

Stock-flow-consistent models

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An introduction to SFC models in Eviews

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Course outline

- A general introduction to theoretical stock-flow-consistent models
- Designing the model
 - Stocks matrix
 - Flows matrix
- The simplest model: a stationary, closed economy
- A growing economy
- A growing economy with portfolio management
- A three-country model

Reasons to be interested in SFC models

- Most (all?) mainstream models failed to predict the crisis
- Most people who saw the crisis coming had some underlying model linking supply and demand in real markets, and supply and demand for financial assets (credit)
- International and national organizations (Oecd, EC, ECB...) have recently started projects for collecting more systematically flow of funds data
- There is a strong demand, among institutions which rely on forecasts, for models which integrate real and financial markets

Other reasons to be interested...

- The SFC approach provides a method for investigating the economy as a whole
- It may provide a unifying framework to discuss heterodox approaches
- No need for micro-foundations?
- SFC and agent-based modeling
- A lot of work needs to be done...

Background - Godley

Wynne Godley

- Interested in tracking the “real economy” (not so much in academic debates)
- Started his work (at the Treasury) when data and computers were not readily available
- Production takes time. Therefore requires finance
- “New Cambridge”: stability of stock-flow ratios. Levy model: analysis of financial balances

The “New Cambridge” hypothesis

$$Y = C + I + G + X - M$$

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

$$S = I + DEF + BP$$

$$NAFA = S - I = DEF + BP$$

- If NAFA is stable relative to income, any increase in government deficit will be mirrored in the external balance (twin deficits)

Wealth to income ratio

$$D_t = a1*Y_t + a2*FA_{t-1}$$

$$\Delta FA_t = Y_t - a1*Y_t - a2*FA_{t-1}$$

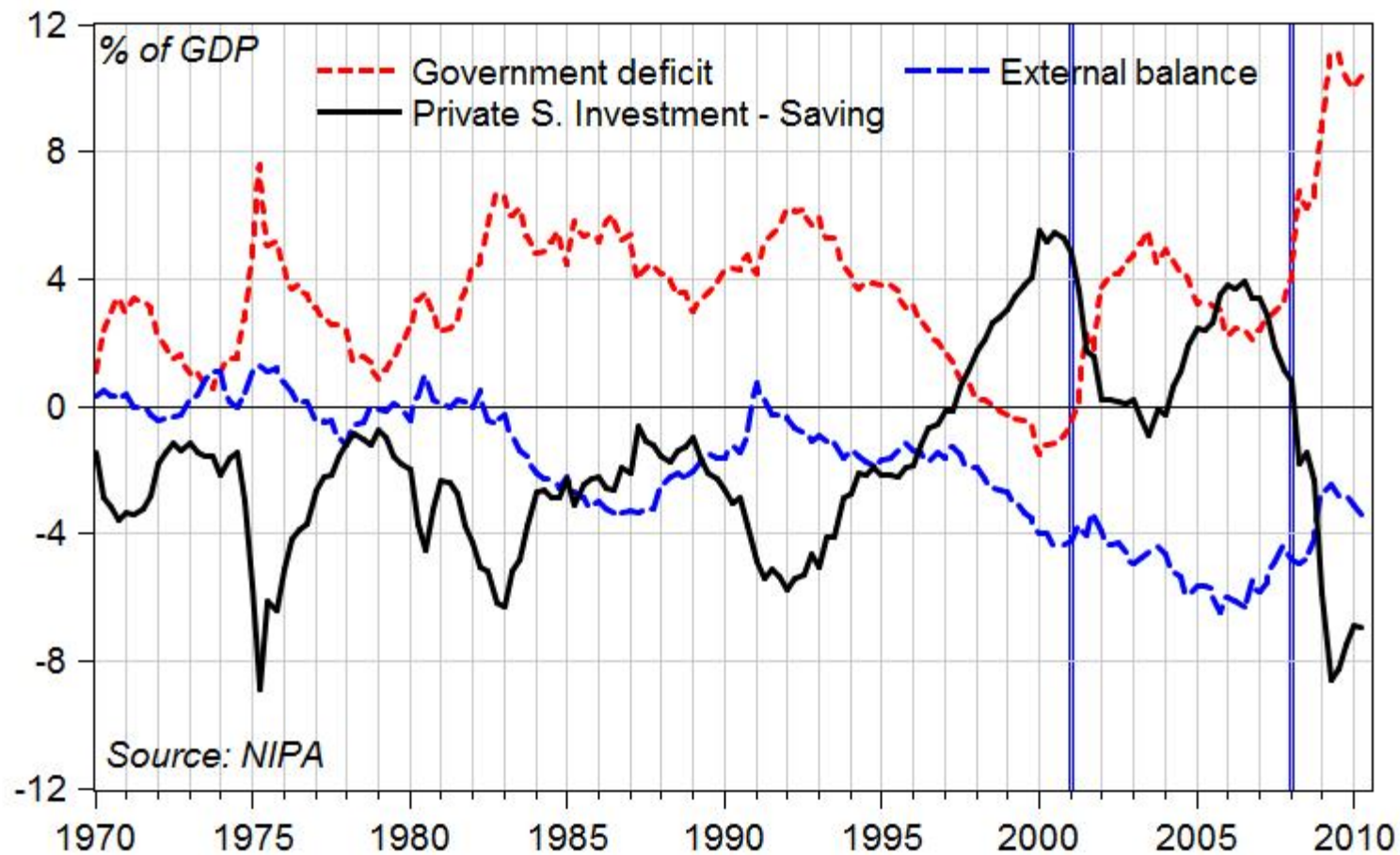
$$FA_t - (1-a2)*FA_{t-1} = (1 - a1)*Y_t$$

