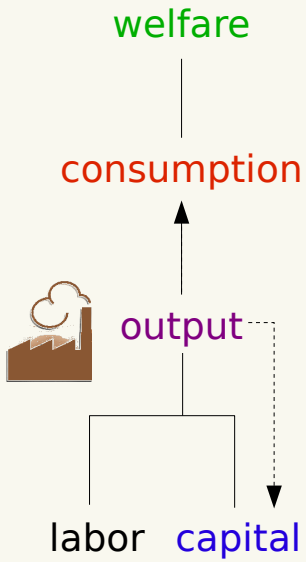
Structure of MICA

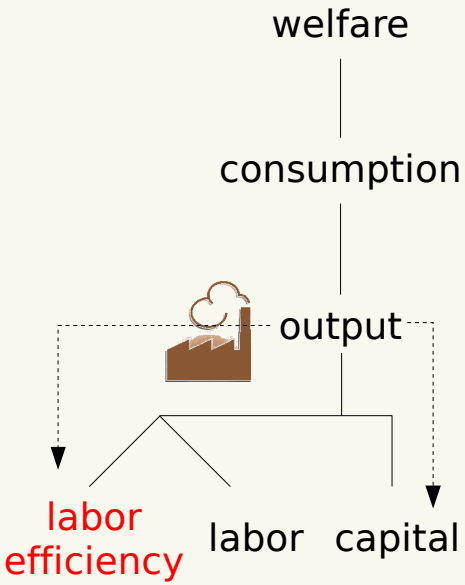
Model of International Climate Agreements

$$
\begin{aligned}
W &= \int_0^\infty L\, u(c/L)\, exp\{-\rho t\}\, dt \\
c &= F(aL, k) - i \\
\frac{d}{dt}k &= i - \delta k
\end{aligned}
$$



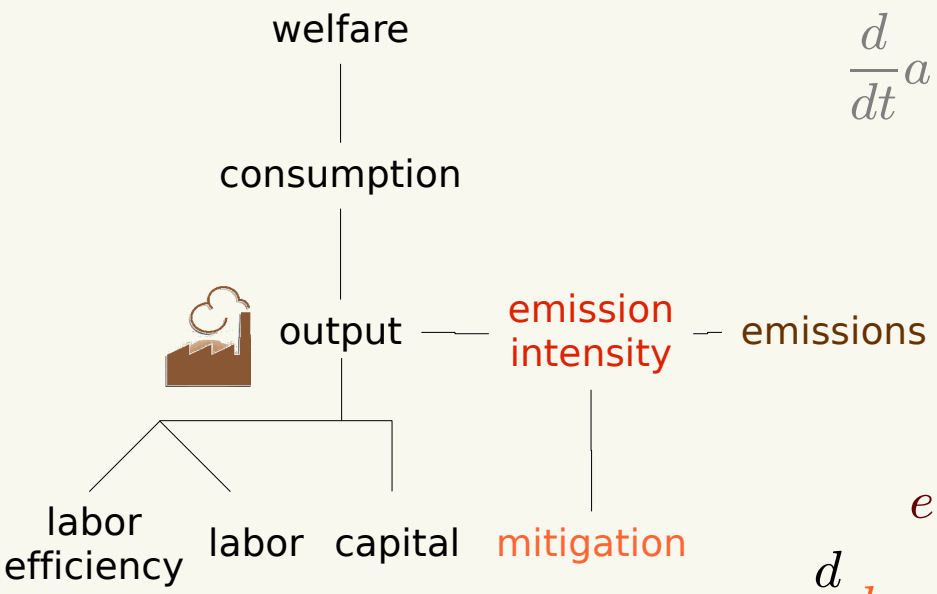
Structure of MICA
Model of International Climate Agreements

$$
\begin{aligned}
W &= \int_0^\infty L\, u(c/L)\, exp\{-\rho t\}\, dt \\
c &= F(aL, k) - i - i^a \\
\frac{d}{dt}k &= i - \delta k \\
\frac{d}{dt}a &= f(i^a)
\end{aligned}
$$



