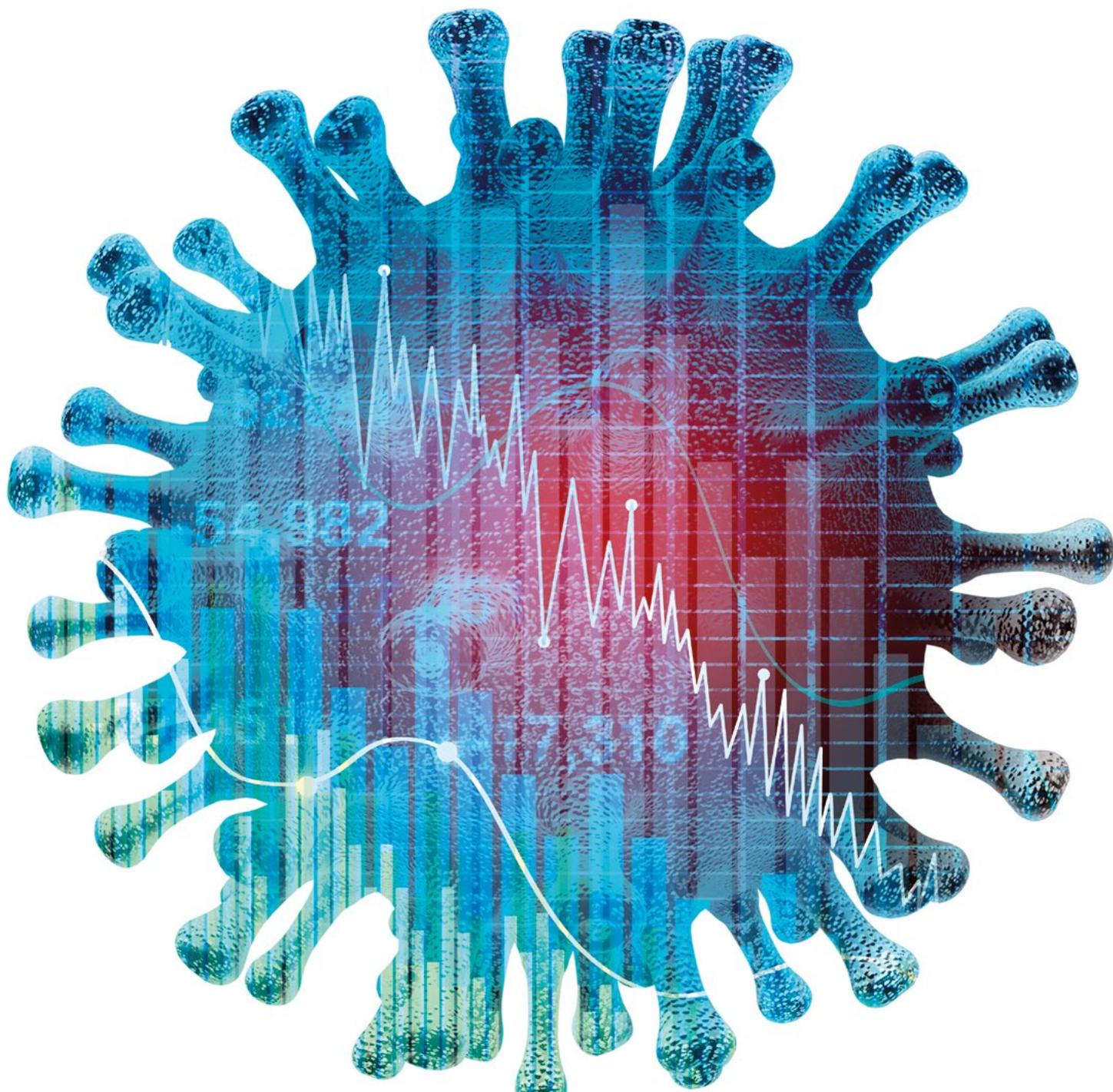


# LOUIS BACHELIER

Economic and financial news seen through research



**The crisis and beyond: academic insights and recommendations**



**With Bertrand Candelon, Christian Gollier,  
David Bounie and Winston Maxwell**

**A severe exogenous shock  
to the economic outlook**



**4**

Based on an interview  
with Bertrand Candelon

**“This radical uncertainty  
about the future makes  
investment and recruitment  
extremely difficult”**



**6**

Based on an interview  
with Christian Gollier

**How did consumers behave  
during lockdown?**



**10**

Based on an interview  
with David Bounie

**“There is nothing objectionable  
about reporting information  
regarding a disease that is  
dangerous to the public”**

