

Environmental Policy in a Federation: Issues and Implications

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Environmental Policy in a **federation**

- Environmental policy options have different economy wide effects
- Federal government's **environmental policy** and associated **budget adjustments** play out differently in different provinces
- Our focus is on provincial:
 - **welfare effects**
 - **budget implications (vertical fiscal interactions)**



Environmental Policy in a **federation**

- Use regional CGE model (computable general equilibrium) (CREAP -- <http://creap.wlu.ca>)
- Captures economy wide effects via changes in prices, labour supply and sectoral activity levels

Environmental Policy in a federation



Two policy experiments (both achieve Kyoto target)

- **International permit trading** (all emitters pay a price equal to the world price assumed to be \$C30/t)
- **Policy mix** (limited domestic permit trading; subsidies for non-fossil electricity sector; CO₂ capture and storage)



Environmental Policy in a federation

- Two financing options - federal government maintains its budget balance by adjusting:
 - ★ federal **direct** taxes (IPT-D, PM-D)
 - ★ federal **indirect** taxes (IPT-C, PM-C)
- provinces adjust transfers to persons (no change in provincial tax rates)



Aggregate Effects

- IPT & PM achieve roughly the same reduction in emissions (13% vs 11%)
- Aggregate welfare effects:
 - -0.58% to -0.60% for IPT
 - -0.61% to -0.65% for PM
- fed revenue shortfall
 - \$4.2 B in IPT (direct tax rate ↑ from 16.2% to 16.8% OR indirect tax rate ↑ from 3.4% to 4.1%)
 - \$7.4 B in PM (direct tax rate ↑ from 16.2% to 17.2% OR indirect tax rate ↑ from 3.4% to 4.2%)



Provincial Welfare Effects

- Provincial welfare effects
 - -0.49% to -1.54% for IPT variants
 - +0.21% to 0.99% for PM variants
- All provinces (EXCEPT Ontario) prefer financing by increasing federal **direct tax** rates
- 6 of 10 provinces prefer PM-D to IPT-D

