Laboratory 1 : Build a Simple Bank

Monday 25th April, 2016

Objectives

Familiarity with Threadneedle, fractional reserve banking operations and cental bank reserve regulation.

Tips

The Save and Load buttons save and load the current configuration respectively. Judiciously saving the configuration once created will allow it to be re-run repeatedly by re-loading.

Reset will remove all agents from the simulation.
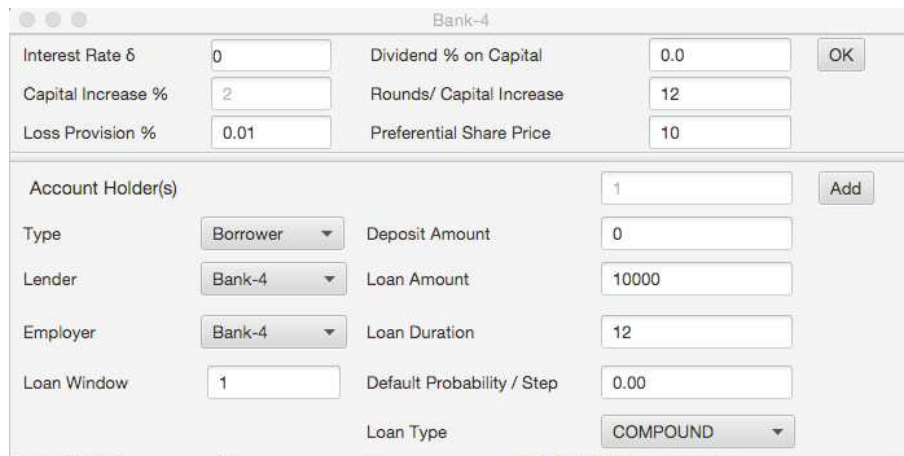
1 Create a Bank

Figure 1: Create Bank and Bring up Ledger

1. Drag and drop a Bank from the left hand side menu onto the main screen.

2. Use the "Show Banks" button to bring up the Bank balance display.

2 Setup Bank Cash and Capital

Tip

Holding the mouse pointer over a field will bring up a tool tip to explain it. Pressing on the Bank's name in the

Figure 2: Bank Configuration

ledger screen will bring up an individual configuration menu for the bank. This screen can be used to set interest rates for the Bank, and also to add account holders with specific, bank related, behaviours.

There are three such agents, Borrowers, Savers and Investors. Borrowers take out loans from Banks and receive a salary from the bank to repay them. Investors provide purchase capital from the bank, and may receive dividend income on that capital, savers simply deposit money (cash).

1. Bring up the central bank menu, and set regulation to be reserve only.

2. Add a single borrower, with a 12 month loan, for 10,000 and a 1,000 initial deposit.

3. Step the simulation forward 10 steps. Note: each step is one day, but if you rotate the step button it will provide a bigger increment.

4. What happens?

5. What is the correct reserve requirement for a loan of 10,000 with 1,000 in asset cash?

6. Add a saver with the additional amount as a deposit and step forward 200 steps. Why is the observed behaviour cyclical?

3 Expansion from Initial Conditions

1. Set central bank regulation to be reserve only.

2. Pick a reserve rate of your choice.

3. Estimate the total expansion of deposits for the current configuration.

4. Run the simulation and explain the results.

5. The central bank increases interest rates by 2%. What do you expect to happen?

6. What does happen? Why?

4 Expansion 2

Explore what combinations of initial deposits, borrowers, loans and interest rates will maximise expansion under reserve requirement regulation?

Using such a simulation, run the simulation until it hits the reserve limit. Now add another loan/borrower combination with a default probability of 50%.

What happens?

Notes

In reality, gold standard reserve regulated banks would maintain minimum capital holdings, as well as their regulatory required reserve holdings. Bank Capital is a fairly general term and is used to cover a number of ledger items including loss reserves, retained income, and the preferential shares issued by banks in exchange for the cash deposits provided by their Investors.