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STAGE

# STAGE<sub>t</sub> Model: Analysing Results

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## Outline

- Principles
- Trees
  - Prices
  - Quantities
- Analyses
  - Elasticities
  - Closure and Market Clearing

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**ANALYSES**

**≠**

**TABLES OF SUMMARY RESULTS**

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*Analyses*

- Results derive from
  - Model – behaviours
  - Data – shares, elasticities, etc.
  - Shocks
- Know your
  - Data
  - Shocks

**Follow the behaviours and prices in the model**

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Price and Quantity ‘Trees’

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Prices

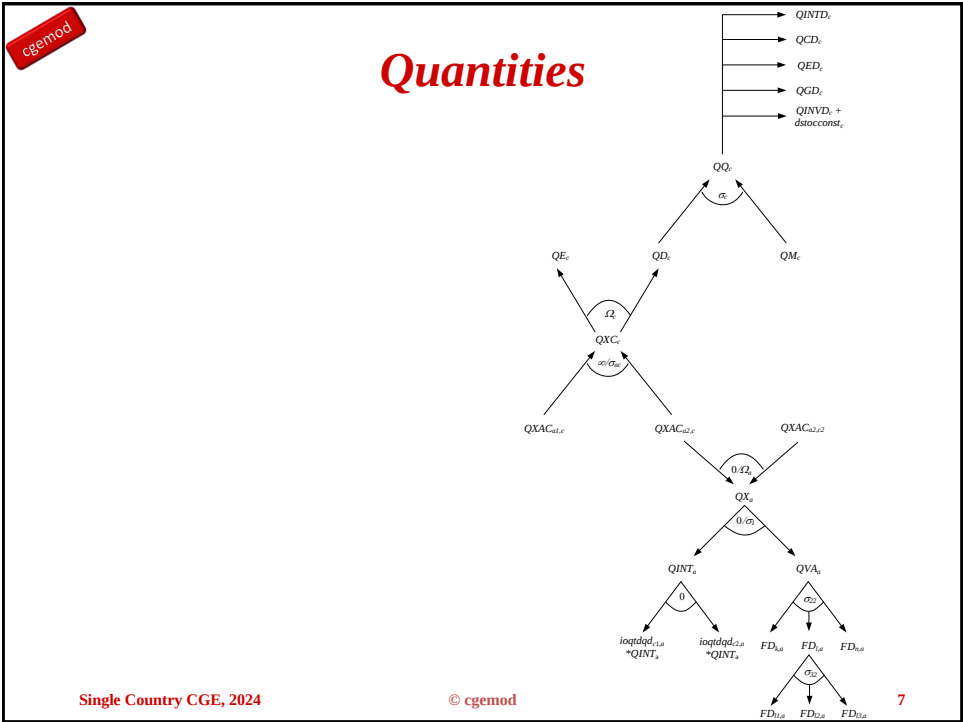
The diagram illustrates a price tree structure. At the top, a node  $PQCd_1$  branches into  $PQCd_2$  and  $TV$ .  $PQCd_2$  further branches into  $TEX$  and  $TS$ . A summation term  $\sum_n (\log(q_{n,t}) * PTT_n)$  is shown near  $PQCd_2$ . Below this, a node  $PQS_1 = 1$  branches into  $PD_1 = 1$  and  $PM_1 = 1$ , with a parameter  $\sigma$  between them.  $PD_1 = 1$  branches into  $PE_1 = 1$  and  $PDS_1 = 1$ .  $PE_1 = 1$  branches into  $PWE * ER$  and  $TE$ .  $PDS_1 = 1$  branches into  $PXC_1 = 1$ .  $PM_1 = 1$  branches into  $PWM * ER$  and  $TM$ .  $PXC_1 = 1$  branches into  $PXAC_{12}$  and  $PXAC_{22}$ , with a parameter  $\Omega$  between them.  $PXAC_{12}$  and  $PXAC_{22}$  both branch into  $PX_{12}$ , with a parameter  $0.5\Omega_{12}$  between them.  $PX_{12}$  branches into  $TX$  and  $PVA_1$ , with a parameter  $0.01$  between them.  $PVA_1$  branches into  $PINT_1$  and  $PVA_2$ , with a parameter  $\sigma_{12}$  between them.  $PINT_1$  branches into  $PQD_1$  and  $PQD_2$ , with a parameter  $\theta$  between them.  $PVA_2$  branches into  $WF_{12}$  and  $WF_{13}$ , with a parameter  $\sigma_{12}$  between them.  $WF_{12}$  and  $WF_{13}$  both branch into  $WF_{14}$ ,  $WF_{15}$ ,  $WF_{16}$ ,  $WF_{17}$ ,  $WF_{18}$ ,  $WF_{19}$ ,  $WF_{20}$ ,  $WF_{21}$ ,  $WF_{22}$ ,  $WF_{23}$ ,  $WF_{24}$ ,  $WF_{25}$ ,  $WF_{26}$ ,  $WF_{27}$ ,  $WF_{28}$ ,  $WF_{29}$ ,  $WF_{30}$ ,  $WF_{31}$ ,  $WF_{32}$ ,  $WF_{33}$ ,  $WF_{34}$ ,  $WF_{35}$ ,  $WF_{36}$ ,  $WF_{37}$ ,  $WF_{38}$ ,  $WF_{39}$ ,  $WF_{40}$ ,  $WF_{41}$ ,  $WF_{42}$ ,  $WF_{43}$ ,  $WF_{44}$ ,  $WF_{45}$ ,  $WF_{46}$ ,  $WF_{47}$ ,  $WF_{48}$ ,  $WF_{49}$ ,  $WF_{50}$ ,  $WF_{51}$ ,  $WF_{52}$ ,  $WF_{53}$ ,  $WF_{54}$ ,  $WF_{55}$ ,  $WF_{56}$ ,  $WF_{57}$ ,  $WF_{58}$ ,  $WF_{59}$ ,  $WF_{60}$ ,  $WF_{61}$ ,  $WF_{62}$ ,  $WF_{63}$ ,  $WF_{64}$ ,  $WF_{65}$ ,  $WF_{66}$ ,  $WF_{67}$ ,  $WF_{68}$ ,  $WF_{69}$ ,  $WF_{70}$ ,  $WF_{71}$ ,  $WF_{72}$ ,  $WF_{73}$ ,  $WF_{74}$ ,  $WF_{75}$ ,  $WF_{76}$ ,  $WF_{77}$ ,  $WF_{78}$ ,  $WF_{79}$ ,  $WF_{80}$ ,  $WF_{81}$ ,  $WF_{82}$ ,  $WF_{83}$ ,  $WF_{84}$ ,  $WF_{85}$ ,  $WF_{86}$ ,  $WF_{87}$ ,  $WF_{88}$ ,  $WF_{89}$ ,  $WF_{90}$ ,  $WF_{91}$ ,  $WF_{92}$ ,  $WF_{93}$ ,  $WF_{94}$ ,  $WF_{95}$ ,  $WF_{96}$ ,  $WF_{97}$ ,  $WF_{98}$ ,  $WF_{99}$ ,  $WF_{100}$ .

