

# TSE MAG

Toulouse  
School of  
Economics

Economics  
for the Common  
Good

**CORONAVIRUS  
COVID-19**

Le Gouvernement a pris des mesures (Décret 2020-260 du 16/03/2020) afin de lutter contre l'épidémie de COVID-19. Pour protéger les habitants en contribuant à limiter la propagation du virus et éviter tout regroupement.

**l'accès aux berges et à leurs dépendances est  
STRICTEMENT INTERDIT**

Tout contrevenant s'expose à une contravention 4<sup>ème</sup> classe  
(Décret 2020-264 du 17/03/2020)



Special Issue  
Spring 2020

The world  
after  
Covid-19

# TSE joins the forces on Covid-19

The Covid-19 pandemic and large-scale population containment raise new social and economic issues that urgently require novel analyses. In the months ahead, the opportunities and obligations for social scientists to contribute to society will be greater than ever. Economic science offers cutting-edge analytical tools for guiding decision-makers and we hope they will be used to manage this health crisis and its devastating health and economic consequences.

Inside, we feature a special dossier on the economics of the new coronavirus. Jean Tirole writes that we must learn greater solidarity and embrace long-term planning. Alice Mesnard and Paul Seabright remind us that trust matters more than transparency. Stephane Straub and I share some insights on the value of human life and the necessity to socialize the losses. Marie-Françoise Calmette looks at the impact of globalization on our health security. With new research on French citizens' compliance with Covid-19 health measures, Michael Becher shows that social science can be of immediate relevance to policymakers. Ulrich Hege warns of looming corporate debt burdens. And Marc Ivaldi discusses the impact on the airline sector.



**Christian Gollier**  
TSE Director

For an escape from thoughts of Covid-19, we also feature an interview with the award-winning architects of our new building. University of Chicago's Marianne Bertrand, winner of our Jean-Jacques Laffont Prize, discusses gender inequalities and the dangers of corporate philanthropy.

TSE is a project that connects people and ideas. We began the year by opening the doors of our new home: an innovative, energy-saving building designed to promote intellectual exchange. Those doors have now closed. Safety concerns are paramount, and we will all need time to adjust to this unprecedented situation. But it is heartening to see that TSE teams are already busy using remote working tools to interact with each other, setting up video conferences and project sharing. We hope also to announce our first remote Department Seminar very soon.

The pandemic is still spreading but the TSE project is already fighting back.

We wish you all the very best and look forward to "seeing" you in the near future.

## News corner

**4.** Grants, Appointments, Books & Prizes

**6.** TSE new building interview with the architects

## The interview

**8.** Marianne Bertrand 'We are losing patience with discrimination'

## The world after Covid-19

**16.** Jean Tirole Rebuilding the world after Covid-19

**26.** Marc Ivaldi Travel & airlines

**36.** Michael Becher Who will rebel against lockdown?

**20.** Marie-Françoise Calmette Globalization: The day after

**28.** Christian Gollier & Stéphane Straub Value of human life

**38.** Cécile Aubert The black hole in public policy

**22.** Ulrich Hege Corporate debt

**34.** Alice Mesnard & Paul Seabright Trust matters

## Experts

**40.** Luc Julia 'There is no such thing as AI'

## Campus

**42.** Business Networking Day

Biannual magazine of the Toulouse School of Economics

www.tse-fr.eu  
contact@tse-fr.eu

Publication Director: Christian Gollier

Managing Editor: Joël Echevarria

Editor in chief: Jennifer Stephenson

Production Manager: Jean-Baptiste Grossetti

With the help of Claire Navarro James Nash

Layout design Blackpaper

ISSN: 2554-3253

Cover photo: Cendrine Robert, Place S<sup>t</sup> Pierre, Toulouse, March 28, 2020

Pictures: studiotchiz fotolia istock unsplash



This magazine has been funded by a French government subsidy managed by the Agence Nationale de la Recherche under the framework of the investissements d'avenir programme reference ANR-17-EURE-0010

## Special issue

### Covid-19

#### Christian Gollier joins board of 'real-time' Journal of COVID Economics

The Centre for Economic Policy Research (CEPR) is launching an online peer-reviewed review to disseminate emerging scholarly work on the Covid-19 epidemic. TSE director Christian Gollier has accepted an invitation to join the editorial board, which will work tirelessly to approve coming publications.

#### Emmanuelle Auriol to advise French government on how to manage crisis

As part of the Conseil d'Analyse Économique (CAE), Emmanuelle Auriol is guiding France's economic response to Covid-19. The CAE is an independent institution helping the French government through policy papers and analysis. The TSE-UT1C researcher joined the CAE in 2018.

## Grants

### New ANR and ERC grants for TSE research

Abdelaati Daoui and Sébastien Gadat, both TSE-UT1C professors, received ANR grants for their projects.

#### Isis Durrmeyer wins ERC grant

Consolidating TSE's position as the third-largest European beneficiary of ERC grants, Isis Durrmeyer has been awarded a starting grant for her research project PRIDISP – Understanding price dispersion: new structural models of price discrimination and applications. This new ERC grant brings to 20 the total number of grants hosted by TSE since the creation of this fund, 10 of which are currently underway.

## Appointments

#### Stefan Ambec to lead commission... on Mercosur

The TSE-INRA professor will coordinate a team of ten scientific specialists to analyse the main impacts of the Mercosur trade deal between the EU and Mexico.

#### Michel Moreaux elected EAERE fellow

Founder of the TSE environment group, Michel Moreaux has been elected Fellow of the European Association of Environmental and Resource Economists (EAERE). Michel's outstanding scientific output over the past 30 years has helped to bring international recognition for French environmental economists.



## Books

#### Jérôme Renault on game theory

A new textbook by TSE researcher Jérôme Renault provides a concise presentation of the mathematical foundations of game theory including recent advances in dynamics and learning. Coauthored with Rida Laraki and Sylvain Sorin, Mathematical Foundations of Game Theory combines the basics with state-of-the-art topics and applications to economics, biology, and learning.



## Prizes

#### Best paper awarded to Daniel Garrett

Congratulations to TSE professor Daniel Garrett who won the ESEM 2019 Prize for Best Applied Economics Paper by a Young Economist. The prize was awarded for his article "Payoff Implications of Incentive Contracting" at the European Meeting of the Econometric Society held in August.

#### Lifetime honor for Jean-Paul Azam

In recognition for his scientific work on militarized conflict, TSE researcher Jean-Paul Azam has been awarded the Lewis Fry Richardson Lifetime Achievement Award 2019. The prize encourages scholars to pursue innovative, systematic and rigorous research in the tradition of British meteorologist and peace researcher Lewis Fry Richardson.



#### Christian Gollier wins the Turgot 2020 prize

The Turgot Prize, which rewards the best financial economics book of the year, took place at Bercy, at the Ministry of Economy and Finance and awarded its 33rd prize to Christian Gollier for his book "Le climat après la fin du mois".

UNIVERSITÉ  
TOULOUSE  
CAPITOLE



A new home  
for science

# Building a space for blue-sky thinking

TSE moved into a new building last November with state-of-the-art research facilities, including a social experiment lab, powerful calculation servers and six amphitheatres. The distinctive design is the work of Shelley McNamara and Yvonne Farrell, who are also this year's winners of the Pritzker Prize, architecture's highest accolade. We talked to them and Grafton Architects' project director Philippe O'Sullivan about their efforts to integrate their bold, powerful vision into the Toulouse landscape.

## What led you to the idea of this building?

**Shelley McNamara** – The shape comes very much from the site. It's not a rectangular site; it's at a corner where the Canal de Brienne meets the Garonne river and the Place Saint-Pierre. We started thinking about a very rectangular building, but it didn't work for the site and for the TSE community who were looking for loose arrangements of groups in order to spark exchanges and interactions.

Regarding the outside of the building, well, you couldn't avoid bricks. It was the obvious thing to do. We come from a brick city as well, Dublin. It's a material that we love, and it seemed very important that we make the new building a part of the city. Bringing the city into the heart of the building was very important, and that when you're in the building you still can see the city.

**Yvonne Farrell** – Alejandro de la Sota, the Spanish architect, once said: "Architects should make as much

**"It's a real honor for us to have built a building which is now part of the wonderful repertoire of Toulouse"**

nothing as possible." The power of the central space, with the lifts and the staircases dancing around the void, is that the "nothing" is in fact the heart of the building. It's the

**"We wanted to frame the sky at that moment when you move from Place Saint Pierre to what we call our 21<sup>st</sup> century courtyard"**



Space makers: Shelley McNamara and Yvonne Farrell, the latest winners of architecture's "Nobel prize"

place people look into, and where they stand and watch; it's a piece of the city held for a moment within the solid. So many contemporary buildings are deep spaces that are sealed environmentally, but this building is no more than 12 meters deep, so that everyone can open a window and connect with nature. This narrowness is a very important part of the building.

