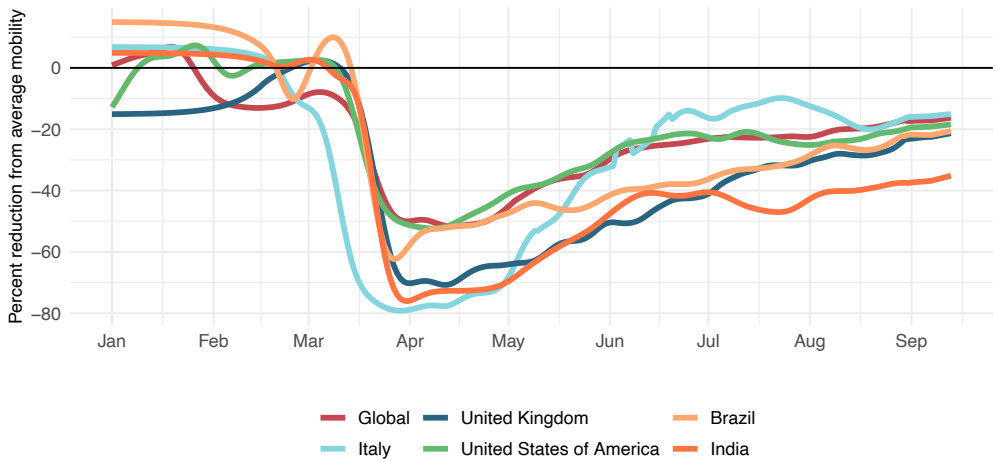
Discussion of Macroeconomic Outcomes and COVID-19 By Fernandez-Villaverde and Jones

Andy Atkeson
UCLA
BPEA September 2020

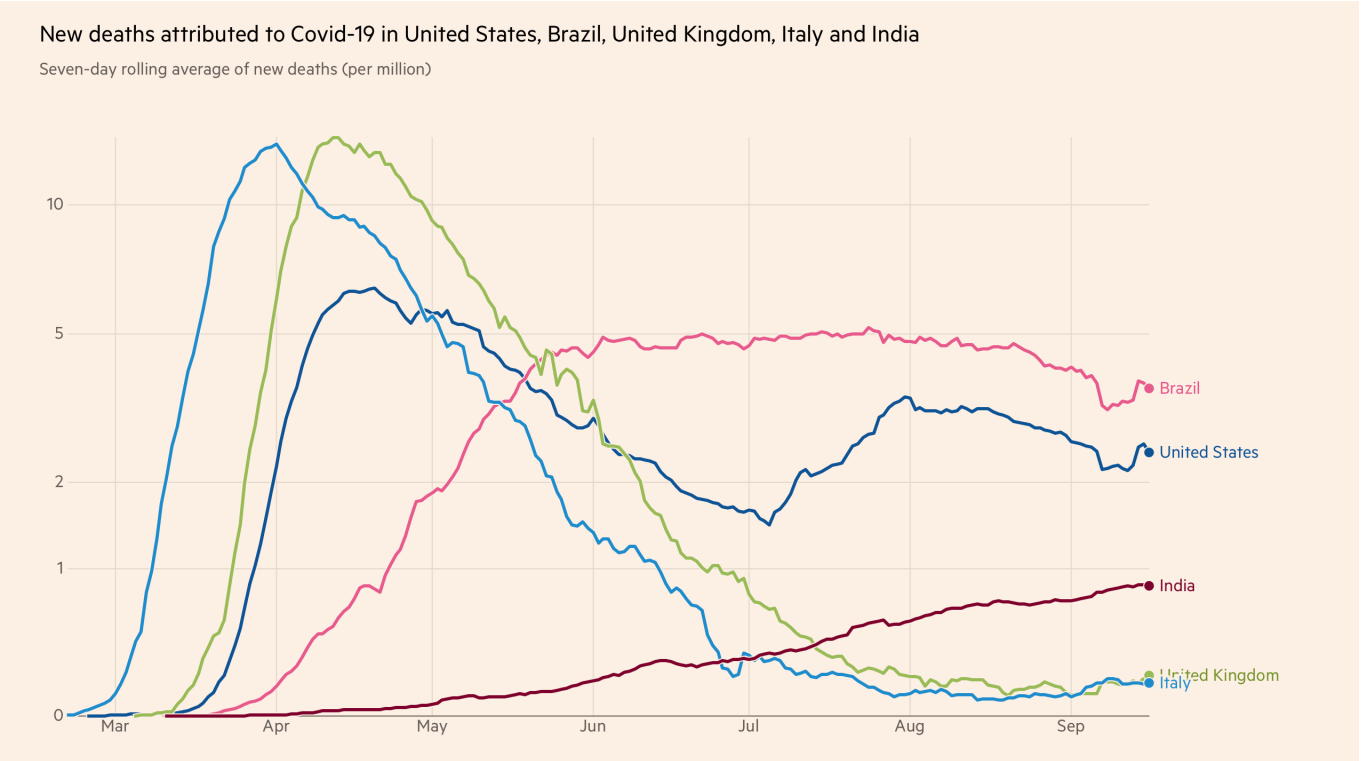
Rich Dynamics of Activity and COVID Deaths

Figure 8a. Trend in mobility as measured through smartphone app use compared to January 2020 baseline



