



Estimating the amount of housing required to reach affordability in Canadian provinces by 2030

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HERE WE GATHER

OTTAWA

Background

Identified housing supply responsiveness as a challenge in 2018 report



Examining Escalating
House Prices in
Large Canadian
Metropolitan Centres

Task

- How much housing supply is required so that everyone has a home they can afford by 2030?
- Presented what we would do in September 2021
- Provide results across provinces, and concentrate on averages
- “Proof of concept” to show economic modelling is possible, and how affordability can be targeted explicitly
- There is room to improve modelling, and we will improve it
- Explain the supply challenge comprehensively
- Convey size so all understand that we cannot continue business as usual (BAU)

Purpose of this session



Provide understanding



Explain methodology



Establish scale of
challenge



Shift emphasis to how
we get this done

Background on method

Integrating economics and demographics, with explicit modelling of supply and demand

Based on analysis done in England and latest academic research.
Advocated in BC Expert Panel on Housing Supply and Affordability

May need different approaches in future because tackling income distributions and more geographic detail

What is “affordability”?

“Affordability” vs. “affordable housing”

We concentrate on housing costs as share of income for average household

Reflect aspiration: “everyone in Canada has a home they can afford”

We use after-tax income as it reflects ability to pay, and incorporates cross-province tax differences

From first principles:

The objective is to maximize

$$\max_{c,h} E \sum_{t=0}^{\infty} (1 + \beta)^{-t} u(c_t, h_t)$$

Subject to a budget constraint

$$y_t = c_t + p_t \cdot h_t$$

And housing consumption

$$h_t = u c_t \cdot H_t$$

Last equation may not be a stable statistical relationship because quality not explicitly included.

No population change

$$p^h = \frac{a_0}{a_2} + \frac{a_1}{a_2} y - \frac{a_4}{a_2} r - \frac{1}{a_2} \frac{H^s}{HH} + \varepsilon$$

