

FETP/MPP8/Macroeconomics/Riedel

The Open Economy Macro Framework

Framework of a Macro Economy

The framework presented here is the skeleton of a macroeconomic model. Models are necessary for economic analysis because the details of real world economies obscure the fundamental forces that determine economic outcomes. Like a road map, the value of an economic model is its simplicity. The ideal model is one that is just complicated enough to capture the fundamental relationships that determine economic outcomes, but no more so.

Here the framework of an open macro economy is developed step-by-step, starting with the simplest possible model and then introducing real world complications one-by-one.

1. The Macro Framework of a “Robinson Crusoe” Economy
2. The Macro Framework of a Modern Closed Economy
3. The Macro Framework of an Open Economy

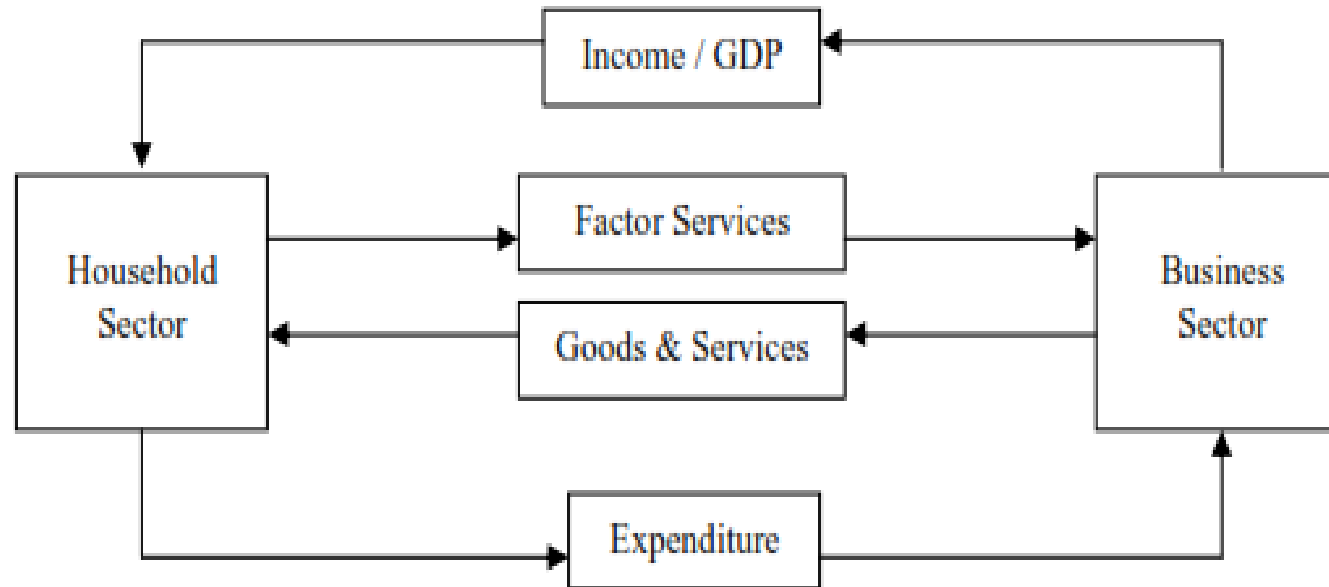
Key concepts:

1. Endogenous versus exogenous variables
2. Ex ante versus ex post
3. Equilibrium versus Accounting Identities

Robinson Crusoe Model

Consider an economy consisting of two sectors: (1) the business sector where goods and services (GDP) are produced with inputs of land (T), labor (L) and capital (K), and (2) the household sector which owns and earns income from selling the services of land, labor and capital. The household sector expends all its income on goods and services produced in the business sector.

In this model there is no saving or investment, no government taxation and spending, no economic relations with the outside world. Like a closed hydraulic system—no leakages or injections—it is always in equilibrium. Say's Law rules; "supply creates its own demand."