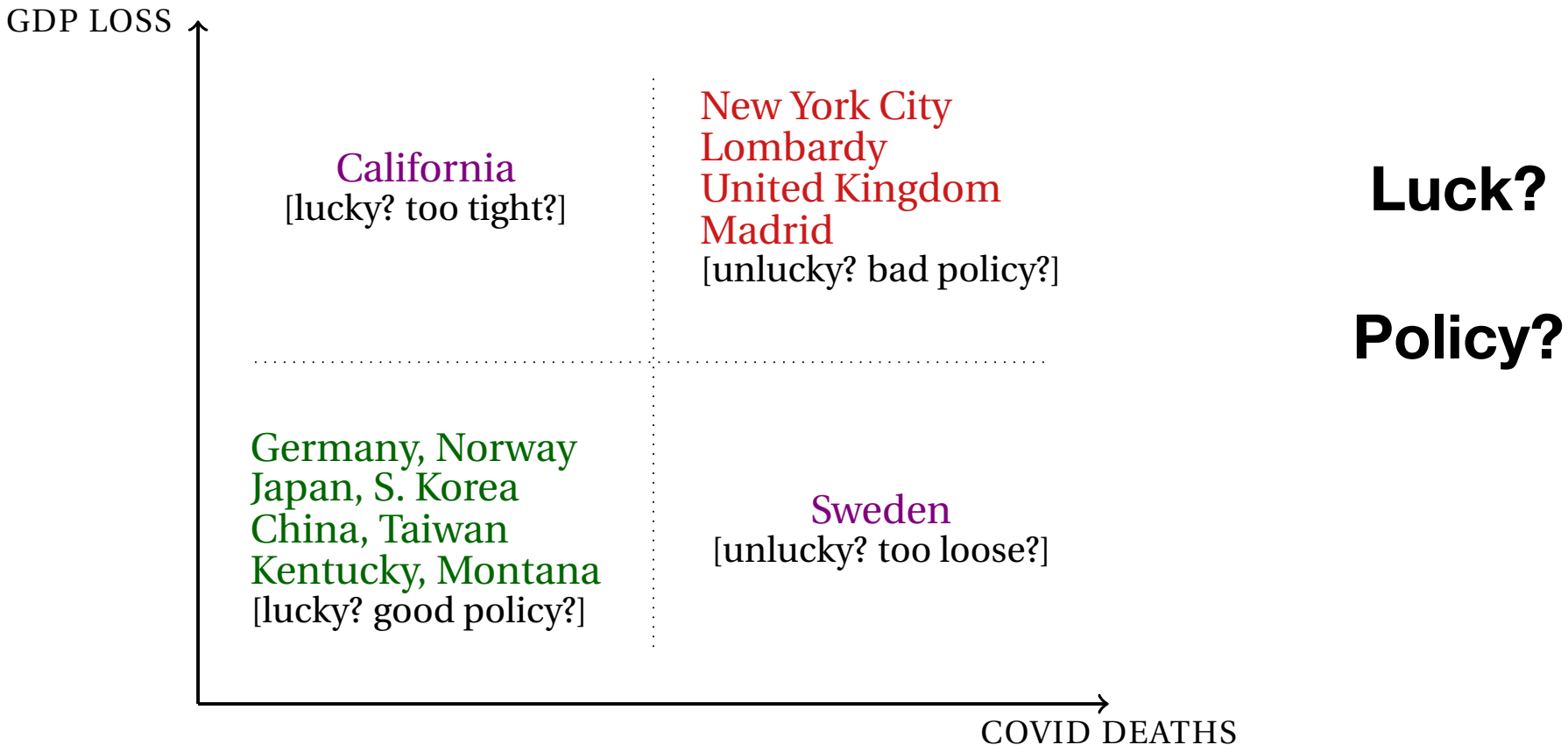
Decline and recovery of mobility

Various patterns of new deaths per million



What is the trade-off between COVID mitigation and the economy?

Figure 1: Summary of the Trade-off Evidence



What is driving the data?

- Behavioral SIRD model (Violante 2020)
  - Intrinsic differences in transmission rate across locations
  - Regional differences in elasticity of response of activity to infections
- Interpretations for “luck” and “policy”
- Consistent with key facts about COVID worldwide
  - Atkeson, Kopecky and Zha (2020)
  - Initially high and highly dispersed $\mathscr{R}_0$ across regions
  - Rapid fall in $\mathscr{R}_t$ and transmission rates everywhere

Behavioral SIRD model

SIRD model equations

$$\dot{S}_i(t) = -\beta_i(t) S_i(t) I_i(t)$$

$$\dot{I}_i(t) = \left[\beta_i(t) S_i(t) - \gamma\right] I_i(t)$$

$$\dot{R}_i(t) = \gamma(1-\nu) I_i(t)$$

$$\dot{D}_i(t) = \gamma\nu I_i(t)$$

$$\gamma = 1/5$$

$$\nu = 0.005$$

$$\alpha = 2$$

Behavioral equations

Transmission rate increases with activity

$$\beta_i(t) = \bar{\beta}_i Y_i(t)^{\alpha}$$

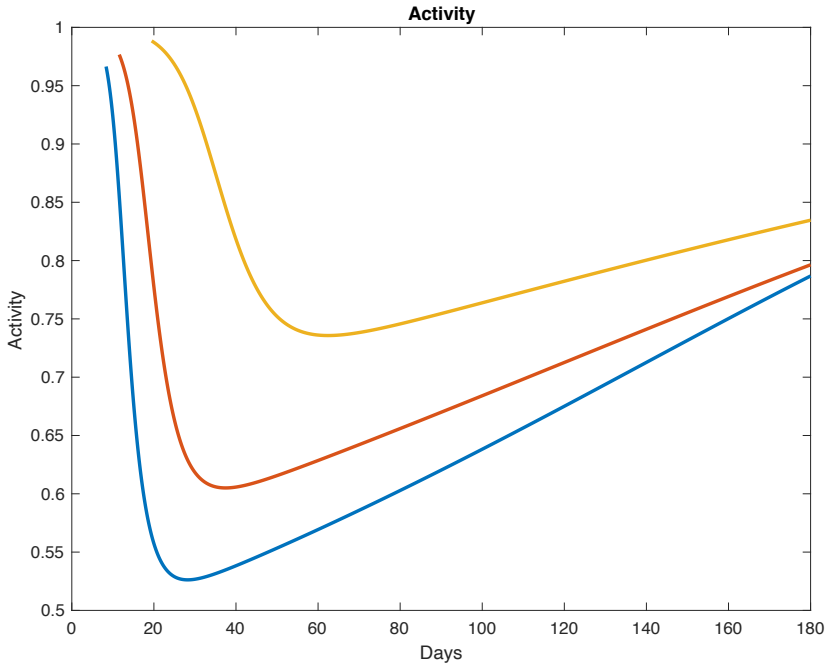
Regional differences in transmission given the level of activity