**Philippe O'Sullivan** – It's a building that you could only build in Toulouse. We wanted the building to be open to the city and the people in the city to see into the building.

**"It's a building that you could only build in Toulouse"**

It was a collaborative process and it couldn't have been possible without the people in Toulouse we exchanged with: Bruno Sire who understood Toulouse and how to make this building part of the city, and the hundreds of people who should be congratulated for their hard work on this building.

## What was the inspiration behind the Sky Cloister?

**SM** – When we looked up from a lot of the small courtyards in Toulouse, we found that the sky is framed by the courtyard, and it feels like a sky window. So we wanted to frame the sky at that moment when you move

from Place Saint-Pierre to what we call our 21st-century courtyard. We also felt that this building should feel like a gateway to Place Saint-Pierre and the Sky Cloister allowed us to make the building closed, down below, and to open it up as you move up through the building.

## How has the collaborative nature of TSE impacted the building?

**SM** – The heart is the center. So the common spaces – the meeting rooms, the lifts, the toilets – all rotate around the heart. Then you can recede to more private research offices, and the corridors aren't too long so you can always feel in contact. You can go away and be private, but you can also open your office door and see what is happening.

**YF** – When you come to the entrance at the lower level before moving up to your office, you can see who's down for coffee, or bump into your colleagues. By the time you get to the top levels, there's a completely different relationship to the city. It's interesting that the building is also full of transparency: you can see what is happening in the meeting rooms, or see colleagues on the other side of the building. When we came to look at the site, during the competition, the alley of trees around the canal was absolutely beautiful. Wandering around Toulouse, going to Saint-Sernin and Jacobins, we realized that a collection of beautiful pieces of architecture are all within walking distance of this site. It's a real honor to have built a building which is now part of the wonderful repertoire of Toulouse.

# ‘We’re losing patience with discrimination’

Marianne Bertrand,  
Jean-Jacques Laffont Prize 2019



Winner of the 2019 Jean-Jacques Laffont Prize, Marianne Bertrand is Professor of Economics at the University of Chicago Booth School of Business. Ahead of the award ceremony at City Hall and her Toulouse lectures in December on ‘Gender Inequalities in the 21st Century’ and ‘Corporate Philanthropy and Politics’, she talked to TSE Mag about some of the far-reaching social implications of her research.

**Your research has focused heavily on gender, harassment and discrimination. How will labor markets be shaped by these concerns in the 21st century?**

There are multiple reasons why finding ways to get women to realize their full labor market potential will be a pressing question for many developed countries for many years to come. First, many countries are facing an aging population and will need to increase women’s labor-force participation in order to avoid sharp reductions in the workforce. Also, for reasons that we still do not fully understand, women are increasingly accumulating more schooling than men. That means that the private sector is going to be interested in finding ways to attract and retain that female talent. The public sector will also need to find ways to tilt institutions and norms that may still be a barrier to women’s fuller engagement with the labor market. Finally, patience for any discriminatory practice, including gender harassment, is running thin in the richest countries, as exemplified by the strength of the #MeToo movement around the world.

**How optimistic are you that gender gaps will narrow in the years ahead? To what extent will policymakers need to adapt to new forms of inequality?**

There is definitely room for some optimism here. When one looks

**“Gender gaps in labor-force participation and earnings have been declining for decades, even if there is still a long way to go. Most alarming are the growing gaps in income and wealth between rich and poor”**

at the broader conversion today on the rise in inequality, what has been happening with regard to inequalities, and especially gender inequalities, emerges among some of the most positive trends. In particular, the gender gaps in labor-force participation and earnings have been declining for many decades now,

even if there is still a very long way to go to get to gender parity, especially at the top of the talent distribution. Most alarming are the growing gaps in income and wealth between rich and poor, the growing fragmentation of many of the most developed societies by social class, and the implications of these growing inequalities for social mobility.

**What do you make of the recent decision by 181 CEOs of the US’s biggest companies to embrace stakeholder capitalism?**

I wish I could trust corporate benevolence but I am skeptical. I have no doubt that stakeholder capitalism would be good for society, even though the implementation details are very tricky. Governments have failed to pass many of the laws and regulations that are needed to correct externalities. Global warming is of course the top-of-mind example. This means that social welfare is not maximized when corporations solely focus on profits, especially short-term profits. However, I doubt that we can trust corporations to do much on their own to address these externalities given the competitive pressures they face.



**One of your recent papers offers empirical evidence that US corporations use charitable grants to influence lawmakers. What are the dangers of corporate philanthropy?**

You are correct that some of my recent work has aimed to show that philanthropy might be partly used by corporations as a way to influence the lawmaking and rulemaking process. In other words, it is another tool of corporate influence on the political process beside the better understood ones, such as lobbying, campaign contributions, or the revolving door. I believe that corporate influence is one of the key reasons why our laws and regulations do not correct important market failures. For example, corporate influence is an important reason why it has been so difficult to pass any global warming policy in the US. So, from that perspective, yes, I believe it is important to document all the ways via which this influence gets exerted.

The philanthropy sector is under-scrutinized. Corporations and wealthy families get tax breaks for their charity. At a minimum, we need more easily accessible information and more transparency on what all these charitable dollars are being spent on.

**How can we encourage social responsibility without, for example, giving bad actors an opportunity to engage in reputation-washing?**

That is a good question, to which I do not have a great answer. I agree with you that a lot of corporate social responsibility, especially in the B2C part of the economy, is not that different from advertising spending. There is a lot of greenwashing going on, even though it is hard to quantify how much. Better reporting systems that force corporations to report on their social outcomes, rather than purely economic outcomes, are going to be important here. However, as I stated before, while the objective is clear, the devil will be in the detail when it comes to developing robust social-impact reporting standards.

**Your research also uses insights from behavioral science to highlight how scarcity affects our decisions. How has this helped to identify policy initiatives and financial tools for lifting people out of poverty?**

The behavioral science agenda has helped identify some of the common mistakes individuals make when faced with important decisions. This agenda inspired some of the work I

did on payday lending. In that work, we showed that “psychology-guided” information disclosure induce borrowers to lower their use of payday loans. In particular, we showed that reminding borrowers of the adding-up dollar fees incurred when rolling over payday loans reduced the take-up of these loans. While I believe that such a “nudge” approach is useful and helps people at the margin, I am less convinced that it has the power to lift people out of poverty. More meaningful progress can only come from addressing the root cause of why so many people use such expensive financial products in the first place. I don’t think the central root cause is a lack of understanding of how expensive these products really are (even if it is a factor, as we show in our work). The root cause is low and stagnant paychecks at the bottom and middle of the income distribution in the US for too many decades.

**What are the costs of the failure of economics, as a discipline, to attract more female researchers?**

As I discussed in a recent interview with UBS, there’s no doubt that by limiting our profession to men, we are leaving a lot of discoveries on the

**“Stakeholder capitalism would be good for society, but implementation is very tricky. Governments have failed to pass the regulations needed so social welfare is not maximized when corporations solely focus on profits”**

table. When our profession becomes more diverse, the kind of questions that we study becomes more diverse as well, and that is a great thing.

**What measures can be taken to address this?**

We need to more institutions to adopt best practices when it comes to reducing bias (implicit or not) in hiring and promotion decisions. The AEA has been doing a lot of work to make these best practices more easily accessible to its members. Here is a link: <https://www.aeaweb.org/resources/best-practices> We also need to build stronger pipelines, starting in high schools. Too many young people have a poor understanding of what economists do, or the type of questions economists study. Again, the AEA has recently taken on this challenge to help reshape the perception of economics, away from the dry and boring and uncaring stereotype. Role models are also an important part of the answer and I guess that we’re going to see a big increase in the number of young women applying to PhD programs next year thanks to Esther Duflo being awarded the Nobel Prize.

## A worthy winner

Organized by TSE, the Jean-Jacques Laffont Prize is awarded every year to an international economist who has made an outstanding contribution to both theoretical and empirical research.

Marianne has already received several prestigious awards, including the American Economic Association’s 2004 Elaine Bennett Research Prize and the Society of Labor Economists’ 2012 Rosen Prize.

Born in Belgium, Marianne is an applied micro-economist with interests in labor economics, corporate finance, and development economics. She is a co-director of Chicago Booth’s Rustandy Center for Social Sector Innovation, Director of the Poverty Lab at the UChicago Urban Labs and on the Board of Directors for the Abdul Latif Jameel Poverty Action Lab.



