Markets, Prices, and Exchange Rate Adjustment in a DBCFT/BAT System

Sherman Robinson
Karen Thierfelder

Peterson Institute for International Economics
February, 2017
Simulating DBCFT or VAT

- DBCFT and VAT systems are similar
  - Both affect prices of domestically produced goods on the domestic market (PD)
  - Both require a border adjustment tax (BAT) to prevent bias in exports/imports
- VAT is well understood
- No past experience with DBCFT
  - Historical analysis is of limited use
  - Must use other methods of analysis
Simulation Models

• Can simulate the operation of the VAT and DBCFT systems in a national economy

• Simulation is widely used for scenario analysis in many fields: “What if” scenarios
  – Can do controlled experiments to isolate “components” of a complex system to see how they operate
  – NOT Forecasts
Role of the Exchange Rate (EXR)

• EXR in asset/financial markets
  – Linked to capital/financial flows

• EXR in commodity markets
  – Determines domestic prices of exports (PE) and imports (PM)
  – Functionally related to the trade balance

• Adjustment mechanisms
  – Fixed trade balance, EXR adjusts
  – Fixed EXR, trade balance adjusts
DBCFT/BAT Scenarios

• What if DBCFT and the BAT are both fully implemented?
  – What are the links between adjustments to EXR, domestic prices, and wages?
    • Tradeoffs?
  – Links between trade balance and EXR
    • Changes in trade balance and aggregate consumption: Mercantilism
DBCFT/BAT Scenarios

• What if the system is only partially implemented, and the BAT is incomplete?
  – No exchange rate adjustment: What happens to exports, imports, trade balance, and aggregate consumption?
  – What if the implicit BAT tariff is partial, perhaps because it is not explicitly collected at the border?
    • Note that the VAT tariff is explicit, collected by the government
A Computable General Equilibrium (CGE) Model

- The CGE model simulates the operation of commodity and factor markets
  - Solves for equilibrium prices and wages (and profits) that “clear” (supply = demand) commodity and factor markets
- Various “agents” in the model: producers (industries), households, government, world (exports/imports), S-I (collects savings and buys capital goods)
Markets and Prices

• Producers and households interact across markets and react to observed prices
  – Maximizing behavior underlies supply and demand equations

• The real exchange rate and the trade balance are linked in the CGE model
  – Can specify fixed EXR, flexible trade balance, or flexible EXR, fixed trade balance
10 sector CGE model with options for implementing DBCFT/BAT or VAT

Work program to expand the model to include many more sectors for tax revenue and incidence analysis

This application focuses on exchange rate and price linkage scenarios, which is feasible with a small model
Production and Demand

Suppliers: World

Commodity Markets:
- QM
- QD
- QE

Actors:
- Households
- Firms
- Govt
- Firms
- World

WalMart/Costco

Suppliers: QX
Price System: domestic tax & BAT
### DBCFT with BAT

<table>
<thead>
<tr>
<th>Policy shock</th>
<th>20% domestic sales tax &amp; BAT</th>
</tr>
</thead>
<tbody>
<tr>
<td>EXR Fixed/flexible</td>
<td>EXR Flexible</td>
</tr>
<tr>
<td>Reference Price</td>
<td>CPI</td>
</tr>
<tr>
<td>Price indices, base = 1</td>
<td></td>
</tr>
<tr>
<td>Exchange rate (EXR)</td>
<td>0.84</td>
</tr>
<tr>
<td>Consumer price index (CPI)</td>
<td>1.00</td>
</tr>
<tr>
<td>Domestic price index (DPI)</td>
<td>0.83</td>
</tr>
<tr>
<td>% change</td>
<td></td>
</tr>
<tr>
<td>Average wage</td>
<td>-0.08</td>
</tr>
<tr>
<td>Real exports</td>
<td>-0.17</td>
</tr>
<tr>
<td>Real imports</td>
<td>-0.13</td>
</tr>
<tr>
<td>Real consumption</td>
<td>-0.01</td>
</tr>
<tr>
<td>Ratio to GDP (%)</td>
<td></td>
</tr>
<tr>
<td>Exports</td>
<td>12.15</td>
</tr>
<tr>
<td>Trade Balance</td>
<td>-3.43</td>
</tr>
</tbody>
</table>
## DBCFT: BAT Failure

### Policy shock

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<tr>
<th>Exchange rate (EXR)</th>
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</tr>
</thead>
<tbody>
<tr>
<td><strong>EXR Fixed/flexible</strong></td>
<td>0.90</td>
<td>0.83</td>
<td>2.75</td>
<td>6.21</td>
<td>4.84</td>
<td>-0.09</td>
<td>12.93</td>
</tr>
<tr>
<td><strong>EXR Flexible</strong></td>
<td>1.00</td>
<td>1.00</td>
<td>1.92</td>
<td>17.12</td>
<td>-0.10</td>
<td>-4.11</td>
<td>14.28</td>
</tr>
<tr>
<td><strong>EXR Fixed</strong></td>
<td>1.00</td>
<td>0.83</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-16.36</td>
</tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-15.64</td>
</tr>
</tbody>
</table>

- **Ratio to GDP (%)**
  - Exports: 12.93, 14.28
  - Imports: -16.36, -15.64
  - Trade Balance: -3.43, -1.36

- **Reference Price**
  - CPI

- **Price indices, base = 1**
  - Exchange rate (EXR)
  - Consumer price index (CPI)
  - Domestic price index (DPI)

- **% change**
  - Average wage
  - Real exports
  - Real imports
  - Real consumption

- **20% domestic sales tax, no BAT tariff**

- **Policy shock**

- **Exchange rate (EXR)**
  - Fixed/flexible
  - Flexible
  - Fixed

- **Consumer price index (CPI)**
  - Fixed/flexible
  - Flexible
  - Fixed

- **Domestic price index (DPI)**
  - Fixed/flexible
  - Flexible
  - Fixed

- **Average wage**
  - 2.75, 1.92

- **Real exports**
  - 6.21, 17.12

- **Real imports**
  - 4.84, -0.10

- **Real consumption**
  - -0.09, -4.11
Conclusions

• Changes in EXR or trade balances are significant and problematic, given potential impacts on global asset markets
• DBCFT/BAT with no trade bias and no change in EXR involves major shocks to domestic prices and wages
• Incomplete DBCFT/BAT scenarios yield uneven trade impacts and violations of WTO rules
Conclusions

• Incomplete DBCFT/BAT scenarios with a fixed exchange rate are Mercantilist, subsidizing exports and/or taxing imports
  – Result in lower aggregate consumption, and
  – Violation of trade agreements and WTO rules

• Implicit taxes, tariffs, and subsidies not reflected in explicit market signals and not in government statistics confuse market information for policy analysis