Lessons for Newfoundland and Labrador from Nova Scotia's Fiscal Experience

Memorial University Symposium: Reasonable Solutions to Newfoundland and Labrador's Fiscal Reality
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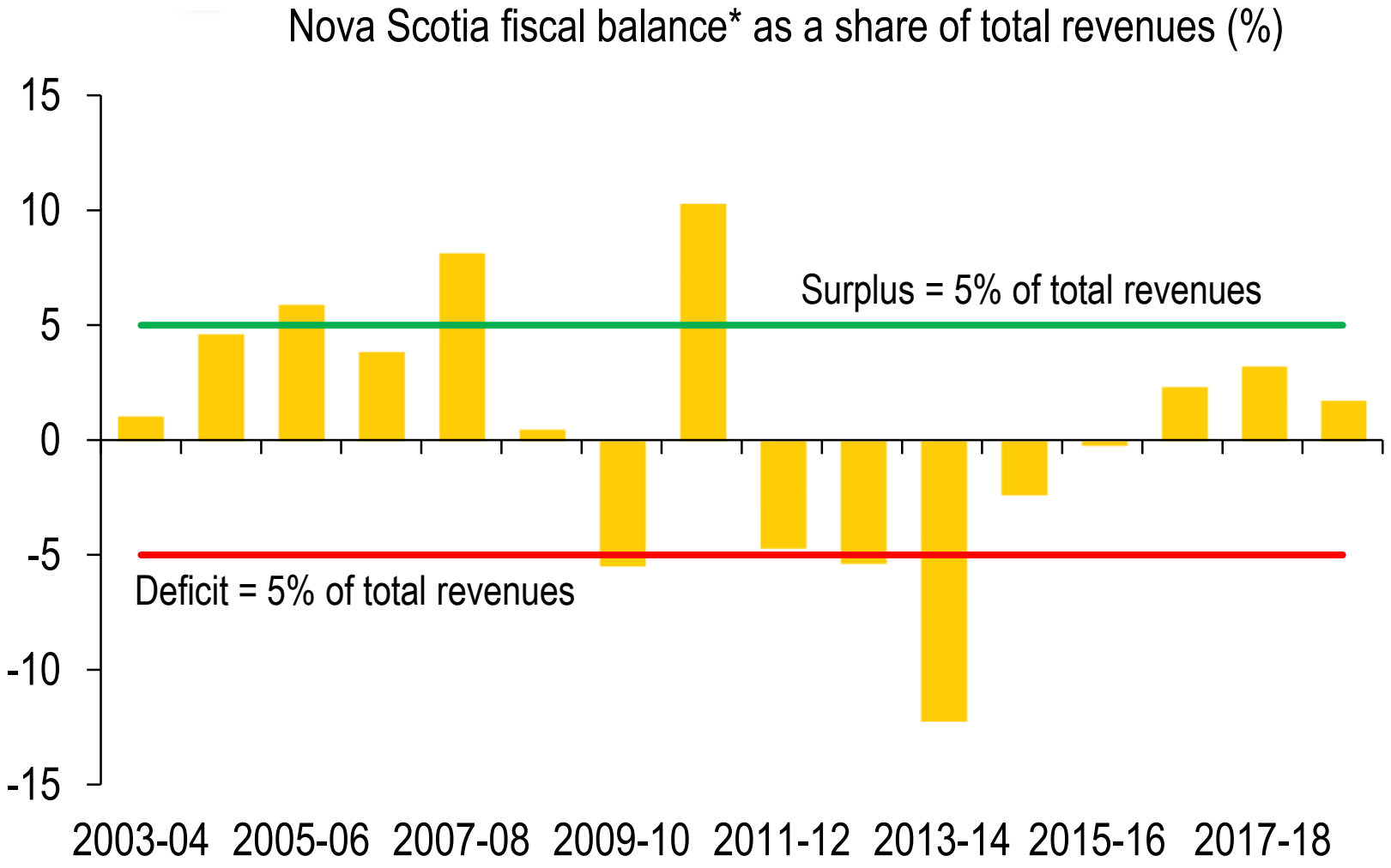
Presentation Outline

Recent Fiscal Performance in NS and NL

Comparison of Recent Revenue Forecasting Error in NS and NL

NS Economic and Revenue Forecasting Approach

Nova Scotia's Recent Fiscal Balance Performance



NS's cumulative fiscal balance over the last 16 years was almost $500 million.