# The world after Covid-19



---

**P16-19.**  
Jean Tirole  
**Rebuilding the world after Covid-19**

**P20-21.**  
Marie-Françoise Calmette  
**Globalization: the day after**

**P22-23.**  
Ulrich Hege  
**Corporate debt threatens to derail recovery**

**P24-25.**  
Marc Ivaldi  
**Travel bans put airlines into nosedive**

**P26-27.**  
Christian Gollier & Stéphane Straub  
**Value of human life**

**P28-33.**  
Alice Mesnard & Paul Seabright  
**Trust matters more than transparency**

**P34-35.**  
Michael Becher  
**Who will rebel against lockdown?**

**P36-37.**  
Cécile Aubert  
**The black hole in public policy**



# Rebuilding the world after Covid-19



**“The recent massive rescue plans by many governments and central banks are well-advised. To be cost-effective and fair, they will again have to focus on the fragile, and not create windfall gains for the others.”**

**Jean Tirole,**  
2014 Nobel Prize laureate

**What will the world look like when it emerges from isolation and the ravages of Covid-19? Predicting what will happen after the pandemic is difficult, not least because we have little information about how long the outbreak and restrictions will last. As a rare event, we have limited historical evidence; as an unexpected event, little thought has been given to how to deal with it.**

In the optimistic scenario, demand and supply shocks will create a temporary disruption in the productive system and an increase in overall debt. If the 2008 crisis is of any guidance, an economic stimulus will facilitate the transition back to normal, boosted by the budgetary and monetary efforts already underway. There will be a severe recession and a loss of purchasing power for a couple of years but the crisis in the business world will be confined to a liquidity crisis, avoiding severe insolvency problems.

If damage from Covid-19 is prolonged, this raises the specter of more pessimistic scenarios, even dystopic ones. Debt in Southern Europe could skyrocket, even though the ECB is likely to use interest rates to keep the cost of borrowing very low for a long time. This would not necessarily be catastrophic, unless financial markets start speculating against sovereign debt. A harbinger is the rise in interest rates demanded by investors in Italian and Spanish bonds prior to the Christine Lagarde's announcement of a strong ECB support. These will be testing times for European solidarity.

Another big question mark hangs over the long-awaited resurgence of inflation. If it comes, will inflation remain low enough to avoid a debt-rollover crisis and huge losses for holders of cash and nominal debt? One thing is certain: authorities will need to inspire public confidence to facilitate the recovery. Building trust will require a delicate balance between showing strong leadership and humility, acknowledging that we learn as we progress. Showcasing scientists modestly expressing both

their knowledge and its limits, as medical experts have done in France, may contribute to recreating such trust.

## Wartime altruism

Whether civil, international or sanitary, wars leave their mark on society. Faced with anxiety-provoking events, people may reconsider their goals in life. Research in the social sciences shows that our individualistic tendencies decline and we display more empathy. We behave more cooperatively and altruistically and are more likely to join social groups.

Much of this new altruism is parochial; it is directed toward those who are “on our side”. But unlike internal wars, external warfare generates common interests that bridge the gaps across groups. In the war against Covid-19, the in-group extends to all mankind and there is no out-group other than the virus (provided we do not follow the US president in calling the virus a “Chinese disease” and that “every country for itself” fails to prevail). If this crisis exhibits the same gap-bridging pattern, this might be good news given the recent trend toward populism, nationalism, and ethnic and religious intolerance. In this respect, President Macron's rephrasing of the coronavirus event as a war may have been judicious.

## Economic solidarity

Today, solidarity with patients and health workers goes without saying; it is both ethical and logical. But solidarity should similarly target the economically most fragile. Liberal precepts call for society to insure and protect citizens from events, such as a pandemic, that they have no control over. In this respect, countries with strong social protection (like France) are better equipped to limit the pandemic damage than those without (like the US).

In the next few weeks or months, French workers on short-term contracts (CDD) or laid off at the end

**“We must take advantage of the pandemic to act on social norms and incentives together. A less individualistic, more compassionate society goes hand in hand with more accountability for our actions.”**



of their notice period will be unable to find a job, regardless of how much effort they put into it. Neither will the unemployed who are no longer eligible for unemployment benefit. Unlike salaried workers under long-term contracts (the CDIs, who will receive 84% of their salary while staying at home) and civil servants, independent workers will lose their source of income. These people require (and will receive) financial support; others do not: the US-style universal-check-for-each-adult approach is easy to implement, but onerous and unfair; and it cannot help stimulate an economy which is under confinement.

Smaller firms, which are less diversified and more credit-constrained than larger ones, must also be supported: shopkeepers, craftsmen, restaurants and hotels, the entertainment and mobility industry and many others no longer have sources of income and their very survival is at stake. Banks also will face liquidity problems. The recent massive rescue plans by many governments and central banks are well-advised. To be cost-effective and fair, they will again have to focus on the fragile, and not create windfall gains for the others.

### Facing the future

We can be cautiously optimistic about increased solidarity, but when will we learn that policymaking must take a longer-term perspective? We underinvest in education, retraining, environmental policy, and various other measures that would limit the damage done to the next generation when confronting climate change, artificial intelligence, debt, inequity and other impending challenges. Covid-19 reminds us of our vulnerability. We must invest in efficient healthcare systems and promote research that will allow us to promptly respond to emerging threats. We were already aware of the dearth of research on antibiotics, given the growing antibiotic-resistance.

We were concerned by biological warfare. We trembled with fear about the melting of the permafrost, which, besides emitting large volumes of greenhouse gases, will release ancient viruses and bacteria. We now realize that the problem is even broader. Global health crises are no longer “rare events”. Unfortunately, people have short memories, rarely learning from history. Are we prepared to spend

enough on healthcare research? Are we willing to pay a carbon tax to save the planet? If our answer to these life-threatening questions is still negative, our tendency to procrastinate, our motivated belief that problems will disappear by themselves or be solved by “others”, our collective irrationality will do us in.

We must also reconsider our Weltanschauung, our world-view. We must face reality rather than hiding behind pseudo-ethical postures. Even the best hospitals around the world face a terrible ethical dilemma: overwhelmed by Covid-19, they have to select who will live and who will die. The public is often unaware, however, that hospitals face similar dilemmas in normal times: the allocation of their budget and personnel prioritizes some patients over the lives of others with different illnesses. Life is not priceless. In our actions if not our stated beliefs, people view life and money as commensurate: for instance, we may not be willing to accept a much higher price for a safer car for our children; and political preferences suggest many are not willing to consume substantially less in exchange for a safer world.

We ought not to banish these troublesome thoughts. As unpleasant and disturbing as cold calculations about alternative health outcomes are, we cannot elude the rationalization of existing healthcare budgets.

But that does not prevent us from rethinking our allocation of resources between ordinary consumption goods on one side and health and education on the other. And perhaps the reconsideration of life goals will make us realize that action on climate change is everybody’s responsibility. We must take advantage of the pandemic to act on social norms and incentives together. A less individualistic, more compassionate society goes hand in hand with more accountability for our actions. We need to move beyond short-term thinking, for our own benefit as well as future generations. Such a reckoning would be a giant step toward remaking a world unmade by Covid-19.

**The worst is yet to come, but this pandemic will end. Our future depends on learning its lessons.**

# Globalization: the day after

Marie-Françoise Calmette



**The Covid-19 epidemic calls into question the very principles of globalization, says TSE researcher Marie-Françoise Calmette. Our health security is just one of the vital areas undermined by lack of regulation and global monopolies. How can we fix the spectacular market failures produced by our global and interdependent economic systems?**

On March 16, President Macron declared: “The day after, when we win, it will not be a return to the day before.” We need to change our analyses and our extravagant behavior in many areas. Globalization has exploded thanks to falling transport costs. But when transport costs suddenly become infinite, everything stops. This is what happened to us, with the coronavirus epidemic acting as a circuit breaker. We now realize how dependent we all are.

## What do we do on the day after?

We cannot retreat and close our borders; that would be to return to the Middle Ages. But globalization must be controlled. It is possible to solve most shortages by reducing demand, as much of our non-essential consumption can be reduced or even eliminated without profoundly damaging our quality of life. Individuals should consider which of these goods they can do without.

## Globalized health

However, this is not the case in other sectors, especially health security: the shortage of medicines is a real potential threat to public health. Underlined by the present crisis, this threat has been hanging over us for some time. For example, we learned a few months ago that the US company Medtronic had decided to stop manufacturing implantable insulin pumps, which are vital for some Type 1 diabetics, in the second half of 2020. This didn't move the masses, apart from the patients concerned, of course, and their doctors (just 397 people are equipped with this pump in the world). However, the recent shortage of the old Levothyroxine formula, which is only produced by the Merck laboratory, has had a worldwide impact. Reports of shortages and supply tensions for drugs of major therapeutic interest have increased from 600 in 2018 to 1,200 in 2019. We learn with amazement that 80% of the active pharmaceutical ingredients used in Europe are manufactured in Asia, mainly in China and India; and that 60% of paracetamol and 90% of penicillin worldwide are produced in China.

