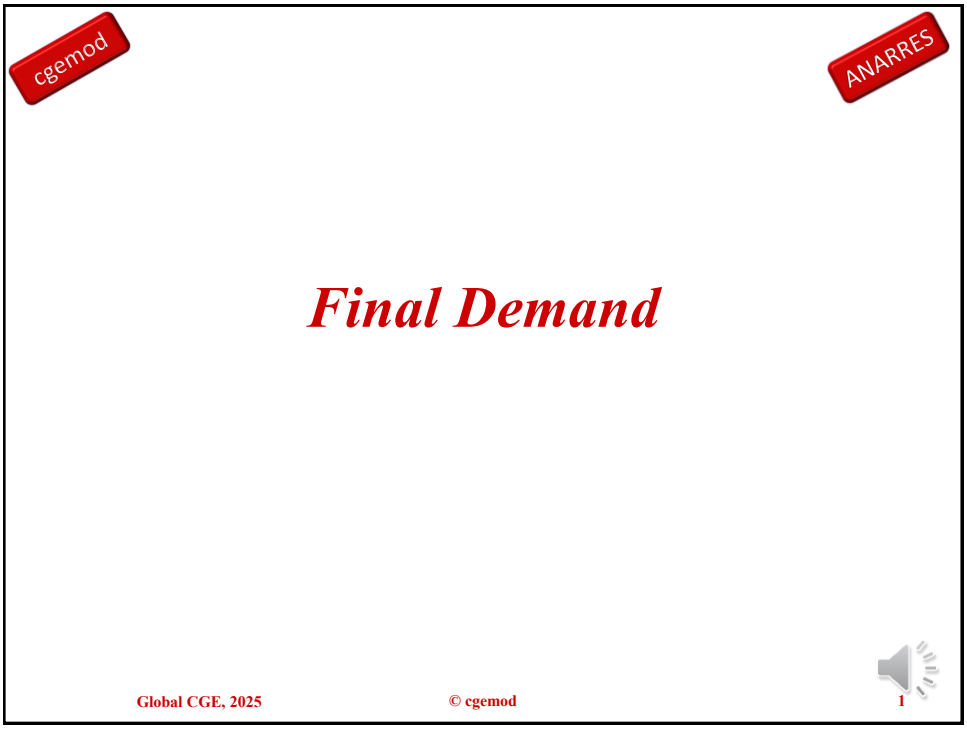
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Final Demand
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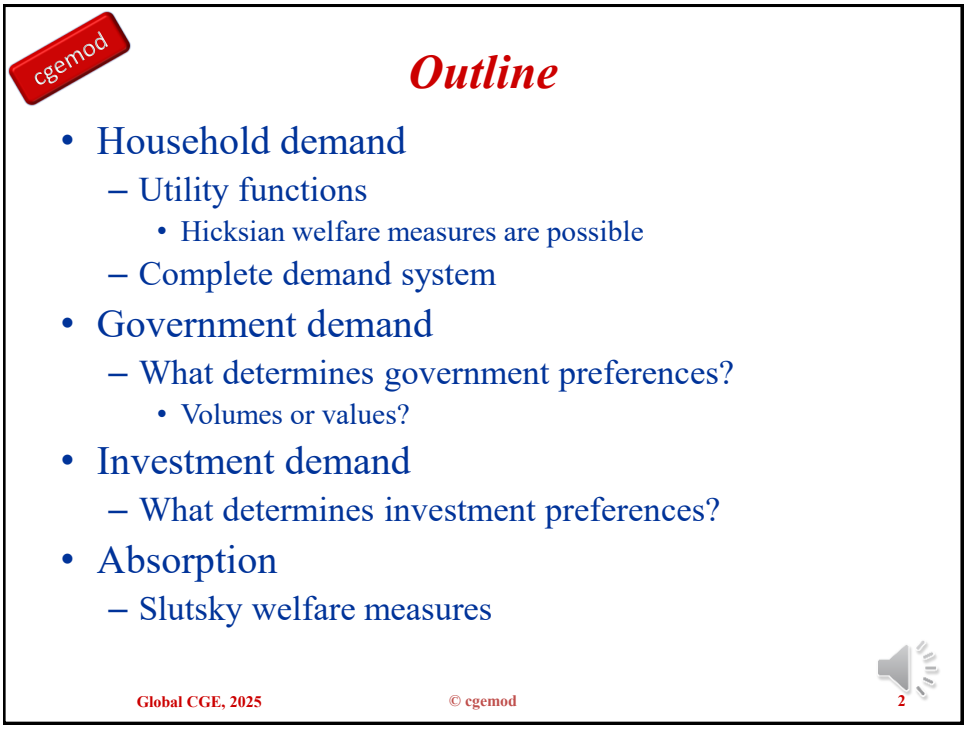
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Outline
• Household demand
– Utility functions
• Hicksian welfare measures are possible
– Complete demand system
• Government demand
– What determines government preferences?
• Volumes or values?
• Investment demand
– What determines investment preferences?
• Absorption
– Slutsky welfare measures
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Households

