Definition of CA
1. CA= - FKA
2. CA= National Savings - Investment <—****important defn
= $S^P + S^G - I$
3. CA= TB + NFP + NUT
4. CA + Valuation effect= △NIIP
5. CA= Y - C - I - G

Lecture 2

Basic Theory of Current Account Determination and Current Account Sustainability

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ECON 356

Bank of canada surprised market on Jan 21 with a 25 basis point rate cut Overnight rate target is reduced to 3/4 % The bank rate is correspondingly 1% and the deposit rate is 1/2 % This decision is in response to the recent sharp drop in oil prices, which will be -ve for growth and underlying inflation in Canada

Lower interest rate
—> lower return on Canadian assets
—> capital outflow to the high yield foreign markets
—>depreciation of CAD
—> goods are cheaper (export increase —> help Canadian GDP (HELP GDP)
—> export oil to US, 1:20 to now 1:24 oil revenue is actually increasing)
—> import is relative more expensive
—> CPI increase —> inflation increases (KEEP INFLATION UP AT AROUND 2%)

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Outline

We developed a simple framework for determination of the components in

$$CA = (S^g + S^p) - I$$

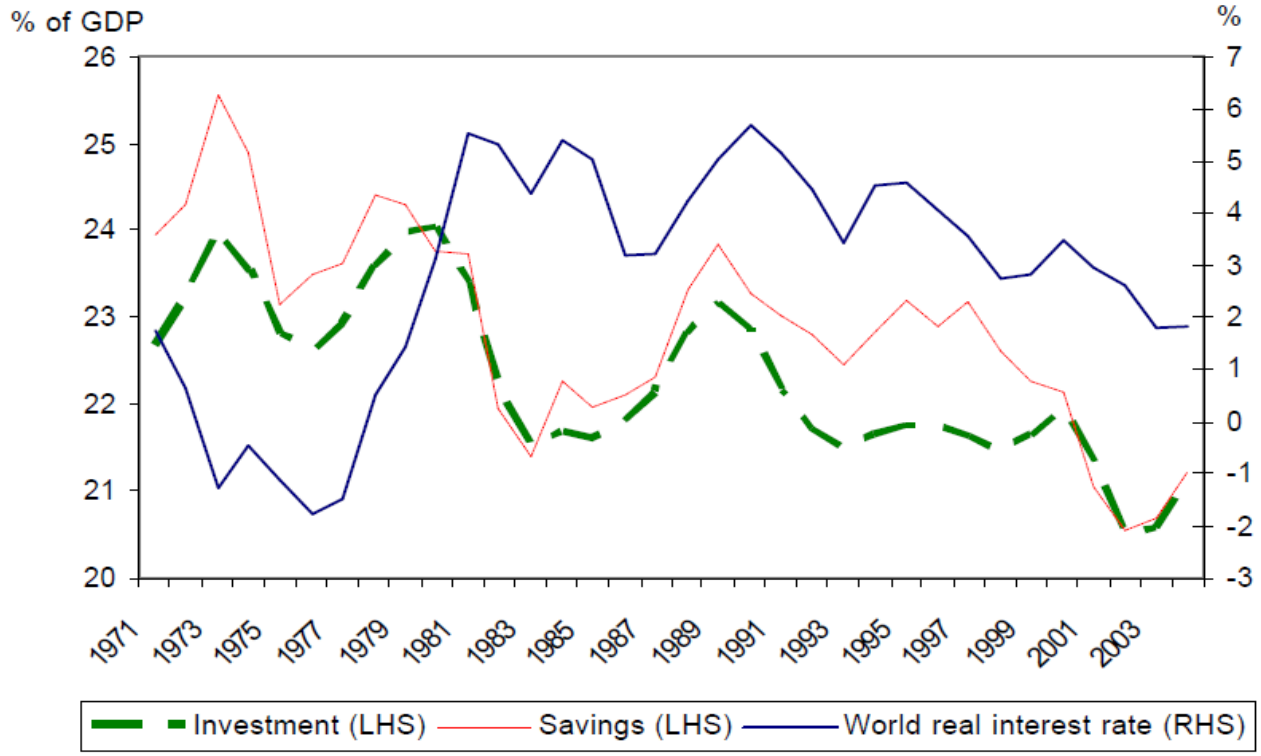
1. Determination of households' savings behavior, S^p.
2. How is investment, I, determined?
3. How do fiscal deficits (and S^g) affect current account?
4. Combine these factors to understand the interactions between S, I and CA at the aggregate level.