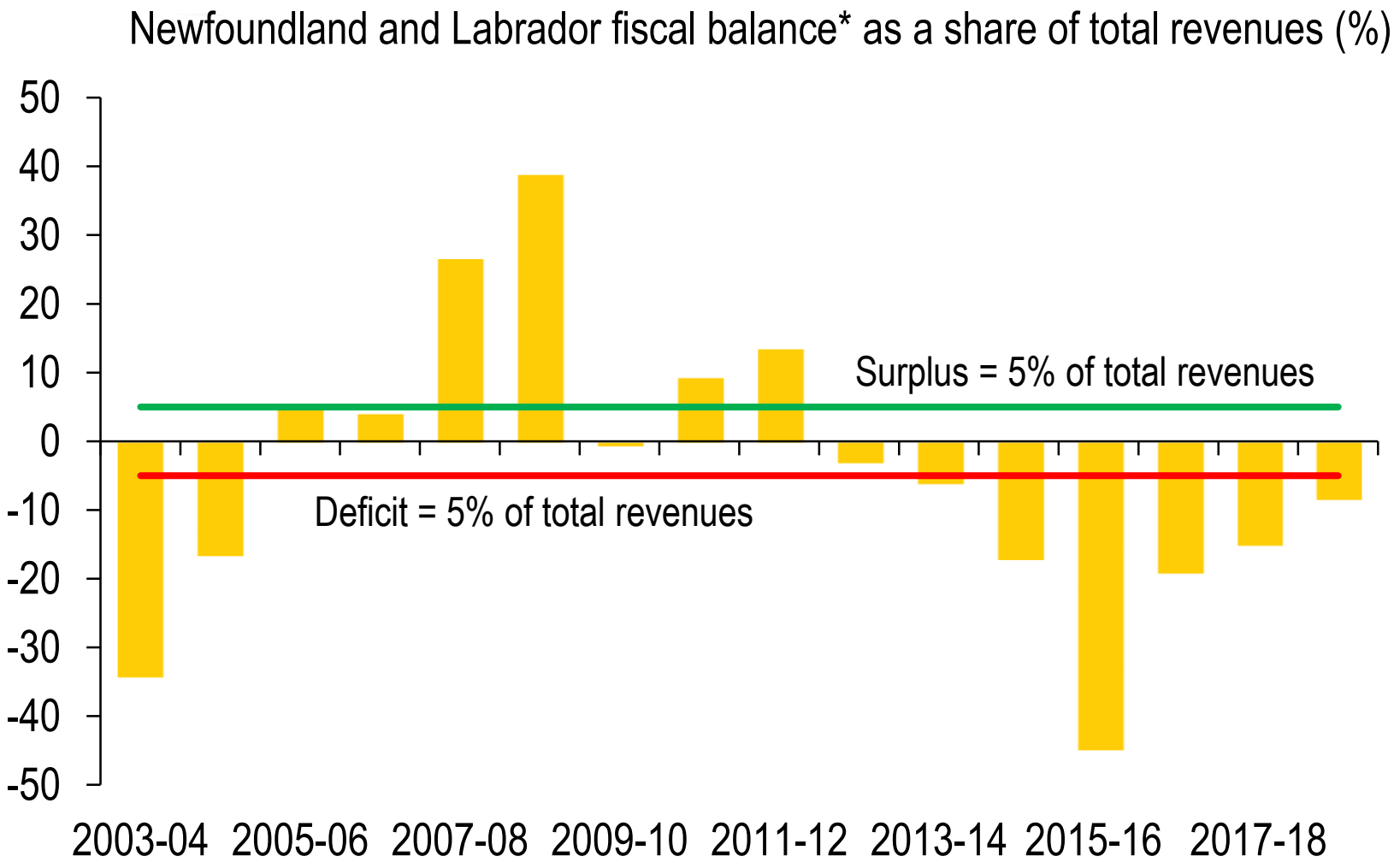
6 of last 16 NS fiscal balances were more than +/- 5% of total revenues; 10 of last 16 years were in surplus.

Limiting the variance in the fiscal balance relative to total revenues is important for fiscal planning purposes.

