

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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Producer Currency Pricing (PCP)

USA^{\$}

Border^{\$}

World*

Imports

Exports

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Producer Currency Pricing (PCP)

	USA ^{\$}	Border ^{\$}	World*
Imports			\overline{P}_m^*
Exports			

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Producer Currency Pricing (PCP)

	USA ^{\$}	Border ^{\$}	World*
Imports		$\mathcal{E}\overline{P}_m^*$	\overline{P}_m^*
Exports			

↓ \mathcal{E} means \$ appreciation. Starred prices are expressed in foreign currency

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	USA ^{\$}		Border ^{\$}		World*
Imports	$\frac{\overline{\mathcal{E}P_m^*}}{1-\tau}$	←	$\overline{\mathcal{E}P_m^*}$	←	$\overline{P_m^*}$
Exports					

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Exports	$\overline{P_x^{\$}}$	→	$(1-\tau)\overline{P_x^{\$}}$	→	$\frac{(1-\tau)\overline{P_x^{\$}}}{\overline{\mathcal{E}}}$

Conditions for C-BAT neutrality

- Prices respond identically to border taxes and exchange rates

Producer Currency Pricing (PCP)

	USA ^{\$}		Border ^{\$}		World*
Imports	$\frac{\mathcal{E}\overline{P}_m^*}{1-\tau}$	←	$\mathcal{E}\overline{P}_m^*$	←	\overline{P}_m^*
Exports	$\overline{P}_x^{\$}$	→	$(1-\tau)\overline{P}_x^{\$}$	→	$\frac{(1-\tau)\overline{P}_x^{\$}}{\mathcal{E}}$


Complete appreciation: $\mathcal{E} = (1 - \tau)\mathcal{E}_0 \implies$ consumer prices unchanged

Conditions for C-BAT neutrality

1. Prices respond identically to border taxes and exchange rates

Dominant Currency Pricing (DCP)

	USA ^{\$}	Border ^{\$}	World*
Imports		$\overline{P}_m^{\$}$	
Exports		$\overline{P}_x^{\$}$	

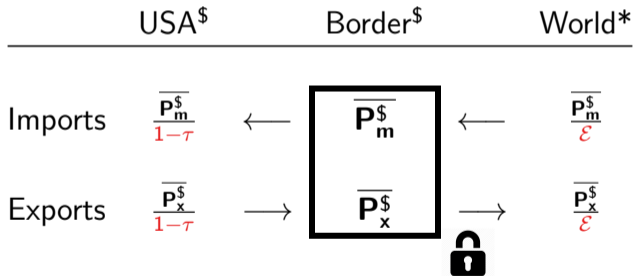


- ▶ 97% of US exports and 93% of US imports priced in dollars

Conditions for C-BAT neutrality

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Dominant Currency Pricing (DCP)



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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

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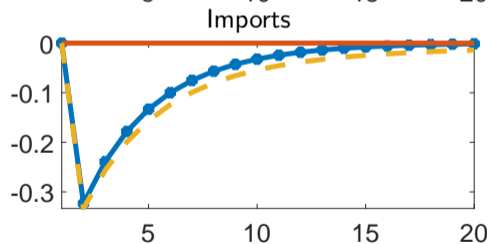
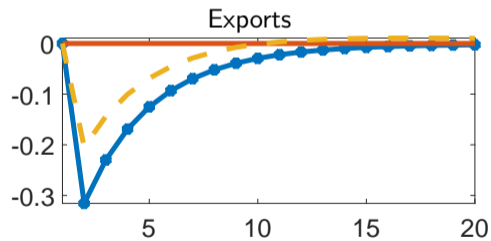
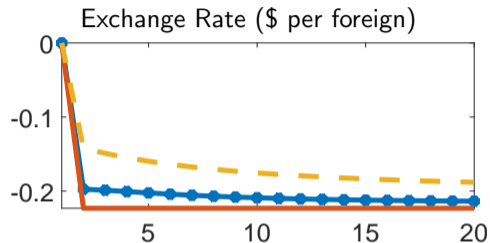
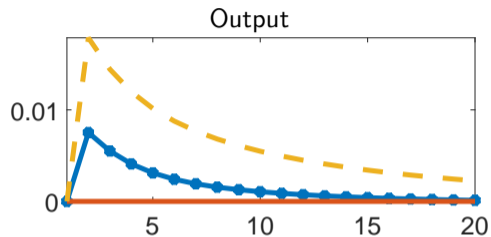
$$\frac{B_{t+1}}{\mathcal{E}_t} - \frac{(1 + i_t)B_t}{\mathcal{E}_t} + B_{t+1}^* - (1 + i_t^*)B_t^* = \frac{(1 - \tau)}{\mathcal{E}_t} P_{x,t} X_t - P_{m,t}^* M_t$$

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

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

B^* : Foreign denominated debt. \mathcal{E} : Dollars per foreign currency. X : exports. M : imports

Quantitative Effects of C-BAT



● 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

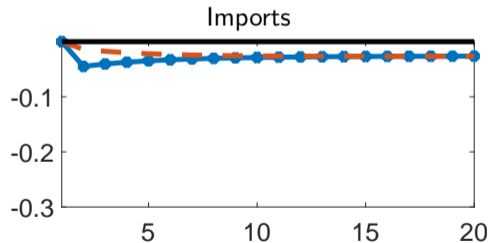
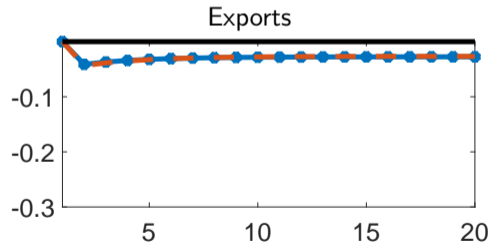
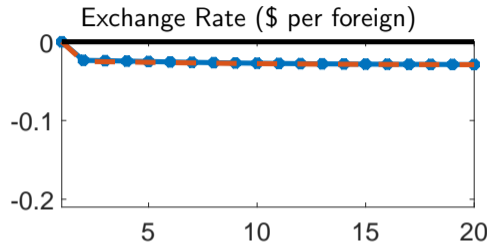
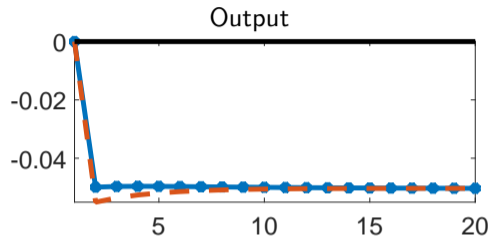
Import vs. Domestic Price: $\frac{P_{m,0}/(1-\tau)}{P_0/(1-\tau)}$

Export vs. Foreign Price: $\frac{P_{x,0}}{\mathcal{E}_0 P_0^*}$

2. **Inelastic labor supply or fully rigid wages**

— Otherwise distortion of labor-leisure condition

Quantitative Effects of VAT



● DCP — PCP — Inelastic Labor

Conclusions

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

First-quarter impact of 20% tax

	C-BAT	VAT
Trade Volume	-30%	-4%
Output	+2%	-5%
\$ Appreciation	15%	2%

- ▶ **C-BAT**
 - ▶ **Valuation effect** to world: 16% GDP
 - ▶ **Fiscal revenues**: short term +0.4p.p. GDP; in NPV -15p.p. GDP