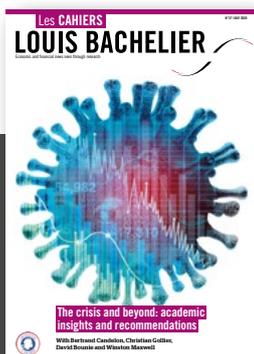


**12**

Based on an interview  
with Winston Maxwell

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**T**he Covid-19 pandemic is an unprecedented event for the modern world in which we live. By the end of June, the virus had resulted in more than 500,000 deaths and infected more than 10 million people. To combat it, countries around the world have adopted lockdown measures of varying degrees of strictness. Great evils, one might say, call for drastic remedies. But while lockdown may seem unavoidable for saving human lives, pending effective therapeutic treatment, it does not have the same impact from one country to another as it does within each country. The differences between France and Germany, for example, and the increase in local inequalities, particularly in the labour market and in education, bear witness to this. In addition to this grim picture as regards health, Covid-19 has led to a self-induced economic and financial crisis, which has forced governments in developed countries to launch massive support plans. As always in crises, there will be winners and losers. On the upside, there are the major digital players, who have fared very well in the face of lockdown. And on the downside, there are sectors deemed non-essential for primary needs, such as the automobile industry, aeronautics or tourism.

Given this unprecedented situation, various innovative solutions have been put in place. Although it is still too early to make a precise and quantified assessment of the crisis, we can draw some initial lessons from it and see that it has

significant consequences for the four societal transitions studied at the Institut Louis Bachelier (ILB), namely the digital, financial, environmental and demographic transitions.

In this new issue of the Cahiers Louis Bachelier, you will find an overview of the scientific work and thinking that has emerged in recent weeks at the ILB. The first article, based on the work of Bertrand Candelon, a specialist in economic crises, addresses the macroeconomic outlook, with the focus on the future of the Eurozone. The second piece consists of an interview with Christian Gollier, an economist specialising in ecological issues and a member of the Blanchard-Tirole commission, which is responsible for making recommendations for economic recovery in France. The third article details an original scientific study, carried out by researchers from the Digital Finance Chair, in particular David Bounie, which examines French consumer behaviour before and during lockdown, based on bank card transaction data. Finally, there is another interview, with Winston Maxwell, one of France's leading personal data protection lawyers, who discusses the fight against the pandemic using digital tools, a closely followed topic in France.

Enjoy your reading and have a good summer!



**Jean-Michel Beacco,**  
Delegate General  
of the Institut Louis Bachelier

# A SEVERE EXOGENOUS SHOCK TO THE ECONOMIC OUTLOOK

The Covid-19 pandemic has brought global economic activity to a standstill, particularly in developed countries. This new crisis, following the one in 2008, has increased uncertainty and forced governments to launch massive support plans to maintain their countries' economies. Bertrand Candelon, a specialist in economic crises, is carrying out research to analyse the situation.

**D**espite a succession of growth forecasts by international bodies, they all remain equally pessimistic. On 10 June, it was the turn of the OECD (Organisation for Economic Co-operation and Development) to update its outlook after the world economy came to a standstill due to the pandemic. The OECD predicts a contraction of global GDP of at least 6% in 2020, the worst recession in peacetime "with extreme and lasting consequences for people, businesses and governments".