Government Saving= SG = T - G
Private Saving SP

(G= government saving + government investment)

Global S, I, and world interest rate

Figure 1: Global Savings, Investment and the Real Interest Rate



Sources: World Bank, BIS, IMF, Bank of Canada calculations.

What determines investment, I?

Firms are the most important source of aggregate investment. They choose how much to invest based on the following factors (among others):

cost of investment —>borrowing —> pay interest rate
-Higher interest rate lower investment rate
-Higher the depreciation rate, the higher the cost of investment, the lower the incentive to invest

COST SIDE

- **Interest rate and depreciation rate**

  Interest rate reflects the cost of borrowing that firms face. Physical capital also depreciates - this is another cost to capital that firms face. Therefore, the total cost of borrowing one unit of capital depends on both the interest rate and depreciation rate. As the rental cost (borrowing cost+depreciation) of capital increases, investment _____.

BENEFIT SIDE

- **Productivity** Higher productivity—> Higher investment rate

  Changes in productivity affect the firms' current profits and expectations of future profits. As firms try to take advantage of these profit opportunities, they adjust their investment. Productivity is difficult to identify, but we can proxy it by looking at measures of productivity such as output per hour, or stock market returns, or number of patents, etc..

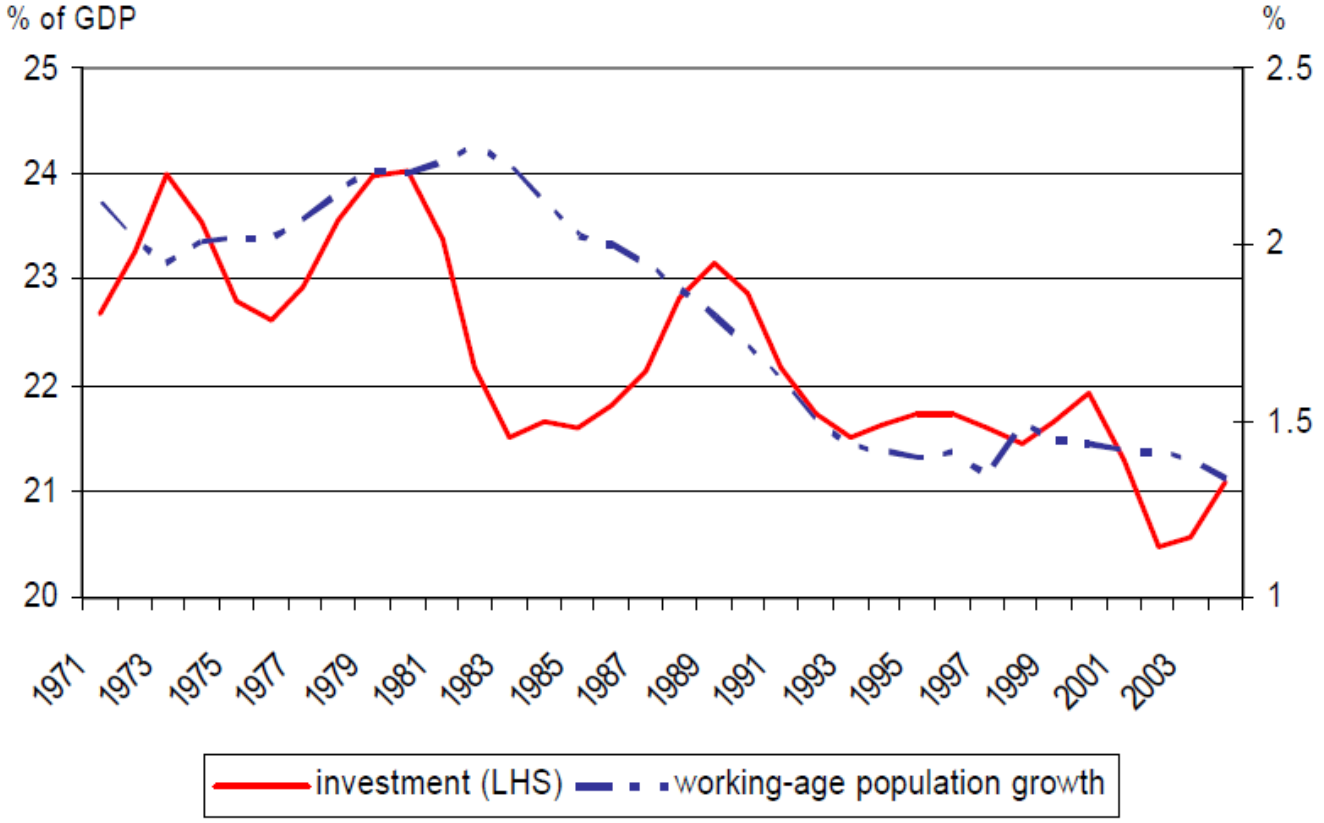
- **Labour force growth**

  A fall in labor force growth implies that less investment is needed to equip workers with capital (machinery, equipment, etc.). This outcome would be more pronounced if production process is _____ capital intensive (like manufacturing).

capital intense industry—>labor forces declining —> investment decline

What determines investment?

