The Macroeconomics of Border Taxes

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Border Adjustment Taxes

**Border Adjustment**: tax imports and exempt exports

- Corporate Border Adjustment Tax (C-BAT)...Ryan-Brady proposal

  "While we have debated the pro-growth benefits of border adjustability, we appreciate that there are many unknowns associated with it…"

  Joint statement on tax reform, July 2017

- Value Added Tax (VAT)
Border Adjustment and Protectionism

- Border adjustment often perceived as protectionist
- Ironically, border adjustment *undoes* protectionism
- Consequence of Lerner symmetry (1936)
- VAT without export rebate = export tax = import tariff (inelastic labor)
- C-BAT = corporate tax $\implies$ C-BAT introduction is neutral
Conditions for Lerner Symmetry

1. Flexible prices

2. Trade balance

- Skepticism about underlying price changes in GE
- Conditions violated in practice
- More general conditions for neutrality (no real effects)?
- Effects when neutrality violated?
Conditions for Neutrality in Open-Economy NK Model

- Conditions for neutrality of C-BAT:
  1. Symmetric pass-through for taxes and exchange rates
  2. All international assets in foreign currency
  3. Monetary policy targets inflation + output gap, *not* exchange rates
  4. Applies uniformly to all imports and exports.
  5. One-time unanticipated

- For VAT, more stringent condition: inelastic labor supply or fully rigid wages
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Conditions for C-BAT neutrality

1. Prices respond identically to border taxes and exchange rates
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$\downarrow E$ means $\$ \text{ appreciation}$. Starred prices are expressed in foreign currency.
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<td>$(1 - \tau)P^*_x$</td>
<td>$(1-\tau)\frac{P^*_x}{\varepsilon}$</td>
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Complete appreciation: $\varepsilon = (1 - \tau)\varepsilon_0 \implies$ consumer prices unchanged
Conditions for C-BAT neutrality

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**Dominant Currency Pricing (DCP)**

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- 97% of US exports and 93% of US imports priced in dollars
### Conditions for C-BAT neutrality

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- 97% of US exports and 93% of US imports priced in dollars
Conditions for C-BAT neutrality

2. All international assets and liabilities in foreign-currency bonds

\[ B_{t+1}^* - (1 + i_t^*)B_t^* = \frac{(1 - \tau)}{\mathcal{E}_t} P_{x,t}X_t - P_{m,t}^*M_t \]

\( B^* \): Foreign denominated debt. \( \mathcal{E} \): Dollars per foreign currency. \( X \): exports. \( M \): imports
Conditions for C-BAT neutrality

2. All international assets and liabilities in foreign-currency bonds

\[
\frac{B_{t+1}}{E_t} - \frac{(1 + i_t)B_t}{E_t} + B^*_{t+1} - (1 + i^*)B^* = \left(1 - \tau\right) \frac{1}{E_t} P_{x,t} X_t - P^*_{m,t} M_t
\]

- 82% of US liabilities are in dollars
- 32% of US assets are in dollars

Wealth Loss: \(\frac{B_0}{GDP} \frac{\Delta E}{E} \% = -1.09 \cdot \frac{\Delta E}{E} \%\)

\(B^*\): Foreign denominated debt. \(E\): Dollars per foreign currency. \(X\): exports. \(M\): imports
Quantitative Effects of C-BAT

Output

Exchange Rate ($ per foreign)

Exports

Imports

DCP PCP DCP with VE
Wealth and Revenues

Valuation Effect
- 16% of GDP wealth transfer from US to world \((1.09 \cdot 0.15)\)

Fiscal Revenues
- Proportional to trade balance path
- Short-run: +0.4 p.p. of GDP
- Net Present Value: −15p.p. of GDP
Conditions for VAT neutrality

1. Complete pass-through of VAT into prices in the short-run

   **Import** vs. **Domestic Price**: \[ \frac{P_{m,0}/(1-\tau)}{P_0/(1-\tau)} \]

   **Export** vs. **Foreign Price**: \[ \frac{P_{x,0}}{\varepsilon_0P^*_0} \]

2. **Inelastic labor supply or fully rigid wages**
   — Otherwise distortion of labor-leisure condition
Quantitative Effects of VAT

Output

Exchange Rate ($ per foreign)

Exports

Imports

DCP | PCP | Inelastic Labor

11 / 12
Conclusions

- **Neutrality** conditions for C-BAT and VAT **unrealistic**

First-quarter impact of 20% tax

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<th>VAT</th>
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<td>Trade Volume</td>
<td>-30%</td>
<td>-4%</td>
</tr>
<tr>
<td>Output</td>
<td>+2%</td>
<td>-5%</td>
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<tr>
<td>$ Appreciation</td>
<td>15%</td>
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- **C-BAT**
  - **Valuation effect** to world: 16% GDP
  - **Fiscal revenues**: short term +0.4p.p. GDP; in NPV -15p.p. GDP