There is no doubt that with the lockdown imposed in many countries over a number of weeks, the closing of borders and the slowdown in world trade, a recession is inevitable just over 10 years after the 2008-2009 crisis. "The current crisis is an exogenous and temporary supply shock, as it is not inherent to financial systems and will end when a treatment or vaccine is found. The current situation has nothing in common with the crises of 1929 and 2008, which were financial and systemic in nature," Bertrand Candelon emphasizes. However, the situation is still critical because, although the world has undergone many epidemics in the past, it was much less globalized than it is today. One of the effects of globalization is the current fragmentation of international value chains, which partly explains such pessimistic growth forecasts. "The euro area has suffered a greater impact than the rest of the world, since countries such as Spain, Italy and France have been severely affected, with sharp, double-digit falls in economic activity. The United States is expected to be more resilient and to recover more quickly, as is often the case after a crisis. Developing countries, especially in Africa, will be indirectly affected by the crisis, in particular through a drop in remittances from diasporas

(which account for a significant share of the GDP of some African countries) and a reduction in development aid budgets," Bertrand Candelon says.

## A DECADE OF WEAK GROWTH

To make matters worse, the current crisis is part of a trend where economic growth has been particularly weak in advanced countries over the past decade. "This situation of sluggish growth over the past decade has been described as the 'new normal' or 'secular stagnation' by economists such as Mohamed El Erian and Larry Summers. In brief, the idea is that the financial crisis of 2008 led to a permanent decline in economic growth from its potential level of the early 2000s," Bertrand Candelon explains. This new normal has weakened the public finances of some countries, which have not been able to introduce adequate reforms to stabilise their public debt. France, in particular, has seen its debt grow to almost 100% of GDP over the last decade, whereas it was at the same level as Germany's, 80%, in 2009. In the course of the decade, Europe's leading economy reduced its debt to 60% of GDP. "This decoupling between the continent's two largest economies is reflected in their respective stimulus packages. Germany has higher tax rates than France, which enables it to have a support plan of around 1,000 billion euros, whereas the one proposed by the French authorities is lower, at around 500 billion euros," Bertrand Candelon points out.

## THE EURO AREA AT A CROSSROADS

The weakness of public finances in France, as well as in Italy and Spain, makes it necessary to coordinate the economic recovery through

Based on work in progress by Bertrand Candelon on the macroeconomic impact of the Covid-19 crisis, and on an interview with him.



**Bertrand Candelon** is Professor of Economics at the Catholic University of Leuven and the University of Maastricht. He is also Scientific Director of the Risk Management and Investment Strategies research programme, a joint initiative of the Institut Louis Bachelier and the financial investment consulting firm Insti7. A specialist in macroeconomics and economic crises, he is a member of the Economic Monitoring Group (ERMG) set up by the Belgian Prime Minister and collaborates with the International Monetary Fund. He regularly publishes articles in leading international journals.

### Methodology

Bertrand Candelon carries out research on macroeconomic forecasts, the impact of crises and the public policies to be implemented in order to overcome them. Within this framework, he has developed a set of dichotomous models that include more than a hundred dynamic variables so as to estimate the probabilities of economic downturn in various countries. He has also developed a Global VAR model for modelling trade and thus measuring the levels of transmission between countries.

public spending at the level of the eurozone. For the time being, it is the European Central Bank (ECB) that is taking on the main support role by injecting massive amounts of liquidity. This Frankfurt-based institution has committed itself to buying debt securities to the value of €1,350 billion without any time limit, thus guaranteeing very low interest rates in the bond markets. However, euro area Member States also need to reach a political agreement on a possible fiscal stimulus to take over from monetary policy. France and Germany have already agreed on a €750 billion recovery plan. But the terms of this plan – grants or loans – have yet to be negotiated with the other Member States, some of which, such as Austria, Denmark, the Netherlands and Sweden, are openly opposed to the idea of a ‘blank cheque’ subsidy. “European coordination also needs go further, even though it is complicated. There is no such thing as a ‘health-care Europe’, and the Schengen area quickly unravelled in the absence of joint consultation in March,” Bertrand Candelon says. “But this crisis is a real opportunity to make Member States face up to their responsibilities and initiate a rebalancing in the euro zone, in order to overcome the problems associated with public finances and expansionary monetary policy”.