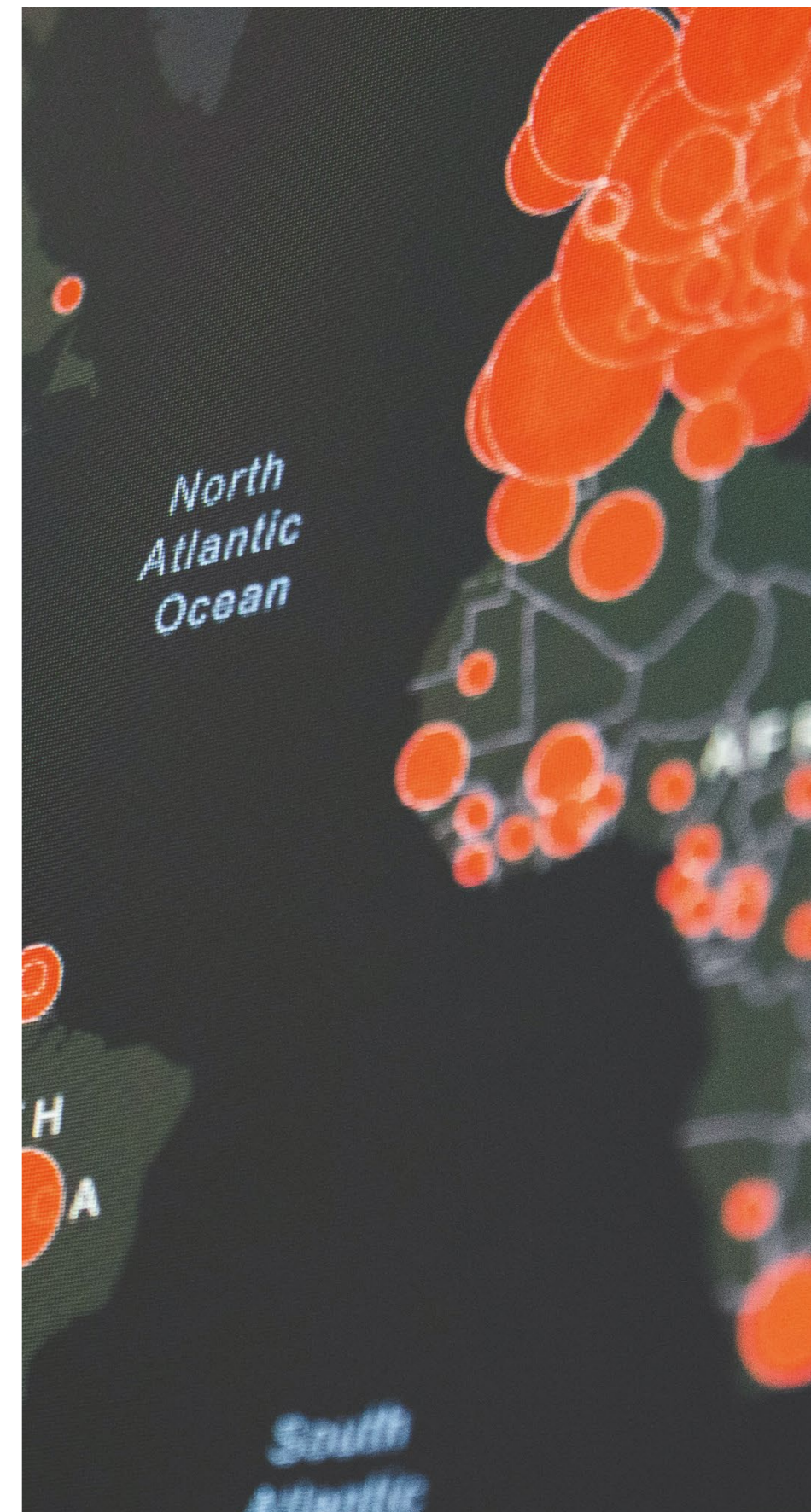
## Changing patterns

This is not just the work of globalization; above all, it is the result of market failures. Ricardo and other international trade theorists claimed that everyone was a winner in international trade. They were not (quite) wrong in a world of pure and perfect competition. But that world has long since passed away, if it ever existed at all. We live in a world of increasing returns that lead to the formation of global monopolies or even oligopolies that have nothing to do with Covid-19. This has only exacerbated the consequences of market failures that are not compatible with food-safety requirements.

This pandemic must lead us to change our models. We need regulation in certain essential sectors, generally those where the price elasticity of goods is zero, in order to establish self-sufficiency. This must be done at European level, and not only because of the increasing returns. We have the example of the Common Agricultural Policy (CAP), created in 1962, which was later so much criticized, but which made the European Union self-sufficient. A first step has now been taken as the European Commission announced the creation of a strategic reserve of medical equipment and launched a Europe-wide call for

**“We need regulation in certain essential sectors, generally those where the price elasticity of goods is zero, in order to establish self-sufficiency.”**

masks, respirators and screening tests “to reduce costs and avoid competition between states”. The aim is to stockpile the reserve, with an initial budget of €50 million, then to “distribute it among the 27 countries according to needs”. It is to be hoped that this healthy solidarity does not gradually wither away in the days to come.



# Corporate debt threatens to derail recovery

Ulrich Hege



**The economic fallout from Covid-19 will be exacerbated by looming corporate debt and the precarious situation of sovereign finances. Together with Bo Becker (Stockholm School of Economics) and Pierre Mella-Barral (Toulouse Business School), TSE researcher Ulrich Hege highlights the policy areas that need urgent attention and explains why planning for debt restructuring should start now.**

China's economy plunged in January and February of 2020 for the first time in many decades, with a 13.5% contraction of manufacturing output. As other countries move into lockdown, it seems increasingly plausible that the coronavirus crisis will not only trigger a steep contraction but also a protracted one, as public-health policies backload the time when the peak of the epidemiological curve will be reached. Financial markets the world over point to severe economic impact. Travel, hospitality, leisure, and some manufacturing firms have already experienced considerable revenue deterioration, other sectors are likely to follow.

**“The Covid-19 crisis arrives against a backdrop of private-sector indebtedness.”**

Governments are putting ambitious support programs in place for both households and firms. Many countries, including Germany, France, Sweden and Denmark, are extending unemployment and short-time work benefits and the US is considering direct transfers to households. Emmanuel Macron has announced that “no company, whatever its size, will have to face the risk of bankruptcy”. Other countries act similarly. Policy responses outlined so far largely aim to be broad and fast (“keeping the lights on”). Germany has announced “unlimited” loan support via KfW, its public development bank, France and Spain are offering loan guarantees of up to €300bn and €100bn for companies, respectively, and Italy and others are also putting in place massive business-support programs. Several countries plan to offer tax deferral programs. Central banks use various policies to encourage banks to lend to affected firms, by releasing countercyclical capital buffers or extended facilities to purchase government and corporate debt.

## Emergency aid

Much of the hundreds of billions of emergency aid packages for companies will come in the form of credit or credit guarantees. This makes sense for two reasons. First, many sovereigns go into this crisis with high levels of government debt, largely due to policies adopted in response to the 2008 global financial crisis (GFC). Sovereign spreads in the Eurozone, for Italy in particular, are already widening, indicating that there could be more trouble ahead for the credibility and solvency of sovereign borrowers. Sovereigns now need to preserve their fiscal resources, and gifts are more demanding than loans and guarantees. Second, the economic effects of Covid-19 are likely to be very heterogeneous across sectors, and there is little time to sort out exactly how. In short, the heterogeneous impact of the health crisis and lockdowns, large uncertainty about the course of the health crisis, the need to use sovereign resources wisely, and a great urgency to respond, all favor using credit to support the private sector.

However, the Covid-19 crisis arrives against a backdrop of private-sector indebtedness. Corporate and household balance sheets in Europe are extended – neither firms nor households deleveraged substantially since the GFC and the European sovereign debt crisis; on the contrary, low monetary policy rates and low credit spreads lured them into complacency about debt levels. Corporate leverage is at an all-time high. A large fraction of corporate debt is now rated BBB, the lowest investment grade rating, and more than ever is rated below investment grade – for example, almost half of all US corporate bonds maturing in the next five years are below investment grade.

Current policies will inevitably leave parts of the corporate sector with even larger debt burdens. These will delay a recovery: distressed firms tend to implement labor reductions, sell assets, reduce investments and employment, and shrink their business, and they become reluctant to raise new capital. Additionally, banks and other lenders stuck with underperforming loans may restrain lending and misdirect it to “zombie firms”. If one firm is affected, its customers, suppliers and employees are affected in turn. All of this can turn a temporary economic shock into a long-term balance-sheet driven dislocation. One policy lesson of the big financial crises in the developed world, starting with Japan in the early 1990s, is that the effects of simmering corporate debt overhang are multiple and nefarious. To manage the looming corporate debt strains and keeping the likely precarious situation of sovereign finances in mind, we see three broad policy areas that require addressing.

## Debt restructuring

First, public credit packages such as loan-guarantee programs should be designed with the looming debt-overhang problem and the future need for debt restructuring in mind. Conflicts of interest become



**“We recommend banning dividend payments and most debt reductions for all recipients of support. We also recommend that any taxpayer-funded credits be senior in the event of future restructurings.”**

important when companies have multiple creditors, and bailouts create new creditors, making restructuring more complicated, as the bank bailouts after the GFC demonstrated. Programs must also ensure that bailout funds are used as intended: to ensure business continuity, and not to benefit existing debt holders or shareholders. Policy should also have an eye to future crises. Unlike the bank bailouts after the GFC, bank risk-taking did not trigger the Covid-19 crisis and this means moral hazard concerns are weaker. They are not absent, however, since banks may use current policy choices to infer the level of taxpayer support that will be available in other types of crisis.