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SAM and Households

OECD	hous
cagr	223,537
cnres	19,874
cmanu	6,871,486
cserv	16,145,884
dirtax	4,817,861
i_s	-2,828,067
total	25,250,575

We will need:

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

Behavioural Assumption:

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

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Household Demand - Equations

Income tax rates

$$HEXP_{h,r} = \left(YH_{h,r} * \left(1 - \left(TYH_{h,r}\right)\right)\right) * \left(1 - \left(SHH_{h,r}\right)\right)$$

Savings rates from AFTER tax income

Subsistence consumption

$$QCD_{c,h,r} * PQCD_{c,r} = \left(PQCD_{c,r} * \left(qcdconst_{c,h,r}\right)\right) + \left(\beta_{c,h,r}\right) * \left(HEXP_{h,r} - \sum_{c} PQCD_{c,r} * qcdconst_{c,h,r}\right)$$

Marginal budget shares

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Household Demand - Calibration

OECD	hous
cagr	223,537
cnres	19,874
cmanu	6,871,486
cserv	16,145,884
dirtax	4,817,861
i_s	-2,828,067
total	25,250,575

$$TYH_{h,r} = \frac{SAM("dirtax",h,r)}{SAM("total",h.r)} = \frac{VTYH_{h,r}}{YH_{h,r}}$$

$$= \frac{4,817,861}{25,250,575} = 0.190802042565532$$

```
tyh0(h,r) =
        SAM("dirtax",h,r)/SAM("total",h,r) ;
```

$$SHH_{h,r} = \frac{SAM("i\_s",h,r)}{SAM("total",h,r) - SAM("dirtax",h,r)}$$

$$= \frac{VSH_{h,r}}{\left(YH_{f,r} - VTYH_{h,r}\right)}$$

$$= \frac{-2,828,067}{\left(25,250,575 - 4,817,861\right)} = -0.138408772123919$$

```
shh0(h,r)= SAM("saving",h,r)
                /(SAM("total",h,r)-SAM("dirtax",h,r)) ;
```


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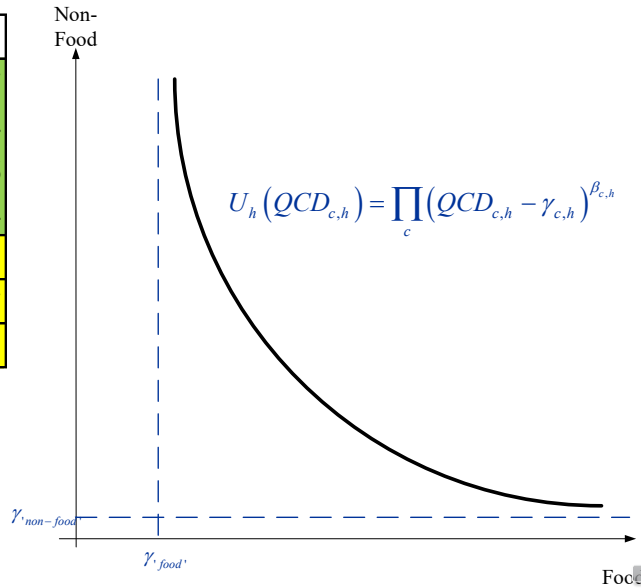
Household Demand - Calibration