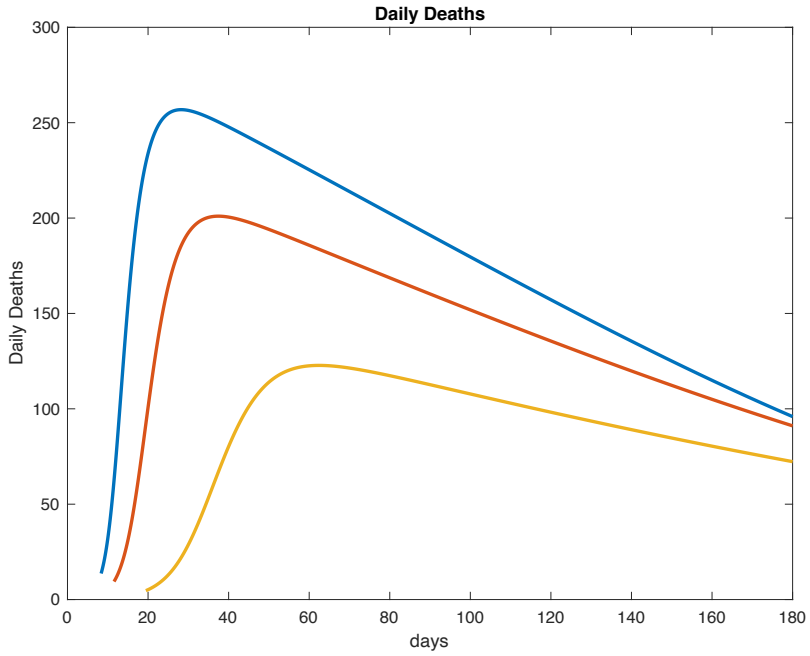
Activity decreases with infections

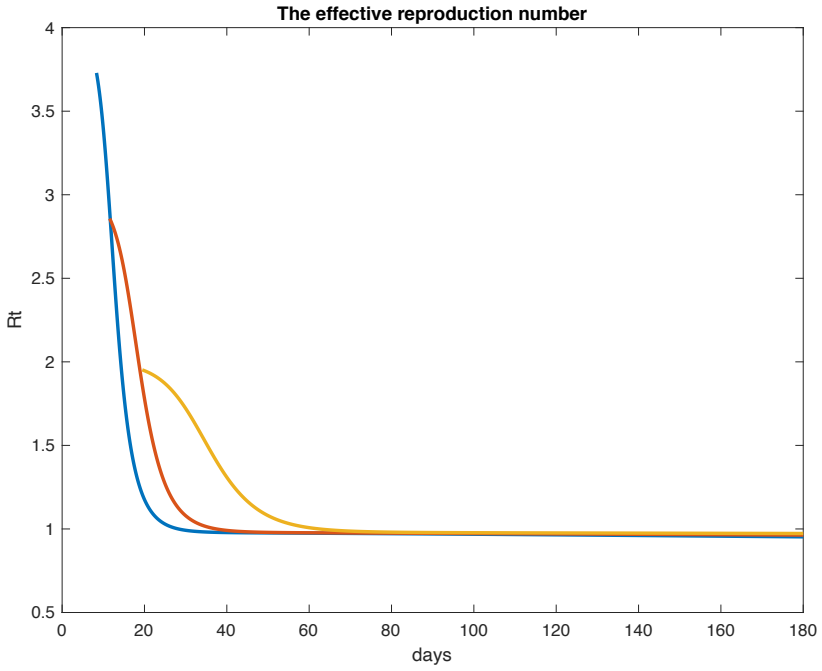
$$Y_i(t) = \exp(-\sigma_i I_i(t))$$

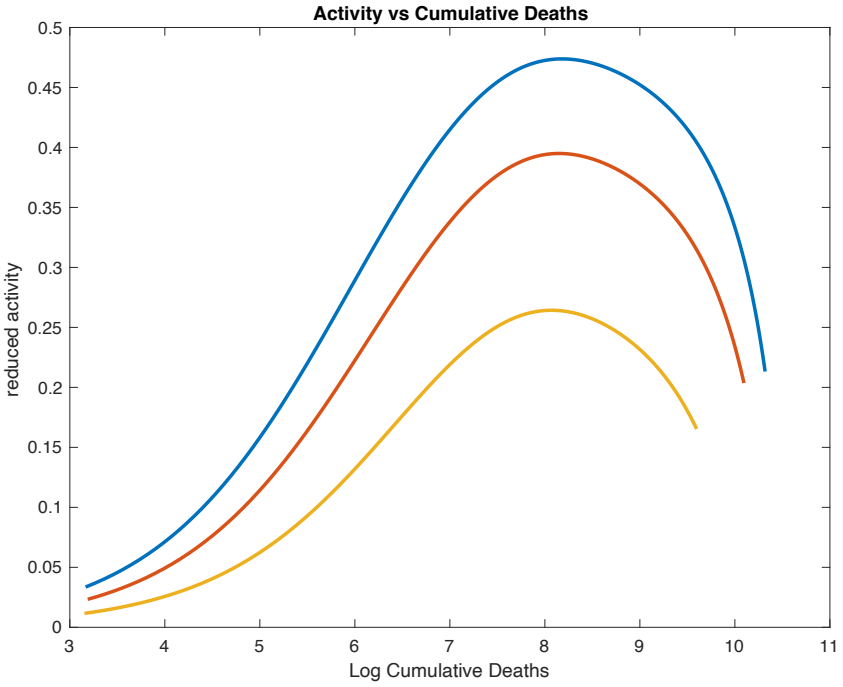
Regional differences in how strongly activity responds to infections