Therefore, bailouts should be designed to avoid benefitting existing creditors and shareholders, when possible. Given all these concerns, bailouts should contain provisions that limit the scope to which investors benefit from support. We recommend banning dividend payments and most debt reductions for all recipients of support. We also recommend that any taxpayer-funded credits be senior in the event of future restructurings. It may also make sense to attach options to the bailout funds in the form of stock warrants or convertibles that can ensure that the public benefits from future gains in corporate valuations made possible by public money, especially for publicly listed companies.

#### Insolvency proceedings in court

Second, European systems for handling insolvency in court are not good at protecting viable businesses with unsustainable capital structures. Businesses are too often liquidated, generating poor returns for bankruptcy claims, and processes can be slow. These inefficient in-court proceedings hold back credit-market development even in good times. In a recession or crisis, it slows down returning productive assets to the economy and may destroy valuable businesses. Any reforms that can simplify and speed up in-court processes should be considered. Such reforms would need to be exceptionally quick to impact short-run developments, but they can help support a vigorous recovery. Current European Union initiatives for better resolution of corporate insolvency should be accelerated.

#### Out-of-court renegotiations

Third, given the inefficiencies of court-supervised bankruptcy procedures, government agencies must be prepared to be a leader in debt restructuring for the companies that are bailed out. They should prioritize out-of-court renegotiations whenever possible. They have proven a successful tool after the GFC. This can include temporary nationalizations where needed, with tough conditions for existing shareholders to avoid distortions. Public agencies such as public development banks in charge of loan guarantees may not be the best placed to oversee debt restructuring – with their own balance sheets exposed, they may be inclined to “extend-and-pretend” distortions in their actions. So it is worth thinking about an independent organization of government leadership in debt restructuring.

# Travel bans put airlines into nosedive

Marc Ivaldi

**As planes are grounded, many airline companies are looking to the government for help. TSE researcher Marc Ivaldi, a specialist in industrial economics and transport, discusses the sector's uncertain future.**

The airline industry is at a standstill. The situation is so serious that we could not avoid using public debt to cushion the shock. In 2008, during the crisis, economists disagreed over the need for public money to rescue the financial system, today the debate is over and it's clear that there is an urgent need for cash.

Very large sums have been announced by the French government to save businesses: €45bn for the deferral of all taxes except VAT up to three months, the deferral of rent payments and invoices, and the financing of partial unemployment. A €300bn guarantee has also been announced on bank loans to guarantee 90% of the sums borrowed by companies from their banks. Despite this, it is difficult to predict today what the impact will be on the sector, even if at TSE we are working under the assumption that the pandemic will be over in a few months.

It's very difficult to know what's going to happen to the French airline industry. President Macron said "we will save everyone" but in my opinion, tour operators will take longer to recover. We estimate that the French will lose on average 20% of their income in 2020, so tourism spending is the one which they will cut first. Even with state aid, this sector will take longer to restart, especially because many countries could still be fighting the disease once others have recovered, hindering tourism to these destinations.

In announcing the possibility of nationalization, France is bringing out the heavy artillery: Air-France-KLM is one of the companies that could be affected. The company has announced

that it will cancel 90% of its flights for two months and temporarily lay off 80% of its employees. If the crisis stops in a few months, business activity will resume but tourism will again take longer to return. Right now, it's impossible to say how long the company will be able to endure.

The airline industry would certainly benefit if China manages to restart its economy quickly, but this is far from certain. China has 1.5 billion inhabitants, but the confinement concerned "only" 500 million inhabitants. They will reopen the Wuhan area, and we do not know if the virus will spread elsewhere. If in a month there is no new outbreak in China, then we can be more optimistic because it would

**"Even with state aid, the airline industry will take longer to restart, especially because many countries could still be fighting the disease once others have recovered, hindering tourism to these destinations."**

mean that once a country has been healed, it can prevent a new outbreak. We will know for sure in late April. It's impossible to predict the overall impact on the French economy, but one thing is clear: with a country no longer working or producing, we are in a recession. Despite the state aid announced, people's savings will take a hit. The markets have gone down, so investments have gone down, so our savings have already gone down.

The scale of the Covid-19 crisis is far beyond that of 2008; and we must remember that the crisis of 2008 was already much more serious than that of 1929. This time, the good news is that the economic-policy reactions have been faster but there is still so much uncertainty as to the duration of this crisis that it's complicated to estimate its complete fallout.

**"If in a month there is no new outbreak in China, then we can be more optimistic because it would mean that once a country has been healed, it can prevent a new outbreak"**



# Coronavirus and the value of human life

The Covid-19 pandemic is a call to arms for social scientists. TSE director Christian Gollier, an economist specialized in decision theory under uncertainty, and Stéphane Straub, a TSE expert on development and infrastructure, share their insights on the story so far and suggest some of the ideas, tools and actions that will be needed to turn the tide.

Christian Gollier & Stéphane Straub



**“In the absence of public intervention, the economic shock will be far harder on the most precarious households, intermittent workers, those whose jobs are not sustainable or are limited by confinement, not to mention the homeless or refugees.”**

Amid a health crisis, scientists have a responsibility to share their knowledge with the public and decision-makers, while acknowledging their doubts and uncertainties. This puts scientists in a very uncomfortable situation, with the quasi-certainty of later being criticized by citizens subject to hindsight bias, judging past decisions on the basis of information that was unavailable at the time.

**“If we expect the economy to only gradually return to normal by the end of the year, we easily reach a loss of more than 10% of GDP due to containment.”**

This pandemic has no equivalent in modern history, neither in its intensity nor in its treatment. Covid-19 appears to have a spread rate and mortality rate much higher than that of influenza. In the “laissez-faire” policy invoked recently in Britain and the Netherlands, for example, some epidemiologists refer to a scenario

involving the infection of 70% of the population and a mortality rate of 2% among the infected, implying a death rate of 1.4% of the population. For France, this would result in an excess mortality of almost 1 million people. We cannot judge the reliability of such an estimate, but we will have to continue to make choices considering our doubts and uncertainty about various parameters.

#### Impact assessment

Health policy may significantly reduce this apocalyptic toll. Consider the containment policy implemented in France since March 17. Confinement leads to a degraded version of work, and often to the complete cessation of production. Fortunately, telework allows many to maintain a value-creating activity, but it is difficult to measure its impact.

Let's start with a “back of the envelope” estimate. Imagine two months of strict confinement cuts economic activity by half. This leads to 1/12 of no wealth creation, i.e. an 8% loss of income. If we expect the economy to only gradually return to normal by the end of the year, we easily reach a loss of more than 10% of GDP due to containment. The financial

markets seem to share this estimate, with a fall in prices of around 40% at the time of writing. Again, keep in mind that these estimates are highly uncertain.

A 10% drop in GDP is huge, but if fairly distributed over the entire population, it would not mean the end of the world. Above all, it will be temporary. Once confinement is lifted, the population will return to work if economic policy is able to avoid a cascade of bankruptcies. We can even imagine a rebound in growth in 2021, with companies seeking to replenish stocks and consumers making purchases delayed during confinement. By way of comparison, France lost 16% of its annual GDP during the 1929 crisis, 31% and 49% due to the First and Second World Wars, with the shock lasting much longer than can be anticipated for Covid-19. The current shock is severe, but not as catastrophic as those experienced by our parents and grandparents.

#### The State as insurer of last resort

In the absence of public intervention, the economic shock will be far harder on the most precarious households, intermittent workers,

those whose jobs are not sustainable or are limited by confinement, not to mention the homeless or refugees. Some businesses (restaurants, tour operators, etc) will lose much more than others, and many could go bankrupt. Large companies will also face major difficulties. These include airlines, car manufacturers, hotel chains, concert halls, and football clubs. Government officials, online

**“Once the crisis is over, we will have to consider permanent realignment of remuneration for some professions.”**

service providers, the food industry and traders in essential services will not lose much. Containment is a necessary sacrifice for the common good. This effort must be shared fairly: it is a moral imperative as much as an economic one. Under the veil of ignorance, not knowing whether we are civil servants or restaurant owners, we would all like to see this happen. Ex-post solidarity is ex-ante insurance. Only the State can set up such an insurance mechanism as a last resort.