OECD	hous
cagr	223,537
cnres	19,874
cmanu	6,871,486
cserv	16,145,884
dirtax	4,817,861
saving	-2,828,067
total	25,250,575



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Household Demand - Elasticities

ELASTF		
Frisch Parameters Household Utility Functions		
		hous
Africa	afr	-3
OECD	oecd	-1
Rest of the World	row	-2

Frisch is negative. Subsistence increases as it becomes MORE negative

ELASTY					
Income Elasticities for Household Utility Functions					
			afr	oecd	row
Agriculture	cagri	hous	0.5	1	0.25
Natural Resources	cnres	hous	0.65	1	0.5
Manufacturing	cmanu	hous	1.6	1	1.5
Services	cserv	hous	1.6	1	1.5

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

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Household Demand - Calibration

OECD	hous
cagr	223,537
cnres	19,874
cmanu	6,871,486
cserv	16,145,884
dirtax	4,817,861
i_s	-2,828,067
total	25,250,575

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

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

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

```
beta(c,h,r) = yhelast(c,h,r)*comhav(c,h,r) ;
```

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

qcdconst(c,h,r)$(PQCD0(c,r) and frisch(h,r))
   = [HEXP0(h,r)/PQCD0(c,r)]
        *{comhav(c,h,r)+[beta(c,h,r)
                    /frisch(h,r)]} ;
```

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Government

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SAM and Government

OECD	govt
cagr	496
cnres	39
cmanu	51,020
cserv	6,827,458
i_s	5,905,878
total	12,784,891

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

OECD	govt
cagr	496
cnres	39
cmanu	51,020
cserv	6,827,458
i_s	5,905,878
total	12,784,891

$$QGD_{c,r} = qgdconst_{c,r} * QGDADJ_r$$

```
qgdconst0(c,r)
      = SAM(c,"govt",r)/PQD0(c,r) ;
```

$$TOTSAV_r = \sum_h \left(\left(YH_{h,r} * \left(1 - TYH_{h,r}\right) \right) * SHH_{h,r} \right) + \sum_f \left(deprec_{f,r} * YF_{f,r} \right) + KAPGOV_r + \left(KAPWOR_r * ER_r \right)$$

```
KAPGOV0(r) = SAM("i_s","govt",r) ;
```


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Savings and Investment

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SAM – Savings & Investment

OECD	i_s
cagr	9,122
cnres	9,040
cmanu	6,498,171
cserv	1,274,480
i_s	0
total	7,790,813

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

OECD	i_s
cagr	9,122
cnres	9,040
cmanu	6,498,171
cserv	1,274,480
i_s	0
total	7,790,813

$$INVEST_r = \sum_c \left(PQD_{c,r} * QINVD_{c,r} \right)$$

Allows investment expenditure to be endogenous

$$QINVD_{c,t} = IADJ_r * qinvdconst_{c,r}$$

```
qinvdconst0(c,r) = SAM(c,"i_s",r)/PQD0(c,r) ;
```


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Measured Welfare

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Welfare Measures: Household

```
EV(h,r,simr)
= PROD{c,[PQCD0(c,r)/resPQCD(c,r,simr)]**beta(c,h,r)}
  *[resHEXP(h,r,simr) - SUM(c,qcdconst(c,h,r)*resPQCD(c,r,simr))]

       -{HEXP0(h,r)- SUM[c,qcdconst(c,h,r)* PQCD0(c,r)]} ;



 EV_slut(h,r,simr)
    = SUM[c,PQCD0(c,r) * QCD(c,h,r,sim)] - HEXP0(h) ;
```

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Welfare Measures: Region

```
EV_R_slut(r,sim)
   = {SUM[(c,h),PQCD0(c) * QCD(c,h,r)]
        + SUM[c,PQD0(c) * (QGD(c,r) + QINVD(c,r)) ] }

      - {SUM(h,HEXP0(h,r))
         + [SUM(c,PQD0(c) * (QGD0(c,r))+ QINVD0(c,r)) ] } ;
```

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The End
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