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### Stages

1. Check the shock
2. Check the macroeconomic closure conditions
3. Check the market clearing conditions
4. Check first round changes match expectations
  1. Are price changes as expected?
  2. Do quantity changes match price changes?
5. Review summary statistics
6. Explore the impacts expected to follow from the policy changes

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### Macroeconomic (Real % Changes)

|                     |                           | 50% TM | 25% TM |
|---------------------|---------------------------|--------|--------|
|                     | private consumption       | 0.08   | 0.12   |
| what causes this?   | → government consumption  | -0.33  | -0.51  |
| is this consistent? | → investment consumption  | 0.37   | 0.54   |
| welfare gain?       | → absorption              | 0.05   | 0.07   |
|                     | ✓ import demand           | 2.33   | 3.58   |
|                     | export supply             | 2.00   | 3.06   |
| is this odd?        | → GDP from expenditure    | 0.00   | -0.01  |
|                     | total domestic production | 0.53   | 0.81   |
|                     | total intermediate inputs | 0.92   | 1.40   |

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# The Problem

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## Factor Prices (% changes)

Why has the price of capital gone up by so much?

|                   | 50% TM | 25% TM |
|-------------------|--------|--------|
| Capital           | 0.819  | 1.253  |
| Land              | -0.481 | -0.738 |
| African unskilled | 0.656  | 1.000  |
| African skilled   | 0.761  | 1.156  |
| Other unskilled   | -0.120 | -0.190 |
| Other skilled     | 0.368  | 0.553  |
| White unskilled   | 0.710  | 1.087  |
| White skilled     | 0.635  | 0.967  |

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# The Analyses (a start!!)

