Structure of MICA
Model of International Climate Agreements

\[ W = \int_0^\infty L u(c/L) \exp\{-\rho t\} \, dt \]
\[ c = F(aL, k) - i \]
\[ \frac{d}{dt} k = i - \delta k \]
Structure of MICA
Model of International Climate Agreements

\[ W = \int_0^\infty L u(c/L) \exp\{-\rho t\} \, dt \]
\[ c = F(aL, k) - i + i^a \]
\[ \frac{dk}{dt} = i - \delta k \]
\[ \frac{da}{dt} = f(i^a) \]
Structure of MICA
Model of International Climate Agreements

\[ W = \int_{0}^{\infty} Lu(c/L) \exp\{-\rho t\} \, dt \]
\[ c = F(aL, k) - i - i^a - i^m \]
\[ \frac{d}{dt} k = i - \delta k \]
\[ \frac{d}{dt} a = f(i^a) \]
\[ e = \sigma(km) \cdot F(L, k) \]
\[ \frac{d}{dt} km = f(i^m) \]
Structure of MICA
Model of International Climate Agreements

\[ W = \int_{0}^{\infty} L u(c/L) \exp\{ -\rho t \} \, dt \]
\[ c = F(aL, k) - i - i^a - i^m \]
\[ \frac{d}{dt} k = i - \delta k \]
\[ \frac{d}{dt} a = f(i^a) \]

\[ e = \sigma(km) \cdot F(L, k) \]
\[ \frac{d}{dt} km = f(i^m) \]

\[ \Omega = \Omega \circ \text{temp} \circ \text{conc} \circ e \]

\text{temp}(\cdot), \text{conc}(\cdot): \quad \text{Petschel-Held et al. 1999}
\text{\Omega}(\cdot): \quad \text{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