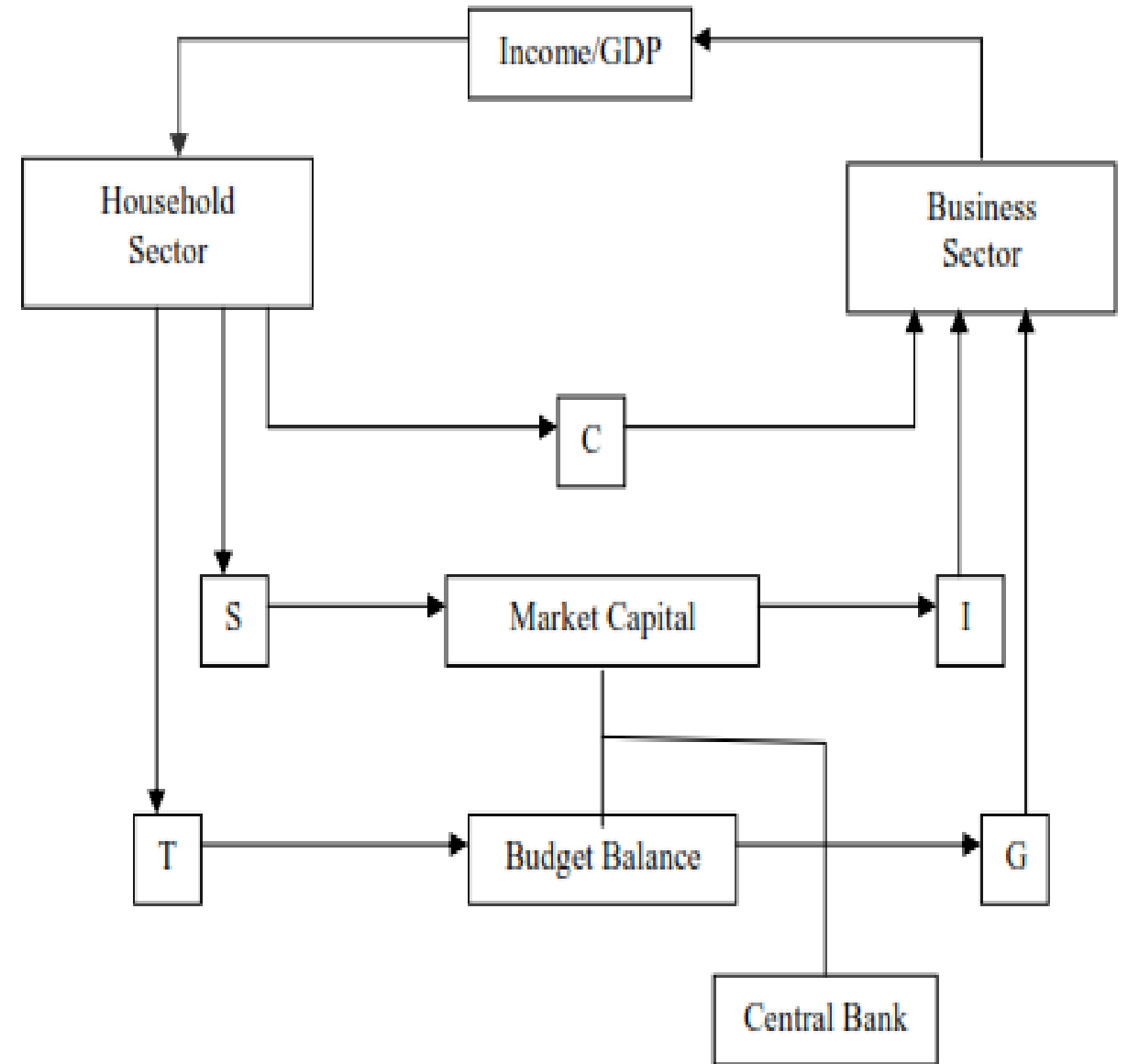


Close Economy Macro Framework

This Macro Framework introduces two leakages in the HH income stream (HH saving (S) and taxation (T) of HH income) and two injection of spending on the goods and service produce in the business sector (business sector investment (I) and government spending (G)). So, the goods market equilibrium condition is:

- (1) $Y = C + I + G$
- (2) $C = Y - T - S$
- (3) $S + T = I + G$
- (4) $I = S + T - G$

Macro theory explains how the macro system achieves and maintains these equilibrium conditions.



