# Gains from Asset Trade

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# Intro

- In this chapter, we see how financially open economies can, in theory, reap gains from financial globalization in the long run.
- We first look at the factors that limit international borrowing and lending, then we look at how a nation's ability to use international financial markets allows it to accomplish three different goals:
  - Consumption smoothing (by steadying consumption when income fluctuates)
  - Efficient investment (by borrowing to build a productive capital stock)
  - Diversification of risk (by trading of stocks between countries)

# Borrowing constraint

- The ability to borrow in times of need and lend in times of prosperity has profound effects on a country's well-being.
- Using changes in an economy's external wealth, we can derive the key constraint that limits its borrowing in the long run: the long-run budget constraint (LRBC).
- The LRBC tells us precisely how and why a country must, in the long run, "live within its means."

# Borrowing constraint

When a household borrows $100,000 at 10% annually, there are two different ways it can deal with its debt each year:

- Case 1 A debt that is serviced. You pay the interest but you never pay any principal.
- Case 2 A debt that is not serviced. You pay neither interest nor principal. Your debt grows by 10% each year.

Case 2 is not sustainable. Sometimes called a rollover scheme, a pyramid scheme, or a Ponzi game, this case illustrates the limits on the use of borrowing.

In the long run, lenders will not allow the debt to grow larger. This is the essence of the long-run budget constraint.

# Long-run budget constraint

Here are some assumptions we make in the model economy:

- The country is a small open economy: The country is a price taker and cannot influence prices in world markets for goods and services, nor can it influence the real interest rate.
- It is a real economy: Prices are perfectly flexible. Analysis is in terms of real variables, and we ignore monetary aspects of the economy. There is one real good and one real asset.
- The asset, real debt, carries a real interest rate $r^*$, the world real interest rate, which is constant. The country can lend or borrow an unlimited amount at this interest rate.

# Long-run budget constraint

- The country pays a real interest rate $r^*$ on its start-of-period debt liabilities L and is also paid r* on its start-of-period debt assets A. Net interest income payments equal to $r^*A - r^*L$, or $r^*W$, where W is external wealth $(A - L)$.
- There are no unilateral transfers (NUT $= 0$), no capital transfers (KA $= 0$), and no capital gains on external wealth. Therefore, there are only two nonzero items in the current account: the trade balance TB and net factor income from abroad, $r^*W$.

# Long-run budget constraint

Change in external wealth from end of $N-1$ to end of $N$ is given by:

$$\Delta W_N = \underbrace{W_N - W_{N-1}}_{\text{Change in external wealth}} = TB_N + \underbrace{r^* W_{N-1}}_{\text{interest paid/received}}$$

Wealth at the end of the year thus:

$$W_N = TB_N + (1 + r^*) W_{N-1}$$

# LR budget constraint

At the end of year 0: $W_0 = (1 + r^*)W_1 + TB_0$

We assume that all debts owed or owing must be paid off, and the country must end that year with zero external wealth.

At the end of year 1: $W_1 = 0 = (1 + r^*)W_0 + TB_1$

Cobined: $W_1 = 0 = (1 + r^*)^2 W_{-1} + (1 + r^*)TB_0 + TB_1$

2 period budget constraint become:

$$-(1 + r^*)^2 W_{-1} = (1 + r^*)TB_0 + TB_1$$

# LR budget constraint

Divide our previous equation with $(1 + r^*)$, we get:

$$\underbrace{-(1 + r^*)W_{-1}}_{\text{Minus last period wealth PV}} = \underbrace{TB_0 + \frac{TB_1}{(1 + r^*)}}_{\text{PV of trade balances}}$$

The present value of X in period N is the amount that would have to be set aside now so that, with accumulated interest, $X$ is available in $N$ periods. If the interest rate is $r^*$, then the present value of $X$ is $X/(1 + r^*)^N$.

# LRBC

Let $N$ go to infinity, we get infinite sum and arriveat LRBC:

$$-(1+r^*)W_{-1} = TB_0 + \frac{TB_1}{(1+r^*)} + \frac{TB_2}{(1+r^*)^2} + \cdots$$

A debtor (creditor) country must have future trade balances that are offsetting and positive (negative) in present value terms.

# Perpetual Loan

Let's compute $PV(X)$ for any stream of constant payment starting in period 1:

$$\frac{X}{(1+r^*)} + \frac{X}{(1+r^*)^2} + \frac{X}{(1+r^*)^3} + \cdots = \frac{X}{r^*}$$

For example, the PV of such a stream of payments of a perpetual loan, with $X = 100$ and $r^* = 0.05$ equals:

$$\frac{100}{(1+5\%)} + \frac{100}{(1+5\%)^2} + \frac{100}{(1+5\%)^3} + \cdots = \frac{X}{5\%} = 2,000$$