Source: Nova Scotia Public Accounts

* Fiscal balance is surplus/(deficit)

Newfoundland and Labrador's Recent Fiscal Balance Performance



NL's cumulative fiscal balance over the last 16 years was -$2 billion.

13 of last 16 NL fiscal balances were more than +/- 5% of total revenues; only 6 of last 16 years were in surplus.

NL fiscal planning is challenged by significant variability in its surplus/(deficit) relative to total revenues.

Source: Newfoundland and Labrador Public Accounts

* Fiscal balance is surplus/(deficit)

Is NS the Best Fiscal Benchmark Comparator for NL?

- Mining, oil and gas sector is less important in NS, as it represented 1% of GDP as compared to 22% in NL in 2017
  - This leads to lower economic and fiscal volatility in NS versus NL
  - Volatility in oil output and pricing makes economic and fiscal forecasting more difficult in NL
    - Offshore royalties averaged 26.5% of own-source revenues in NL since 2005 versus only 2.5% in NS
- Demographic trends are also quite different:
  - NS has net in-migration and higher immigration, contributing to population growth
  - NL is sparsely populated, making program delivery more expensive and some NL economic activity is concentred in remote areas (offshore and Labrador)

Government Budgeting Process

- Typically, governments forecast total revenues first to determine funding available for program spending, while planning for a modest surplus/(deficit)
- Revenue forecast accuracy is central for fiscal balance accuracy
- Budgets can be top-down or bottom-up
- Spending budgets can apply various approaches, including line-item budgeting and budget lapsing, as well as incremental or zero-based budgeting
- Compare actual performance to best available standards: budget variance, historical trend or external benchmark

How to Measure Forecast Error and Apply Quality Control

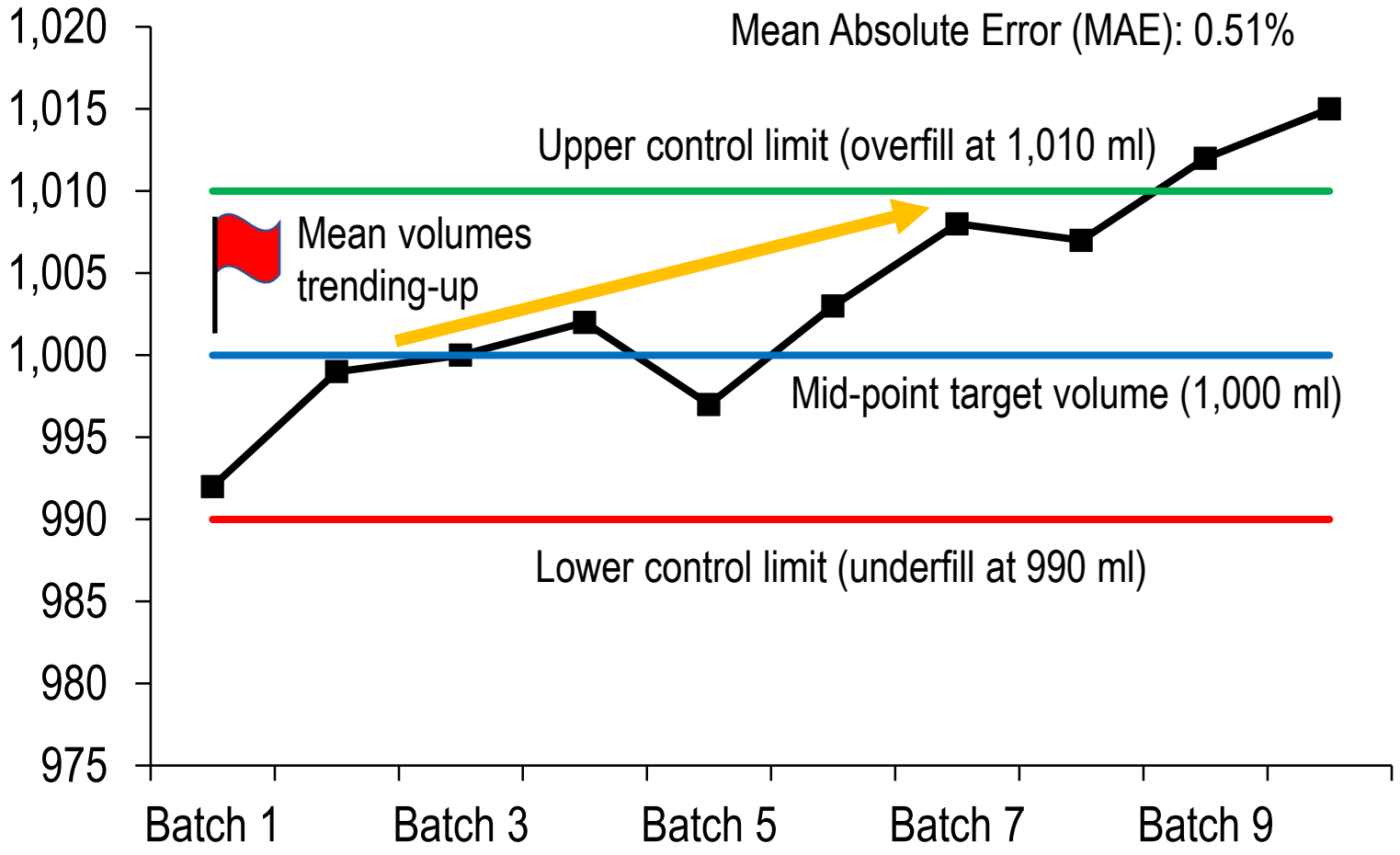
- Mean Absolute Forecast Error (MAE) = $\frac{\text{Sum of Absolute Forecast Error}}{\text{\# of Observations}}$