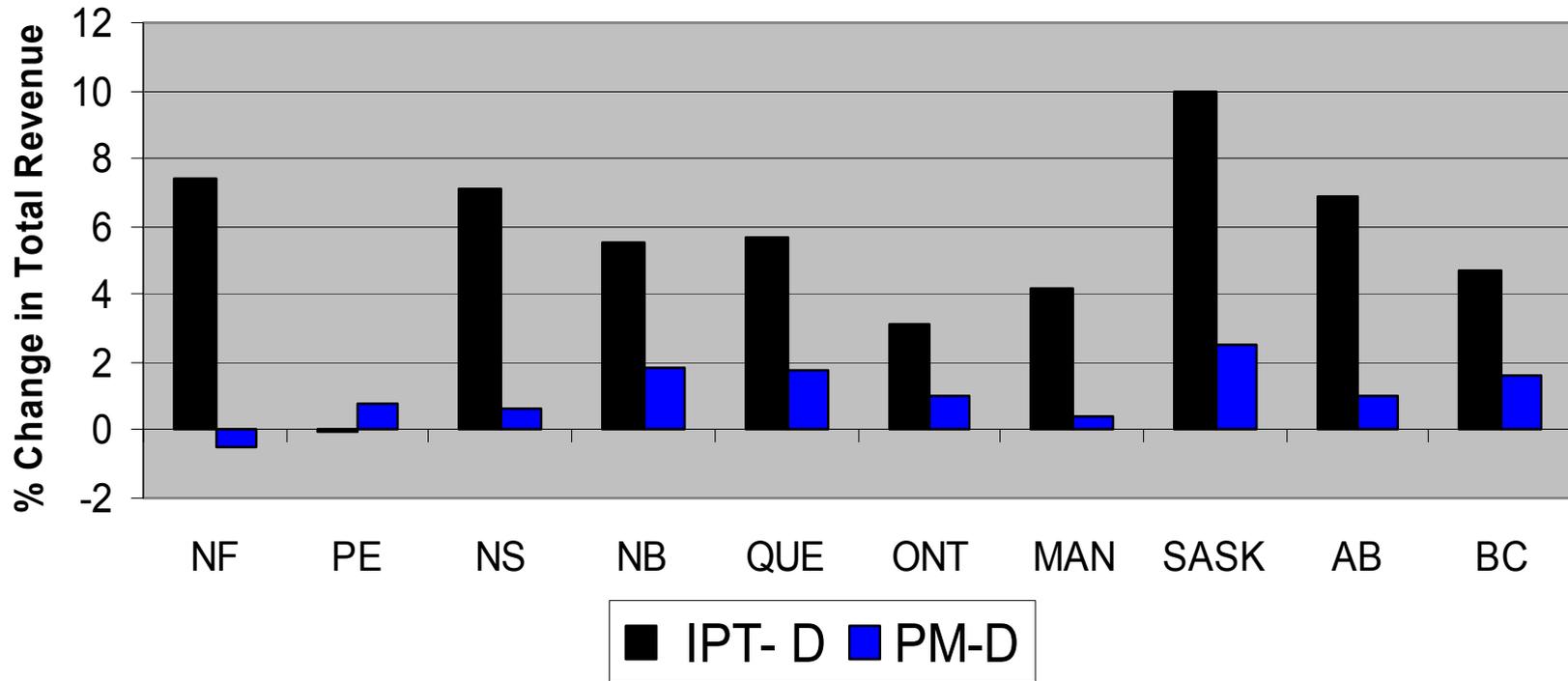


Vertical Fiscal Interactions

- Here we focus on IPT-D vs PM-D
- Consider the effects on provincial:
 - total **tax revenues**
 - **direct and indirect** tax revenues
 - direct and indirect **tax bases**



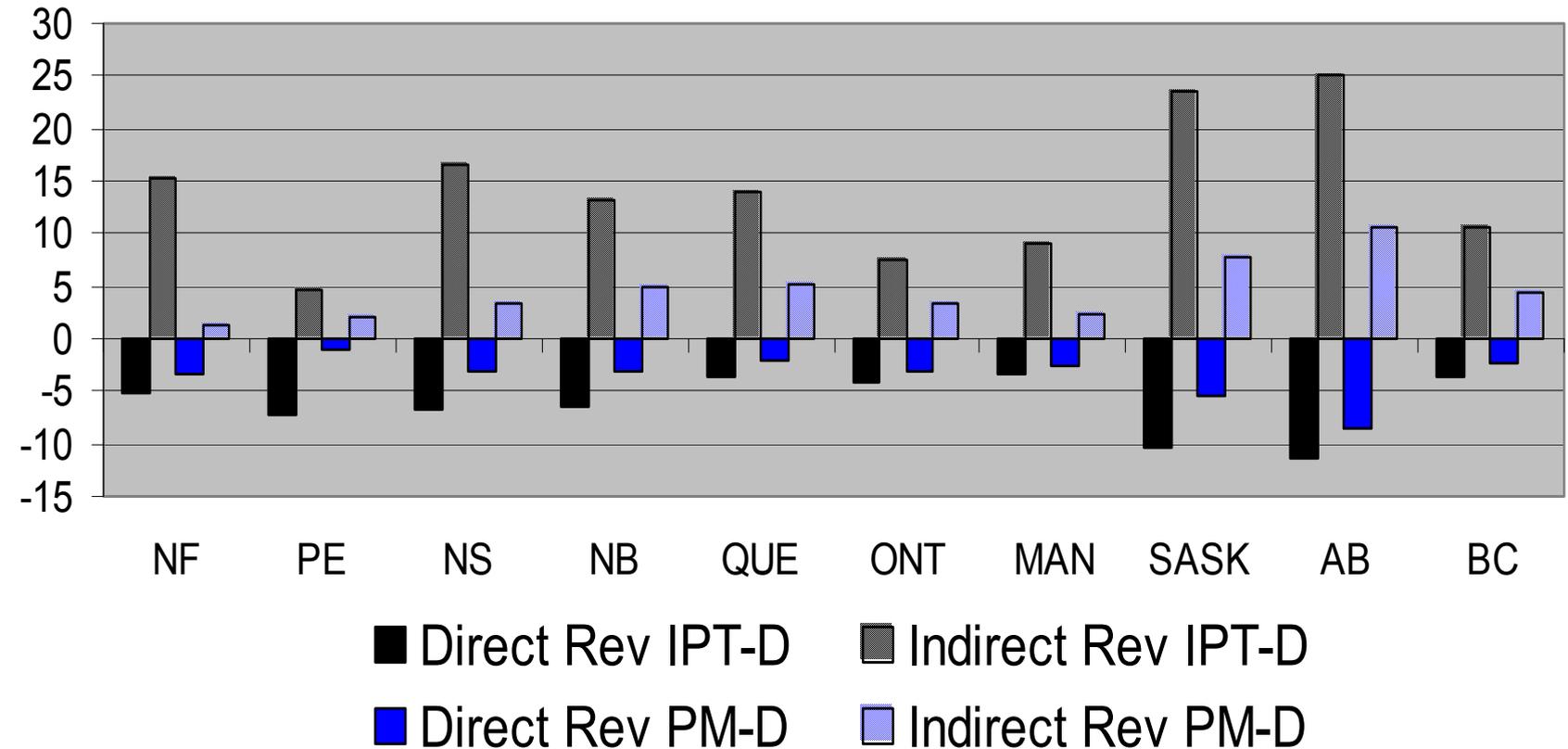
Provincial Total Tax Revenue IPT-D and PM-D