Economists have long argued that there is an opposition between the need to make individuals and companies accountable on the one hand, and the need to share risks effectively on the other. Strengthening insurance often means reducing the incentive to prevent risk effectively. But in the context of Covid-19, we are in a very different situation from that of 2008 (subprime crisis) and 2011-12 (euro crisis) where the “moral hazard” argument had an indisputable empirical basis. Covid-19 and containment are a combination of an “act of god” and a political decision, and no actor has the possibility to intervene to prevent them. Any losses linked to confinement must be transferred to the State accounts. The victims must be compensated, and only them. Fortunately, France has a much more efficient and generous social security system

than countries like the United States. Ideally, unemployment insurance should cover 100% of the salary during confinement, at least below an upper limit. The State should also compensate the losses of self-employed workers by paying a cheque (or tax rebate) proportional to the duration of confinement, based on declared income for 2019. The US plan to send a cheque to all households has no economic justification; this “helicopter money” is only useful in response to a demand shock, which is not (yet) the case.

Compensation of losses is also a way to avoid a demand shock. By maintaining households’ purchasing power, the propagation of the shock over time is cut off. You have to know how to be Keynesian when the situation requires. The State must also keep the industrial apparatus intact by preventing bankruptcies. Temporary state participation in the capital of certain companies may prove necessary. As in 2008, if the economic rebound is confirmed, this could even be done at no cost to the taxpayer. Maintaining demand may also lead to a small temporary surge in inflation that would be rather welcome in Europe.

**“The US plan to send a cheque to all households has no economic justification; this ‘helicopter money’ is only useful in response to a demand shock, which is not (yet) the case.”**

#### Debt and self-insurance

Public opinion has clearly understood the need to flatten the infection curve. But a second curve also needs to be flattened: the fall in income due to containment. Socialization of losses will result in a massive public deficit in 2020, perhaps around 10% of GDP, and a corresponding increase in public debt, which will have to be

gradually repaid. Unfortunately, the French treasury’s room for maneuver is limited, and the State has few assets that it could dispose of to finance the intertemporal smoothing of the shock. Given the huge fall in stock-market valuations, it would be unwise to immediately dispose of Aéroport de Paris, EDF or the assets held in the Pension Reserve Fund. For decades, France has let deficits grow during recessions, without reducing its debt in better times.

In the present circumstances, the suspension of the budgetary discipline rules of the European Treaties is welcome. However, our inability to balance the public budget over the long term will have to be reckoned with one day.

Public transfers will mean that the fall in GDP could be reduced to virtually nothing in 2020. The bulk of the GDP loss would be carried forward to following years, when part of the wealth creation would be neutralized to repay the “corona debt”. Fortunately, France is not at the forefront of this exposure to sovereign debt risk.

Italy has the joint misfortune of being the European country most affected by the pandemic and by sovereign debt. The exogenous nature of the economic shock removes any problem of moral hazard and the stigma associated with it.

The EU should socialize the corona loss on our continent. If not, the EU will lose credibility, especially since Italy’s containment policy has benefitted other members. A European corona-bond should be issued with member states sharing responsibility for its reimbursement. Failing this, the ECB should ensure that the conditions of indebtedness of the States do not diverge within the EU. The rule capping purchases of sovereign debt under the European Stability Mechanism should be exceptionally suspended. The recent widening of government bond yield spreads within the EU should be contained. The ECB’s launch of the €750bn Pandemic Emergency Purchase Programme (PEPP) at least partially addresses this concern.



**“In our hyper-individualistic society, this lesson reminds us that liberalism cannot do everything. Beside religious faith, we need mechanisms of solidarity and citizenship that can only be implemented by a powerful state with legitimacy in the eyes of the people.”**

In the short term, the ECB must also avoid a liquidity crisis by offering cash to all financial institutions that request it. This is so that the latter can in turn finance solvent companies which are struggling to meet payments. The socialization of losses by governments should help reassure banks about the solvency of their borrowers. Trust and credibility are key.

#### Evaluation of health policy

There is much to be said about the management of the health crisis. Let’s start with the call for good citizenship. At the beginning of March, the French government counted on the civic-mindedness of its citizens to encourage them to behave responsibly. The failure of this policy was widely reported. Do citizens understand that their behavior affects not only their own survival, but also that of others? This is a bit like climate

change: your efforts protect me and my efforts protect you. Perhaps I could just rely on your efforts, while avoiding making my own; such free-rider behavior is well known to economists.

Let’s continue with the controversy over the usefulness of containment. As we have seen, the loss of wealth could exceed 10% of annual GDP, or about €250bn for France. Non-confinement, on the other hand, could lead to a million deaths. To compare these policies, we must somehow put a value on human life.

Everyone can take action to increase their life expectancy, through simple preventive gestures (such as using pedestrian crossings, or exercise) or safety investments (such as changing tires, or moving to a less polluted area). These actions are often costly, making it possible to estimate a “value of statistical life”.





In France, this value is set at €3 million. In other words, the State is prepared to spend up to €3m to save a whole life in expectancy. This is how we estimate, for example, the benefit of reducing speed limits to 80km/h, or building a new motorway or hospital.

Given the age of the victims, the value of one million deaths from Covid-19 is probably equivalent to the loss of 300,000 whole lives. At €3m a lifetime, the value of this excess mortality equals €900bn. This is much higher than the estimated €250bn in lost GDP due to two months' containment. Under these assumptions, the message is clear: even disregarding ethical issues, containment is a far better option than laissez-faire.

How do we determine exemptions to containment? Epidemiological models should allow us to estimate the impact of going to work on overall excess mortality. Using the value of human life mentioned above, this cost can be compared to the activity's societal benefit. For a nurse, a baker, a scientist in search of a vaccine, there is no debate. For a teacher or a bank clerk, the calculation is more complicated. But this cost-benefit method will help us prepare a gradual exit from confinement targeted at various professions.

In times of crisis, it is likely that the social value of some jobs (such as hospital workers, or sales staff in food stores) is much higher than their wages. These employees may also consider their health risk to be excessive. We favor paying exceptional bonuses to reduce the gap between a job's pay and its social value. Beyond demonstrating our collective gratitude to those taking risks for our benefit, this policy aligns private interests with the common good, and focuses energies on the most essential activities. Once the crisis is over, we will have to consider permanent realignment of remuneration for some professions.

Finally, there is the question of how to exit containment. A recent report from Imperial College in the UK indicates that a French-style lockdown strategy

appears to be the only one likely to avoid the total submersion of the health system, but exposes us to the risk of a significant rebound in infection when social-distancing measures are lifted.

It is difficult to envisage extending containment beyond 4-8 weeks without incurring disproportionate economic and human costs. Production and deployment of an effective vaccine is estimated to take around 18 months, so we must develop an exit strategy that will gradually allow economic activity to resume. Such a strategy can be defined by taking advantage of multiple skills, especially those of epidemiologists and social scientists. It should combine two main components.

The first is the deployment of large-scale tests. Using a rough-estimate unit cost of €100, including implementation methods, the entire French population could be tested at an overall cost of €7bn, i.e. less than 0.3% of GDP. This is an absolute priority, and a very small sum compared with lost GDP from containment. If it puts more than 90% of the population back to work, the savings would be €225bn. There are many immediate obstacles, such as the lack of reagents or dedicated production lines, but the potential benefits justify a total mobilization on this objective, as imposed in times of war.

The second element is tracing, using test results to identify all contacts that infected people may have had. This is particularly important because many contaminations occur when carriers are asymptomatic and unaware of the risk they pose to others. A test-and-trace strategy will allow individuals who are cured or uncontaminated to gradually resume activities in safety, and allow infected people to be isolated or cared for. This is the condition for a gradual recovery of the economy within two to three months.

Numerous articles report the success of these strategies in South Korea, Taiwan and Singapore. However, it is clear that this success depends to a large extent on institutional and

cultural factors specific to these countries, and replication in our society could prove difficult. Social scientists have significant expertise in this area, including the use of very large geolocated databases. Testing and tracing is likely to encounter significant resistance in France, related to concerns about privacy or the stigma that testing can generate. Another critical problem is that part of the population, probably the most at-risk, does not have a smartphone suitable for rigorous monitoring. But economic analysis can identify the mechanisms and incentives necessary for the chosen strategy to work. Encrypted applications, allowing tracking that would respect the anonymity of users, have already been launched, for example at the MIT Media Lab or in Singapore. Specific subsidies, for example through mobile-phone subscriptions, making individual exit authorizations conditional on the use of these secure technologies, can eventually replace the paper authorizations we currently use.

**The 2008 crisis revealed a weakness in our society due to the "interconnection" of banks, with financial risks taken by one bank affecting the financial risks of others. The 2020 crisis reveals another interconnection, with health risks chosen by some affecting the health risks of others. We all depend on each other. In our hyper-individualistic society, this lesson reminds us that liberalism cannot do everything. Beside religious faith, we need mechanisms of solidarity and citizenship that can only be implemented by a powerful state with legitimacy in the eyes of the people. This crisis will hopefully strengthen our awareness of the social bond and our sense of individual responsibility towards humanity. It is also a striking demonstration of how a strong and resolute political will, guided by science, is capable of transcending individualism to eliminate an existential peril. Will we learn from this cathartic experience to mobilize for the other world war that faces us: the fight against global warming?**

# Trust matters more than transparency

Alice Mesnard & Paul Seabright



**In the war on Covid-19, truth has been among the first casualties. Together with Alice Mesnard from City University of London, IAST director and TSE researcher Paul Seabright argues that transparency isn't everything in the fight against Covid-19: what matters is trust.**

Governments have been urged to be more transparent about the progress of the pandemic, and their plans for dealing with it. But sometimes the less information the public has in advance, the better.