Experiment 1: Differences in transmission given activity



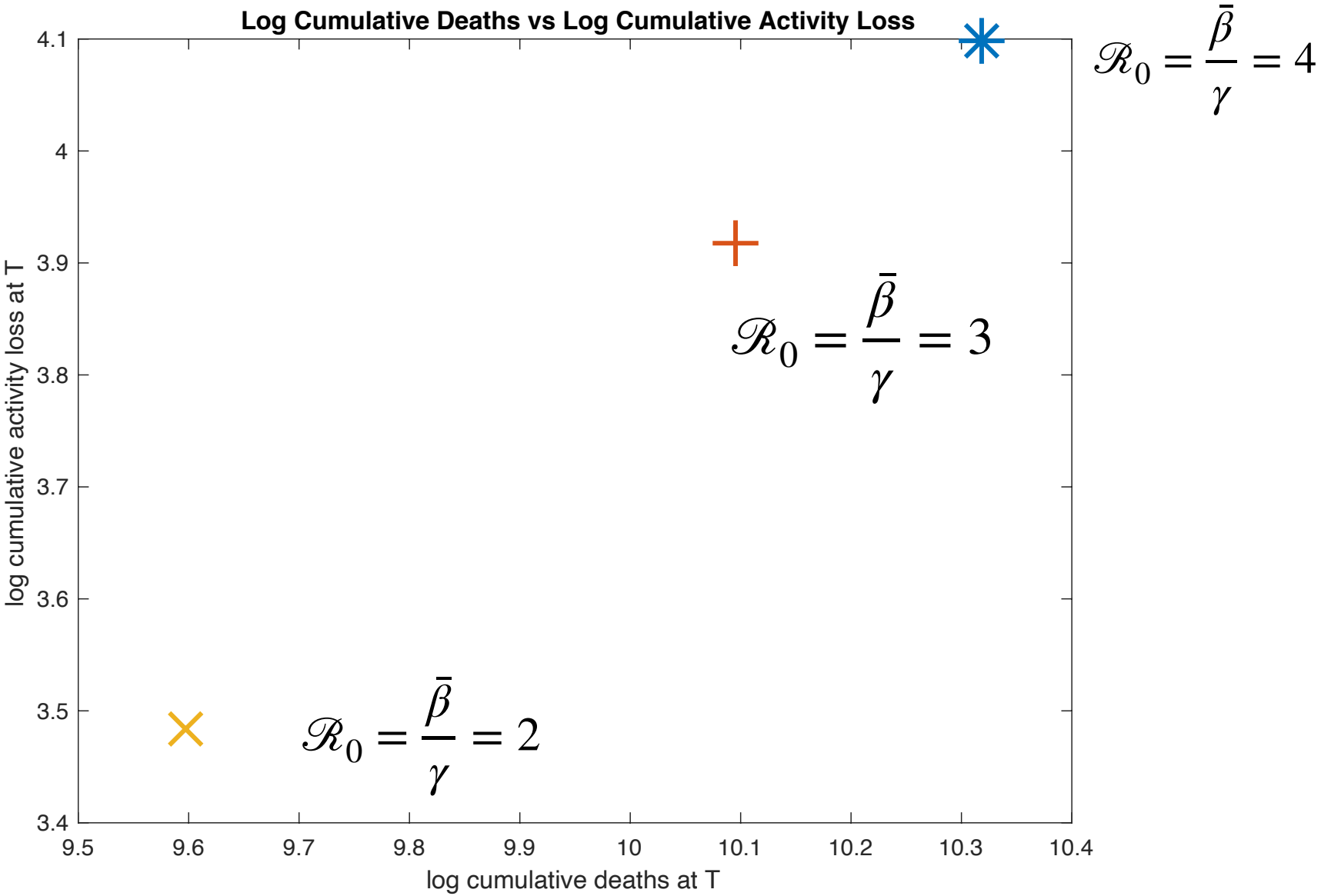




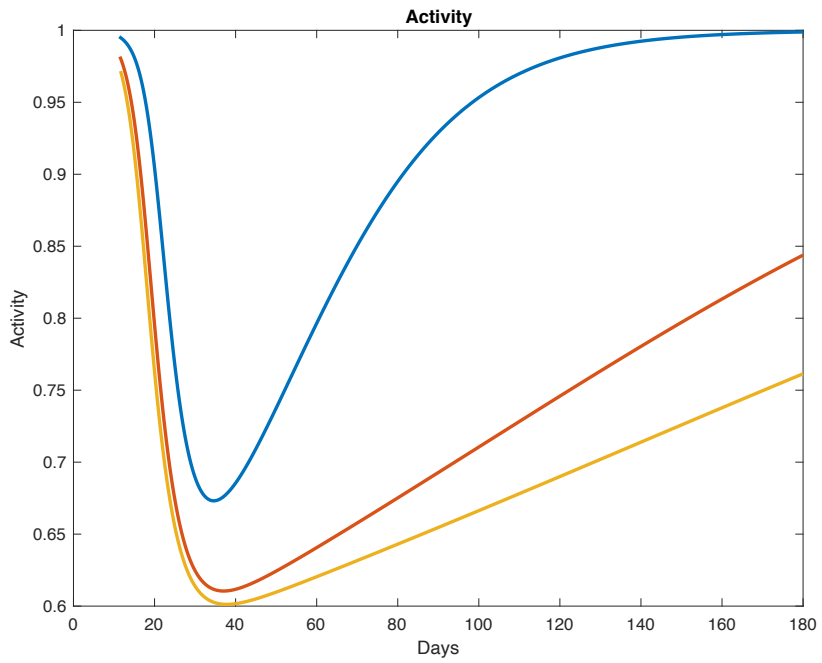


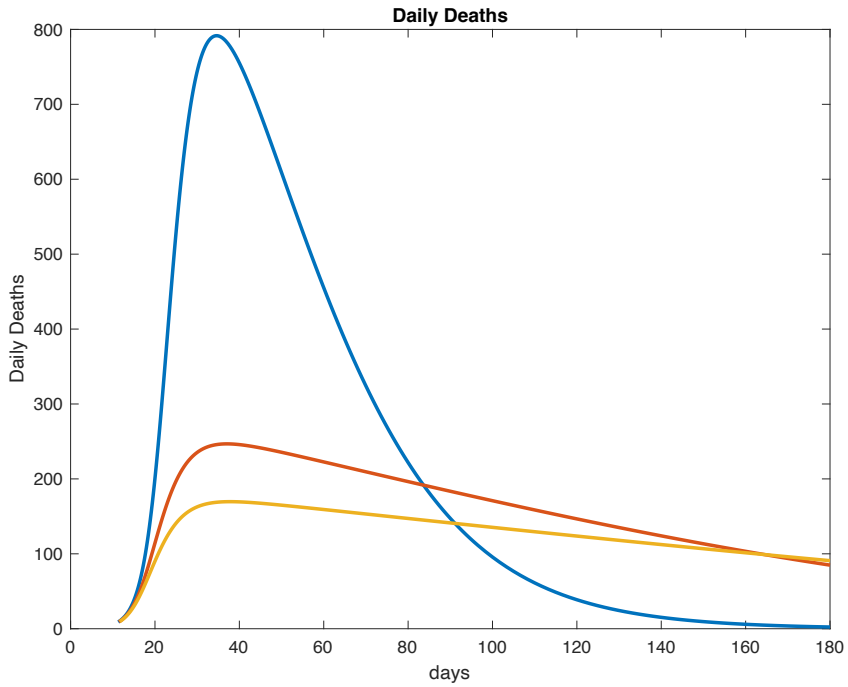
Luck: more cumulative deaths goes with more cumulative lost activity