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## Demand for Capital (% change & level)

Looks as if minerals activity may be important

But ‘Trade and comms’ and ‘services’ biggest users of capital

|                     | % Change |        | Level  |        |
|---------------------|----------|--------|--------|--------|
|                     | 50% TM   | 25% TM | 50% TM | 25% TM |
| Agriculture         | -1.03    | -1.58  | 17.28  | 17.19  |
| Minerals            | 2.13     | 3.27   | 36.06  | 36.46  |
| Food                | -1.62    | -2.47  | 13.74  | 13.62  |
| Textiles            | -5.40    | -8.30  | 2.10   | 2.03   |
| Petrol & chemical   | -0.60    | -0.91  | 18.99  | 18.94  |
| Metal & minerals    | 0.31     | 0.49   | 20.14  | 20.18  |
| Machinery           | -0.58    | -0.85  | 1.74   | 1.73   |
| Vehicles            | -0.62    | -0.90  | 5.87   | 5.86   |
| Other manufacturing | -1.25    | -1.87  | 12.67  | 12.59  |
| Utilities           | 0.25     | 0.37   | 17.08  | 17.10  |
| Construction        | -0.38    | -0.60  | 7.99   | 7.97   |
| Trade and comms     | 0.28     | 0.42   | 91.53  | 91.66  |
| Services            | -0.19    | -0.29  | 124.86 | 124.72 |

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K/L ratio in Minerals at upper end but not an outlier

Capital/Labour Ratios (base)

|                     | Ratio K/F | Ratio K/L |
|---------------------|-----------|-----------|
| Agriculture         | 0.474     | 0.524     |
| Minerals            | 0.581     | 0.581     |
| Food                | 0.556     | 0.556     |
| Textiles            | 0.199     | 0.199     |
| Petrol & chemical   | 0.642     | 0.642     |
| Metal & minerals    | 0.587     | 0.587     |
| Machinery           | 0.314     | 0.314     |
| Vehicles            | 0.533     | 0.533     |
| Other manufacturing | 0.514     | 0.514     |
| Utilities           | 0.751     | 0.751     |
| Construction        | 0.298     | 0.298     |
| Trade and comms     | 0.525     | 0.525     |
| Services            | 0.361     | 0.361     |

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Activities (% changes)

|                     | Output |        | Value added |        | Intermediates |        |
|---------------------|--------|--------|-------------|--------|---------------|--------|
|                     | 50% TM | 25% TM | 50% TM      | 25% TM | 50% TM        | 25% TM |
| Agriculture         | -0.32  | -0.50  | -0.86       | -1.31  | 0.29          | 0.43   |
| Minerals            | 2.76   | 4.24   | 2.19        | 3.36   | 3.30          | 5.06   |
| Food                | -0.65  | -1.01  | -1.53       | -2.33  | -0.38         | -0.60  |
| Textiles            | -3.73  | -5.78  | -5.14       | -7.90  | -3.09         | -4.81  |
| Petrol & chemical   | 0.33   | 0.51   | -0.53       | -0.80  | 0.53          | 0.81   |
| Metal & minerals    | 1.15   | 1.77   | 0.39        | 0.61   | 1.42          | 2.18   |
| Machinery           | 0.68   | 1.06   | -0.44       | -0.63  | 0.92          | 1.41   |
| Vehicles            | 1.60   | 2.48   | -0.51       | -0.73  | 1.84          | 2.86   |
| Other manufacturing | 0.06   | 0.10   | -1.12       | -1.67  | 0.43          | 0.66   |
| Utilities           | 0.80   | 1.22   | 0.28        | 0.43   | 1.31          | 2.00   |
| Construction        | 0.49   | 0.73   | -0.23       | -0.36  | 0.80          | 1.20   |
| Trade and comms     | 0.87   | 1.32   | 0.36        | 0.55   | 1.32          | 2.01   |
| Services            | 0.27   | 0.40   | -0.09       | -0.14  | 0.81          | 1.21   |