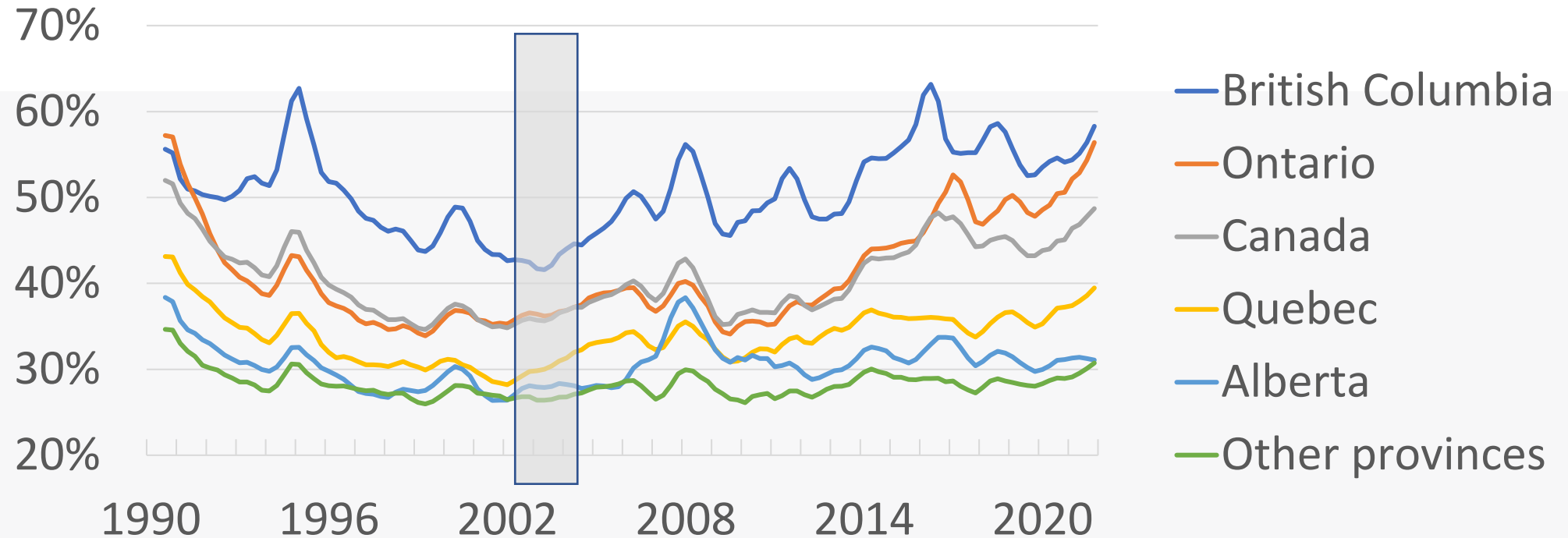
Leave r out of discussion

If change in H^s is the same as H then p^h will be constant -
planning

But affordability p^h / y will only be constant if $a_1 / a_2 = 1$

