THE POWER OF CREATIVE DESTRUCTION

PHILIPPE AGHION
CELINE ANTONIN
SIMON BUNEL
CREATIVE DESTRUCTION ...

- Process whereby new innovations displace old technologies
  - Joseph Schumpeter in *Capitalism, Socialism et Democracy* (1942)
“SCHUMPETERIAN GROWTH” PARADIGM

- Long-run growth driven by cumulative process of innovation
- Innovations result from entrepreneurial activities motivated by prospect of innovation rents
- Creative destruction: new innovations displace old technologies
CREATIVE DESTRUCTION ...

• Contradiction:
  • The innovator is motivated by prospect of monopoly rents
  • But those rents can be used ex post to prevent future innovations and to block new entry

• Schumpeter was deeply pessimistic about the future of capitalism
• This book is about why Schumpeter’s pessimistic prophecy did not come true
• It advocates an « optimism of the will »
CREATIVE DESTRUCTION IN REALITY

• New patents:

Corrélation positive entre croissance du PIB par habitant et brevets
Source : Akcigit, Grigsby et Nicholas (2017).
CREATIVE DESTRUCTION IN REALITY

- Link to firms’ life cycle

Taux de croissance de l’emploi et taux d’éviction en fonction de l’âge des entreprises.
CREATIVE DESTRUCTION IN REALITY

- Firm and job turnover

Corrélation positive entre croissance du PIB par habitant et taux de destruction créatrice. 
Source: Eurostat.
THIS BOOK USES THE LENS OF CREATIVE DESTRUCTION TO...

• Revisit some main *enigmas in economic history*
• Question some *common wisdoms*
• Rethink *the future of capitalism*
SOME HISTORICAL ENIGMA
SOME HISTORICAL ENIGMA

- Industrial take off
- Technological waves and their effects on employment
- Secular stagnation
- Middle income traps
- Sources and dynamics of inequality
- Path dependence in clean versus dirty innovation
INDUSTRIAL TAKE OFF
SOME HISTORICAL ENIGMA

- Industrial take off
- **Technological waves and their effects on employment**
- Secular stagnation
- Middle income traps
- Sources and dynamics of inequality
- Path-dependence in clean versus dirty innovation
Figure 3.1. Taux de croissance annuel de la productivité globale des facteurs. Note : Indicateur filtré par le filtre Hodrick-Prescott ($\lambda = 500$).
SOME HISTORICAL ENIGMA

- Industrial take off
- The effect of technological revolutions on employment
- Secular stagnation
- Middle income traps
- Sources and dynamics of inequality
- Path-dependence in clean versus dirty innovation
Rise and Decline in TFP Growth

![Graph showing the rise and decline in TFP growth over three periods: 1949-1995, 1996-2005, and 2006-2017. The graph indicates a significant peak in TFP growth during the 1996-2005 period, followed by a decline in the subsequent period.]
TFP Growth by IT Intensity
SOME HISTORICAL ENIGMA

- Industrial take off
- The effect of technological revolutions on employment
- Secular stagnation
- Middle income traps
- Sources and dynamics of inequality
- Path-dependence in clean versus dirty innovation
Figure 7.1. PIB par habitant en Argentine par rapport au niveau américain. 
Source : Aghion (2016).
SOME HISTORICAL ENIGMA

• Industrial take off
• The effect of technological revolutions on employment
• Secular stagnation
• Middle income traps
• **Sources and dynamics of inequality**
• Path-dependence in clean versus dirty innovation
Income shares at the very top over last 100 years:
US top 1% increases from 9% in 1978 to 22% in 2012

Source: Atkinson, Piketty & Saez; High Income Database
Top Income Share and Patenting

United States, 1963-2013

Number of patents per 1000 inhabitants

Top 1% income share

Source: Aghion et. al. (2015)
Innovation, part des revenus du top 1 % et coefficient de Gini. 

SOME HISTORICAL ENIGMA

- Industrial take off
- The effect of technological revolutions on employment
- Secular stagnation
- Middle income traps
- Sources and dynamics of inequality
- Path-dependence in clean versus dirty innovation
QUESTIONING COMMON WISDOMS
QUESTIONING COMMON WISDOMS

• Taxing robots protects employment
• Taxation is main instrument to make growth more inclusive
• Protectionism is the way to regain control of value chains
• Zero or negative growth is the best response to the climate challenge
Impact de la variation de l'automatisation sur la variation de l’emploi au niveau de l’usine.
Price Dynamics

Controlling for 4-digit industry by year F.E. and HS6 product F.E.
Effet d'un investissement substantiel en machines sur la probabilité de sortie d'une entreprise
QUESTIONING COMMON WISDOMS

- Taxing robots protects employment
- **Taxation is main instrument to make growth more inclusive**
- Protectionnism is the way to regain control of value chains
- Zero or negative growth is the best response to the climate challenge
Figure 5.6. Innovation et mobilité sociale.
Source : Aghion, Akcigit, Bergeaud, Blundell et Hémous (2019).
Figure 5.7. Salaire moyen des travailleurs peu qualifiés.
Source : Aghion, Bergeaud, Blundell et Griffith (2019).