Without an agreement, there is a real risk that the euro area could disintegrate. “A monetary union cannot function sustainably with such large disparities between its member countries in terms of economic activity and public finance. Given this situation, there are two scenarios. The first is a division of the euro area, with one (strong) currency in the north and another (weak) currency in the south. The second involves the introduction of major structural reforms in the southern countries, of which

France is one. These measures should focus primarily on the introduction of a debt ceiling with a mandatory reduction during periods of growth, and increased flexibility in the labour market. I’m inclined to forecast the second, more optimistic, scenario. In which case, France will need to make some major political choices,” Bertrand Candelon says.

### GROWING UNCERTAINTY

Pending a possible European agreement and, more generally, a favourable outcome regarding future emergence from the pandemic, there is little prospect of uncertainty subsiding. This is shown by the high levels recorded in June of the Vix index (the well-known “fear index”), which measures volatility in the financial markets. “When uncertainty is high, a small shock can have major effects,” Bertrand Candelon warns. Lastly, a return of the inflationary threat in the medium term, particularly in Europe, cannot necessarily be ruled out in the event of a rise in energy prices, massive relocation or a crisis in the euro area. “Even if inflation automatically lowers public debt, its return would not be good news for household purchasing power,” Bertrand Candelon says in conclusion. ●

### Key points

- The economic crisis caused by the global pandemic is an exogenous and temporary supply crisis. It differs greatly from the crises of 1929 and 2008, which were systemic financial crises.
- The current crisis is revealing the weaknesses of developed countries, in particular their public finances and expansionary monetary policies.
- Developed countries must use this crisis to move forward with structural reforms. These should focus on limiting or even reducing debt during periods of economic expansion, and on making the labour market more flexible.

# “THIS RADICAL UNCERTAINTY ABOUT THE FUTURE MAKES INVESTMENT AND RECRUITMENT EXTREMELY DIFFICULT”

An expert in climate economics for more than twenty years, Christian Gollier has been looking from the beginning of the pandemic in models of its dynamics. The scale of the pandemic surprised everyone, particularly its extent in France and elsewhere in Europe from February to May. After his initial astonishment, Christian Gollier decided to work on the issues raised by the virus, and has produced several scientific papers, including one on containment strategies (see Box). In late May, he was appointed to the Blanchard-Tirole commission of experts tasked with making recommendations to the French president on the major economic challenges, in which he heads the section concerned with ecology. In this interview with the Institut Louis Bachelier (ILB), he discusses the economic crisis caused by Covid-19 and how to overcome it.

## **ILB:** How do you view the current crisis?

**Christian Gollier:** That's a very broad question, but to answer it straightforwardly and frankly, I would say that it's a disaster. This crisis shows the fragility of the world's economies, which now are facing a further shock following the crisis of 2008. It is evident that the good times of the post-war boom, with continuous growth, are probably over. I was very surprised in March, when the growth forecasts by international bodies were predicting a slight recession, while at the same time epidemiological models were extremely pessimistic about the duration and spread of the pandemic. The current situation therefore calls for major public action to deal with this unprecedented and multi-faceted shock, which affects not only short-term supply but also demand in countries where social security coverage is weak.

## **Yes indeed. What is your opinion regarding the economic measures taken by the French government?**

**CG:** The government has agreed, as a matter of urgency, to play its role as insurer of last resort by supporting businesses and employees with short-time working measures. This is a welcome development. The postponement and waiver of tax liabilities has also enabled the lockdown



**The government has agreed, as a matter of urgency, to play its role as insurer of last resort by supporting businesses and employees with short-time working measures. This is a welcome development.**



phase to be managed fairly well without creating risk of moral hazard. However, this risk is beginning to appear, with businesses and individuals that are able to resume work not doing so, which could delay the economic recovery phase. Now it is the easing of lockdown restrictions that needs to be properly managed, and this is probably more difficult.

