Restarting an Economy with Heavy Reliance on Cross-Border Workers

World Bank E-Seminar Series on « Labor Mobility, Migration, and Covid-19 »

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I. Labor mobility and Covid – the Luxembourg exception!

II. Modeling economic and health dynamics (Eco-SIIR model)

III. Implementing containment measures

IV. Lifting containment measures

V. What lessons from Luxembourg?
Labor mobility & Covid – HIC in general

- Pre-Covid migration to HI countries
  - From 4.5% in 1960 to 12.5% in 2020 in total
  - From 1.5% to 9% from developing states
  - Some very HS + many LS immigrants
  - Causal effect of LS immig. on votes for right-wing parties
Labor mobility & Covid – HIC in general

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➔ Surge of populism (Brexit, La Lega, FN, AfD, FPö, Vox, Vlaams Belang... Trump’s border wall)
**Labor mobility & Covid – HIC in general**

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- **Covid and post-Covid times**
  - Lockdown: limit mobility to avoid propagation
  - After lockdown: heterogeneous capacity to eradicate the virus across countries (Africa?)
  - Travel and migration restrictions in the coming years?
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➔ Implications for economic development and for illegal migration pressures?
Labor mobility & Covid – The Luxembourg exception

• Pre-Covid migration to Lux
  • From 14.8% in 1960 to 45.0% in 2020 in total
  • With 88% of Europeans + many HS
  • And cross-border workers around ½ of labor force
  • Very modest populist tensions
Labor mobility & Covid – *The Luxembourg exception*

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**• Covid and post-Covid times**

- Lockdown: travel controls but never close borders as cross-border workers are vital for many sectors (health)
- Heterogeneous capacity to eradicate the virus in neighboring regions (Greater Region)
- Impossible to restart without cross-border workers!
Labor mobility & Covid – The Luxembourg exception

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➤ Implications of cross-border flows for public health and economic policies?
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An Eco-SIIR model

**Economic block**

- I/O linkages between sectors (weekly lag)
- Two types of sectors (19)
  - Non-lockdown ➔ demand-constrained
  - Lockdown ➔ supply-constrained
  - Limited I/O multiplier!
- Exo trade flows + teleworking
- Restarting a sector impacts the demand addressed to other sectors ➔ ΔEmployment
- Infection determines supply of labor

**Epidemiological block**

- SIR with 16 types of workers
  - 4 regions of residence: Lux, Bel, Ger, Fra
  - 4 types (no deaths) : S, I_s, I_a, R
- SIR system for each sector (19x16/week)
  - Prob to be infected on the job (β_{lab})
  - Prob to be infected outside (β_{orig})
- Exo public health measures + infection curves in neighboring regions
- Employment determines P_{lab} and P_{out} through endogenous time allocation
An Eco-SIIR model

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Parameterization

**Economic block**

- **Pre-lockdown period**
  - VA + Employment by sector
  - I/O table of Luxembourg (STATEC)
  - Scenarios about exports and imports (Ifo)

- **Post-lockdown**
  - Changes in total sales, teleworking (CoC)
  - Chômage partiel + parental leave + covid cases (IGSS/ADEM)
  - Domestic demand: hypotheses

**Epidem. block**

- **Reproduction number**
  - Industry FE: « prox/exp » index for $\beta_{\text{industry}}/\beta_{\text{Lux}}$
  - Time FE: increasing social distancing and medical protection measures

\[
R_{\text{tot}} = \rho_{\text{tot}} \frac{\beta}{\gamma} = \rho_{\text{tot}} \frac{E R_s \beta}{ER_u \gamma}
\]

  - $I_a = 2.I_0$ by hypothesis

- **Fit the infection curve**
  - Initial stock of infected by sector from IGSS
  - Time FE calibrated to match the dynamics of average infection rates
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Effect of permanent containment measures

Key findings:

- Pre-lockdown week: -3%
- Lockdown weeks: -29%
- Annual GDP loss: -22%

- Infection peak by end of March
- Almost zero at beginning of June
- LR percentage of immune = 3.1%
- Restarting with immune workers only is useless
Sensitivity to trade and teleworking

Key findings:

- Trade scenarios induce minor effects in a supply-constrained economy
- Negligible effect on infection curve
Sensitivity to trade and teleworking

Key findings:

- Teleworking has huge effect on VA
- Mostly in services (80% of GDP) and finance (45%), among HS workers
- Smaller but beneficial effect on infection curve
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Restarting construction sectors on April 20

Key findings (no testing):

- If Ro cst (very opt) or x2 (opt), no rebound in infection curve (Ro<1)
- If Ro x3, rebound with smaller peak around Oct 20
- Around 1800 infected (600 sympt.)

Testing

- Assume Ro x3
- Weekly/daily testing prevents a relapse
- One-shot testing has almost no effect
Restarting all other sectors on June 1

Key findings (no testing):

• Nb infected almost nil w/o in lockdown
• But >0 due to const. (1000 if Ro x3)

• If Ro cst or x2, no rebound
• If Ro x3, rebound with new peak in Nov
Restarting all other sectors on June 1

Key findings (testing):

- Assume Ro x3
- Weekly or daily testing prevents a relapse
- One-shot testing slightly attenuates and postpones the second peak
On-demand testing, when infected >2000

Key findings (testing if infected >2k):

• First massive testing on April 20 (const.) and June 1
• New massive testing needed in September (3m)
• Other massive testing needed by mid-October (1.5m)

... until vaccine is on the market!
Role of cross-border workers

Key findings (testing residents only):

• If frequent tests, no contamination
• Due to low contamination in other regions
• If infrequent tests for nationals, XB workers accelerate the relapse
• Infrequent testing for res. = absence of testing
Role of cross-border workers

Key findings:

- Relapse is inevitable without testing
- Role of reproduction nb. abroad is crucial (Ro x2 of x3 => infected x3 or x4)
- Can be solved with more frequent testing (monthly)
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Lessons from Luxembourg

- Except under optimistic social distancing (Ro<1 in all sectors), restarting with very small share of infected generates a rebound. And labor mobility propagates the virus...

- But labor mobility is vital in Luxembourg
  - XB>60% in CON, WHO bus., MAN; 52% in FIN
  - Like posted workers, but remunerated as Lux workers and subject to Lux fiscal system; not perceived as social dumping

- **Teleworking + frequent testing help prevent this rebound**

- XB mobility is not an issue if XB workers are tested as nationals (or if nationals are tested frequently and reproduction is low at origin)
(Simple) lessons from Luxembourg

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- Restarting ➔ conditions are favorable for relapse, which can be accelerated if (il)legal migration (from countries with high share of infected people)
- International migration is vital for LDC’s and more and more seen as a development tool
  - Despite positive selection, positive effects through remittances, diaspora ext, brain circulation, incentive to invest in human capital

- Digital capitalism? For the HS, teleworking = way to benefit both origins & destinations
- Int’l migration is not an issue if newcomers are tested upon arrival, then tested as nationals
The End