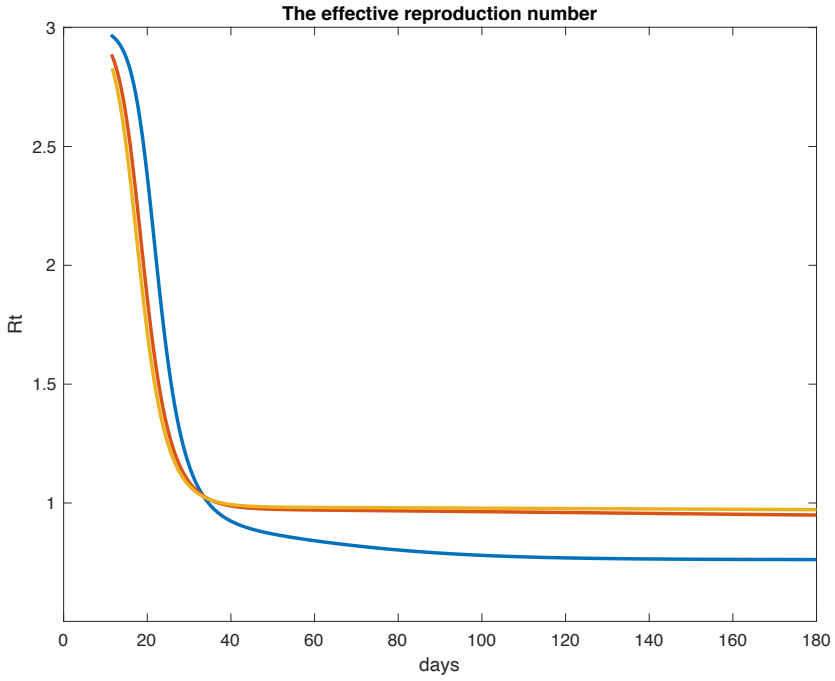
$\sigma = 25$

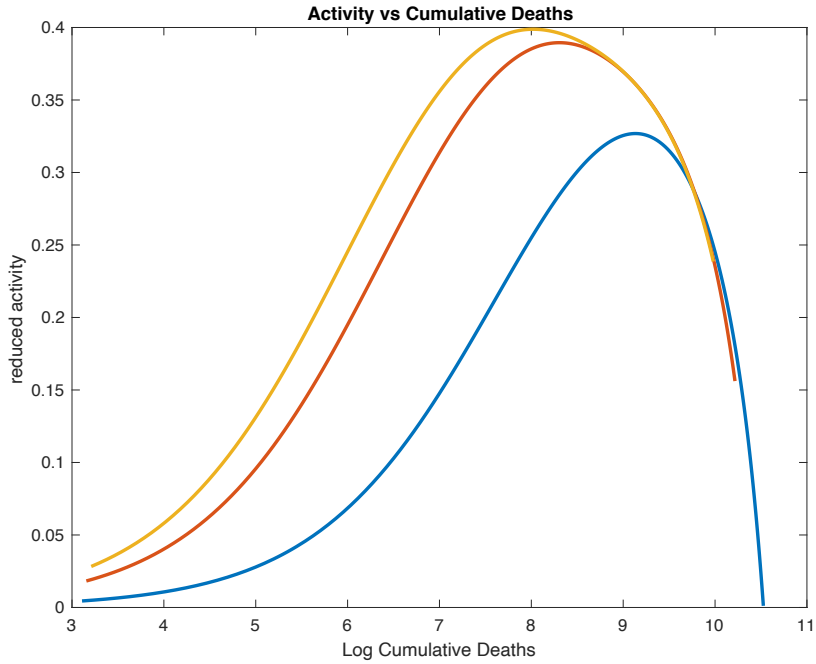


Experiment 2: Differences in elasticity of activity