If $a_1 / a_2 > 1$ then affordability worsens over time even if $H^s = HH$

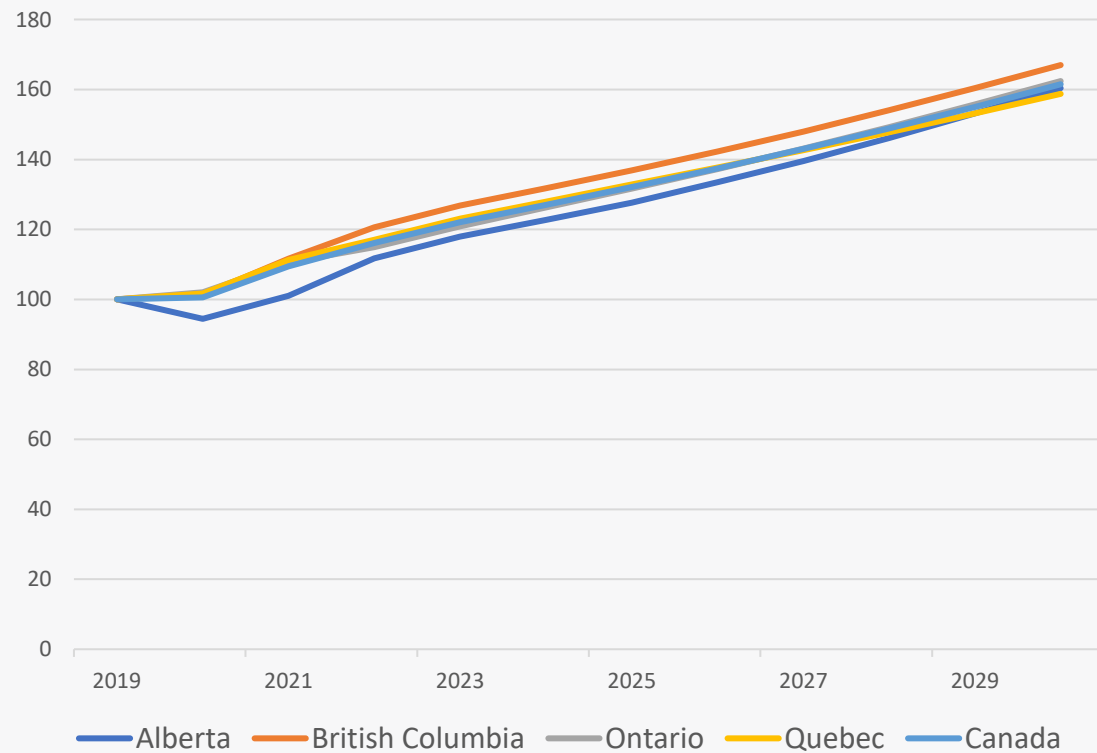
Affordability in history



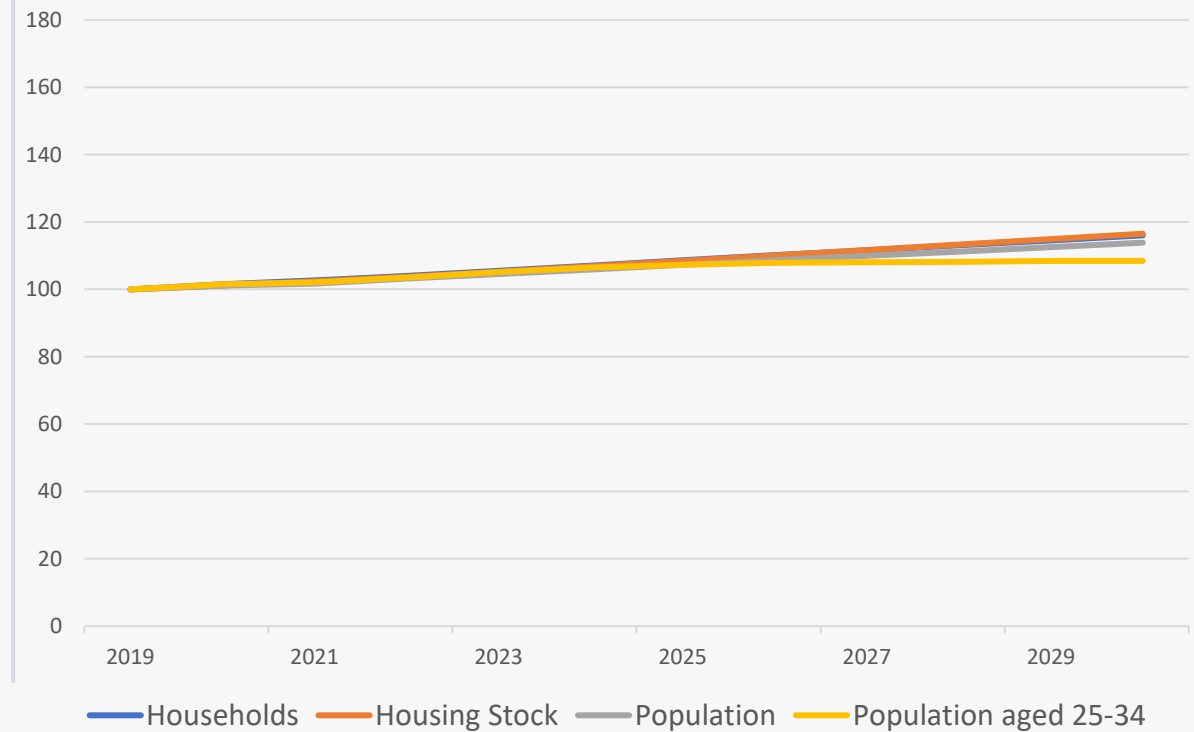
	British Columbia	Alberta	Ontario	Quebec
Target	44%	30%	37%	30%