Figure 2: Investment and Labour Force Growth



Sources: World Bank, official sources, Bank of Canada calculations.

What determines investment, I?

typically we think firms are borrower—>interest rate △

- **Trade and financial liberalization**

  Since the mid-1980s world economy has experienced a massive wave of economic and financial liberalization. Liberalization is associated with the reduction in capital controls, tariffs, and other impediments to economic mobility. This process lowers costs of capital mobility, increases firm's current and expected profits, and leads to higher investment.

- **Business environment**

  Stable and institutionally sound business environment stimulates investment. Other incentives, such as business taxes, subsidies, etc. may also affect investment.

- **Uncertainty**

  Larger uncertainty induces firms to postpone investment. What if higher uncertainty is associated with high returns?

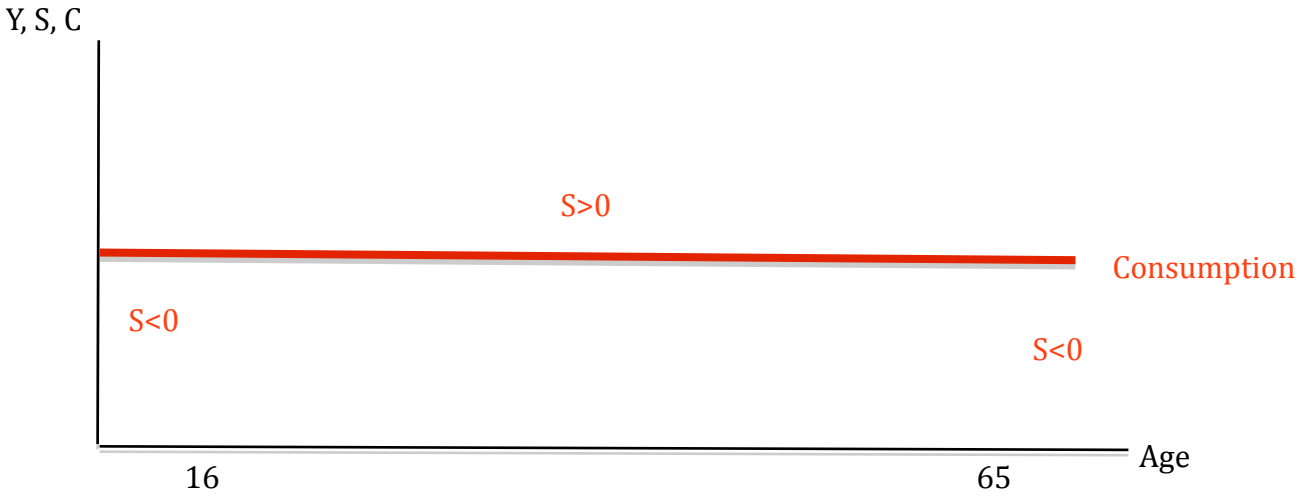
- **Other?**

What determines private savings, S^p?

Savings plans are made by households. Some of the factors affecting private savings are:

- **Demographics**

  One of the key reasons for why people save is to smooth consumption over the life-cycle. As a result, savings rate varies over the life cycle: savings rate is low or even negative when young and old; and it is high when individual is at her prime (in the middle of their life-cycle). As the elderly-dependency ratio rises, the savings rate is expected to _decrease_.



Elderly- dependency ratio
= pop. 65+ / pop. 16-65

Youth- dependency ratio
= pop. 16-/ pop. 16-65

What determines private savings, S^p?

- **Fluctuations in Income**

  Households typically prefer a smooth path for consumption over time, that is, they are averse to fluctuations in their consumption. Households accumulate savings to buffer the shocks to their income, and maintain a smooth consumption path over time. The consumption and savings behavior will be different depending on whether households perceive income fluctuations to be permanent or temporary.

  What happens to consumption and savings if household experiences a permanent increase in her income?

