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STAGE

Final Demand

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Outline

- Household demand
  - Utility functions
    - Hicksian welfare measures are possible
  - Complete demand system
- Government demand
  - What determines government preferences?
    - Volumes or values?
- Investment demand
  - What determines investment preferences?
- Absorption
  - Slutsky welfare measures

How are these accounts cleared?

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Households

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	haffmed
cagric	1.802
cmins	0.044
cfood	5.490
ctext	2.111
cpetchem	1.640
cmprod	0.102
cmach	0.239
cveh	0.073
comanu	1.143
cutil	0.692
ccns	0.051
ctrad	1.884
cserv	4.360
hoho0	0.323
dirtax	0.902
i_s	0.057
total	20.913

SAM: Households

We will need:

1. **Income tax rate**
2. **Savings rate**
3. **Transfers**
4. **Determinants of demand**
5. **Method to ensure the account clears**

Behavioural Assumption:

1. **Average & Marginal income tax rates equal**
2. **Share of income after income tax**
3. **Shares of income after income tax**
4. **Determinants of demand**
   - **Disposable income**
   - **Stone-Geary utility functions**
5. **Complete demand system**

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Household Demand: Equations

Income tax rate

$$HEXP_h = \left(YH_h * \left(1 - TYH_h\right)\right) * \left(1 - SHH_h\right) - \sum_{hp} HOHO_{hp,h}$$

Savings rate from AFTER tax income

Subsistence consumption

$$QCD_{c,h} * PQCD_c = \left(PQCD_c * qcdconst_{c,h}\right) + \beta_{c,h} * \left(HEXP_h - \sum_c PQCD_c * qcdconst_{c,h}\right)$$

Marginal budget shares

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Household Demand: Calibration

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$$TYH_h = \frac{SAM("dirtax",h)}{SAM("total",h)} = \frac{VTYH_h}{VYH_h}$$

$$= \frac{0.902}{20.913} = 0.043148$$

```
TYH(h) = SAM("dirtax",h)/SAM("total",h) ;
```

$$SHH_h = \frac{SAM("saving",h)}{SAM("total",h) - SAM("dirtax",h)}$$

$$= \frac{VSH_h}{\left(VYH_f - VTYH_h\right)}$$

$$= \frac{0.057}{\left(20.913 - 0.902\right)} = 0.002747$$

```
SHH(h)= SAM("saving",h)/[SAM("total",h)-SAM("dirtax",h)];
```


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Household Demand: Calibration

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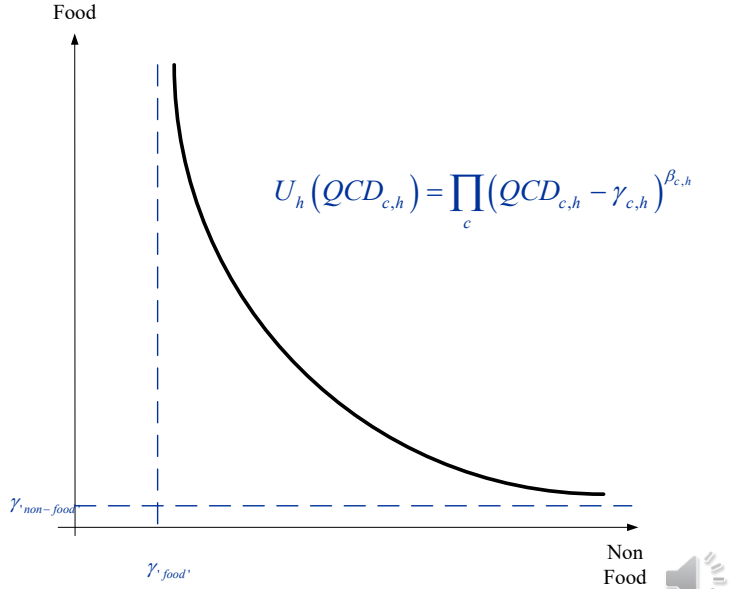

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Household Demand: Calibration

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total	20.913

```
sumelast(h)= SUM(c, alphah(c,h)*ELASTY(c,h)) ;

yhelast(c,h)$sumelast(h)
                = ELASTY(c,h)/sumelast(h) ;

yhelast(c,h)$(alphah(c,h) eq 0)   = 0 ;
```

```
beta(c,h) = yhelast(c,h)*alphah(c,h) ;
```

```
frisch(h) = ELASTF(h) ;

qcdconst(c,h)$(PQCD0(c) and frisch(h))
   = (HEXP0(h)/PQCD0(c))
        *(alphah(c,h)+(beta(c,h)/frisch(h))) ;
```


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Household Demand: Elasticities

elastmu	
	frisc
hafflow	-4.59
haffmed	-4.30
haffhigh	-2.76
hafmlow	-4.07
hafmmed	-3.43
hafmhigh	-2.32
hcalow	-3.48
hcahigh	-1.88
hwhlow	-1.96
hwhhigh	-1.05