- Apply statistical process control to budget revenue forecasting, including setting upper and lower control limits on revenue forecast error (%)
  - Measure and critique actual versus budget revenue variance
  - Determine what caused the variance each year and adjust revenue forecasting models/processes, where required

- Watch for trends within control limits, which are red flags and take corrective action before forecast error exceeds control limits – be proactive to avoid surprises

Example of Statistical Process Control – Dairy Processor

Mean volume of milk in a one litre container, per batch of 1,000 containers (ml)



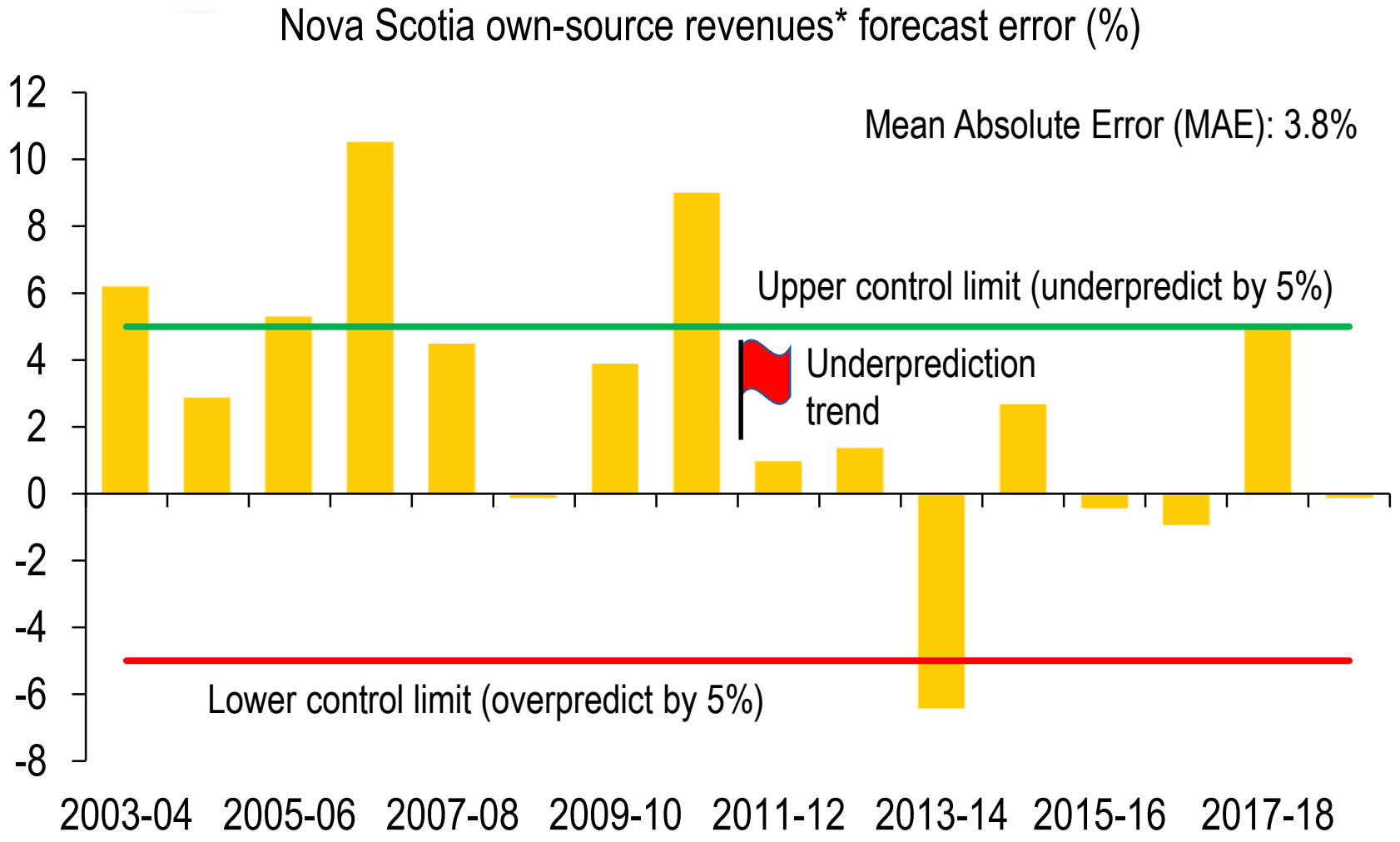
Dairy processor's control limits highlight only 1% room for error (plus or minus 10 ml per 1,000 ml container of milk).