Projected income and demographics

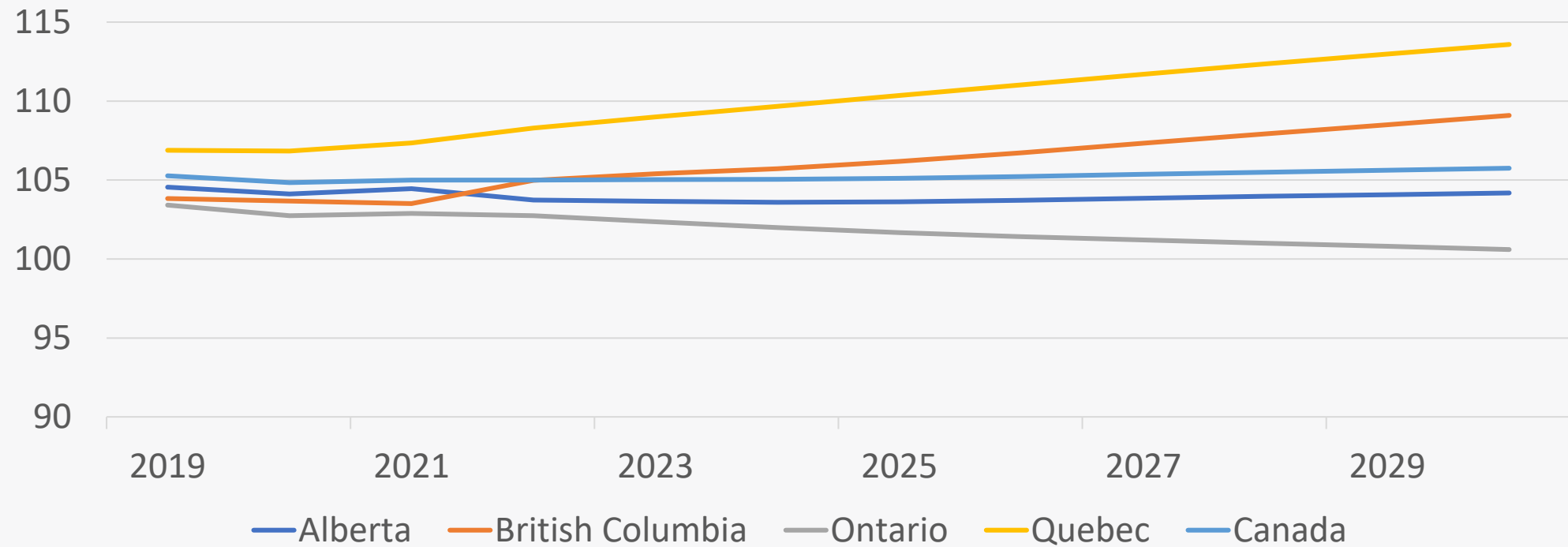
Income



Demographics



Projected housing stock-to-population ratio



Estimation Results

Elasticities

Panel A: Demand Elasticities				
Price Elasticity				
	BC	AB	ON	QC
Model 1: LR	-0.26	-0.45	-0.44	-1.09
Model 2: No Rent	-0.20	-0.38	-0.35	-0.33
Model 3: DPW	-0.14	-0.28	-0.44	-0.24
User Cost Elasticity				
Model 1: LR	-0.00075	-0.02005	-0.01905	-0.02754
Model 2: No Rent	-0.00092	-0.01714	-0.01375	-0.02546
Model 3: DPW	0.00004	-0.01081	-0.01611	-0.01853
Income Elasticity				
Model 1: LR	0.97	0.81	1.57	3.59
Model 2: No Rent	0.75	0.70	1.30	1.05
Model 3: DPW	0.82	1.13	1.33	1.12
Ratio: Income Elasticity to Price Elasticity				
Model 1: LR	3.70	1.82	3.58	3.30
Model 2: No Rent	3.81	1.81	3.74	3.15
Model 3: DPW	5.98	4.05	3.05	4.69

$$\eta_p = \frac{1-\theta_6}{\theta_1} * P * \frac{H}{S}, \eta_u = \frac{\theta_5}{\theta_1} * UC * \frac{H}{S}, \eta_r = \frac{\theta_4}{\theta_1} * INC * \frac{H}{S}$$

Panel B: Supply Elasticities				
Supply Elasticity				
	BC	Alberta	Ontario	Quebec
Model 1	0.04	0.09	0.04	0.08
Model 2	0.04	0.09	0.03	0.07
Model 3	0.02	0.06	0.01	0.06
Construction Elasticity				
	BC	Alberta	Ontario	Quebec
Model 1	2.29	4.00	2.63	6.27
Model 2	2.22	4.04	2.06	5.54
Model 3	1.49	3.34	0.47	5.72