$$FA*[1-(1-a2)/(1+g)] = (1 - a1)*Y$$

- For stable parameters in the private demand equation, and a stable growth rate, the stock-flow ratio FA/Y has to be stable

Financial balances

U.S. Main Sector Balances



How to read financial balances

- As they are drawn in the previous charts, financial balances represent addition to aggregate demand (injections)
- A given growth rate in output can be achieved with any combination of financial balances
- However, when a balance to output ratio exceeds the growth rate of output (roughly) the underlying stock/output ratio is growing

Debt and deficit

$$\text{Debt} = \text{Debt}(-1) + \text{GD} \{ + \text{capital gains} \}$$

$$D/Y = D(-1)/[Y(-1)*(1+g)] + \text{GD}/Y$$

$$d = d(-1)/(1+g) + gd$$

$$\Delta d = d(-1)*[-g/(1+g)] + gd$$

Assume $d = 100\%$; $g = 5\%$: if $gd > 4,8\%$ the debt/output ratio will be growing. For $d = 50\%$, the debt/output ratio will grow when $gd > 2.4\%$ etc.

Financial balances relative to GDP can be roughly compared to the GDP growth rate, to see if the underlying stock of assets/debt is growing

Movements in the balances

- When one of the financial balances increases, the contribution of that sector to aggregate demand is growing
- The other balances will be adjusting
- We need a (SFC!) model to examine the links among balances
- Godley used to say that these models are a “tool for thinking”. He did not trust fancy econometrics techniques

Links between real and financial markets

- Saving for each sector determines the increase in net wealth, along with credit
- Credit conditions matter for investment decisions
- Financial stocks imply interest payments and capital gains/losses which are relevant for investment and consumption decisions
- Wealth is relevant for consumption and investment decisions

Portfolio management: Tobin

- The allocation of wealth among financial assets is determined by (expected) relative rates of return, and liquidity preference
- The set of equations is such to ensure that any increase in one asset is matched by a decrease in other assets (if we want to hold more equities we want to hold less bonds) and that reactions to changes in rates of return are symmetric.

Summing up

- SFC models a la Godley start from standard Keynesian features
 - Demand led models
 - Quantity adjustment
 - Price setting is related to income distribution
- But they include links between stocks and flows
 - Convergence towards income/wealth ratio for households
 - Convergence towards a desired capital/output ratio
 - Debate on rate of capacity utilization
 - Convergence for stock of government debt?
 - Foreign debt?