

14.03/14.003 Recitation 9

COVID-19 and Public Policy

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Agenda

- The lock down and VSL
- Optimal labor market policy

Evaluating the lock down

Why are we stuck inside?

- Clearly, the policymakers thought this was the right choice;
- What does this mean for the implied value of a statistical life? (Benefits in terms of lives lost)
- What are we losing out of this? (Costs in terms of foregone consumption)

The trade-offs of a lock down

Simple way to think about it (from Alvarez et al., 2020).

- Benefit: slower contagion rate \Rightarrow less infected people at any given time \Rightarrow hospitals are not overwhelmed \Rightarrow less fatalities (for vulnerable age groups mostly?)
- Cost: lost output (for not infected and lost lives).

The planner therefore wants to minimize the present discounted value of the following loss:

$$\underbrace{wL}_{\text{wages lost}} + \underbrace{I\phi(I)}_{\text{deaths}} \left[\underbrace{\frac{w}{r}}_{\text{lost production}} + \underbrace{\chi}_{\text{extra loss}} \right],$$

where I is the number of infected patients, and $\phi(I)$ is a fatality rate increasing in the number of infections (due to congested hospitals). The stock of infections, I , evolves according to an epidemiological SIR (susceptible-infected-recovered). If lock down is activated and effective, the rate of increase falls.

It's all in the numbers!

Figure: Baseline Parameters

| Parameter | Value | Definition/Reason |
|-----------|----------------------|--|
| β | 0.20 | Daily increase of active cases if unchecked |
| γ | 1/18 | Daily rate of infected recovery (includes those that die). |
| φ | $0.01 \times \gamma$ | IFR: fatality per active case (per day). |
| κ | $0.05 \times \gamma$ | Implies a 3 percent fatality rate with 40 percent infected. |
| r | 0.05 | Annual interest rate 5 percent. |
| ν | 0.667 | Prob rate vaccine + cure (exp. duration 1.5 years) |
| \bar{L} | 0.70 | 1 - GPD share health, retail, government, utilities, and food mfg. |
| θ | 0.50 | Effectiveness of lockdown |
| χ | 0 | Value of Statistical Life $20 \times w$ (i.e. $v.s.l \approx \$1.3M$) |

Plausible? My friend Gianluca Rinaldi estimated 0.05% for the population below 60, and about 4% above, so overall 1% makes sense.

Welfare gains from lock down

| Case | Parameters | Welfare Loss | Output Loss | Welfare Loss |
|-------------------------------------|-----------------------------------|--------------|-------------|--------------|
| | | w/Policy | w/Policy | No Policy |
| $v.s.l = 10 \times$ GDP per capita | $\chi = -\frac{1}{2} \frac{w}{r}$ | 0.9 % | 0.1 % | 0.9 % |
| $v.s.l = 20 \times$ GDP per capita | $\chi = 0$ | 1.6 % | 0.4 % | 1.9 % |
| $v.s.l = 30 \times$ GDP per capita | $\chi = \frac{1}{2} \frac{w}{r}$ | 2.2 % | 0.6 % | 2.8 % |
| $v.s.l = 80 \times$ GDP per capita | $\chi = 3 \frac{w}{r}$ | 4.5 % | 2.5 % | 7.5 % |
| $v.s.l = 140 \times$ GDP per capita | $\chi = 6 \frac{w}{r}$ | 6.2 % | 2.7 % | 13.2 % |

Benchmark assumes VSL is 20 times the GDP per capita in a year (about \$1.3m.) The EPA suggests \$7.4m of 2006 dollars, about \$9.5m today, so for this look at last line. Using the EPA number, the gains in this model are about 7% of annual GDP averted losses (pretty big!).

What's missing?

- Heterogeneity by age: VSL varies a lot!