## **How can we revive the economy after such a long period of inactivity?**

**CG:** There is a great deal of uncertainty, particularly with regard to investment by businesses, because they have little or no idea what will happen next. We don't even know how the September back-to-school season will work out.



**Christian Gollier** is the co-founder, with Jean Tirole, of the Toulouse School of Economics, where he currently holds the position of Director General. His research work ranges from the economics of uncertainty to environmental economics, finance, consumption, insurance and cost-benefit analysis, with a particular interest in long-term sustainability. He is one of the authors of the 4th and 5th Assessment Reports of the Intergovernmental Panel on Climate Change (IPCC, 2007 and 2013). He is President of EAERE, the European Association of Environmental Economists. Christian Gollier is also the author of numerous books, including *Le Climat après la fin du mois* published by Editions PUF in 2019, and scientific articles in leading journals.

This radical uncertainty about the future makes investment and recruitment extremely difficult. To remedy this situation, even though it is complicated, the government should provide clear information regarding its various scenarios. If the virus does not reappear, what policies and reforms will be implemented? What would happen if a second wave of the virus were to occur in the start of the new school year or in the autumn? Would the same strategy of total lockdown of the population and the closing of businesses be repeated?

**In the event of a second wave, total lockdown does not strike you as appropriate. Why is that?**

**CG:** It's too costly and doesn't promote herd immunity. In my opinion, partial lockdown and allowing people of working age, that is, 18-64 year olds, to continue working, would be more effective. Today, we are no longer in the situation in March. Barrier measures have been widely introduced and physical distancing has been implemented in companies. On the other hand, young people would be subject to restrictions to avoid hospital overcrowding, just like people over 70, who are more vulnerable and 100 times more likely to die from Covid-19. Such a strategy would have a negligible economic cost and obvious health benefits.

**President Macron recently announced measures in aid of the environment, but at the same time environmentally polluting sectors have been supported. Is this not contradictory?**

**CG:** Without going into the details and the specific environmental measures that will be adopted, I think that in the short term it is better not to further exacerbate this crisis. The economy is on its knees and we need first to get it back on its feet before we can promote sustainability. You don't kick somebody when they're down. For example, questioning the support given to

the automobile and aeronautics industries without any ecological quid pro quo makes little sense, because they need to be safeguarded for obvious reasons related to jobs and growth. Ideally the French state, or better still Europe, would have announced a credible agreement to penalise carbon-intensive sectors increasingly between now and 2030, and to an even greater extent in the longer term. Massive investments, using public and private capital, will have to be made in tomorrow's world. The allocation of this capital must take into the long-term social and environmental aspects, otherwise it will have little effect. And even if these investments are financed by debt, we have to think about the problem of household purchasing power, some of which has suffered greatly from the crisis. Putting public money on the table, however much, is not enough to bring about the ecological transition. We need to send the right signals to all stakeholders, consumers and businesses, or tell them that we will soon have to manage without fossil fuels. In this regard, climate policy lacks coherence both in France and in Europe.

**However, Europe seems to want to green its policies. Ambitious announcements have been made, in particular the 750 billion euros announced by the Franco-German axis and the European Commission's Green Plan.**

**CG:** This Franco-German plan, which is still under negotiation, features massive subsidies for the electricity sector. However, this measure would lead to a drop in demand for emission allowances and thus in the price of carbon under the EU Emissions Trading Scheme (EU ETS). The plan would be neither relevant nor consistent in terms of emission reductions unless it is accompanied by a radical reform of the EU ETS, the weaknesses of which have been evident since its creation in 2005. Another example of the lack of coherence in Europe is the Commission's 50 billion euro

support plan to help regions affected by energy conversion. This support mechanism should be conditional on a comprehensive deal on a rise in carbon prices in Europe, which has been a sticking point among Member States for too many years. The objective would be to have a carbon price of €100 per tonne by 2030, so that the most polluting industries are forced either to change or to shut down. I'm thinking in particular of coal in Poland and East Germany. Raising carbon prices is clearly necessary at the European Union (EU) level, because it is not the financing and access to capital for green projects that are most problematic, at least for the moment.