$$\eta_s = \alpha_{price} \frac{P}{Stock}$$

$$\eta_c = \alpha_{price} \frac{P}{Starts}$$

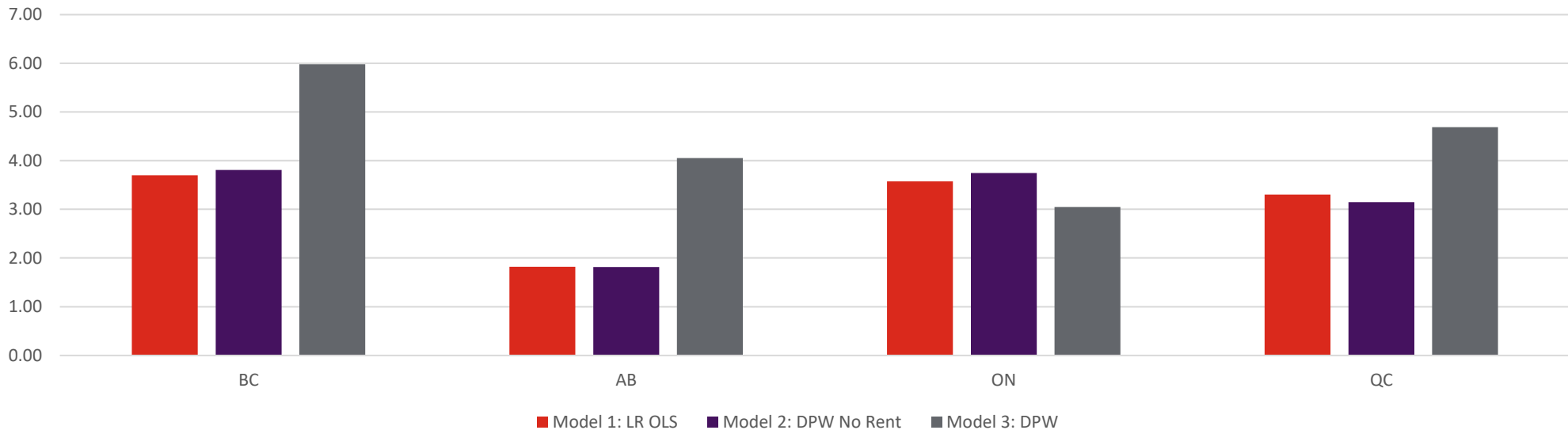
- Where α_{price} is the steady state price coefficients from the estimated flow model

Estimation Results

Income Elasticity of Price

Markets with high income elasticities of price are prone to affordability issues in markets where supply is planned to match population growth (Meen & Andrew, 2007)

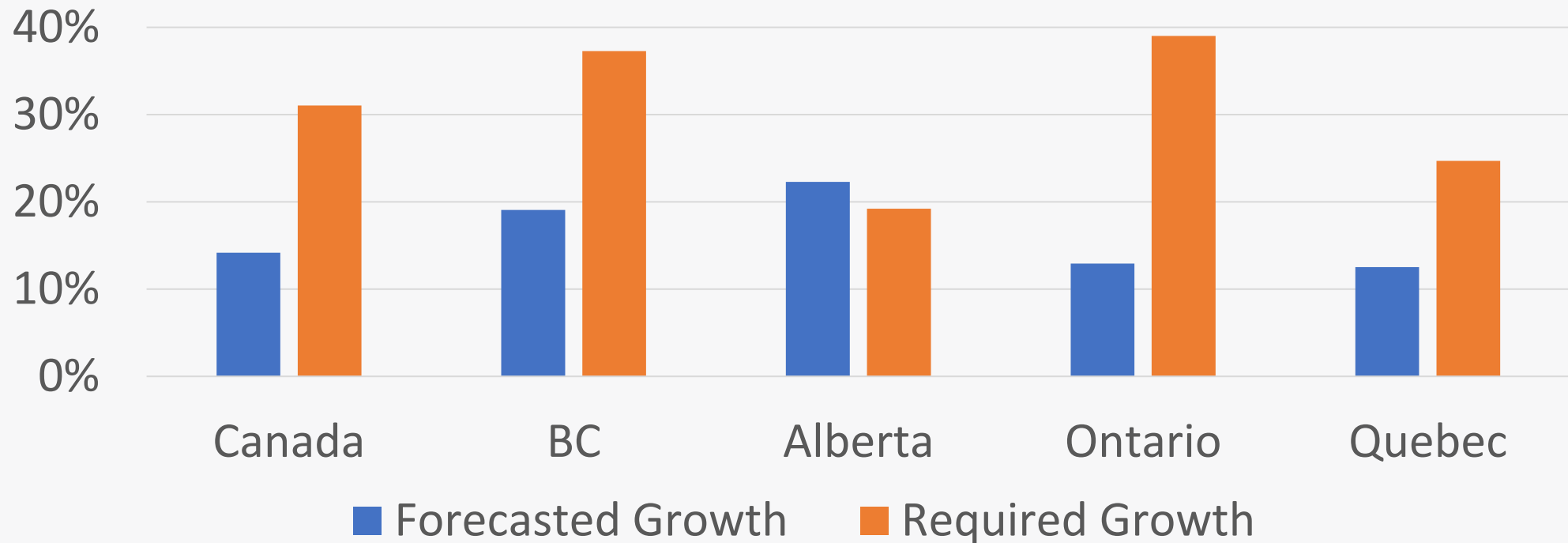
Ratio: Income Elasticity to Price Elasticity