Note that mean volumes of milk per batch were trending up, suggesting the dairy processor should have ceased production after batch 7 was complete and determined what caused the deviation and take corrective action.

While the MAE was within acceptable limits (+/- 1%) for the first 7 batches, corrective action was still required.

Note: Forecast error (%) = [(mean volume of milk per batch – 1,000 ml target) / mean volume of milk per batch] x 100
One litre = 1,000 ml

Nova Scotia Does a Good Job Forecasting Provincial Revenues



NS's mean absolute error related to forecasting own-source revenues was 3.8% over the last 16 years

Annual revenue forecast error guideposts (low volatility):

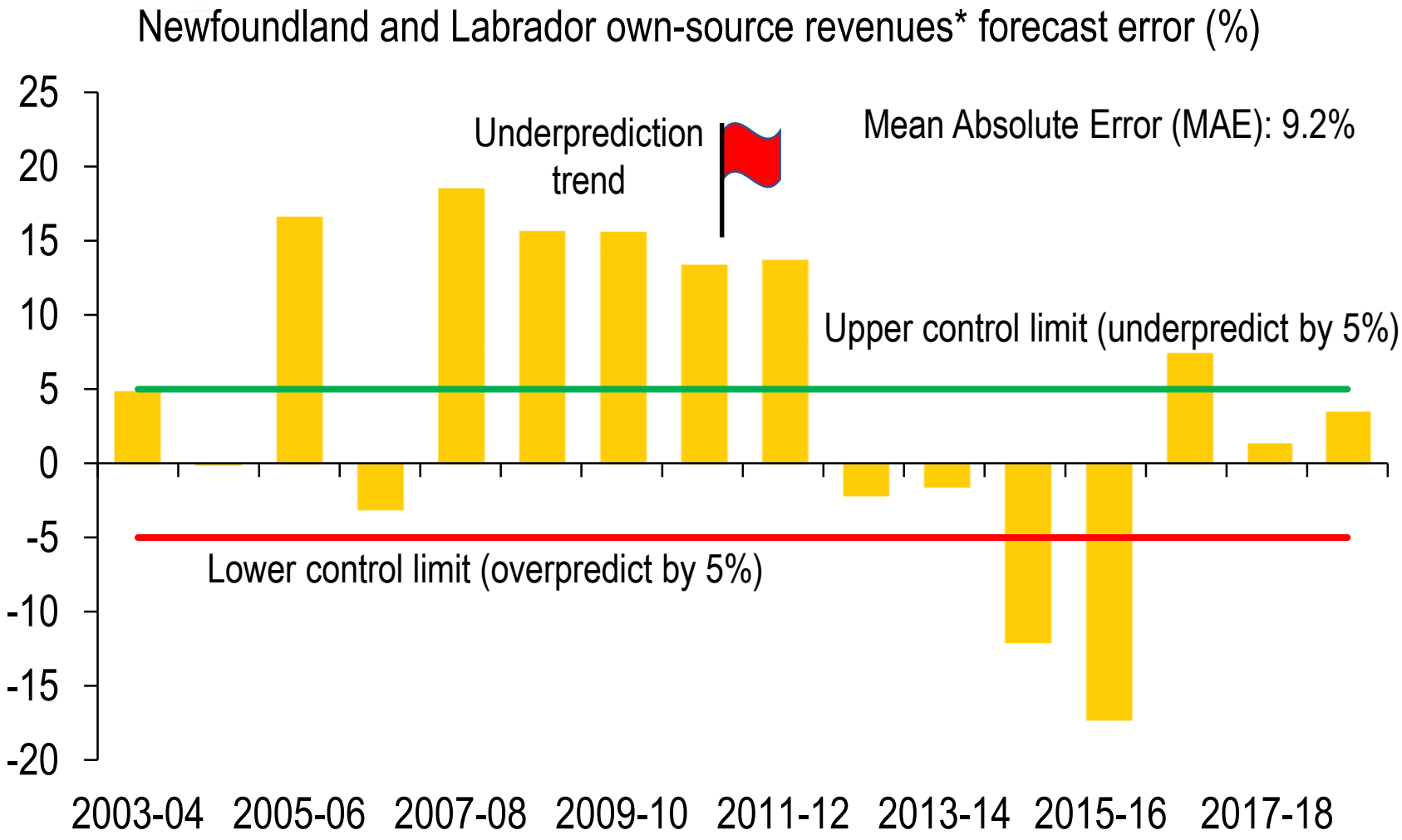
Poor: > 5%
Good: 2% to 5%
Very good: 1% to 2%
Excellent: < 1%