Structure of MICA
Model of International Climate Agreements

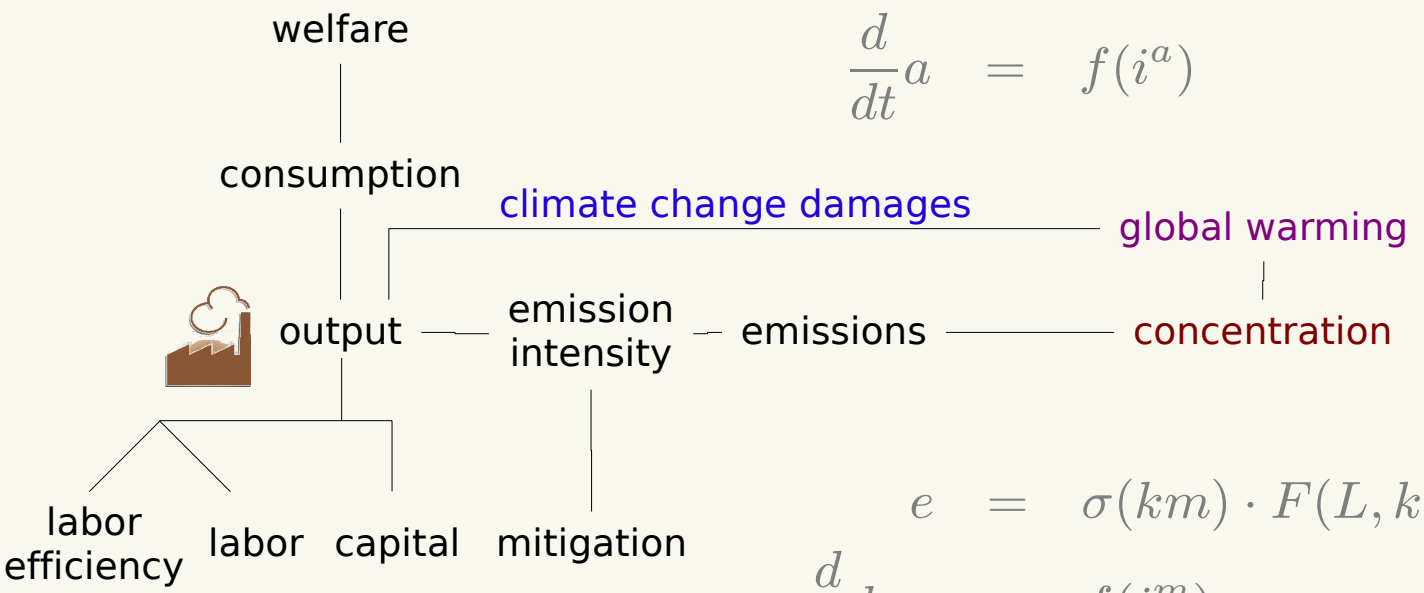
$$
\begin{aligned}
W &= \int_0^\infty L\, u(c/L)\, exp\{-\rho t\}\, dt \\
c &= F(aL, k) - i - i^a - i^m \\
\frac{d}{dt}k &= i - \delta k \\
\frac{d}{dt}a &= f(i^a)
\end{aligned}
$$



$$
\begin{aligned}
e &= \sigma(km) \cdot F(L, k) \\
\frac{d}{dt}km &= f(i^m)
\end{aligned}
$$

Structure of MICA
Model of International Climate Agreements

$$
\begin{aligned}
W &= \int_0^\infty L\, u(c/L)\, exp\{-\rho t\}\, dt \\
c &= F(aL, k) - i - i^a - i^m \\
\frac{d}{dt}k &= i - \delta k \\
\frac{d}{dt}a &= f(i^a)
\end{aligned}
$$