IPT-D and PM-D

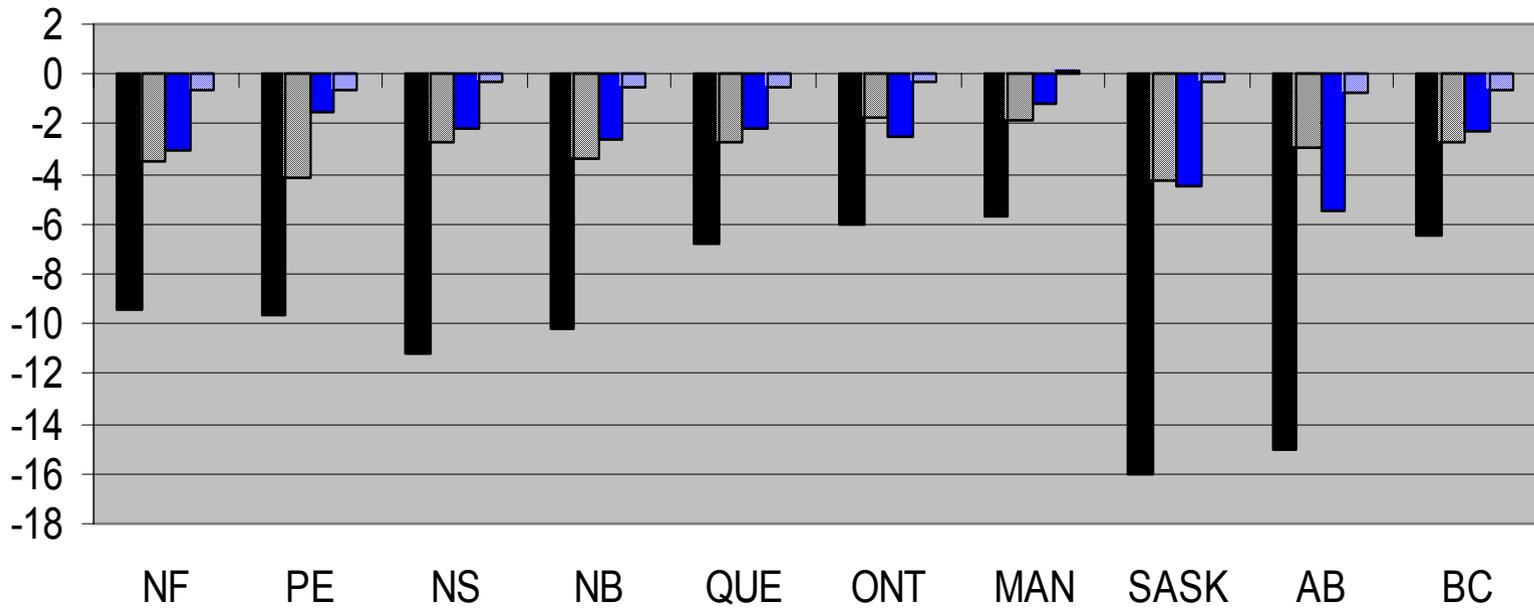
Direct & Indirect Tax Revenue





IPT-D and PM-D

Direct & Indirect Tax Base



■ Direct Tax Base - IPT-D
■ Direct Tax Base - PM-D

■ Indirect Tax Base - IPT-D
■ Indirect Tax Base - PM-D



Summary of findings

- IPT-D has smallest aggregate welfare loss; smallest federal revenue shortfall to recover
- Provincial welfare losses lower when federal shortfall financed with **direct taxes** (except Ontario)
- **Fiscal interactions** (tax revenue & base) are significantly greater in IPT-D vs PM-D; provincial tax revenues increase 0 to 10 % in IPT-D vs -0.5 to 2.5% in PM-D



Issues and implications

- Fiscal interactions can lead to potentially large changes in equalization to provinces (in Canada – grants to equalize revenue raising ability of provinces)
- Provincial welfare & budgetary effects have economic & political implications for implementation of environmental policies



Next steps

- Disaggregate indirect tax revenue and base effects by tax category (sales tax, gasoline and fuels, alcohol and tobacco etc) for provinces
- Explicitly incorporate equalization into the model
- Re- examine provincial welfare effects and fiscal interactions when equalization is included