To go further in the EU's climate management, we recommend, with Jacques Delpha, the creation of a central carbon bank. This independent institution would be responsible for climate coordination and curbing the rise in emissions. It would have to set a single price for carbon and its growth rate over time.

**The Citizens' Climate Initiative has recently submitted its proposals, and carbon taxation is excluded in favour of a tax at the EU's borders. Is this a good compromise?**

**CG:** It should be remembered that Europe has great ambitions in terms of carbon neutrality by 2050. In recent years, carbon emissions have fallen significantly in Europe, but they have increased in countries with low labour costs, particularly in Asia, leading to a significant increase in imported emissions. Moreover, those European polluting industries most exposed to international competition have been eligible for free emissions allowances, on the grounds of environmental dumping by competitors based in countries with no climate ambitions. This is a disincentive. So under these conditions and despite the many technical problems to be solved around to the evaluation of carbon footprints, adjustment at EU borders →

is a good solution. Such a system would help to raise additional tax revenues and improve European competitiveness, which could be reflected in a certain degree of reindustrialisation. In addition, a border tax would project an international carbon price on companies exporting to the EU. In this context, it would be very much in the interest of countries harbouring these companies to introduce their own carbon tax at the same level as the adjustment at European borders. This would provide them with additional tax revenue, whereas otherwise exporting companies would pay the European tax. This amounts to creating “carbon clubs” between countries, an idea developed by the American economist William Nordhaus, winner of the Nobel Prize in 2018.

**You are a member of the Blanchard-Tirole commission that is advising the French President on economic recovery. This will have a major ecological component. What can you tell us about the work in progress?**

**CG:** At the moment, we are at a very important stage in the discussions, and the report containing the proposals will be published in December. It remains to be seen how the commission will bring together the very diverse views of its members on the climate dossier. Personally, I believe that a carbon tax is Plan A. There is a strong consensus within the economics profession on this issue. But it is likely to be difficult to implement in the short term, in particular in order to achieve the necessary long-term price level compatible with the highly ambitious European objectives in terms of emissions reduction. It is therefore essential to have a Plan B. This will have to take the form of a myriad of so-called command and control actions, which would require certain measures such as the mandatory thermal renovation of buildings. In this case, if we want to avoid deterioration in household purchasing power and social inequalities – low-income households spend a larger share of their budget on energy –, we will have to ensure that all these future actions are carefully evaluated on a case-by-case basis with cost-benefit analyses of the amount of carbon avoided. These evaluations will also need to include a price of carbon to serve as a threshold: should all projects with a carbon price of 50, 100 or 200 euros be carried out? The setting of a carbon price is therefore also necessary to evaluate the projects to be implemented, even if this mechanism differs from direct carbon taxation

**The big difference between the virus and climate change is what in finance is called the tragedy of the horizon, which may be both temporal and geographical.**

**The Covid-19 crisis has reduced global carbon emissions. Does this offer grounds for hope in the fight against climate change, which has become stalled in recent years?**

**CG:** It's true that we are 30 years behind in the fight against climate change, but better late than never. The Covid-19 crisis has made it clear that with real political will and social acceptability it is possible to change things: the initial battle against the virus has been won through lockdown and travel restrictions. So why not do the same thing with climate change, you might ask? The big difference between the virus and climate change is what in finance is called “the tragedy of the horizon”, which may be both temporal and geographical. Let me explain. The benefits of lockdown were almost immediate, following the sacrifices and efforts on the part of the population. Conversely, for climate change, today's European efforts benefit others, for example Asian or American industries that have fewer constraints, and that benefit from European deindustrialisation partly due to our climate commitments – so-called carbon leakage. Moreover, such efforts will only benefit future generations in Europe. It is for these two reasons that the success achieved with the Covid-19 crisis will be difficult to transpose to the fight against global warming.

