Lecture 16: Assessing macro and BOP balances

DEV- 309
Accounting identities

- 3 types of accounts
  - Current transactions
  - Sources and uses of funds
  - Balance sheet

- 2 types of accounting identities
  - By agent
  - By market

- Walras’s Law
### Summary view of the accounting system

<table>
<thead>
<tr>
<th></th>
<th>HH</th>
<th>Firms</th>
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<tr>
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<td><strong>Capital services</strong></td>
<td>iBf+iFf</td>
<td>iBg+i*Fg</td>
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<td>i*Fh+iBh</td>
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Outline

- Review of the BB-NN framework
- Introduction of fiscal balance
- Introduction of private wealth balance
- Assessing external balance
- Assessing fiscal balance
- Assessing labor balance
The market for non-tradables

Relative Price

Domestic Supply

Domestic demand

Quantity
The market for tradables

Relative Price

International Price

Domestic Supply

International supply/demand

Domestic demand

Quantity

$X_s$  $X_d$
Impact of increased demand

![Graph showing the impact of increased demand on domestic and international supply and demand.](image-url)

- **Relative Price**
- **International Price**

- **Domestic Supply**
- **International supply/demand**
- **Domestic demand**

- Quantity: Xs, Xd
Impact of increased supply

- Domestic Supply
- Domestic demand
- Relative Price
- International supply/demand
- International Price
- Domestic demand

Diagram:

- Axes: Relative Price on the y-axis, Quantity on the x-axis.
- Points: Xs, Xd.
Impact of increased relative price: the real exchange rate

- Domestic Supply
- Domestic demand
- International supply/demand
- Net imports
- Net exports

Graph showing the relationship between relative price and quantity, with intersecting curves for domestic supply, domestic demand, international supply/demand, net exports, and net imports.
The macroeconomist’s map

Relative Price

Surplus

Deficit

BB curve

Good external news
Prices, volumes, finance

Demand
The BB-curve

\[ Y = X_t + X_n/q + Z \]

Tradables, non-tradables, oil

\[ X_t = X_t(q) \]

Supply of tradables

\[ X_n = D_n \]

Non-t are demand-determined

\[ D_t = a \ Y \]

Cobb-Douglas utility function in t \& n

\[ D_n = (1 - a) \ q \ Y \]

BB-curve

\[ X_t(q) + Z = a \ Y \]

\[ BB(q, Y) = 0 \]
The real exchange rate
- RER = P_{tradable}/P_{non-tradable}
- RER = E P^*/P

Up or down?
- Up here is depreciation
- Data inverted in many datasets

What do you mean by external balance?
- Zero current account deficit?
- Constant external debt ratio
- Balance of trade in goods and non-factor services
- TB = (r – g) d
  - Where r is the real interest rate, g is the growth rate and d is the debt ratio
- Example
  - r= 10, g = 4, d = 0.5 imply TB = 3 % of GDP
What is the equilibrium real exchange rate?

- Many

- Good or bad?

- How about achieving something else?

- What?
Full employment
The NN curve

Relative Price

More labor,
More product.

Unemployment

Overheated

Demand

NN curve
The NN-curve

\[ \begin{align*}
    L_t &= L_t(q) \\
    L_n &= L_n(X_n) = L_n(Y) \\
    L_t(q) + L_n(Y) &= L \\
    \text{NN}(q, Y) &= 0
\end{align*} \]
The macroeconomist’s map

Relative Price

Surplus Unemployment

Surplus Overheated

Deficit Overheated

Demands

Deficit Unemployment

BB curve

NN curve
The real meaning of the equilibrium real exchange rate

- Not related to some historical benchmark
  - Although you may want to look at it
- Achieves external and internal balance
An economy with three sectors

<table>
<thead>
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<th>Oil</th>
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Add some accounting identities

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Assume a demand structure

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Balance the market for non-tradables

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Balance the market for tradables

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Assume an increase in oil income

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## The Dutch Disease

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How do you know where you are in the map?

- Placing your country vis a vis the BB curve
  - Short vs. long run external balance and inter-temporal considerations
  - Sustainability
- Placing your country vis a vis the NN curve
  - Natural rate, NAIRU
The Nintendo game

- Demand management policies move the economy horizontally
- Exchange rate policy moves it vertically
- Automatic adjustment with fixed exchange rates
  - Surplus/Deficit leads to higher/lower demand
  - Overheated/Unemployment leads to appreciation/depreciation
- Policy trade-offs with only one instrument
Automatic adjustment

Relative Price

Surplus Unemployment

Surplus Overheated

Deficit Overheated

Deficit Unemployment

BB curve

NN curve

Demand
Understanding the RER in El Salvador

- How to model the impact of remittances?
- Impact on BB
- Impact on NN
- What would you expect to observe?
The real exchange rate has appreciated
...look at the balance of goods and services
...but then look at remittances
...so the current account looks fine
...putting it all together
Explaining El Salvador