  Temp ↑
  —> ↑ in consumption (a little bit)
  —>smooth out the income shock (spend the increase amount in several periods)
  —>↑ the incentive to save as you know your income wont increase the next few periods,TEMP ONLY
  S = (Y - T) - C
  Y↑ > C↑

  What happens to consumption and savings if household experiences a temporary increase in her income?

  Permanent increase (Y) —> increase in consumption (C) —>no incentive to save
  Disposable income = Income - Consumption ? (Y↑ = C↑, Saving wont change)
  S = (Y - T) - C

  $CA = S^P + S^G - I$

  Temporary ↓ in Y (P of oil ↓ in oil exporting country)
  Y↓ —> C↓

  S^P = Y (↓)- T - C (↓) —>Private saving ↓ —> CA↓

What determines private savings, S^p?

- **Interest rate**

  The effects of interest rate on savings is two-fold.

  – Interest rate is a reward for savings. Therefore, an increase in interest rate will lead to higher savings. We refer to this channel as the **substitution effect**.

  – Interest rate also affects households' income, but this effect depends on whether household is a net borrower or net lender.

  For instance, consider an increase in the interest rate. If household is a net lender (saver), she will receive higher interest payments on her savings, and may choose to save some or all of it. If household is a net borrower (debtor), she will have to make larger interest payments, so her income will be lower, thus leading to lower savings. We refer to this channel as the **income effect**.

  – The net effect on savings depends on which of the two channels dominate. Usually, the substitution effect is found to be stronger.

interest rate ↑

SE: S^P↑

IE: If you are a NET LENDER
—>IE is +ve as you earn r(A-L) which means (A-L)>0
—>Interest income >0 and ↑ when r↑
—> S^P↑ > C↑

Net lender to the rest of the world —> SE and IE SAME AMT
Net borrower to the rest of the world —>SE and IE OPP direction
SE>IE

If you are a NET BORROWER
—>r(A-L) <0 which means (A-L) <0
—> S(Private)↓ >C↓

What determines private savings, S^p?

- **Financial Sector Development**

  Financial sector development refers to its ability to mobilize savings, allocate capital, and facilitate risk management. However, the effect of financial sector development on savings is ambiguous.

  – More developed financial market facilitate access to credit and better insurance mechanisms, and thus may lead to lower savings.

  – More developed financial markets also provide access to a larger variety, cheaper, or higher-return financial instruments, thus stimulating household savings.

- **Fluctuations in corporate profits**

  In the recent years, firms have emerged as an important saver. Corporate sector in G-7 countries have retained a large fraction of its earnings and has shifted from being a net borrower of funds to being a net saver. This could be due to higher profits and firms' perception that this increase in profits is temporary; it could also be due to changes in regulatory environment, or larger business uncertainty.

What determines private savings, S^p?

- **Fiscal policy**

  Government can affect households' savings rate through its tax and spending policy.

  – Suppose government rises taxes that it levies on households. What would happen to private savings?

  Consider T↓; G→ (cutting tax with constant G, they might eventually introduce a heavier tax next year to compensate
  S^G= (T- G) ↓
  S^P =
  T ↑ —> (Y- T) ↓
  T ↓ —> (Y - T) ↑
  C→ —>Sp↑ = (Y-T)↑ - C→
  S(National)= Sp↑ +Sg↓
  CA= Sn - I