As the cases of Italy and Spain sadly demonstrate, being transparent about a likely future quarantine is a really bad idea. Leaks about impending quarantine measures caused mass flight from cities. And advance warnings of lockdown restrictions in the UK and elsewhere have led to panic buying in supermarkets. When the public anticipates quarantine, too much transparency can provoke the very actions the policy is designed to prevent.

To see which dimensions of public policy need less transparency and which need more, we need to distinguish two features of pandemics. The first is that individuals often fail to consider the impact their decisions can have on the wellbeing of others, to an extent that varies a great deal across risk groups. Right now, it's hard to persuade the young to take social distancing seriously because their risk is much lower than for the elderly.

But it's the young who are the greatest risk to everyone else because they are much more likely to mix with others when carrying the virus without showing symptoms. Restricting the movements of the young and healthy is much more important for fighting the pandemic than trying to confine the elderly,

who are more likely to stay home of their own accord.

The second important feature of pandemics is that many people know much more about their risk of being infected than the authorities do. They know where they have been and whom they have seen. And they don't necessarily want this information to become more widely known. They might want to be discreet about visits to friends, or to others such as sex workers. They might be doing things the government or their employer would disapprove of. Or they might simply be feeling guilty about casual contacts with friends or neighbours.

**“When the public anticipates quarantine, too much transparency can provoke the very actions the policy is designed to prevent.”**

It doesn't matter what the motive is – if people can't trust the medical professionals with this information, it won't be provided. But the information could be a goldmine for public health. Suppose 90% of infections came from only 10% of the spreaders. If we could tell what made the difference between these “super spreaders” and the rest, we could target public health interventions much more effectively. We could lower the overall infection rate with much less disruption to society. In this dimension, we need more transparency rather than less. Potential super spreaders need to be reassured that they will not be penalized for sharing information with professionals. And the public in general needs to be reassured that while the anonymity of individuals is guaranteed, the basic facts of the pandemic are being communicated fast and without political spin.

Trust in the capacity of the state matters too. Disparities between places in the quality and availability

of healthcare encourage people to evade restrictions on movement so as to avoid low-quality or overcrowded hospitals. For normal illnesses, such behaviour would help to distribute demand more efficiently around the available sources of treatment. But it becomes deadly when those moving around are most likely to infect others. More transparency about the rules determining eligibility for treatment will help to avoid movement intended to game the system.

The emerging experience of different countries suggests several lessons. The tendency to spread the disease appears to vary a lot between different places and social groups. For instance, the rate of spread of the virus seems to have been much higher in Hubei Province (where the epidemic began) than elsewhere in China. We don't know whether that's just because the rest of China locked down earlier, or if other differences in behaviour were also responsible.

This makes it vital to understand what is causing these differences, by encouraging individuals to tell professionals as much as they can. Taiwan and South Korea began detailed tracing of contacts of all individuals presenting symptoms very early in the pandemic. This contrasts with Italy, which adopted such measures late and has now been forced to resort to much heavier-handed policies that hardly distinguish between different risk groups.

In China, the authorities have used their draconian powers not just to ensure public conformity with tough measures of confinement but also to crack down on public dissent.

The stifling of any information that might contradict the official story has had consequences for the early management of the outbreak, and also, perhaps, for the willingness of the population to continue to accept confinement. China's expulsion of foreign journalists suggests this simple message is not getting through.



**“To build trust, we need transparency about the procedures for collecting information about individuals and their networks, and democratic oversight of the authorities' use of this information. Beyond that, transparency may do more harm than good.”**

Trust is what matters: whether it's to induce individuals to cooperate with the authorities in helping them to trace contacts, or to persuade the public to stick with long-term coercive measures for the common good. To build trust, we need transparency about the procedures for collecting information about individuals and their networks, and democratic oversight of the authorities' use of this information. Beyond that, transparency may do more harm than good.

# Who will rebel against lockdown?

Which people are expected to resist a Covid-19 lockdown? Using French survey data, new research by Michael Becher (IAST) suggests that older people and women are more likely to adhere to containment policies. Extroverts, and supporters of the far right and far left, may be more likely to rebel. As Covid-19 restrictions tighten around the world, their findings provide insights into the potential public response and can help to ensure that health measures are effectively targeted.

Michael Becher



The infection and mortality rate of Covid-19 have forced governments to implement a wave of public health measures, ranging from simple hygienic rules about handwashing or handshakes to social distancing or lockdowns. “Enforcing a lockdown is an enormous challenge, especially for democratic societies,” says Michael Becher, a political scientist at the Institute for Advanced Study in Toulouse.

**“If the current restrictions being adopted by governments around the world are to be successful, voluntary cooperation by citizens is essential.”**

As the virus spread, the French government provided a number of recommendations for its citizens, which gradually intensified in severity until a lockdown was imposed on March 17. Despite grave concerns for public health, instances of public disobedience were frequently presented in the media, leading government officials to repeatedly urge the public to abide by the measures.

Together with Sylvain Brouard (Sciences Po) and Pavlos Vasilopoulos (University of York), Michael wanted to investigate the individual responses of French citizens to Covid-19 health recommendations by comparing their sociodemographic and psychological characteristics.

Drawing on data previously collected for the French National Election Study (ENEF), a representative sample of 1,010 participants from the ENEF panel were again surveyed on March 16–17. They were asked whether they had changed daily behaviors, including: “Washing your hands”; “Coughing or sneezing into your elbow or a handkerchief”; “Shaking hands or kissing”; “Keeping one meter from other people outside your home”; “Reduced trips”; “Avoiding crowded places”; “Meeting friends”.



The findings show that older people and women were more likely to adhere to the public health recommendations. “Given that the risk of dying from Covid-19 increases with age, one would expect older people to be more likely to comply with measures to stop the spread of the virus,” says Michael, adding that compliance may also be less likely among the young because they have more active social lives.

The researchers also expected education to play a role. Previous studies have shown that educated people are more likely to be informed about current affairs. They may consequently be more aware of the measures, their targets, as well as the threat posed by Covid-19.

However, this French study found no link between education levels and compliance with Covid-19 health policy. This may suggest that lack of information is not a main driver of non-compliance in the context of intensive government and media campaigns on the issue.

The researchers’ findings also suggest that personality matters. Conscientious individuals, who tend to be duty-bound, hard-working, and have a high sense of obligation, were more likely to abide with the public health measures.

Extroverts, on the other hand, were more likely to rebel. “Extroverted individuals may find it harder to disrupt sociability by complying with isolating measures, such as avoiding public gatherings or meeting with friends,” says Michael. He added that one attractive feature of their data is that respondents’ personality traits were measured three years ahead of the current crisis, which reduces the concern that the correlation simply reflects reverse causality.

Past research has shown that individuals who place themselves in ideological extremes tend to be both more distrusting of the state and its powers as well as more prone to endorsing conspiracy theories. Accordingly, the researchers found that those who identify as far left or

far right were less likely to comply with health policy on Covid-19.

This study is currently under peer-review and Michael and his colleagues insist that their results be interpreted with caution. “The observational nature of our data prevents us from drawing causal conclusions, and age or personality traits are not directly amenable to policy interventions,” they write. “However, our results provide insights into the individual foundations of compliance that can provide the basis for policymakers to evaluate the effectiveness of their measures.”

The researchers suggest that their work could be developed by adding behavioral measures of compliance and conducting future experiments on the effect of monitoring and social pressure. In fact, they are conducting follow-up work to address some of these issues and to cover other countries such as Germany and the UK.

# The black hole in public policy

Cécile Aubert



**The current pandemic highlights many vulnerabilities in our health, economic and political systems, says TSE and University of Bordeaux researcher Cécile Aubert. Among these, it is striking to realize that political debates and electoral policies have paid scant attention to the risks and uncertainties associated with public decision-making, as well as our vulnerabilities.**

There are occasional debates about the precautionary principle, but they are relatively rare. During the debates on pension reform, very few questions have been asked about the uncertainties about future changes in labor markets.

**“We never vote, either directly or indirectly through references in an electoral manifesto, for risk-management methods. Yet there are many crucial issues, as we are all being reminded today.”**

At what level of risk is it acceptable to sacrifice economic activities, and thus to bear the ensuing cost in exchange for a hypothetical benefit (obtained if the risk materializes)? Should containment have been enforced earlier? Should more ventilators have been financed? Looking at these questions in the light of the information we have today on the reality of the health risk will be less important, once the crisis has passed, than asking what rules we want to put in place to manage risks and sources of vulnerability.