Figure 5.8. Salaire moyen des travailleurs qualifiés.
Source : Aghion, Bergeaud, Blundell et Griffith (2019).
QUESTIONING COMMON WISDOMS

• Taxing robots protects employment
• Taxation is main instrument to make growth more inclusive
• Protectionnism is the way to regain control of value chains
• Zero or negative growth is the best response to the climate challenge
Evolution des importations et exportations de produits destinés à la lutte contre le Covid-19
QUESTIONING COMMON WISDOMS

• Taxing robots protects employment
• Taxation is main instrument to make growth more inclusive
• Protectionnism is the way to regain control of value chains
• Zero or negative growth is the best response to the climate challenge
Figure 9.1. Évolution du nombre de brevets triadiques verts et polluants dans le secteur de l’automobile, 1980-2005.

*Source* : Aghion, Dechezleprêtre, Hémous, Martin et Van Reenen (2016).
RETHINK CAPITALISM
RETHINK CAPITALISM: COVID AS A REVELATOR

• Broken social model in the US
• European ecosystem does not favor innovation
COVID AS REVELATOR

<table>
<thead>
<tr>
<th></th>
<th>Indice de Gini</th>
<th>Taux de pauvreté</th>
</tr>
</thead>
<tbody>
<tr>
<td>États-Unis</td>
<td>0,390</td>
<td>0,178</td>
</tr>
<tr>
<td>Allemagne</td>
<td>0,289</td>
<td>0,104</td>
</tr>
<tr>
<td>Suède</td>
<td>0,282</td>
<td>0,093</td>
</tr>
<tr>
<td>Norvège</td>
<td>0,262</td>
<td>0,084</td>
</tr>
<tr>
<td>France</td>
<td>0,292</td>
<td>0,081</td>
</tr>
<tr>
<td>Danemark</td>
<td>0,261</td>
<td>0,058</td>
</tr>
</tbody>
</table>
COVID AS REVELATOR
COVID AS REVELATOR

[Graph showing trends over years for different countries and indicators]
COVID AS REVELATOR

Brevets en biotechnologies (pour 1 million d’habitants)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>US</td>
<td>10.37</td>
<td>10.56</td>
<td>10.84</td>
<td>12.25</td>
<td>11.74</td>
<td>12.71</td>
<td>12.77</td>
</tr>
<tr>
<td>EU27</td>
<td>5.12</td>
<td>5.19</td>
<td>5.02</td>
<td>4.87</td>
<td>5.13</td>
<td>5.02</td>
<td>4.67</td>
</tr>
<tr>
<td>OECD -</td>
<td>6.69</td>
<td>6.75</td>
<td>6.69</td>
<td>7.11</td>
<td>7.17</td>
<td>7.47</td>
<td>7.48</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>China</td>
<td>0.23</td>
<td>0.25</td>
<td>0.25</td>
<td>0.31</td>
<td>0.34</td>
<td>0.42</td>
<td>0.49</td>
</tr>
</tbody>
</table>

Source: Authors’ calculations using OECD data.

Notes: Reference country: Inventor’s country of residence. Reference date: priority date.
Mesures de la BARDA pour lutter contre le COVID-19

<table>
<thead>
<tr>
<th>Type of Product</th>
<th>Total Award Amount ($)</th>
<th>Total number of funded companies</th>
<th>Total number of funded products</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vaccines</td>
<td>10,799,025,489</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>Diagnostic</td>
<td>44,996,752</td>
<td>22</td>
<td>28</td>
</tr>
<tr>
<td>Therapeutics</td>
<td>991,702,154</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>Rapidly Deployable Capabilities</td>
<td>10,432,068</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>Other</td>
<td>37,333,253</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>11,883,489,716</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
COVID AS REVELATOR

Financement de la Commission européenne et de la Banque européenne d’investissement

<table>
<thead>
<tr>
<th>Funding Purpose</th>
<th>Amount (USD)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>European Commission</strong></td>
<td></td>
</tr>
<tr>
<td>R&amp;D</td>
<td>1,081,600,000</td>
</tr>
<tr>
<td>Preparedness and emergency response</td>
<td>217,107,249</td>
</tr>
<tr>
<td>Unallocated</td>
<td>436,667,248</td>
</tr>
<tr>
<td>Vaccine development</td>
<td>109,166,812</td>
</tr>
<tr>
<td><strong>Total EC</strong></td>
<td>1,844,541,309</td>
</tr>
<tr>
<td><strong>European Investment Bank</strong></td>
<td></td>
</tr>
<tr>
<td>Manufacturing and delivery of therapies</td>
<td>63,316,751</td>
</tr>
<tr>
<td>Manufacturing and delivery of vaccines</td>
<td>91,700,122</td>
</tr>
<tr>
<td>Preparedness and emergency response</td>
<td>2,025,044,367</td>
</tr>
<tr>
<td><strong>Total EIC</strong></td>
<td>2,180,061,240</td>
</tr>
</tbody>
</table>

*Source: Authors’ calculations using data from the COVID-19 Health Funding Tracker, from The Economist.*
RETHINK CAPITALISM

• Combine good side of American model (innovation) with good side of European model (protection)

• Magic triangle: Firms/Market – State – Civil Society (Bowles and Carlin)
OUTLINE

1. Paradigm
2. Take off
3. Technological waves
4. Competition
5. Inequality
6. Secular stagnation
7. Middle income trap
8. Structural change
9. Green innovation
10. Behind the scene
11. Creative destruction, health and happiness
12. Financing creative destruction
13. Globalization
14. Emergence de Investor-State and Insurer-State
15. The magic triangle between firms, the state, and civil society

Conclusion: the future of capitalism
Thank you!