EC6012 Lecture 6
Government Money with Portfolio Choice

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Notation

Symbol	Meaning
G	Pure government expenditures in nominal terms
Y	National Income in Nominal Terms
C	Consumption of goods supply by households, in nominal terms
T	Taxes
θ	Personal Income Tax Rate
YD	Disposable Income of Households
α_1	Propensity to consume out of regular (present) income
α_2	Propensity to consume out of past wealth
ΔH_s	Change in cash money supplied by the central bank
ΔH_h	Cash money held by households
H, H_{-1}	High Powered cash money today, and yesterday ($_{-1}$)
V	Wealth of Households, in nominal terms
$B_{h,cb}$	Bills held by households, central banks.

1 Introduction

Now we are moving on, to extend SIM in interesting and more realistic ways. The first and most reasonable place to begin is by adding a **central** bank which can issue T-bills. These bills will give an interest rate, r, and have the same price over their lifetimes to simplify the analysis. We'll call this model PC for portfolio choice. We'll see that we immediately need to endogenise money creation to close the model, as well as breaking the household's decisions up into two stages: first, a consumption/saving decision, and second, an allocation decision. These take place in the same period, but sequentially. Capital is still instantaneously created and destroyed (a haircut economy), and there is still no production as we are still in a pure service economy, so things are pretty simple in the balance sheets, as we see in table 1:

	Households	Production	Government	Central Bank	$\sum$
Money	$+H$			$-H$	0
Bills	$+B_h$		$-B$	$+B_{cb}$	0
Balance (net worth)	-V		$+V$		0
$\sum$	0		0	0	0

Table 1: Balance Sheet for PC.

The sum of household wealth is now V, where the wealth is a sum of household holdings of cash (H), and bonds (B_h). Private wealth has got to be equal to public debt in this system, so we see in the Balance of table 1 that $-V$ occurs in the household's balance sheets, and $+V$ in the central bank's.

The transactions flows for the economy is given by table 2:

				Central Bank		
	Households	Production	Government	Current	Capital	$\sum$
Consumption	- C	+ C				0
Govt. Expenditures		+ G		-G		0
Income = GDP	+Y	-Y				0
Interest Payments	-$r_{-1} \cdot B_{h-1}$		$+r_{-1} \cdot B_{-1}$	$+r_{-1} \cdot B_{cb-1}$		0
Central Bank Profits			$+r_{-1} \cdot B_{cb-1}$	$-r_{-1} \cdot B_{cb-1}$		0
Taxes	-T	+T				0
Change in Money	$-\Delta H$				$+\Delta H$	0
Change in Bills	$-\Delta B_H$	$+\Delta B$			$-\Delta B_{cb}$	0
$\sum$	0	0	0	0	0	0

Table 2: Transactions matrix for PC.

Here again, all rows and columns sum to zero, so all transactions are taken into account, but this time we have to take account of interest payments arising from stocks of assets issued by the Central Bank, and the flow of funds to and from households has these financial assets in them (money and bonds). The really big change, though, is the introduction of a central bank 'sector' in the economy. This has two sections: capital and current, and this sets us up for chapter 6, when we introduce and open economy model.

1.1 Equation System

$$Y = G + C \tag{1}$$

$$YD = Y - T + r_{-1} \cdot B_{h-1} \tag{2}$$

$$T = \theta \cdot (Y + r_{-1} \cdot B_{h-1}) \tag{3}$$

$$V = V_{-1} + (YD - C) \tag{4}$$

$$C = \alpha_1 \cdot YD + \alpha_2 \cdot V_{-1}, 0 < \alpha_1 < \alpha_2 < 1 \tag{5}$$

$$\frac{H_h}{V} = (1 - \lambda_0) - \lambda_1 \cdot r + \lambda_2 \cdot \left(\frac{YD}{V}\right) \tag{6}$$

$$\frac{B_h}{V} = \lambda_0 + \lambda_1 \cdot r - \lambda_2 \cdot \left(\frac{YD}{V}\right) \tag{7}$$

$$H_h = V - B_h \tag{8}$$

$$\Delta B_s = B_s - B_{s-1} = (G + r_{-1} \cdot B_{s-1}) - (T + r_{-1} \cdot B_{cb-1}) \tag{9}$$

$$\Delta H_s = H_s - H_{s-1} = \Delta B_{cb} \tag{10}$$

$$B_{cb} = B_s - B_h \tag{11}$$

$$r = \overline{r} \tag{12}$$

1.2 Steady State Solutions

$$\alpha_3 = \alpha_2 \cdot (1 - \alpha_1)/\alpha_2 \tag{13}$$

$$\Delta V = \alpha_2 \cdot (\alpha_3 - V_{-1}) \tag{14}$$

$$\frac{V^*}{YD^*} = \alpha_3 \tag{15}$$

$$r^* = \frac{B_h^* \cdot r}{V^*} \tag{16}$$