**In conclusion, are you nevertheless optimistic about the future?**

**CG:** I am not particularly optimistic, for several reasons. Oil prices are very low and won't rise in the immediate future. Carbon prices on the European market are weak, having fallen from 25 euros to 15 euros per tonne, before tentatively stabilising at 20 euros in March. We still have a long way to go, not least because many sectors and emitters are exempt from any penalty when they pollute. And governments now have fewer resources available for financing the climate transition. Before the crisis, it was possible to hope for financing and subsidies, through the issue of public debt, but today that is likely to be more complicated. With public debt expected to reach 120% of GDP

by the end of the year, France will have much less leverage to take on further debt. That said, economists differ on this point. Some argue in favour of modern monetary theory, which would allow debt to continue rising to above 200% of GDP, while others believe that such debt will have to be repaid at some point. In that case, I wish all the best to future generations who will have to shoulder that debt, especially when interest rates return to higher levels. ●

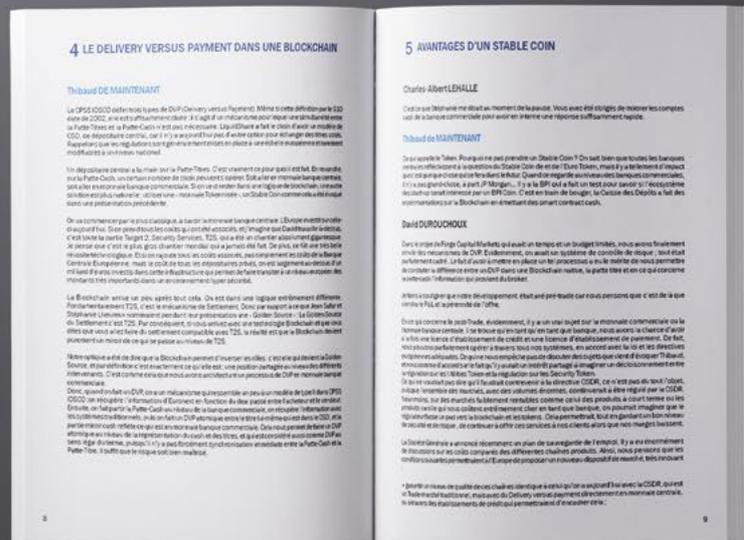
#### Further reading

➤ *Cost-benefit analysis of age-specific deconfinement strategies*, Covid Economics, vol. 24, 1 June 2020, CEPR Press

➤ *If the objective is herd immunity, on whom should it be built?*, vol.16, 11 May 2020, CEPR Press

➤ *Group testing against Covid-19*, vol.2, 8 April 2020, CEPR Press

## Round tables



The interdisciplinary research programme FaIR (Finance and Insurance Reloaded), directed by Charles-Albert Lehalle, embraces a range of initiatives bringing together industry and research partners with regard to the impact of new technologies on the world of finance and insurance.

Transcripts of the round tables organized by FaIR are available on [fair.institutlouisbachelier.org](http://fair.institutlouisbachelier.org)

# HOW DID CONSUMERS BEHAVE DURING LOCKDOWN?

The period of lockdown to curb the Covid-19 pandemic has considerably altered consumer behaviour and greatly affected economic activity in France. To evaluate these effects, researchers have conducted an original study using high-frequency data from bank card transactions.

**T**he progressive easing of lockdown restrictions in recent weeks is a welcome boost to economic activity in France, particularly household consumption. Accounting for around 54% of French GDP in 2019 according to Insee, household consumption was particularly constrained during the lockdown imposed from 17 March to 11 May. In fact, although basic food products in supermarkets were in very high demand during the first few days to build up stocks, many other shops simply had to close and remain closed throughout this period.

In the context of this economic shock of a magnitude not seen since the Second World War, the assessment and identification of consumer spending, and by extension of business losses, are useful for guiding public policy. However, the official statistical indicators produced by economic organisations such as Insee are time-consuming and costly to calculate, and are subject to various subsequent adjustments.

