# Extensions of the basic model
## More goods, more consumers, government

Jan Hagemejer

March 22, 2010

Model 1 is essentially the same model as previous one with a single exception:

- One consumer (Cobb-Douglas)
- 2 factors
- 4 goods (Cobb-Douglas)

Things to do:

1. Implement the SAM (next slide)
2. Determine the effects on all equilibrium variables of a 10% increase in the endowment of capital

|  | X1 | X2 | X3 | X4 | L | K | W | CONS | Total |
|---|---|---|---|---|---|---|---|---|---|
| X1 |  |  |  |  |  |  | 100 |  | 100 |
| X2 |  |  |  |  |  |  | 55 |  | 55 |
| X3 |  |  |  |  |  |  | 100 |  | 100 |
| X4 |  |  |  |  |  |  | 90 |  | 90 |
| L | 40 | 15 | 70 | 10 |  |  |  |  | 135 |
| K | 60 | 40 | 30 | 80 |  |  |  |  | 210 |
| W |  |  |  |  |  |  |  | 345 | 345 |
| CONS |  |  |  |  | 135 | 210 |  |  | 345 |
| Total | 100 | 55 | 100 | 90 | 135 | 210 | 345 | 345 |  |

|  |  |
|---|---|
| Production structure | |
| Consumption structure | |
| Total consumption | |
| Consumers income | |

Model 2 has:

- Two consumers (Cobb-Douglas)
- 2 factors
- 4 goods (Cobb-Douglas)

Things to do:

1. Implement the SAM (next slide) by changing the model (introduce another set, households and change all the relevant variables and equations).

2. Determine the effects on all equilibrium variables of a 10% increase in the endowment of capital owned by consumer 1

3. Introduce a transfer between consumer 1 and 2 equal to 10% of the value of consumer 1 income.

| | X1 | X2 | X3 | X4 | L | K | W1 | W2 | CONS1 | CONS2 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| X1 | | | | | | | 70 | 30 | | | 100 |
| X2 | | | | | | | 20 | 35 | | | 55 |
| X3 | | | | | | | 50 | 50 | | | 100 |
| X4 | | | | | | | 15 | 75 | | | 90 |
| L | 40 | 15 | 70 | 10 | | | | | | | 135 |
| K | 60 | 40 | 30 | 80 | | | | | | | 210 |
| W1 | | | | | | | | | 155 | | 155 |
| W2 | | | | | | | | | | 190 | 190 |
| CONS1 | | | | | 100 | 55 | | | | | 155 |
| CONS2 | | | | | 35 | 155 | | | | | 190 |
| | 100 | 55 | 100 | 90 | 135 | 210 | 155 | 190 | 155 | 190 | |

| | |
|---|---|
| Production structure | |
| Consumption structure | |
| Total consumption | |
| Consumers income | |

# Model 3

Model 2 has:

- Two consumers (Cobb-Douglas)
- A govenment (a Cobb-Douglas consumer that derives income from taxes)
- 2 factors
- 4 goods (Cobb-Douglas)

Things to do:

1. Implement the SAM (next slide) by changing the model (introduce a third household that derives all its income from taxes on other consumers).
2. Simulate a 20% increase in taxes.
3. Introduce a tax on capital used in production of good 1 and 4. Perform a simulation that replaces the initial tax with a tax on capital.

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# SAM 3

| | X1 | X2 | X3 | X4 | L | K | W1 | W2 | WG | CONS1 | CONS2 | CONSG | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X1 | | | | | | | 60 | 26 | 20 | | | | 106 |
| X2 | | | | | | | 15 | 25 | 30 | | | | 70 |
| X3 | | | | | | | 40 | 40 | 14 | | | | 94 |
| X4 | | | | | | | 10 | 55 | 10 | | | | 75 |
| L | 46 | 15 | 64 | 10 | | | | | | | | | 135 |
| K | 60 | 55 | 30 | 65 | | | | | | | | | 210 |
| W1 | | | | | | | | | | 125 | | | 125 |
| W2 | | | | | | | | | | | 146 | | 146 |
| WG | | | | | | | | | | | | 74 | 74 |
| CONS1 | | | | | 100 | 55 | | | | | | | 155 |
| CONS2 | | | | | 35 | 155 | | | | | | | 190 |
| CONSG | | | | | | | | | | 30 | 44 | | 74 |
| Total | 106 | 70 | 94 | 75 | 135 | 210 | 125 | 146 | 74 | 155 | 190 | 74 | |
| | | | | | | | | | | | | | |
| | | Production structure | | | | | | | | | | | |
| | | Consumption structure | | | | | | | | | | | |
| | | Total consumption | | | | | | | | | | | |
| | | Consumers income | | | | | | | | | | | |
| | | Government earnings | | | | | | | | | | | |