14.03/14.003 Recitation 9
COVID-19 and Public Policy

Andrea Manera

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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 ⇒ less infected people at any given time ⇒ hospitals are not overwhelmed ⇒ 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 if 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 w/Policy	Output Loss w/Policy	Welfare Loss 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!

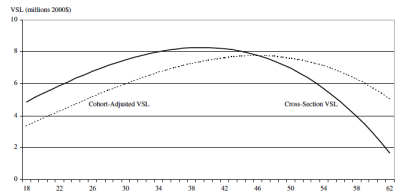


Fig. 5.1 Cohort-adjusted and cross-section value of statistical life, 1993–2000.
Source: Aldy and Viscusi (2008).

- 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 ⇒ insurance loss ⇒ *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 ⇒ 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

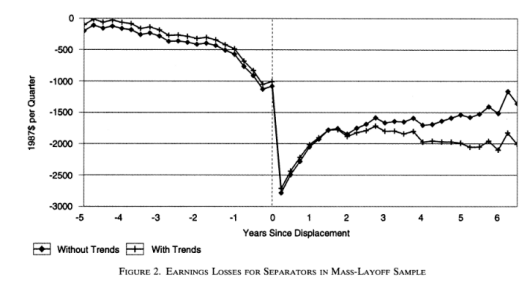


FIGURE 2. EARNINGS LOSSES FOR SEPARATORS IN MASS-LAYOFF SAMPLE

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:

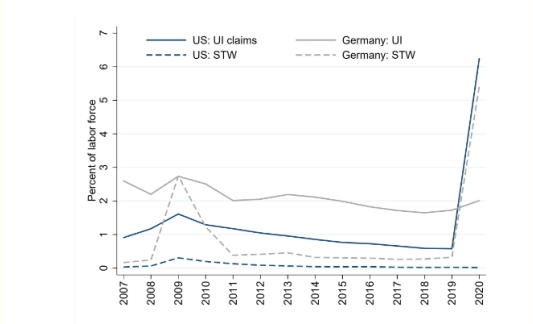
- Boost unemployment benefits, so that demand does not fall as much (what US has done);
- Subsidize firms to keep workers and implement short-time work (STW), so that demand does not fall much *and* the search costs post-recession are saved (what EU has done).

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?

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