Frisch is negative. Subsistence increases as it becomes MORE negative

IF Frisch = - 1 AND ALL ELASTY = 1 ∀c Then utility function is CD

elasty										
	hafflow	haffmed	haffhigh	hafmlow	hafmmed	hafmhigh	hcalow	hcahigh	hwhlow	hwhhigh
cagric	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
cmins	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
cfood	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
ctext	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
cpetchem	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
cmprod	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
cmach	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
cveh	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
comanu	2	2	2	2	2	2	2	2	2	2
cutil	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
ccns	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
ctrad	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
cserv	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2

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Enterprises

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SAM: Enterprises

	ent
hoho0	111.03
dirtax	33.07
i_s	40.16
total	184.26

We will need:

1. **Corporation tax**
2. **Savings rate**
3. **Transfers**
4. **Determinants of demand**
5. **Method to ensure the account clears**

Behavioural Assumptions:

1. **Average & Marginal corpoar tax rates equal**
2. **Savings are a residual**
3. **Transfers based on ownership shares**
4. **Enterprise demand is fixed (exogenous) volume shares**
   - **total volumes can vary**
   - **shares can vary**
   - **total expenditures can vary**
5. **?????**

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Enterprises: Calibration

	ent
hoho0	111.03
dirtax	33.07
i_s	40.16
total	184.26

$$QED_{c,e} = QEDADJ * qedconst_{c,e}$$

```
qedconst(c,e) = SAM(c,e)/PQD0(c) ;
```

Enterprises typically do not consume.

But the set **e** can be used for institutions not elsewhere covered, e.g., charities, NPISH, etc. If so used the equation for *YE* may need extending to specify sources of income to these other institutions.

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Government

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SAM: Government

	govt
cserv	163.05
hoho0	28.00
ent	43.35
i_s	-20.29
total	214.10

We will need:
1. **Savings rate**
2. **Determinants of demand**
3. **Method to ensure the account clears**

Behavioural Assumptions:
1. **Savings are a residual**
2. **Government demand is fixed (exogenous) volume shares**
   - **total volumes can vary**
   - **shares can vary**
   - **total expenditures can vary**
3. **?????**

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Government: Calibration

	govt
cserv	163.05
hoho0	28.00
ent	43.35
i_s	-20.29
total	214.10

$$QGD_c = QGDADJ * qgdconst_c$$

```
qgdconst(c) = SAM(c,"govt")/PQD0(c) ;
```

$$KAPGOV = YG - EG$$

```
KAPGOV0 = SAM("saving","govt") ;
```

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Savings and Investment

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SAM: Savings

	i_s
fcap_fix	103.69
fcap_flex	15.84
hafflow	0.16
haffmed	0.06
haffhigh	0.27
hafmlow	0.29
hafmmed	0.33
hafmhigh	0.97
hcalow	0.28
hcahigh	0.67
hwhlow	0.40
hwhhigh	3.50
govt	-20.29
ent	40.16
row	2.37
total	148.70

We will need:

1. **Determinants savings by sources**
2. **Method to ensure the account clears**

$$TOTSAV = \sum_f \left(deprec_f * YF_f \right) + \sum_h HHSAV_h + \sum_e ENTSAV_e + KAPGOV + \left(CAPWOR * ER \right)$$

$$HHSAV_h = \left[YH_h * \left(1 - TYH_h \right) \right] * SHH_h$$

$$ENTSAV_h = \left[YE_e * \left(1 - TYE_e \right) \right] * SEN_e$$

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SAM: Investment

	i_fix	i_flex
cagric		1.64
cfood		0.95
ctext		0.31
cpetchem	0.09	1.41
cmprod	2.73	1.02
cmach	30.88	4.69
cveh	5.41	15.72
comanu	10.55	12.48
ccns	55.46	
cserv	2.87	2.47
total	108.00	40.69

We will need:

1. **Determinants of demand**
2. **Method to ensure the account clears**

Behavioural Assumptions:

1. **Investment demand is fixed (exogenous) volume shares**
   - **total volumes can vary**
   - **shares can vary**
   - **total expenditures can vary or be fixed**
2. **?????**

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Savings & Investment - Calibration

	i_fix	i_flex
cagric		1.64
cfood		0.95
ctext		0.31
cpetchem	0.09	1.41
cmprod	2.73	1.02
cmach	30.88	4.69
cveh	5.41	15.72
comanu	10.55	12.48
ccns	55.46	
cserv	2.87	2.47
total	108.00	40.69

$$QINVD_{c,i} = QINV_i * ioqinvd_{c,i}$$

$$QINV_i = qinvb_i * IADJ$$

$$INVSH\_I_i = \frac{\sum_c \left[PQD_c * QINVD_{c,i} \right]}{\sum_{c,i} \left[PQD_c * QINVD_{c,i} \right]}$$

$$INVEST = \sum_c \left[PQD_c * \left(\sum_{in} QINVD_{c,in} + dstocconst_c \right) \right]$$

Allows investment expenditure to be endogenous

```
ioqinvd(c,i) = SAM(c,i)/PQD0(c)/QINV0(i) ;
```


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Final Demand

The End

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