  Ricardian equiavakent

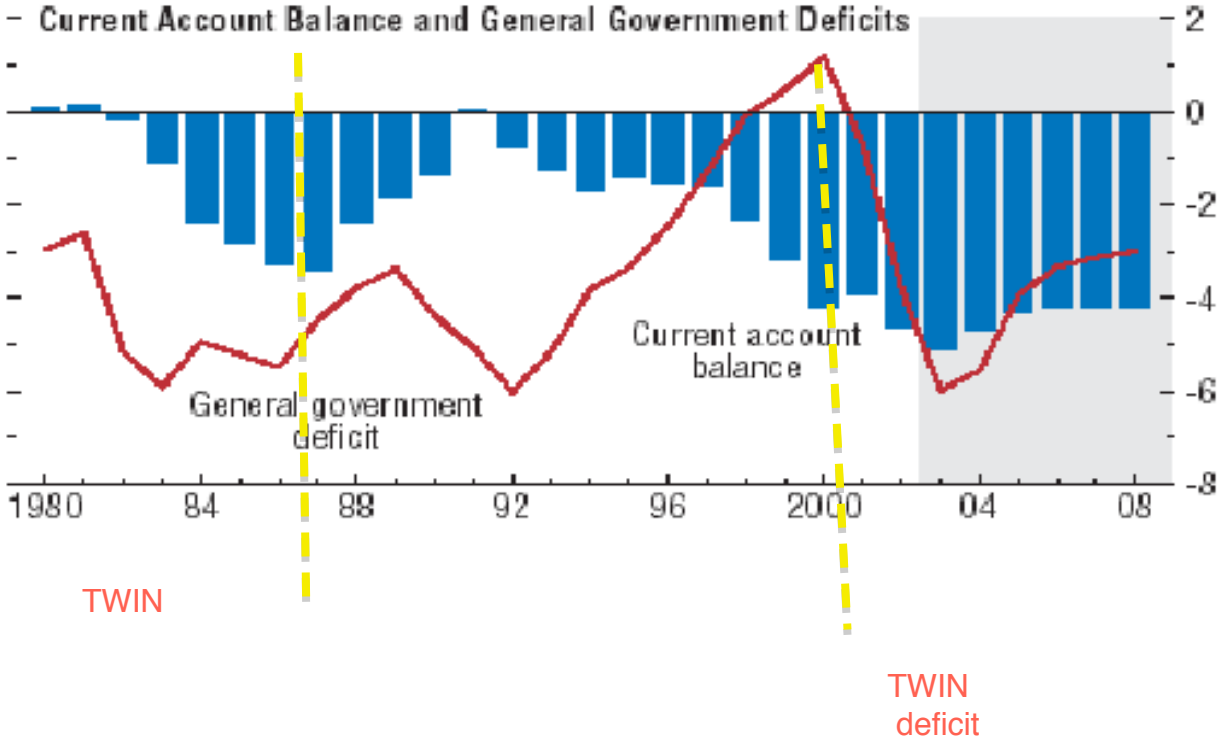
  – Suppose government increases its spending. What would happen to private savings?

  Trade ↑I ; T→
  Sg= (
  Tt number

What determines private savings, S^p : Twin Deficits.

Figure 1.10. United States: Return of the Twin Deficits
(Percent of GDP)

The sharp deterioration in the U.S. fiscal position has led to a reemergence of the twin deficits of the 1980s. With fiscal deficits expected to persist, government debt will now not be reduced in advance of the retirement of the baby boomers.



What determines government savings, S^g?

Governments are typically a source of dissaving because they tend to run budget deficits by spending more than they collect in taxes. What are budget deficits? Primary government balance is

$$T - G,$$

where

- G is government consumption, investment and other budget expenditures
- T is taxes and other budget revenues

We define government savings as equal to primary government balance:

$$S^g = T - G.$$

Current account adjustment to shocks: Permanent output shock

Example: Ecuador looses 10% of its banana crops forever due to global warming and its effects on the temperatures:

What will happen to consumption, savings, current account in Ecuador?

permanent -ve income shock—>we ADJUST to perm shock

Y↓ permanently

1. C↓
2. Sp→ (as C↓ one-for-one: Sp = ⇓Y - T - ⇓C)
3. I↓
4. CA= (Sp + Sg -I)↑

overall saving wont change

fall in investment

*lower consumption if -ve shock
*increase consumption if +ve shock

Results:

- Consumption, C, falls one-to-one with output.
- Savings, S, _____
- Current account, CA, does not change.

****Only permanent shocks will lead to a change in Investment!

Current account adjustment to shocks: Temporary output shock

Example: Ecuador looses 10% of its banana output in a drought, but next year banana crop is expected to go back to normal.

What will happen to consumption, savings, current account in Ecuador?

Y↓ temporary

1. C↓ (little)
2. Sp↓ = (Y↓ - T - C↓(little))
3. I→
4. CA↓ = (Sp↓ + Sg - I)

shows a -ve in CA
—>import is rising
—> TB goes -ve

temp shocks —> we FINANCE them

bad now—>you predict it will be great later —> BORROW
bright now—> bad future —>better save for the bad days!

access the international market
we can finance that!
borrowing abroad to smooth out the -ve shock
make our consumption more or less the same
(decline for a bit only but not in a great amout)

Results:

- Temporary negative output shocks reduce consumption, but by less than when drops in output are permanent. This is because people prefer smooth consumption over time.
- Savings, S, D E C R E A S E — private saving ↓, government saving →, —>National saving ↓
- Country smooths consumption over time by borrowing from abroad. As a result, current account deteriorates following the shock.