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Commodities (% changes)

|                     | Supply |        | Imports |        | Domestic |        | Exports |        |
|---------------------|--------|--------|---------|--------|----------|--------|---------|--------|
|                     | 50% TM | 25% TM | 50% TM  | 25% TM | 50% TM   | 25% TM | 50% TM  | 25% TM |
| Agriculture         | -0.32  | -0.50  | 5.34    | 8.16   | -0.42    | -0.65  | 0.40    | 0.60   |
| Minerals            | 2.76   | 4.24   | 0.18    | 0.28   | 1.66     | 2.54   | 3.16    | 4.85   |
| Food                | -0.65  | -1.00  | 8.00    | 12.36  | -0.75    | -1.15  | 0.30    | 0.44   |
| Textiles            | -3.56  | -5.53  | 13.84   | 21.91  | -3.93    | -6.09  | -1.40   | -2.23  |
| Petrol & chemical   | 0.31   | 0.48   | 2.81    | 4.26   | 0.13     | 0.20   | 1.10    | 1.68   |
| Metal & minerals    | 1.15   | 1.76   | 2.89    | 4.40   | 0.81     | 1.24   | 1.80    | 2.76   |
| Machinery           | 0.72   | 1.12   | 1.27    | 1.92   | -0.01    | 0.00   | 2.05    | 3.14   |
| Vehicles            | 1.57   | 2.43   | 1.60    | 2.41   | 0.89     | 1.38   | 3.82    | 5.90   |
| Other manufacturing | 0.08   | 0.13   | 2.81    | 4.26   | -0.37    | -0.55  | 1.41    | 2.15   |
| Utilities           | 0.80   | 1.22   | 0.47    | 0.71   | 0.80     | 1.22   | 1.14    | 1.73   |
| Construction        | 0.58   | 0.87   | -0.32   | -0.50  | 0.58     | 0.86   | 1.49    | 2.25   |
| Trade and comms     | 0.85   | 1.30   | 0.36    | 0.54   | 0.83     | 1.26   | 1.30    | 1.99   |
| Services            | 0.27   | 0.40   | -0.09   | -0.15  | 0.26     | 0.39   | 0.61    | 0.92   |

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Export Prices (% change)

BUT small country closure!!!! (Was this set right?√)

So what is causing this?

|                     | 50% TM | 25% TM |
|---------------------|--------|--------|
| Agriculture         | 0.69   | 1.05   |
| Minerals            | 0.69   | 1.05   |
| Food                | 0.69   | 1.05   |
| Textiles            | 0.69   | 1.05   |
| Petrol & chemical   | 0.69   | 1.05   |
| Metal & minerals    | 0.69   | 1.05   |
| Machinery           | 0.69   | 1.05   |
| Vehicles            | 0.69   | 1.05   |
| Other manufacturing | 0.69   | 1.05   |
| Utilities           | 0.69   | 1.05   |
| Construction        | 0.69   | 1.05   |
| Trade and comms     | 0.69   | 1.05   |
| Services            | 0.69   | 1.05   |

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PE (c) =E= PWE (c) \* ER \* (1 - TE (c) ) - SUM (m, ioqttqe (m, c) \* PTT (m) ) ;

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$\Omega = 2.00$

$\forall a$

Hence CET elasticities may be important

Export Value Shares

|                     | base  | 50% TM | 25% TM |
|---------------------|-------|--------|--------|
| Agriculture         | 0.030 | 0.029  | 0.029  |
| Minerals            | 0.319 | 0.323  | 0.325  |
| Food                | 0.034 | 0.034  | 0.033  |
| Textiles            | 0.019 | 0.018  | 0.018  |
| Petrol & chemical   | 0.103 | 0.102  | 0.102  |
| Metal & minerals    | 0.155 | 0.155  | 0.155  |
| Machinery           | 0.042 | 0.042  | 0.042  |
| Vehicles            | 0.066 | 0.067  | 0.068  |
| Other manufacturing | 0.093 | 0.092  | 0.092  |
| Utilities           | 0.000 | 0.000  | 0.000  |
| Construction        | 0.001 | 0.001  | 0.001  |
| Trade and comms     | 0.069 | 0.068  | 0.068  |
| Services            | 0.069 | 0.068  | 0.068  |

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Scalars Summaries (% changes)

|                                             | 50% TM | 25% TM |
|---------------------------------------------|--------|--------|
| Import tariff revenue                       | -46.99 | -72.66 |
| Sales tax revenue                           | 0.27   | 0.42   |
| Direct Income tax revenue                   | 0.32   | 0.48   |
| Government Savings                          | 18.29  | 28.30  |
| Value of final domestic demand              | 0.19   | 0.28   |
| Value of Government consumption expenditure | 0.19   | 0.28   |
| PPI                                         | 0.27   | 0.41   |
| Exchange rate                               | 0.69   | 1.05   |

Exchange rate is driving the export price changes

But closure issues? (Govt savings & consumption)

Also, domestic costs of production have risen: why?

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# The End

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