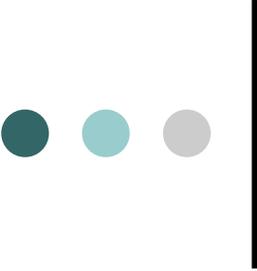


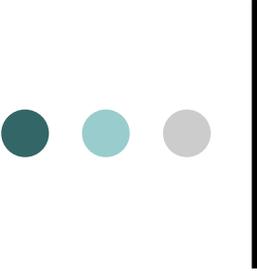


Welfare Decomposition



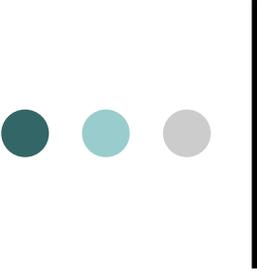
Welfare measures

- Equivalent variation (**EV**)
 - how much money is a particular change (that had taken place between equilibria) equivalent to
 - the minimum required to accept to forgo the change (or maximum prepared to pay to avoid the change where there is a welfare loss)
 - reference point is the old equilibrium
- $EV = E(U^N, P^0) - E(U^0, P^0)$
 - where $E(U^N, P^0)$ is the expenditure necessary to achieve utility level U^N with prices P^0



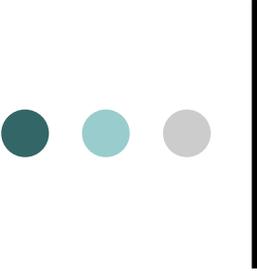
Do all regions gain?

- Look at changes in welfare (The variable is **EV**):
 - EU loses \$2,715 million
 - ROW gains \$5,858 million
 - And...
 - SSA loses \$223 million
 - Can we explain the EU welfare loss?



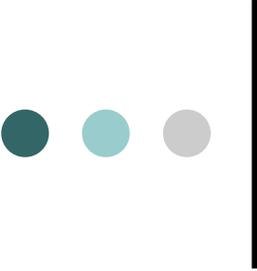
Decomposition of welfare effects

- Welfare results can be difficult to understand: decomposition assists understanding of where the gains came from, eg:
 - more favorable terms of trade
 - improved allocation of existing resources
 - additional resources
 - improved technology
- Welfare can be decomposed following Huff and Hertel (1996):
 - allocative efficiency effects
 - terms of trade effects
 -



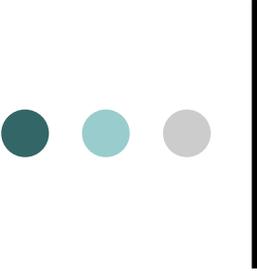
Allocative efficiency effects

- allocative efficiency gains result when resources are reallocated into areas of more efficient production
- can be decomposed to find the allocative efficiency effect attributable to a given commodity and region
- these can be further decomposed by tax instrument



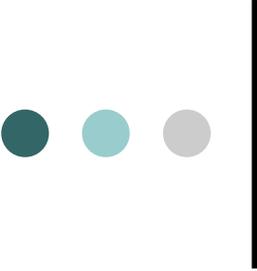
Terms of trade effects

- terms of trade effects reflect movements in the terms of trade
- changes in the terms of trade can be decomposed into three components:
 - contribution of changes in world prices
 - contribution of changes in regional export prices
 - contribution of changes in regional import prices



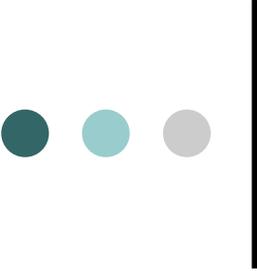
A welfare decomposition

- **View|Updated Data|Welfare decomposition**
- That due to changes in allocative efficiency
 - Click on **line 2**
 - EU gain is \$2778, mainly from 'food'
- That due to changes in ToT
 - Click on line 24
 - 'All TRAD_COMM' 'EU' 'Sum prices' 'sum form'
 - Loss of \$5,589
 - Mainly in manufactures



Still looking at ToT decomposition

- In the 3rd drop-down box
 - Change to '**All prices**'
- World price changes had small positive effects on EU welfare
- As did changes in prices paid by EU for imports
- But welfare losses due to reduced prices received for EU exports



Digger deeper into the ToT contribution to welfare

- Return to GTAP solution
- Look at these variables:
 - `tot`
 - `psw`
 - `pdw`
 - `pxw`
 - `Piw`
 - `pxwcomm`