6 of last 16 NS budget forecasts (38%) were poor

Source: Nova Scotia Public Accounts, budgets, APEC

* Own-source revenues exclude federal transfers and net income of government business enterprises.

Newfoundland and Labrador's Provincial Revenue Forecasts Have Room for Improvement



NL's mean absolute error related to forecasting own-source revenues was 9.2% over the last 16 years

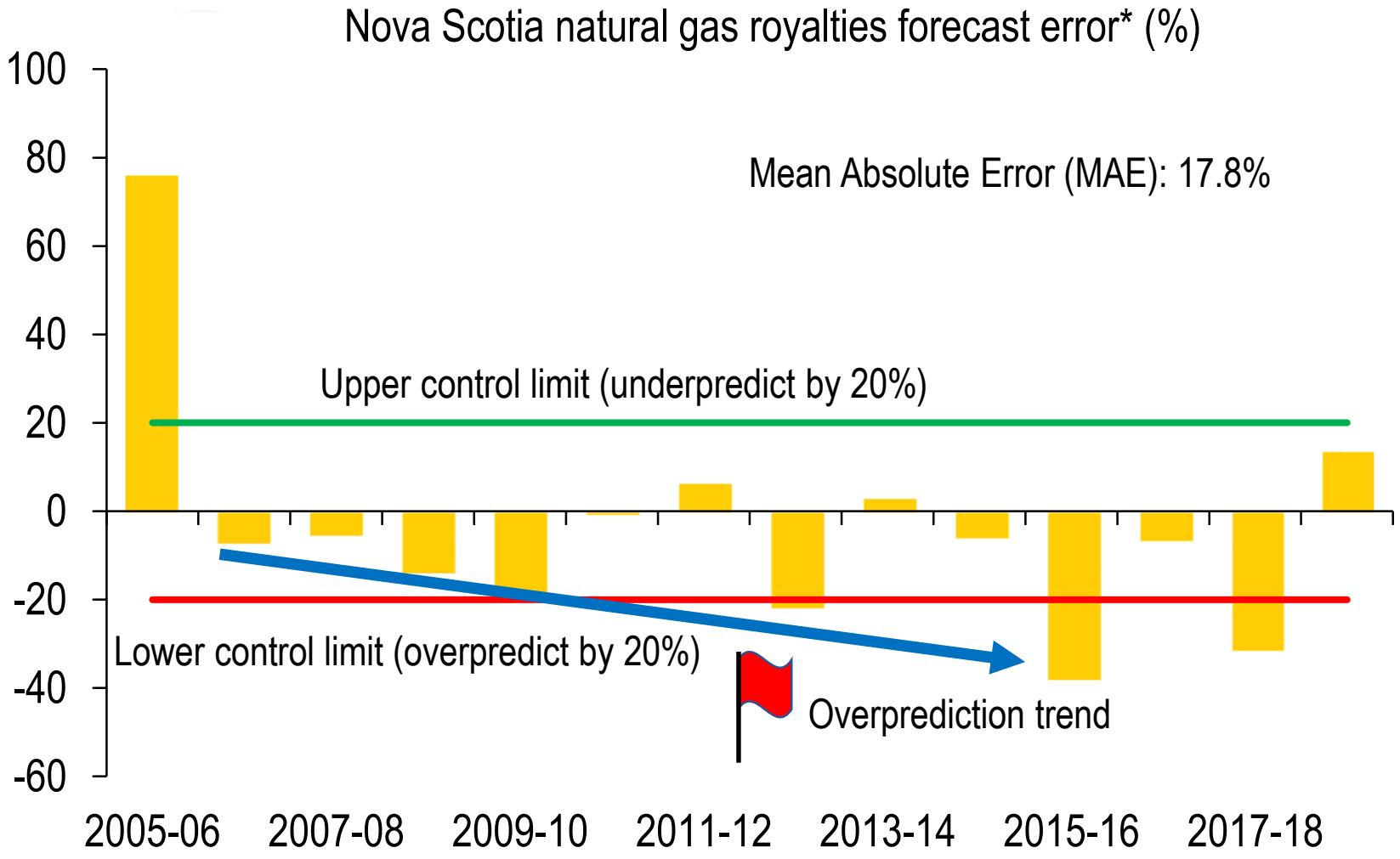
Offshore royalties account for a large share of provincial royalties, but oil prices, production and the exchange rate are highly volatile.

