

# 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
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## Conditions for C-BAT neutrality

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## Producer Currency Pricing (PCP)

USA<sup>\$</sup>

Border<sup>\$</sup>

World\*

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Imports

Exports



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Imports			$\overline{P}_m^*$
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↓  $\mathcal{E}$  means \$ appreciation. Starred prices are expressed in foreign currency

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

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Exports	$\overline{P}_x^{\$}$	→	$(1-\tau)\overline{P}_x^{\$}$		

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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 <sup>\$</sup>	Border <sup>\$</sup>	World*
Imports		$\overline{P}_m^{\$}$	
Exports		$\overline{P}_x^{\$}$	

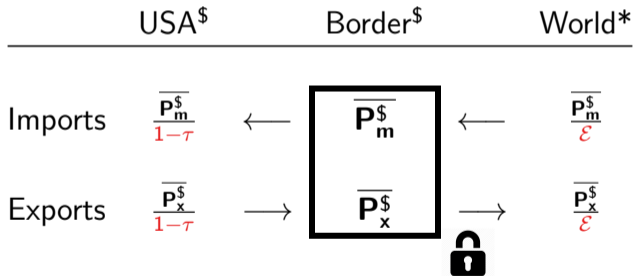


- ▶ 97% of US exports and 93% of US imports priced in dollars

# Conditions for C-BAT neutrality

1. Prices respond identically to border taxes and exchange rates

## Dominant Currency Pricing (DCP)



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# Conditions for C-BAT neutrality

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

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

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$B^*$ : 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

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

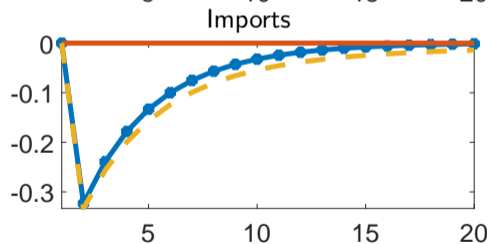
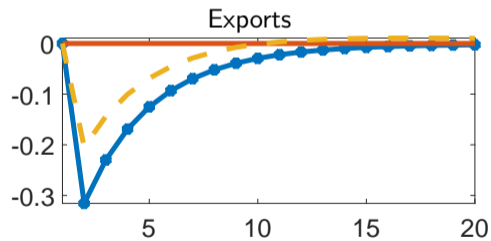
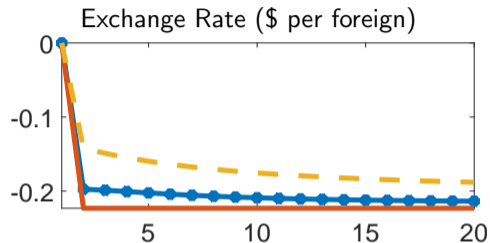
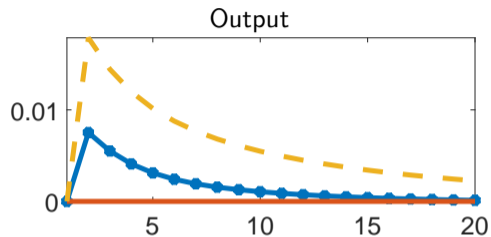
- ▶ 82% of US liabilities are in **dollars**
- ▶ 32% of US assets are in **dollars**

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

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# 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

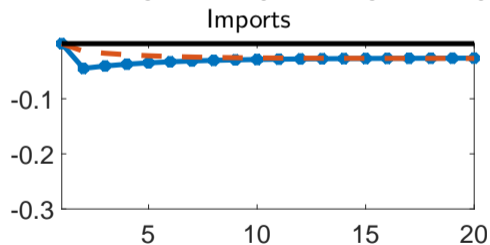
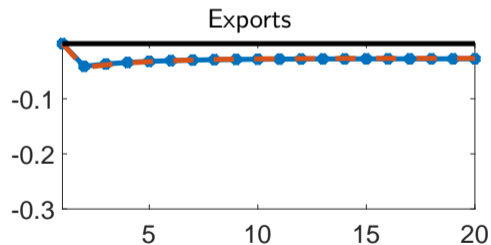
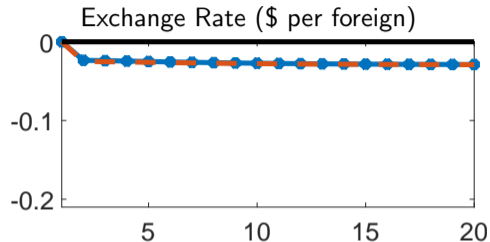
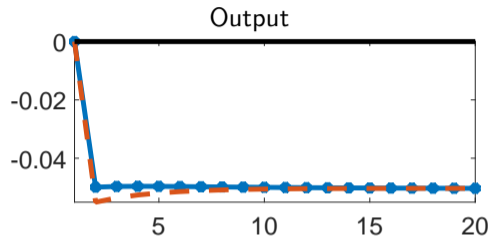
**Import** vs. Domestic Price:  $\frac{P_{m,0}/(1-\tau)}{P_0/(1-\tau)}$

**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