Open Economy Macro Framework

Complications introduced by openness:

1. One more leakage (imports= M) and one more injection (exports= X)
2. Income flows to and from the Foreign sector (mainly interest income, $iNFA$).
3. Savings flow into and out of the domestic capital market to and from foreign capital markets (ΔNFA).
4. The central buys and sells foreign reserve assets (ΔR), which have a major impact on the exchange rate and interest rate.

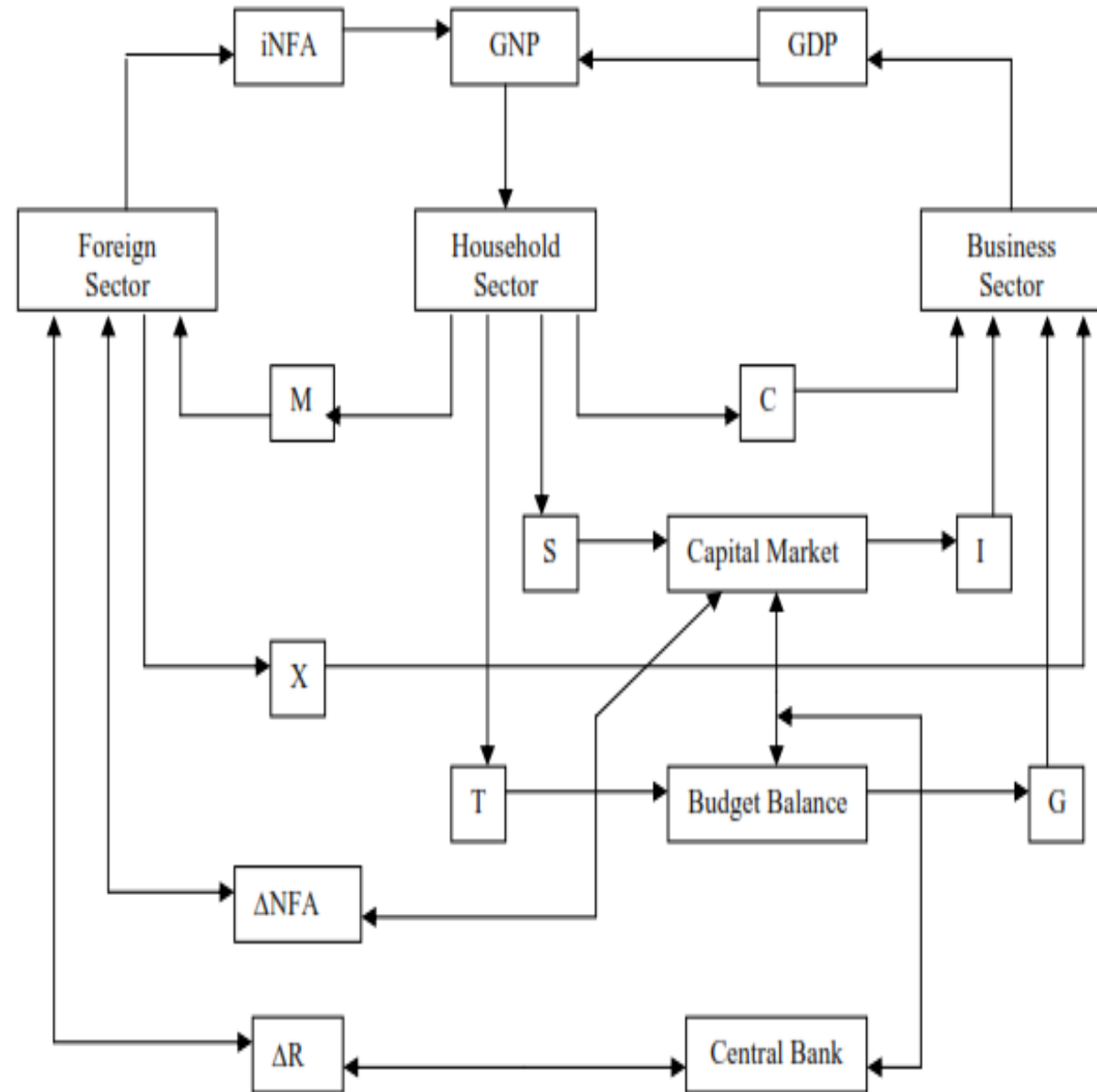
Goods market equilibrium condition:

$$(1) Y = C + I + G + X - M$$

$$(2) S + T + M = I + G + X$$

$$(3) X - M = S - I + T - G$$

$$(4) I = S + (T - G) + (M - X)$$



The Balance of Payments

All transaction between domestic residents and foreigners are recorded in the balance of payments.

The BOP accounting identity is. The balance on trade ($X - M$) and net income flows ($iNFA$) is the current account balance (CA). The CA is matched by the sum of changes in net foreign assets (ΔNFA , known as the financial (formerly capital) account plus change in official foreign reserves (ΔR).

$$(1) \quad X - M + iNFA = CA = \Delta NFA + \Delta R$$

$$(2) \quad CA = Y - (C + I + G) = \Delta NFA + \Delta R$$

$$(3) \quad I - [(S + (T - G))] = -CA = -\Delta NFA - \Delta R$$

Implications:

1. A trade surplus is an increase in the nation's stock of foreign assets. A trade deficit, the opposite.
2. A trade surplus is the difference between national income (Y) and expenditure (C+I+G).
3. A trade surplus is the difference between national saving and investment.
4. The difference between national income and expenditure is a change in net foreign assets.
5. A country that invests more than it saves has a CA deficit and accumulates foreign debt.
6. A country that invests more than it saves is trading future spending for current spending, i.e. it is trading over time (intertemporal trade).

The Financial System

At the bottom of the Macro Framework diagram, looking like a forgotten appendage, is the central bank. In reality, the central bank is a central role of the Macro Economy, as the simple version of the financial system illustrates:

Central Bank		Commercial Banks		Household & Firms	
Assets	Liabilities	Assets	Liabilities	Assets	Liabilities
Reserves (R)	Currency in Circulation (CC)	Loans	Deposits	Deposits	Loans
Claims on the Government, known as Domestic Credit (D)	Commercial Bank Required Reserves (RR)	RR	Equity	CC	Other Liabilities
				Other Assets	

$$M^S = CC + Deposits = CC + RR/rr = h(CC + RR) = h(R + D)$$

Note: rr is the percent of deposits that commercial banks are required to hold as reserves at the Central Bank: $RR = rr \times Deposits$. The variable “h” is the e money supply (M2) to central bank assets (= liabilities), the latter known as “High Powered Money” or “Reserve Money”.

Key Concepts

1. Endogenous versus Exogenous Variables

The first step in modelling the macro economy is to decide which variables are endogenous (determined in the model) and which are exogenous (taken as given). Modelling the macro economy requires theories of (1) the goods market, (2) the factor (labor and capital) markets, (3) the financial markets (money and other financial assets), (4) the foreign exchange market (trade and financial flows). General macro equilibrium requires simultaneous equilibrium in each and every of these individual markets.

2. Ex ante versus ex post

Equilibrium obtains when supply equals demand, but ex post supply is always equal to demand—every thing supplied (sold) is by definition demanded (bought). The condition for equilibrium obtains when desired supply equals desired demand (i.e. ex ante supply equals demand)

3. Accounting identities versus equilibrium conditions

Accounting identities (NIA and BOP) are ex post measures of supply and demand, but do not imply equilibrium.