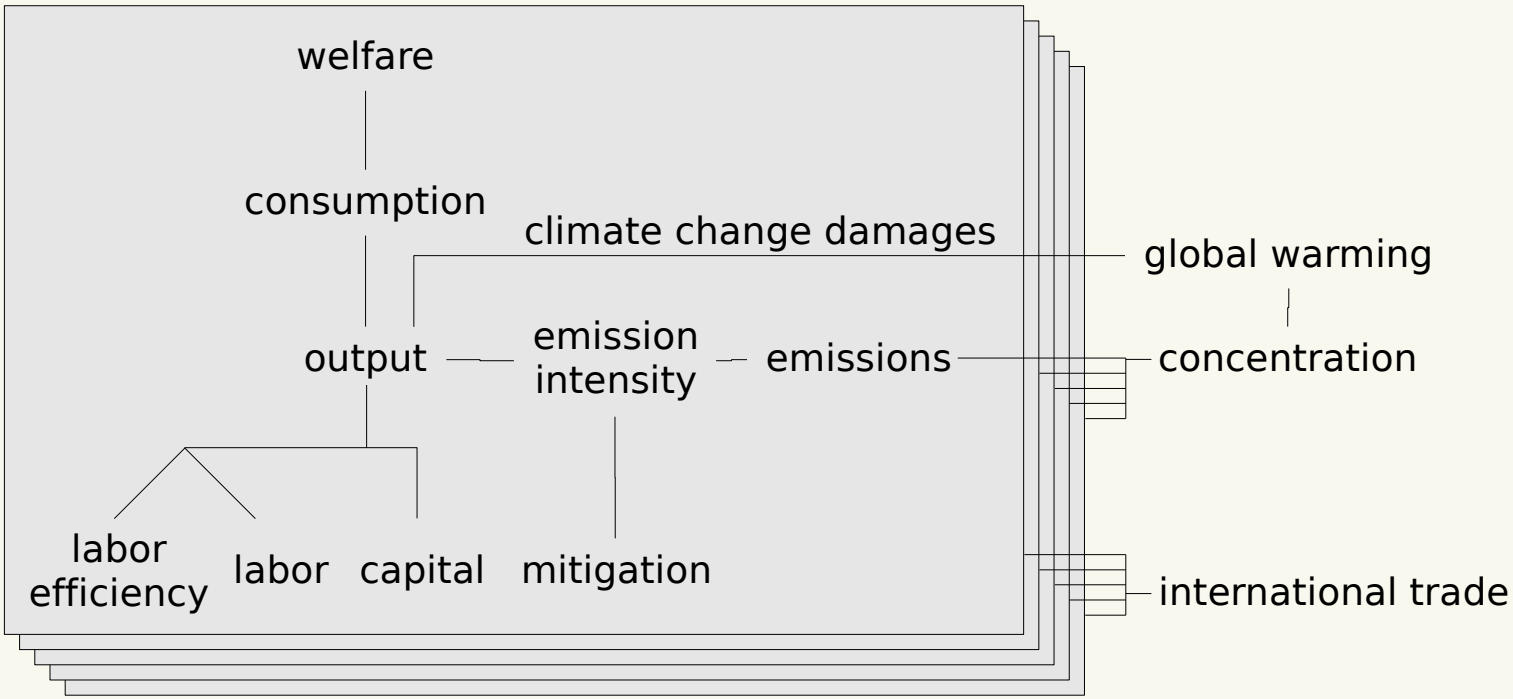
$$
\begin{aligned}
e &= \sigma(km) \cdot F(L, k) \\
\frac{d}{dt}km &= f(i^m)
\end{aligned}
$$

$$
\Omega = \Omega \circ \mathrm{temp} \circ \mathrm{conc} \circ e
$$

temp(·), conc(·): Petschel-Held et al. 1999
Ω(·): Nordhaus/Yang 1996

Structure of MICA
Model of International Climate Agreements

- Multiple regions (here: 9)
- International trade
  with national product differentiation



- Solving multi-actor intertemporal optimizations with trade + external effects is numerically challenging