Results – province-specific targets

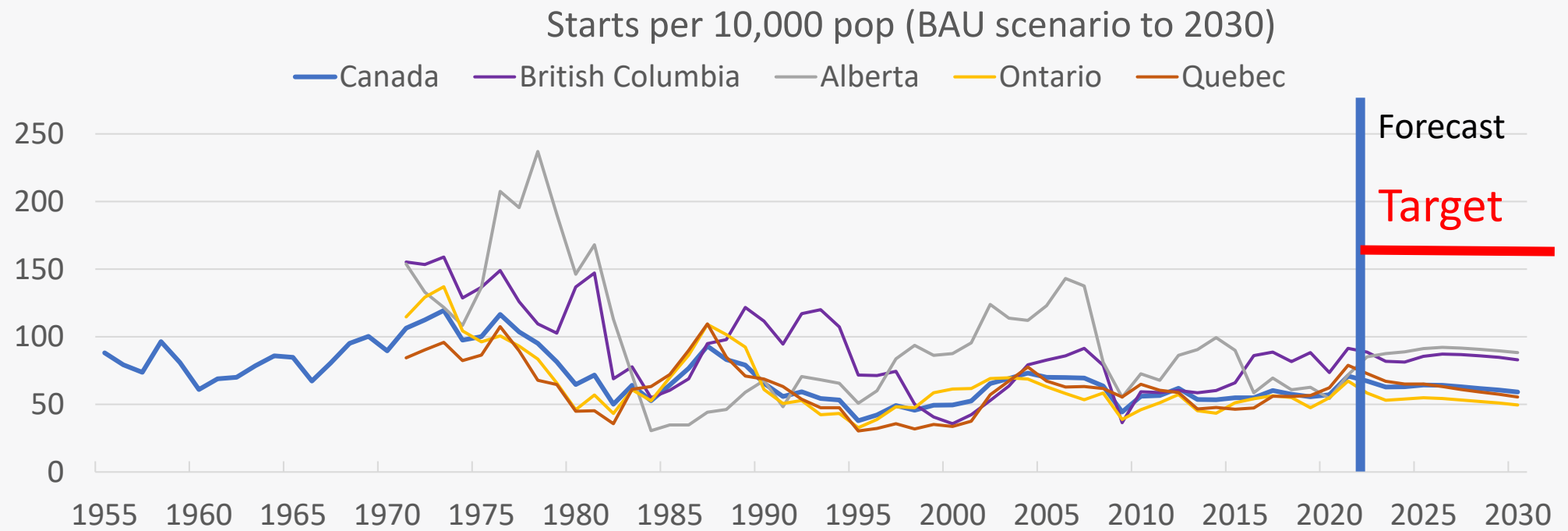
	Target level of affordability in 2030	Housing supply required
Ontario	37	1.85
Quebec	32	0.62
BC	44	0.57
Manitoba	30	0.26
Saskatchewan	30	0.10
Newfoundland	30	0.06
Nova Scotia	31	0.05
Alberta	30	0.02
New Brunswick	30	
P.E.I.	30	
Total		3.53

Growth in supply for affordability vs. how much is expected (BAU), 2021-2030



Historical context

With Canada target



Implications

Government cannot fill supply gap on its own – 100,000 from Housing Accelerator Fund

We need partnerships and innovative thinking

Government and the private sector need to rethink processes and technology on housing supply

Shift discussion to how to do it

Caution on interpreting results

- Do not examine what type of supply is better to improve affordability
 - Clearly **not** single-detached housing on multi-acre lots in city centres
 - But “affordable housing” may not act quickly either to affect affordability for everyone

Next steps

- Proof of concept achieved
- Need to refine, check, develop more scenarios
- Future work:
 - Looking at affordability across income groups
 - Looking at results at CMA level (which incorporates population mobility effects)
 - Separating results between home-ownership and rental
 - Climate change
- Significantly more complex – need component research and analysis pieces

Thank you