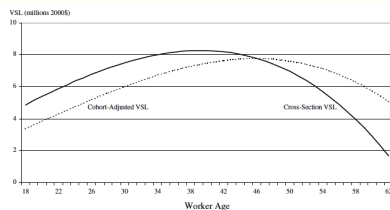


Fig. 5.1 Cohort-adjusted and cross-section value of statistical life, 1993–2000.
Source: Aldy and Viscusi (2008).

- Hall et al. (2020) incorporate this fact and show that, on average, the US population would be willing to give about 20% of annual consumption in order to avoid the COVID mortality *overall*.

What's missing? Distributional issues!

- This is a “representative agent” model. Everyone gets the same utility and faces the same mortality.
- However, different *labor market risks*;
- In the US: job loss \Rightarrow insurance loss \Rightarrow *higher health risk(!)*
- The model assumes economy bounces back right after...what about debt?
- Job prospects of incoming cohort?
- Next topic: job destroyed and costly to create \Rightarrow labor market policies.

Unemployment and search

In this class, we have always assume that labor markets clear.

- Crucial assumption: Everyone who wishes to work can get a job, every firm who wishes to fill a position does so instantly;
- Reality: both workers and firms *search* for a match.
- Typical assumption:

$$\text{matches} = m \cdot (\text{Number unemployed})^\alpha (\text{Number vacancies})^{1-\alpha}.$$

- Probability of entering a match for workers:

$$\frac{\text{matches}}{\text{Number unemployed}} \Rightarrow \text{Falls with Unemployment.}$$

- Many loose job at the same time \Rightarrow long unemployment spells.

The individual costs of destroying a match

A large literature has found that losing a job has large, persistent effects for workers.

Figure: From Jacobson et al. 1993



Why? Loss of skills specific to the match (training received in the firm), loss of general human capital during unemployment.

The social costs of destroying a match

But that's not all...

- In a recessions the many jobs that are destroyed will have to be recreated;
- Creating vacancies is costly (ads, agencies);
- Searching for a job is costly (time not spent otherwise);
- \Rightarrow aggregate loss from unemployment crises;
- Partial mitigation: if there is a lot of unemployment, firms will open more vacancies *ceteris paribus*. But what if recession affects their revenues and demand?

The policy challenge

How to best allocate funds to fight the impending recession? Labor market alternatives:

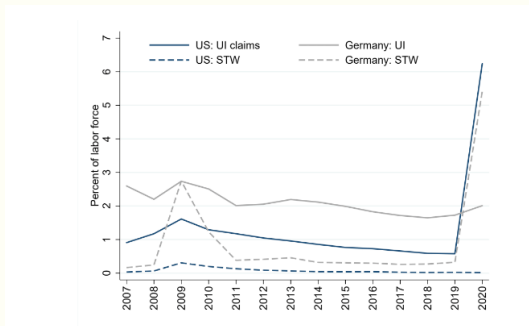
- Boost unemployment benefits, so that demand does not fall as much (what US has done);
- Subsidize firms to keep workers and implement short-time work (STW), so that demand does not fall much *and* the search costs post-recession are saved (what EU has done).

Requires these assumptions to be optimal:

- US alternative: firms are optimally laying off, keeping the workers they will need after, thus partially internalizing the search costs to be borne later. Firms will not have long-term impact (survival not significantly affected now). Only friction is demand externality;
- EU: firms are often liquidity constrained, so they cannot keep their workers optimally. There is a labor market friction to correct.

Differences in UI vs. STW across US and EU

Figure: Giupponi and Landais, some weeks back (2020)



Quantitative estimates from Italy by Giupponi and Landais (2020) show that there are benefits over UI for short-term crises!

Costs and benefits

So why did the US not do so?

- ❶ Government actually believes markets operate efficiently. US labor market operates consistently better than the Italian one. Costs might not be worth the benefits.
- ❷ Costs/political concerns: UI benefit raise temporarily might cause less lobbying requests in the future compare to STW, afraid to introduce it;
- ❸ Related concern that it might become a more permanent policy: in the long-run, subsidizing jobs in crisis hampers reallocation across sectors.