**Relative Price**

- BB curve
- NN curve

**Demand**

- Fewer workers
- More remittances
China’s external imbalance in 2008

- In 2008 China had a current account surplus of some 10 percent of GDP.
- It also had an FDI surplus of another 4 percent of GDP.
- In addition, it had speculative capital inflows in anticipation of revaluation.
- Reserves had been accumulating very fast.
- Money supply and sterilization bonds were also growing very quickly.
- There were international political pressures for appreciation.
- What should China do?
China’s external surplus

China: Current account balance and inward FDI

- Current account
- Current account + FDI
- FDI

Chart showing the current account balance/GDP, inward FDI flow/GDP (%), and CARA_INVR over the years from 1980 to 2010.
Analysis

- A current account surplus involves an excess of domestic savings over investment.
- Investment is at world record levels.
- The country suffers from excess-savings, or insufficient consumption.
China’s investment rate is almost at world record levels.
What do you make of this inflation rate?
Where is China? Where should it go?

depreciation

Real Exchange Rate

Unemployment Surplus

Over-heating Surplus

Unemployment Deficit

Over-heating Deficit

External Balance

Full employment

Demand
What should macro policy do?

- A real appreciation by itself risks generating unemployment and deflation
  - Inflation is running at about 7 percent
  - ...because of the rise in commodity prices and energy?
- It needs to be complemented with an expansion of demand
- This could come from monetary or fiscal sources
- The banking system is already very leveraged
- ...and would allocate the resources in the most prosperous areas where there is good collateral
- Fiscal policy can be targeted socially and regionally
Introducing fiscal balance

FD = G_t + G_n/q – t X_t(q) – t aD/q 
  – i*_L* – iL/q
Expressed in units of tradables, where:

- G is government spending
- subscript t, n refer to tradables and non-tradables
- t is the tax rate
- L* and L are foreign and domestic currency liabilities
Deriving the FD curve

FD = Gt + Gn/q - t Xt(q) - t aD/q - i*L* - iL/q

\[ dFD = 0 = \frac{dFD}{dq} + \frac{dFD}{dD} \]

\[ \frac{dFD}{dq} = -\frac{(Gn + iL - taD)}{q^2} - t \frac{dX_t}{dq} \]

\[ dFD = -\frac{(Gn + iL - taD)}{q^2} - t \frac{dX_t}{dq} - ta \]

\[ FD = (q, D, G_n, t) \]
Which way does the FD schedule slope?

- It depends
- On the relative weight of non-tradable income vs. non-tradable spending and debt

Two polar cases:
- Venezuela before: tax revenue from oil exceeds spending in foreign debt (and tradables)
- Venezuela now: tax revenue from oil smaller than spending in foreign debt (and tradables)
FD in Venezuela then

\[
FD (G, -t)
\]

Surplus

Deficit
FD in Venezuela now

Deficit $\langle -G, t \rangle$

Surplus
Introducing private financial wealth balance

- Private financial wealth goes up with:
  - A fiscal deficit
  - A current account surplus

- $\Delta A = FD + BB$

- $\Delta A = 0$ requires that
  - Fiscal deficit and BB in deficit
  - Fiscal surplus and BB surplus
  - $FD = BB = 0$
$\Delta A = 0$ in Venezuela then
$\Delta A = 0$ in Venezuela then
Moving the curves

- What does a foreign grant to the government do?
- What does a grant to households do?
- What does an increase in export prices do if the exporter is the public sector?
- What if it is the private sector?
$\Delta A = 0$ in Venezuela now
$\Delta A = 0$ in Venezuela now

\[ \Delta A > 0 \]

\[ \Delta A < 0 \]
How does this change the overall picture?

- The economy will tend to move towards a point where $\Delta A = 0$ and $NN = 0$
- This may be a point where the fiscal surplus equals the BB surplus
  - Sustainable
- ...or where the fiscal deficit equals the BB deficit
  - Unsustainable
- What do we mean by deficit?
Where is the NN curve? (Venezuela then: the good case)

\[ \Delta A > 0 \]

\[ \Delta A < 0 \]
Where is the NN curve? (Venezuela then: the bad case)
Where is the NN curve?
(Venezuela now: the bad case)
A crisis in Venezuela then
Venezuela: GDP and the current account

Non-oil GDP and the Current Account

Gs. Constant 1984 prices)


GDP

Current Account

(As % GDP)
Nominal exchange rate depreciation rates

Quarterly devaluation during the 90s

Venezuela

Chile

Colombia
Dollar value of domestic financial assets

M2 in dollars at the official exchange rate
A crisis in Venezuela now

\[ \Delta A > 0 \]

\[ \Delta A < 0 \]
Contrasting Venezuela then with Venezuela now

- In Venezuela then, a BOP crisis made the fiscal deficit disappear.

- In Venezuela now, it makes it bigger requiring a larger monetary emission.

- If the $\Delta A = 0$ curve crosses the NN curve below the BB curve, there will be a crisis.

- Venezuela then would generate recurrent crises with Kangaroo pegs.

- Venezuela now fell into hyperinflation as they need to increase money creation to finance the deficit.