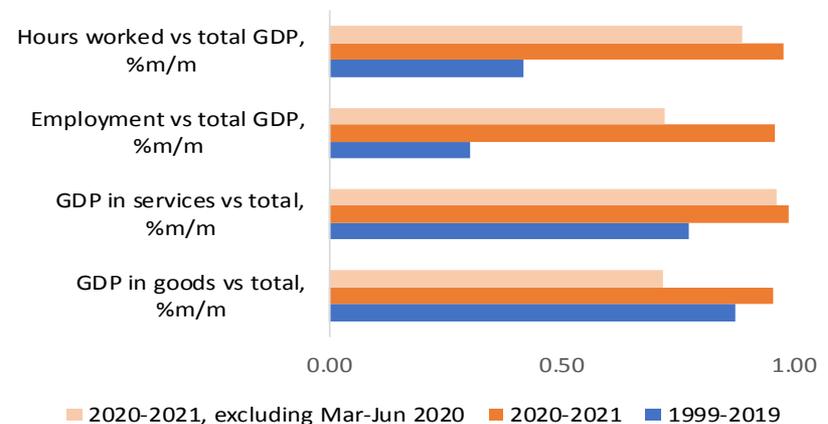
- Size of GDP decline/rebound of 20Q1-20Q3 not seen in decades
- GDP contraction occurred very abruptly – mid-March to mid-May, depending on the province
 - Easy to be *very* wrong
- Re-opening was very quick
 - Important to get the turning point right
- Correlation among macroeconomic series changed abruptly in the midst of 2020 lockdowns, continues to shift in 2021

Real GDP, expenditure, Canada



Sources: Scotiabank Economics, Haver Analytics.

Correlation Coefficients, Canada



4. Scotiabank: model performance 2020-21

- Nowcast accuracy comparable to consensus
- 20Q1: March employment (released in early April) declined by -5% m/m, hours worked -14% m/m (GDP: -7.5% m/m)
 - Low correlation in sample means the model discounted LFS, underestimated the GDP decline
 - Nowcast suspended after flash GDP estimate released
- 20Q3: largest reason is downward revisions to published monthly industry-level GDP data for July and August; more on revisions later

Table: Quarterly GDP by expenditure, %Q/Q SAAR

	Nowcast, initial	Nowcast, final	Consensus, final	Actual, first release	Nowcast error, final release	Consensus error
20Q1	0.9	-2.1*	-10	-8.2	-6.2	1.8
20Q2	-42.7	-38.5	-40	-38.7	-0.2	1.3
20Q3	47.7	47.9	47	40.5	-7.4	-6.5
20Q4	5.1	7.5	7.5	9.6	2.1	2.1
21Q1	3.5	6.6	6.5	5.6	-0.9	-0.9
21Q2	1.7	2.9	2.5	-1.1	-4.0	-3.6
Mean absolute error, 20Q2-21Q2					2.9	2.9

* The nowcast was suspended in early April after the first release of flash GDP estimates.

Source: Statistics Canada, Scotiabank Economics

4. Scotiabank: nowcasting through 2020-21

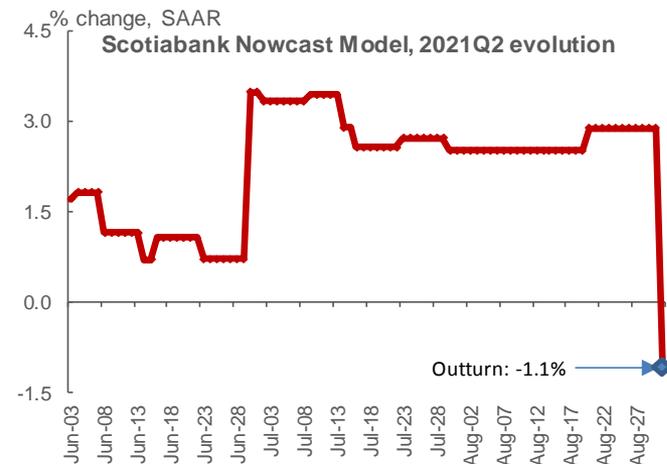
Pandemic has been a challenge for statistical agencies as well:

- StatCan responded by producing a series of early estimates for various indicators, including industry-level GDP – great help for anchoring growth in the quarter;
- Industry-level GDP, published monthly, *once revised*, is the best predictor of expenditure-level GDP;
- There are frequent revisions to industry-level GDP, largest ones usually coinciding with expenditure-side release (e.g. 21Q2);
- Forecasters/models rely on published data, revision risk ever-present

Table: sensitivity of quarterly growth to the first month

Release date, Statistics Canada	GDP estimate for April 2021, %m/m	GDP in 2021Q2, %Q/Q SAAR, snapshot (assuming no growth in May, June)
31-Aug-21	-0.87%	0.5%
30-Jul-21	-0.47%	2.2%
30-Jun-21	-0.33%	2.7%
01-Jun-21	-0.80% (flash)	0.2%

Source: Statistics Canada, Scotiabank Economics



Sources: Scotiabank Economics, Bloomberg, Haver Analytics.

4. Scotiabank: nowcasting through 2020-21

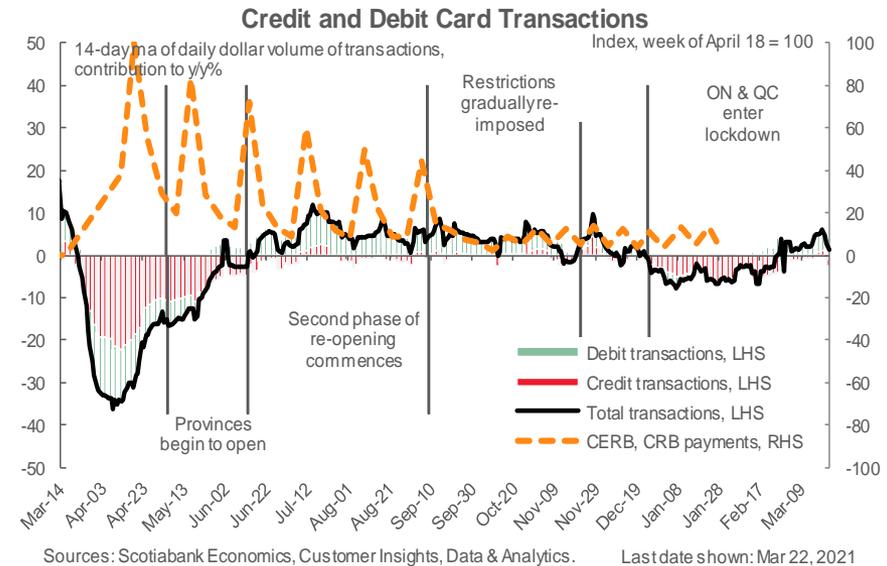
Improvements to the model so far:

- Re-estimated the model and included alternative data – internal transactions – into the data panel as a cross-check;
- Model overweighs industry-level GDP: increased uncertainty around the series within the quarter;
- Run several versions of the model (with/without in-quarter monthly GDP, estimated over different samples);
- Recent data and the challenges of estimation:
 - employment and growth in 2021 again less in-synch (closer to the pre-pandemic correlations);
 - supply shortages caused goods and services industries to diverge further;
 - including the March-June 2020 data in the estimation sample biases the estimation: sample 2020H2+ is very different.
 - Each lockdown is different: first wave \neq second wave \neq third wave \neq fourth wave (vaccinations; policymakers, households, businesses adapt)

4. Scotiabank: from nowcast to ST outlook

Model only one input into ST outlook:

- Pandemic:
 - Tracking announcements on lockdowns/re-openings;
 - Careful accounting of the timing of industry closures, including assumptions on duration;
 - Assumptions on the level of industry activity once re-opened;
 - Use alternative data (e.g. internal transactions, mobility data);
- Separate analysis of incoming data through alternative models: indicator models for GDP components (e.g. retail sales -> consumption);
- Judgment to account for idiosyncratic factors (virus waves, supply challenges, other shocks before they are in the available data)



5. Scotiabank: next steps for the outlook

Challenges for short-/medium-term forecasting in Canada:

- Supply/labour shortages in various industries, impact on growth and inflation
- Housing slowdown
- Trade: logistical issues, input shortage, labour shortage

Plan for model development:

- Estimate using time-varying covariance matrices to account for the COVID shock
- Include more alternative indicators (mobility, open table, measure of supply chain strains)

Some issues would not be solved in the model, judgment on top of the model output is needed to construct the short-term outlook

Keep in Touch

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