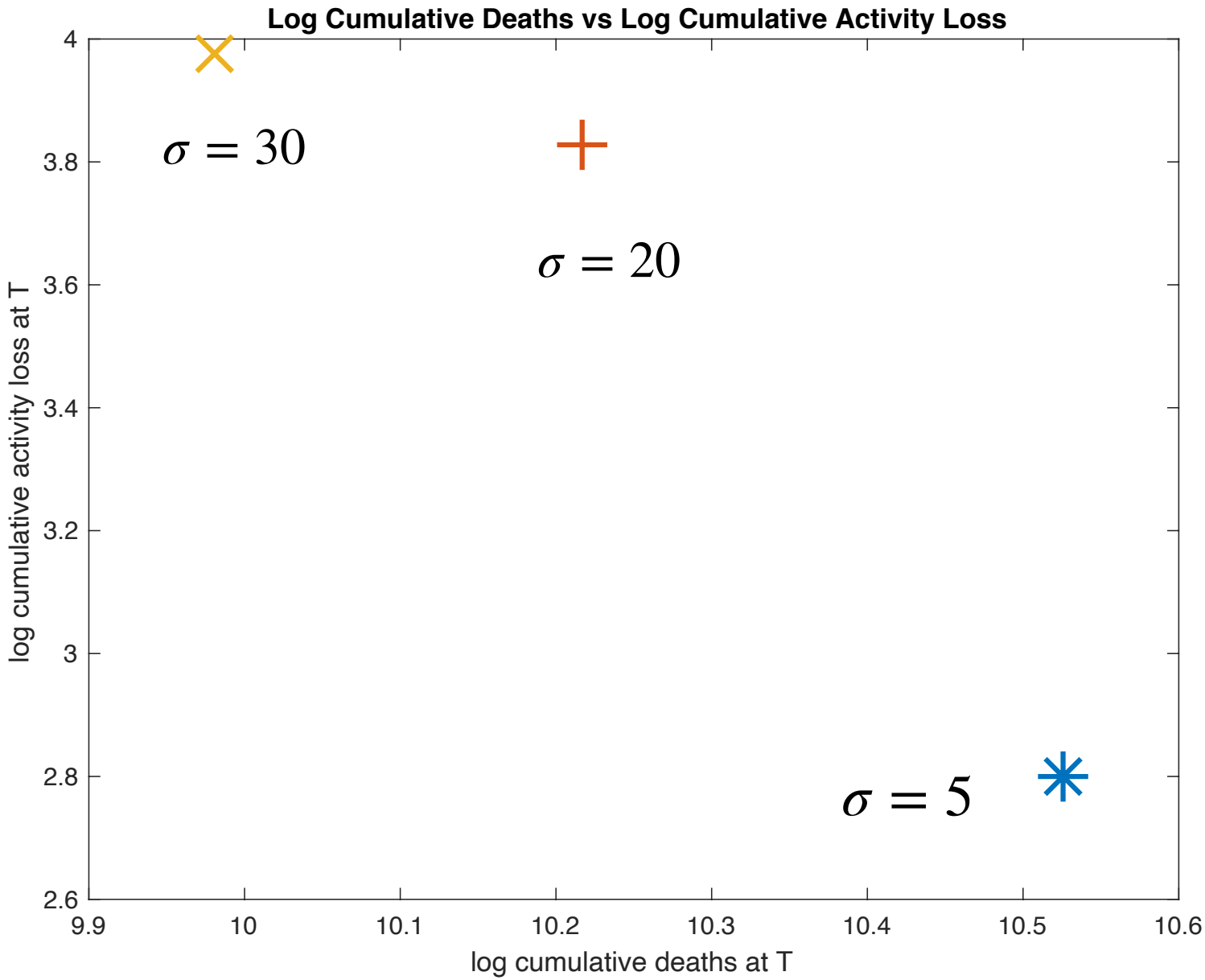






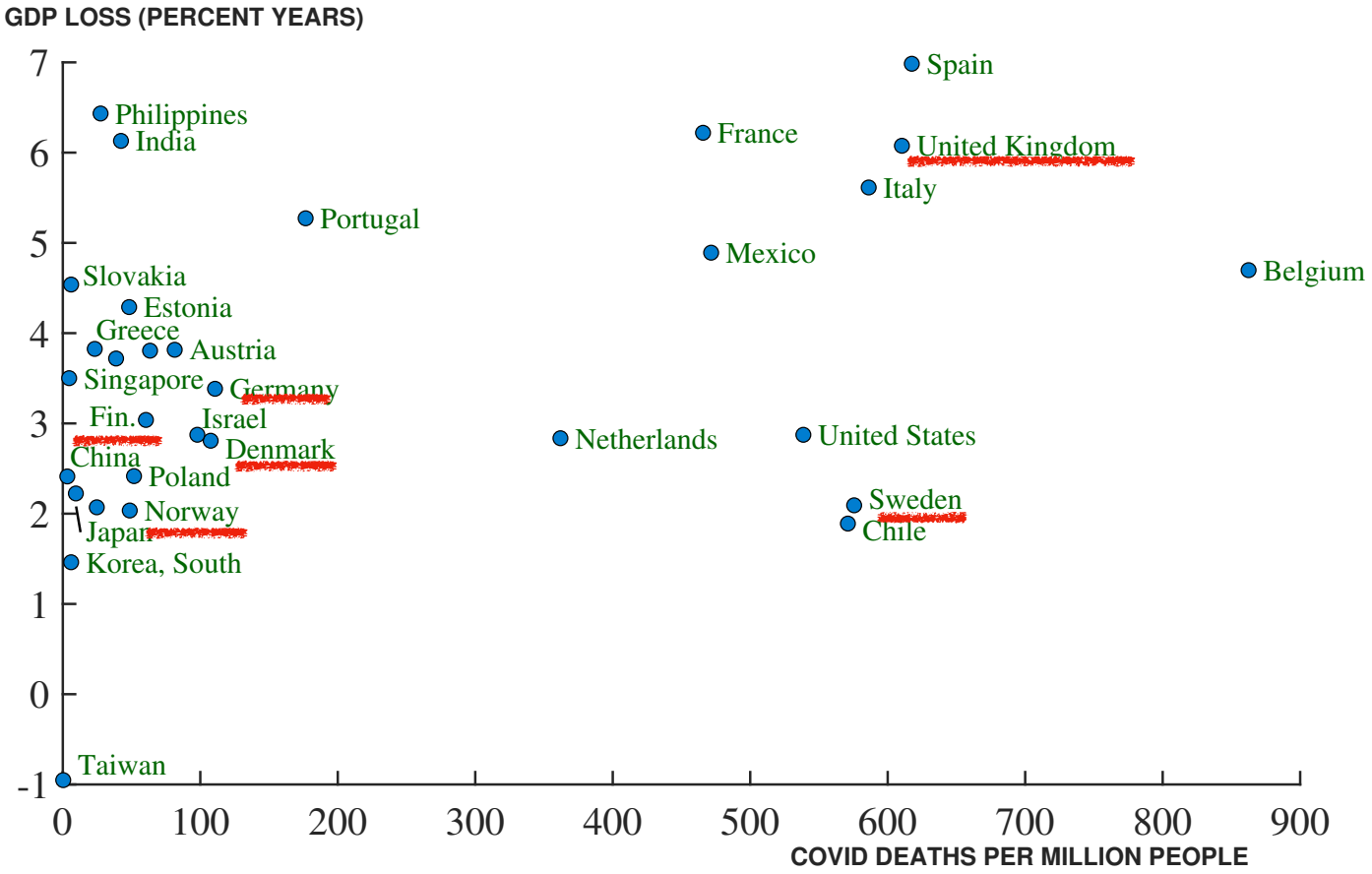
More cumulative deaths goes with less cumulative lost activity