9 of last 16 NL budget forecasts (56%) were poor

Source: Newfoundland and Labrador Public Accounts, budgets, APEC

* Own-source revenues exclude federal transfers and net income of government business enterprises.

Nova Scotia has Some Room to Improve Forecasting Natural Gas Royalties



NS's mean absolute error related to forecasting gas royalties was 17.8% over the last 16 years (below +/- 20% control limits).

Annual royalty forecast error guideposts (high volatility):

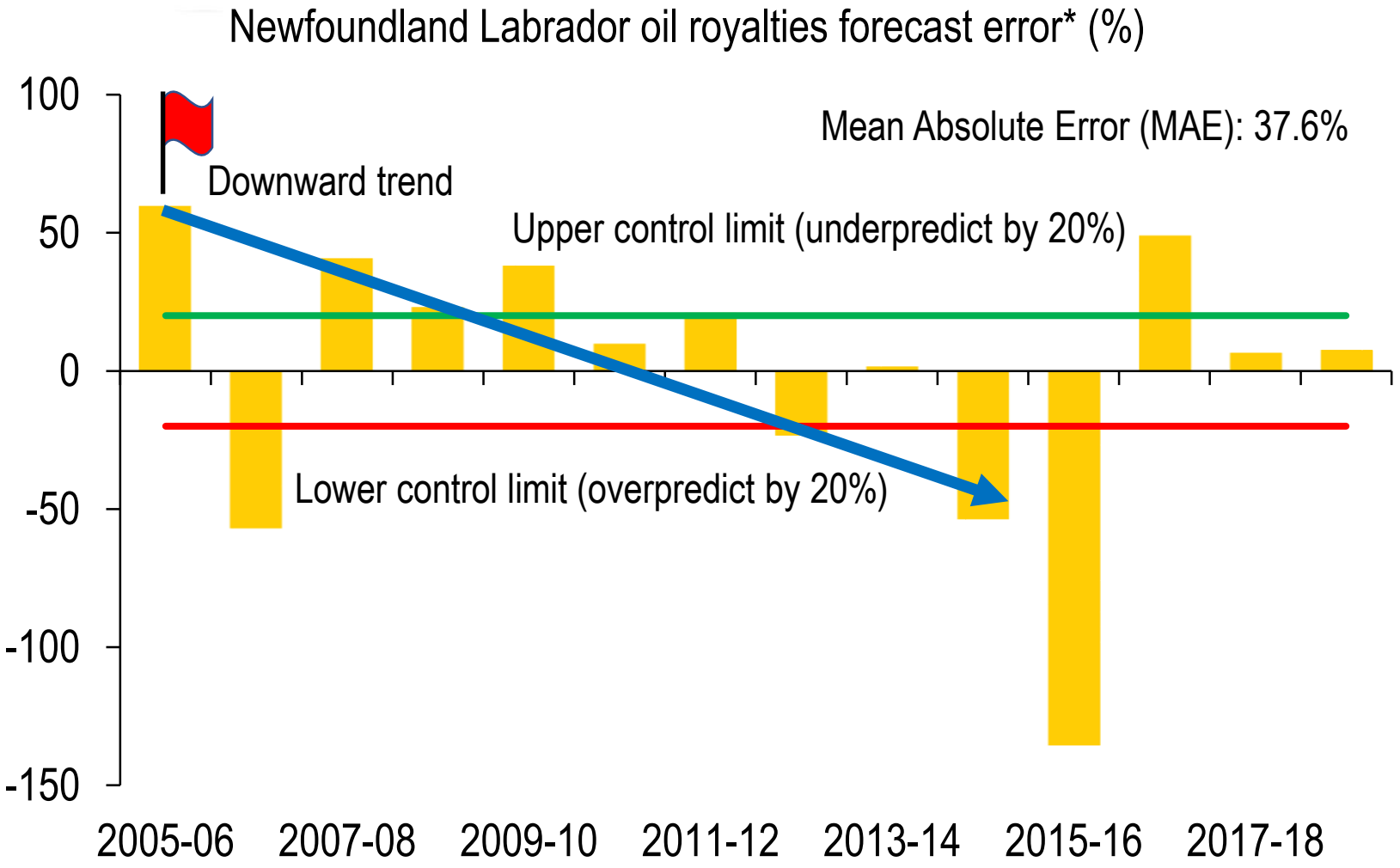
Poor: > 20%
Good: 10% to 20%
Very good: 5% to 10%
Excellent: < 5%

5 of last 14 NS budget forecasts (36%) were poor

Source: Nova Scotia Public Accounts, budgets, APEC

* Forecast error (%) = [(public accounts – budget) / public accounts] x 100
Natural gas royalties exclude prior year adjustments from 2008/2009 to 2018/2019

Newfoundland and Labrador's Track Record Forecasting Oil Royalties Suggests Changes May be Required



NL's mean absolute error related to forecasting oil royalties was 37.6% over the last 16 years (above +/- 20% control limits).

Annual royalty forecast error guideposts (high volatility):

Poor: > 20%
Good: 10% to 20%
Very good: 5% to 10%
Excellent: < 5%

10 of last 14 NL budget forecasts (71%) were poor

Source: Newfoundland and Labrador Public Accounts, budgets, APEC

* Forecast error (%) = [(public accounts – budget) / public accounts] x 100

Role of Private Sector Economists and Auditor-General in NS

- Every year, at least a few months prior to budget, NS Department of Finance and Treasury Board hosts a Challenge and Review session with private sector forecasters
  - Is the department's NS economic forecast consistent with your outlook for the province and does it provide a reasonable basis for making fiscal plans?
  - What are the most substantial risks to the outlook – globally or for NS?

- In 1994, NS introduced legislation that required the Auditor-General provide an opinion on the reasonableness of the revenue estimates in the budget address (including economic and fiscal assumptions) – completed annually for last 25 years
  - Only province that does this, although ON does it for pre-election report on finances

Overview of NS Economic and Revenue Forecasting Approach

- NS has a rigorous economic forecasting process to estimate various tax bases
  - NS econometric model forecasts the NS economy, including by industry
    - Includes assumptions about Canadian and US economic variables
  - NS Input-Output model assesses impact of economic shocks or fiscal policy changes

- NS uses sophisticated revenue forecasting models
  - NS uses T1 and T2 file universe, plus Department of Finance Canada information
    - NS uses its own assumptions, plus some federal assumptions
    - Incorporates detailed information from the HST revenue allocation formula, major federal transfer estimates and other provincial taxes and royalties
    - The natural gas royalty model is complex and incorporates historic data inputs

Questions

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