Current account adjustment to shocks: Interest rate shock

Example: Suppose world interest rate increases. What will happen to consumption, savings, investment, current account in Ecuador?

Given:
CA>0 before the increase in r
NIIP>0 before the increase in r

temp. r↑

1. Sp↑ (by Substitution effect)
   Sp ↑ (by Income effect)
2. government is not affected
3. I↓ (interest rate is a cost of investment)
4. CA↑ = Sp↑ + Sg - I↓
5. C↓ (save more?)

*net lender will benefit by the ↑r
*net borrow will suffer

Results:

- Investment, I, _____
- Consumption, C, _____
- Savings, S, _____
- Current Account, CA, _____=>TB= Y (Px/Pm) - C - I - G

y= oil Px= P of oil $10/barrel of oil
c=food Pm= P of food $2/kg of food

Terms of trade TOT= Px/Pm
= 10/2 = 5 kg
—> 5kg of food can be produced with a barrel of oil

if Px ↑
= the output value for more (EXPORT)
= +ve income shock (temp/perm?)

Capital Controls

Often countries impose capital controls to limit capital account and current account imbalances.

Definition 0.1 *Capital controls consist of imposing restrictions prohibiting flows of capital across country's borders.*

Question: Why would country want to prevent international capital flows?

Answer:

if CA<0 (example: US)
—> capital controls will prohibit tax capital inflow
—> CA must =0
—> interest rate of US ↑
—> higher interest rate will lead to decline in investment level
—> S=I (domestic investment)

if CA>0 (example: China)
—> capital controls will prohibit tax capital outflows
—> CA must =0
—> interest rate of China ↓
—> less ppl save, more ppl borrow and invest
—> S↓= I↑ [CA= S↓ - I↑>0]
—>CA surplus will be eliminated

- Do capital controls improve household's welfare?
- Would country's interest rate be above, below or equal to the world interest rates after capital controls are imposed?

domestic interest rate lower than world interest rate —>capital outflow —>lack of capital —> interest rate increases??

Can a country run perpetual trade balance deficits?

Are the observed trade balance and current account deficits in the U.S. sustainable in the long run?

- The answer depends on the sign of a country's net international investment position (NIIP).
- A negative NIIP $\Longrightarrow$ the country is a net debtor to the rest of the world. Thus, the country must generate trade balance surpluses in the future in order to service its foreign debt.
- A positive NIIP $\Longrightarrow$ the country is a net creditor to the rest of the world. The country can afford to run trade balance deficits, which can be financed with the interest revenue generated by the country's lending to the rest of the world.
- Let's show this argument formally.

a country is a net lender (+NIIP) there is no problem for them running trade deficits / CA deficits

Can a country run perpetual trade balance deficits?

Consider a 2-period economy. Define

TB_1	trade balance in period 1
CA_1	current account in period 1
B_0^*	net international investment position (NIIP) at the end of period 0
B_1^*	net international investment position (NIIP) at the end of period 1
r	interest rate paid on investment held between period 0 and 1
rB_0^*	net investment income (NII) in period 1

Assume: Net unilateral transfers = 0 and net int'l compensations to employees = 0, then current account is equal to net export plus NII:

$$CA_1 = TB_1 + rB_0^*$$

Assume: No valuation effects. Then we also showed that current account is equal to the change in country's NIIP:

$$CA_1 = B_1^* - B_0^*$$

Combine the two equations to eliminate CA_1:

$$B_1^* = (1 + r)B_0^* + TB_1$$

Think of a 2-period world

TB1 = TB at t=1
TB2 = TB at t=2
B0 = NIIP at the END of t=0
B1 = NIIP at the END of t=1
B2 = NIIP at the END of t=2
r = interest rate

*B1= B0 +CA1 — — — — (1)
= B0 + TB1 +rB0
= (1+r)B0 + TB1
*B2 = (!+r)B1 + TB2 — — — (2)

Sub (2) into (1)

B1= B2/ (1+r) - TB2/ (1+r)

(1+r)B0 = B1 = TB1

(1+r) BO= B2/(1+r) - TB2/ (1+r) - TB1

B2 CANNOT be -ve
B2 CANNOT >0
⇒ B2 can only be 0

Thus, (1+r) B0 = -TB1 - TB2/(1+r)

if B0>0 —> TB1<0 or TB2<0 or both
if B0<0 —> TB1>0 or TB2 >0 or both
if B0=0 —> TB1= -TB2/(1+r)

earning income from the previous year

CA1 = TB1 + NFP1 + (NUT1 —>0)

rA x FA x r2 x FL
r(FA-FL) = r(NIIP0)=r(B0)