$$\mathscr{R}_0 = \frac{\bar{\beta}}{\gamma} = 3$$



Luck vs. Policy Revisited
Sweden and its neighbors

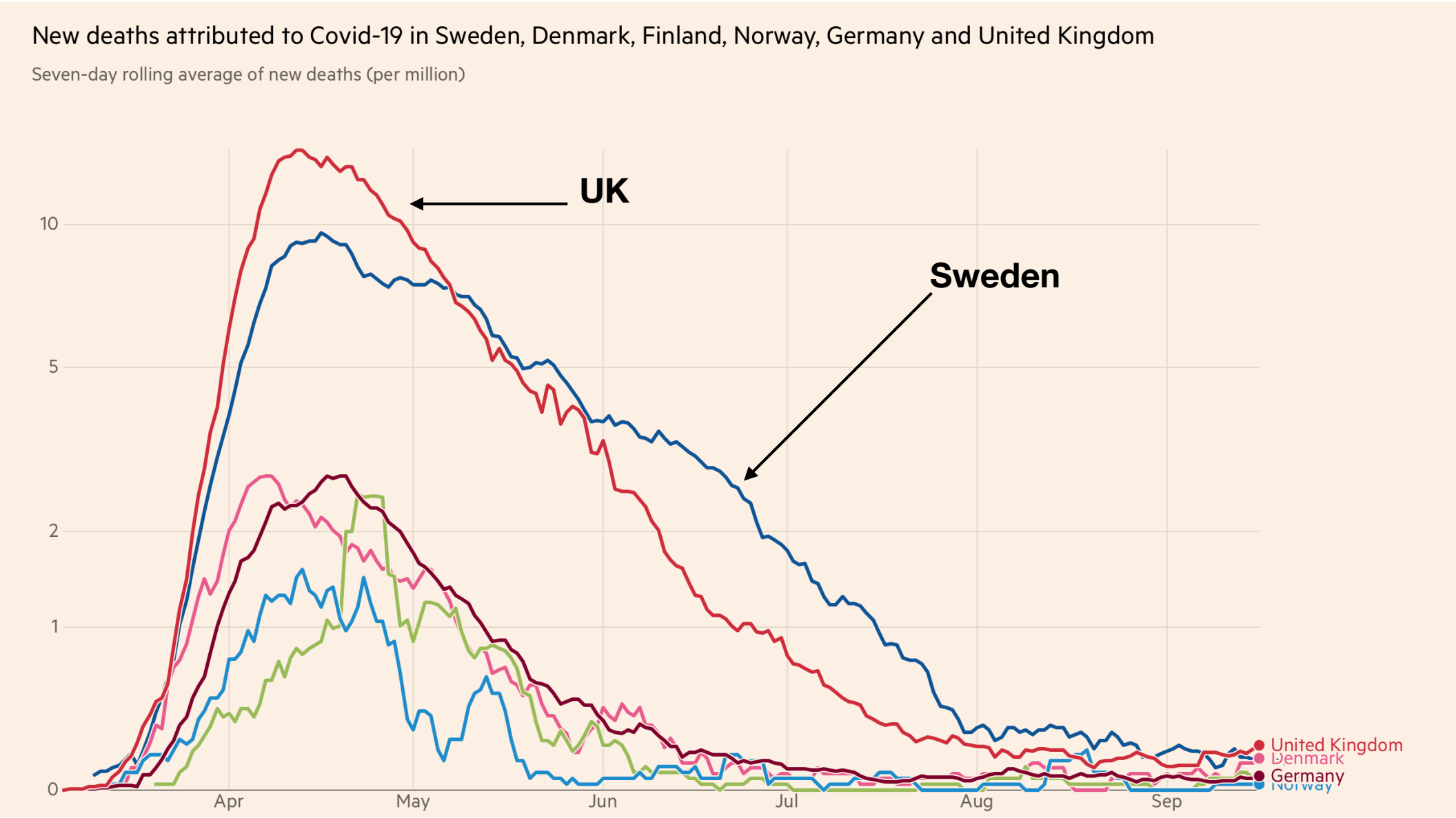
Figure 5: International Covid Deaths and Lost GDP



