

LIST OF MARC'S VARIABLES (foreign variables carry an asterisk, superscript e denotes the expectation of a variable)

1. Stock variables

- K Capital stock
- W Net wealth of a country (net claims on the future output of the rest of the world)

2. Flow variables

- Y^{GNP} Output—measured as Gross National Product, i.e. as the income generated by domestic factors of production in one year. Y^{GNP} roughly equals national income
- C Consumption of private households
- G Government consumption
- I Investment, $I = \Delta K$ (increase of capital stock)
- EX Exports
- IM Imports
- CA Current account balance, (roughly) defined as $CA \equiv EX - IM$ (net exports)

In general, $CA = \Delta W$ must be satisfied

A current account surplus is equivalent to foreign lending. Domestic consumers give up consumption of their goods today, but only in exchange for future consumption of foreign goods. A current account surplus is therefore an accumulation of claims on the future output of the rest of the world. A current account deficit is equivalent to borrowing from abroad. If *private* capital flows do not match the current account surplus (or deficit), the central bank has to “fill-in” and to increase (or reduce) its reserves. Reserves are part of a country’s net wealth, held by the central bank.

- S Savings, $S = I + CA = \Delta K + \Delta W$. In an open economy, national savings are used for

both domestic investment and foreign lending.

- E *Nominal* exchange rate (denominated in [\$/units of foreign currency]). A *nominal* appreciation is equivalent to a lower E . (E^e is the expected nominal exchange rate.)
- F *Forward nominal* exchange rate (denominated in [\$/units of foreign currency]_{tomorrow})
- P Domestic price level (price of one unit of the domestic consumption basket)
- P^* Foreign price level (price of foreign basket)
- Q *Real* exchange rate, defined as $Q \equiv \frac{EP^*}{P}$ (denominated in quantities: [1]). It denotes the relative price of a unit of the foreign consumption basket (numerator) in terms of the domestic consumption basket (denominator). A *real* appreciation is equivalent to a lower Q .
- M Money supply of domestic central bank
- M^* Money supply of foreign central bank(s)
- R *Nominal* interest rate
- π^e (Expected) inflation rate, $\pi^e \equiv \frac{(\Delta P)^e}{P}$
- r^e (Expected) *real* interest rate; $R = r^e + \pi^e$.

$[Y^{GDP}$ Output—measured as Gross Domestic Product, i.e. as the production of goods within domestic borders in one year. Then,
 $Y^{GNP} = r \cdot W + Y^{GDP}$, $CA = r \cdot W + EX - IM$.
 The $r \cdot W$ term is there because wealth yields interest income. $W > 0$ means that $r \cdot W > 0$ ($r > 0$): domestic capital invested abroad is generating income for domestic residents.]