****** CA1= TB1 + rBo
CA2 = TB2 +rB1

△NIIP = CA + (Val effect —>0)
****** CA1= B1-B0
CA2= B2- B2

This also holds in period 2:

$$B_2^* = (1+r)B_1^* + TB_2$$

Combine the last two equations to eliminate B_1^* to get:

$$(1+r)B_0^* = \frac{B_2^*}{(1+r)} - TB_1 - \frac{TB_2}{(1+r)} \tag{1}$$

Cases for B_2^*:

- Can $B_2^* < 0$? No, nobody is willing to lend when the world ends. So $B_2^* \geq 0$. This is the no-Ponzi-scheme condition.
- Can $B_2^* > 0$? No, I am not willing to die with claims that are not served.

Thus, it must be the case that $B_2^* = 0$. This condition is known as the transversality condition.

Expression (1) becomes

$$(1+r)B_0^* = -TB_1 - \frac{TB_2}{(1+r)} \tag{2}$$

Result: It follows that any debtor country (one with negative NIIP) must generate trade surpluses in the future.

Question: *Can a country run perpetual* ***trade deficits****?*

Answer:

Can a country run perpetual current account deficits?

Recall

$$CA_2 = B_2^* - B_1^*$$

Combine it with equation (2) to get

$$B_0^* = -CA_2 - CA_1$$

Therefore, a country's initial NIIP position must be equal to the sum of its current account deficits.

Question: *Can a country run perpetual* ***current account deficits****?*

SURE
if B0 is positive
if the country is China

Answer:

(1+r) B0 = -TB1 - TB2/(1+r)
recall: CA1= TB1 + rB0
CA2= TB2 + rB1
(1+r) B0 = -(CA1-rB0) - [(CA2-rB1)/(1+r)]

B0 + (rB0—>0) = -CA1 + (rB0—>) - CA2/(1+r) + rB1/(1+r)
B0= -CA1 - CA2/(1+r) + rB1/(1+r)
⇒ CA2= (B2—>0) - B1
⇒ B1= -CA2

B0 = -CA1 -CA2/ (1+r) + -rCA2/ (1+r)
= -CA1 - CA2(1+r)/(1+r)
=-CA1-CA2

if NIIP0=B0>0 (china) —>CA1<0 or CA2<0 or both
if B0<0 (US) —> CA1>0 or CA2>0 or both
if B0=0 —> CA1= -CA2

Definitions of CA

Let's review the alternative ways of defining the current account:

- Current Account deficits are reflections of trade deficits:

$$CA_t = rB^*_{t-1} + TB_t$$

- Current Account is the gap between savings and investment:

$$CA_t = S_t - I_t$$

- Current Account is the change in the Net International Investment Position (assuming no valuation effects):

$$CA_t = B^*_t - B^*_{t-1}$$

- Current Account is the gap between national income and domestic absorption:

$$CA_t = Y_t - A_t$$

where $A_t = C_t + I_t + G_t$ is country's absorption. Also

$$\begin{aligned} CA_t &= Y_t - C_t - I_t - G_t \\ &= \left(rB^*_{t-1} + GDP_t\right) - C_t - I_t - G_t \\ &= rB^*_{t-1} + TB_t \end{aligned}$$

Are current account deficits good or bad?

It depends! On the sources and desirability of the CA deficits:

- If reflects an excess of imports over exports – may be a sign of competitiveness problem. Good or bad?
- If reflects low savings relative to investment
  - saving is too low. Good or bad?
  - investment is high. Good or bad?
- If reflects intertemporal trade: importing goods today (running a current account deficit) and, in return, exporting goods in the future (running a current account surplus then)
  - natural disaster/weather shock. Good or bad?
  - changing demographics. Good or bad?

Sustaining the unsustainable?

Are global imbalances unsustainable? It depends!

- "The standard view in policy circles is that they represent a serious threat to economic stability rather than a sensible market reallocation of capital. In the standard view, such imbalances are "unsustainable" and the longer they last, the more drastic and painful will be the ultimate "adjustment." " WSJ, Jan 12, 2010.
  - Reflects profligacy by U.S. consumers
  - Empirical studies showed that deficits of more than 5% of GDP caused trouble
  - "Caused the 2007-09 crisis!" U.S. Treasury Secretary Henry Paulson

Sustaining the unsustainable?