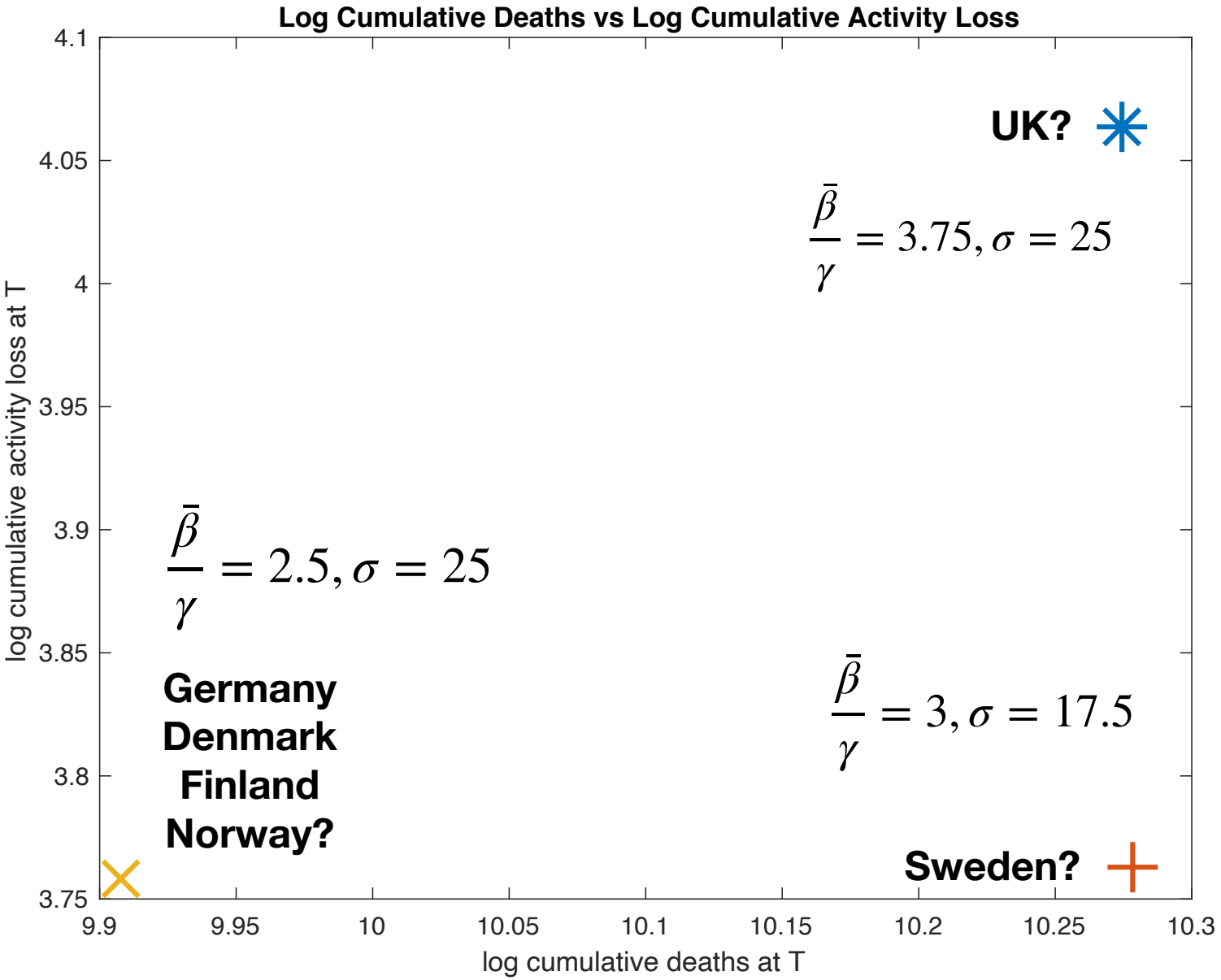
Note: "GDP Loss" is the *cumulative* loss in GDP since the start of 2020 and is annualized. For example, a value of 6 means that the loss since the start of 2020 is as if the economy lost six percent of its annual GDP.

Disentangling luck and policy

Sweden: High basic reproduction number (unlucky) and relatively slow response (policy)



Differences in transmission and elasticity of response of activity to infections

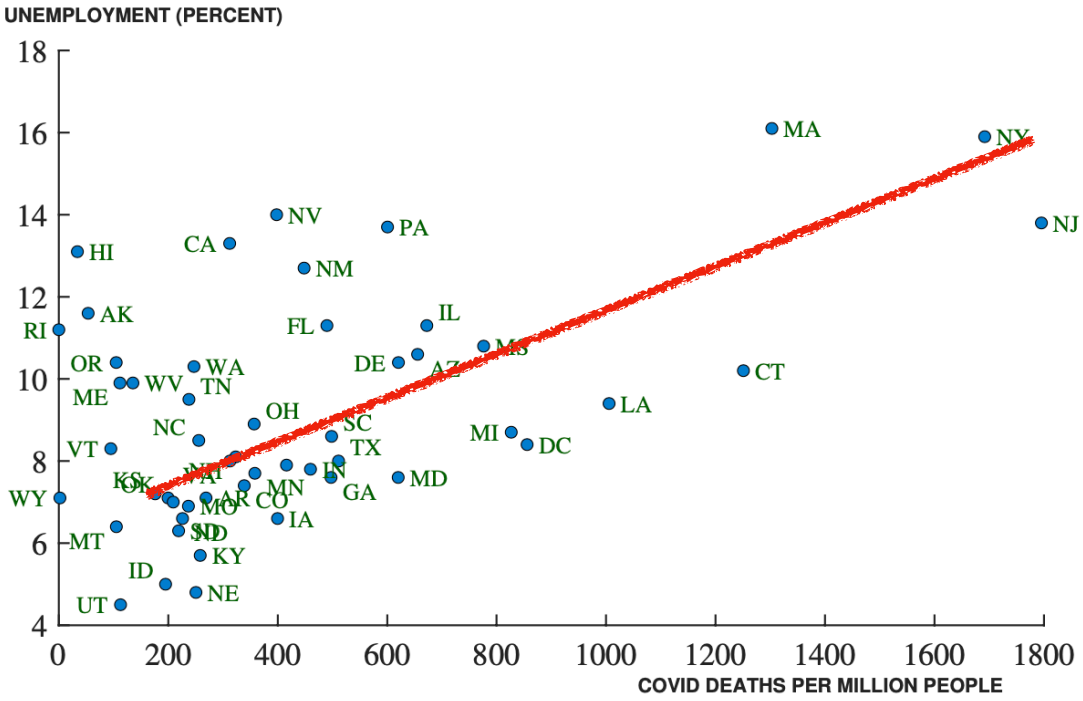


Conclusions

- Simple comparisons of economic and disease outcomes across countries and regions are not very informative about good versus bad policies

- Luck may well play the most important role

Figure 6: U.S. States: Covid Deaths and the Unemployment Rate



Note: The unemployment rate is from July 2020.