For example, how can we arbitrate between the objective of rationalizing hospital expenditure and maintaining a sufficient reserve to deal with risks that are sufficiently probable or sufficiently large? How to define what seems “sufficient”? We cannot prepare for all eventualities; it would be extremely costly. But we can try to decide collectively what constitutes an acceptable risk (in terms of its magnitude, or in terms of its probability of occurrence).

Similarly, our economies are vulnerable to certain external sources of supply. In the run-up to the current crisis, many debates in France and the United States have focused on economic protectionism (the negative effects of which many economists agree to denounce). But the question of maintaining a minimum level of local activity in certain sectors and to produce essential products, in order to cope with a breakdown in international transport, has not been raised. The current crisis highlights our vulnerabilities in terms of international trade, and many other areas.

Economists, since Frank Knight in 1921, have been distinguishing between risk and pure uncertainty, a notion linked to ambiguity. Risk is probabilistic uncertainty: we know that there is a 60% chance that tomorrow’s weather will be good at a place.

Pure uncertainty is a situation in which we do not know the probabilities well: either we have no reference system that allows us to elaborate risk probabilities (such as a very new situation, or the weather on a distant planet); or we are faced with several possible scenarios (as is often the case with global warming); or

we have an idea of the probabilities but little confidence in their value (we know we can be wrong, but we do not have an alternative scenario). The advice of experts is essential to reduce uncertainties but is often not enough to eliminate them.

In the face of uncertainty, individuals may have different preferences. One of the possible preferences is to choose the action that would be best in the worst-case scenario. This is extreme pessimism, which is obviously costly since it can lead to the adoption of measures that would only be appropriate for the realization of an unlikely scenario (this is the trouble with the precautionary principle).

Other preferences seem more realistic. Decision-makers do not currently have the means to assess what the public want, or will accept, given the information available from experts on the various health, social, environmental and terrorist crises that we may face in the future. Economists use experimental methods and various data from insurance and other actual decisions, in order to obtain estimates about.

**We need a public debate, in due course, so that our collective preference can emerge about the management of uncertainties and vulnerabilities by our governments. This would also help to prevent these public authorities from being automatically held responsible, either for a delay in managing a crisis or for excessive precautions.**



# 'AI doesn't exist'

Samsung's  
Luc Julia on the future of AI

**Luc Julia is Samsung's CTO and Senior Vice President of Innovation. He visited TSE in November to discuss his latest book 'Artificial Intelligence Doesn't Exist' and to exchange ideas with TSE economists about AI, its future impact on society and the need for regulation.**

## You say that AI does not exist, why?

The artificial intelligence we hear about every day in the media is Hollywood's; from Robocop to Her. It is alternatively called strong, or general, AI and it simply does not exist. Human intelligence is the only intelligence there is, and the only intelligence there will ever be. In particular areas, the machine is able to surpass us – for example, in games of chess or Go – but the energy deployed is completely different from that mobilized by the human.

For example, the AI that defeated the world champion of Go uses 440 kWh, when humans use 20 watts: AI are mobilizing energies and amounts of data that have absolutely nothing to do with what humans need. These results do not seem impressive to me as we use methods that have nothing to do with those of human intelligence.

I hate the term "artificial intelligence"; I prefer "augmented intelligence" because we are augmented by AI. Like all the tools that humans have created, AI has a purpose and is better than humans in a particular field. We could compare AI to a hammer, which is better than us at driving a nail, but a hammer can also be used for violent purposes and we must therefore regulate and educate. The same questions arise with AI, but basically, the problems come from the use that can be made of it.

## What form could AI regulation take?

This depends on the areas. If we think of medicine and DNA sequencing, AI makes it possible to correct serious genetic errors and therefore to treat people, but we can also imagine being able to alter DNA for less noble purposes and correct things that should not be corrected, such as eye or hair color. We will have to be



vigilant to make sure we do not make mistakes, as we may be tempted to with a tool as powerful as this one.

## How do you see the field of AI evolving?

There are many exciting things to do, especially to save lives, in the medical field where AIs can be trained to recognize cancers or DNA sequence errors, but also in transport with the autonomous Level 4 vehicles that will make roads much safer. But we must be careful because these techniques are extremely energy-intensive so we must select projects carefully. If we do everything and anything, we will go into the wall and use far too much energy for the final service provided.

## What impact do you think AI will have on employment?

AI does not replace the human, it augments it. AI is better than radiologists at detecting cancers, allowing us to replace the radiologist for time-consuming tasks, such as sorting and analyzing images. The human will therefore be augmented because he or she will have more time to concentrate on the final diagnosis. There is a lot of talk about translators, but even the most advanced translation AIs are very far from the level of professional translators: if you

had a book translated by an AI, you would have some good laughs when you read the results.

However, if we think of notaries, who have an extremely repetitive job, it will be possible to replace them completely. It will not be the first time that jobs have been replaced by technology: we can think of the Canut Revolts in the 19th century, when silk workers began to be replaced by weaving machines; or more recently, as counter clerks were replaced by ATMs. For each example, at t time, it's annoying because there are job losses; on the other hand, at t+n we systematically realize that there are more jobs.

After the Canuts disappeared, there were people who built the weaving machines, those who designed them, those who repaired them – in the end it was more people than at t time. With bank tellers, it took 10 years to set up ATMs, after which there was a 3% increase in the number of jobs in the banking sector. Counter clerks remained and evolved in more diversified professions. In both cases, the job becomes more pleasant and complex.

This changes a lot of things regarding education, because we need a society in which workers can easily move

from one way of working to another. Flexibility is becoming essential. We need an education system that can both train young people in working methods rather than in specific work, and that can support people throughout their working lives.

## Does this mean that some will be left out by these developments?

I don't think so. We can find an acceptable level of education for everyone to be able to follow these requirements. They are not that high and I think it will be relatively easy to create new opportunities around them to provide jobs for everyone. However, it may take a long time. For the Canuts, it took 30 years for jobs to increase, hence the importance of learning flexibility and anticipating changes. If you are prepared, you can considerably reduce this transition time.

## What have you learned from your exchanges with TSE economists?

I am very impressed by the multidisciplinary nature of the group. There are many economists working on many different subjects and talking together, which is outstanding. There are many areas covered by the different centers. I hope that we will continue to exchange ideas and benefit from each other's expertise.

# Business Networking Day 2019

Every year, recruiters from some of the most high-profile companies and institutions in France, and beyond, attend TSE's Business Networking Day to engage with our talented young economists. Held this year on November 29, the forum offers TSE students exciting job and internship opportunities. Students also have the chance to discuss career paths, experiences and employment issues with TSE alumni, many of whom now work at prestigious international firms, as well as a wide range of potential employers.

Key Employers: Airbus, World Bank, etc.

## BND 2019 Highlights

**53** businesses

**36** conferences

**600** students

**58** internships arranged

## Employee's View

“

Students from TSE really captured what Oxera is about. They have certain skills and the passion for economics which is vital.

**Oxera Consulting LLP**  
Andres Caro, Consultant

Data science attracts people but the specialty of TSE students is to make a difference. It's not only to extract data from black boxes, but to understand the models.

**Meilleurs agents**  
Pierre Vidal, Economist

TSE is renowned for recruiting future collaborators within the Data Corp, which is our Data Division.

**JCDecaux**  
Sébastien Petit  
Talent Acquisition Manager

Here we found the profiles related to finance we were looking for, mainly applied to digital and to information systems specialized in finance.

**Accenture**  
Montserrat Angles  
Financial Systems Support Analyst

The Commission has a very broad spectrum of activities and TSE has a variety of profiles, whether in the fields of the environment, public policy, development, and competition-related issues.

**European Commission**  
Valentin Moreau, International Aid/  
Cooperation Officer

We need various profiles for our six major divisions. Soft skills such as curiosity, initiative, dynamism, and desire are very important to us.

**Accenture**  
Bianca Maria Giura  
Recruitment Officer

We are attending the BND Forum for the first time and we are delighted with the organization and the students we met.

**Altran**  
Eve Omet  
Recruitment Officer

We greatly appreciated the hospitality and organization of the forum and conferences. We met many Master 1 and Master 2 students specialized in very different fields.

**Conseil Supérieur de l'audiovisuel**  
Raphaël Sitruk  
Data scientist

We work in public policy research so we are after anyone who's got an interest in research to help with policymaking, for policy decision-makers across all sorts of different topics.

**Rand Corporation**  
William Phillips  
Research Assistant

”



Economics  
for the Common  
Good

---

You can share you  
internship and job offers  
with our students  
via the platform:  
[alumni.tse-fr.eu](http://alumni.tse-fr.eu)

Toulouse School of Economics  
1 Esplanade de l'Université,  
31080 Toulouse Cedex 06  
France

[www.tse-fr.eu](http://www.tse-fr.eu)  
[contact@tse-fr.eu](mailto:contact@tse-fr.eu)  
[twitter@TSEinfo](https://twitter.com/TSEinfo)