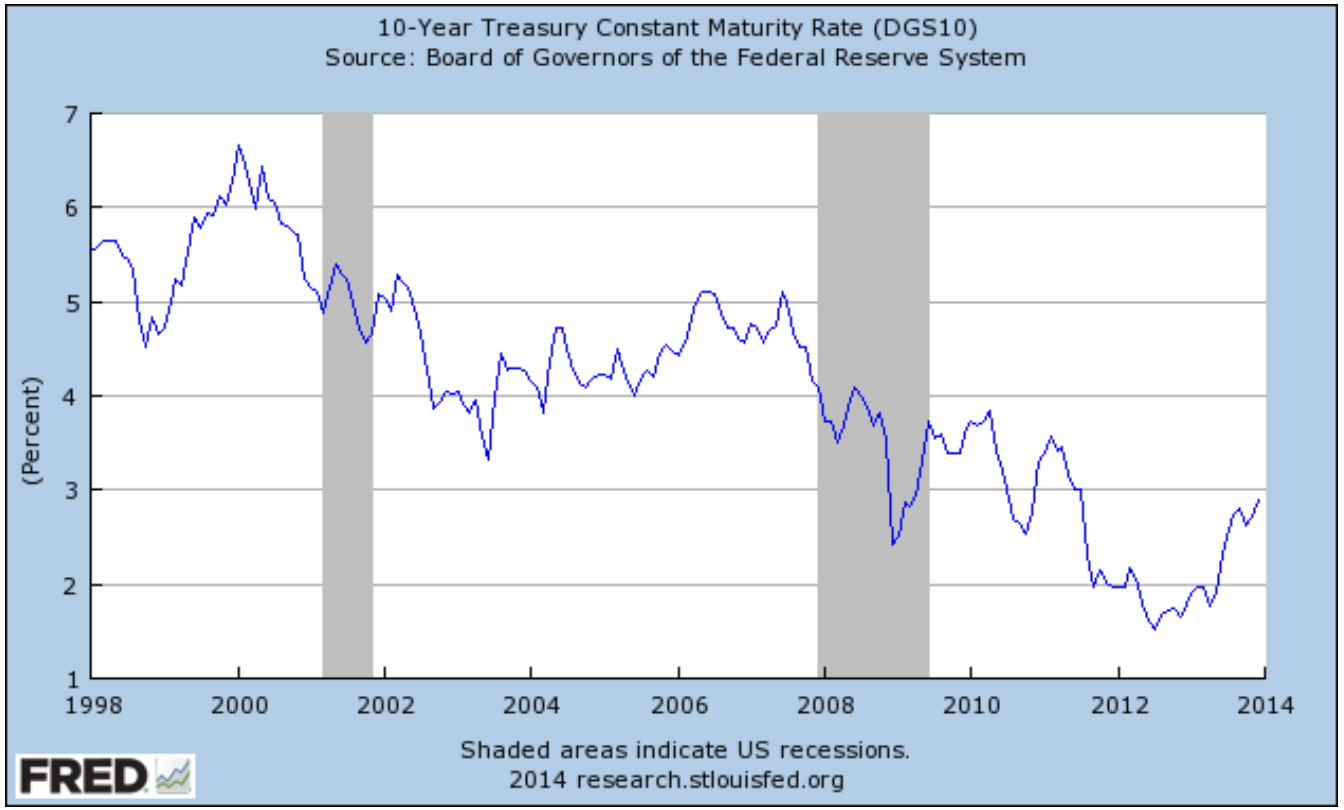
Are global imbalances unsustainable? It depends!

- An alternative view is that "The world wants to park its savings in the U.S." And thus imbalances reflect long-term frictions around the world. But why?
  - U.S. Treasurys are the deepest and most liquid market of safe securities in the world.
  - The U.S. has good institutions.
  - The U.S. has favorable demographics
  - High energy prices don't last forever.
  - The dollar is the *de facto* international reserve currency
  - Asian economies want to keep their currencies cheap to promote export-led growth

US demanding funds —> push interest rate up
Chinese want to supply the funds —> interest rate has to come down

Is there a way to distinguish between the views?

Text



international capital prohibited
—>Balanced CA
—>Cannot be deficit or surplus
—>But it is a market economy, they need to adjust domestic interest rate—> interest rate need to increase
(u can borrow initially but now you cant!—>higher interest rate increase the burden of borrowing and encourage savings)
—>Now, CA can be balanced with more saving and less borrowing

borrow
—> money inflow
—>selling assets to the rest of the world

(PG17 CAPITAL CONTROL)

Is there a way to distinguish between the views?

BYE