## A RICH DATABASE FOR AN ORIGINAL STUDY

To get around the problem of the provisional nature of Insee statistics and to gain an overview of economic activity in real time, the researchers conducted an original study based on an exceptionally large database: nearly 5 billion transactions from more than 70 million bank cards carried out before and during the lockdown (from 2 January to 16 March, then from 17 March to 10 May). These data also have the advantage of covering the entire French banking system in 2020, as well as in 2019, which serves as the baseline year. "From the anonymised high-frequency data from the bank cards made available to us we were able to assess spatially the economic losses associated with the decline in current consumer spending



**Whereas physical commerce was hit hard during the lockdown, online commerce suffered less.**

(excluding transfers and direct debits). While there have been other such studies elsewhere in the world, they have generally focussed on more restricted data and are mainly related to fintechs or a single bank. In total, the data we are working on represents nearly 20% of GDP," says David Bounie.

## A DRAMATIC FALL IN MOBILITY AND CONSUMPTION

By comparing the data from their model, the researchers were able to measure several variables such as the mobility of bank cards, the fall in consumption in terms of volume, value and geographic region, and distribution channels (offline or online sales). Unsurprisingly, the majority of the figures dropped significantly during the lockdown. Bank card mobility fell by 25%, resulting in more local consumption in physical stores during the morning. Consumption in these brick-and-mortar outlets plummeted by no less than 60% in value! On the other hand, the average purchase increased from 35 to 41 euros. "These findings are fairly intuitive and do not seem to be particularly revolutionary. However, our database enabled us to establish precise figures by economic sector and by city, which would not have been possible with aggregated data," says David Bounie. He adds, "In the light of work carried out in other countries such as China, Denmark and Spain,

Based on *Consumers' Mobility, Expenditure and Online/Offline Substitution Response to COVID-19: Evidence from French Transaction Data*, by David Bounie, Youssef Camara and John W. Galbraith, and on an interview with David Bounie.



**David Bounie** is a professor and head of the economic and social sciences department at Telecom Paris. He is also co-founder of the Digital Finance Chair. His research, published in international journals, focuses on the impact of new technologies on the financial sector.

### Methodology

The researchers analysed current consumer spending in France during the Covid-19 pandemic. They were able to do so through access to a rich database of nearly 5 billion credit card transactions. They then used difference-in-difference statistical models to compare the behaviour of French consumers before and during the containment. They were also able to measure the impact of online sales on consumption and economic activity.

it would appear that business was harder hit in France". Moreover, consumption fell much more in Paris (down 75%) than in other major French cities (down 50%). This result can be explained in particular by the fact that many Parisians left for the provinces just before the lockdown and by the high proportion of businesses deemed to be non-essential, such as bars, restaurants, cafés, hairdressers, florists, etc.

### E-COMMERCE ACTED AS A SHOCK ABSORBER

Whereas physical commerce was hit hard during the lockdown, online commerce suffered less, with sales falling by 30% at the beginning of the lockdown, before gradually returning to their pre-crisis level. "E-commerce clearly cushioned the fall in consumption induced by the lockdown. Indeed some sectors selling non-essential goods have been able to benefit from it," says David Bounie. Among the big winners in online sales were supermarkets and convenience stores, and remote medical consultations. Other retailers that benefitted include those selling clothing and beauty and cleaning products, where the share of online sales is usually lower. The same applies to opticians, whose Internet sales increased tenfold, from 3% to 30% of their turnover. On the other hand, hotels and restaurants are, unsurprisingly, among the losers. The same goes for tobacconists and petrol stations, even though these businesses remained open during the lockdown.

### BANKING DATA: AN INVALUABLE AID FOR MONITORING THE ECONOMY

In carrying out the work described above, researchers are pursuing an even more ambitious goal, that of monitoring economic activity in real time. "At this still preliminary stage, we

are able to observe sectors experiencing distress, but we also want to estimate the impact of exogenous shocks at more detailed levels on businesses and consumers so as to help the most vulnerable through appropriate policies," says David Bounie. For example, the researchers would like to determine consumer profiles in terms of wealth, vulnerability and geographical location. The aim is to find out which categories of consumers have suffered most from lockdown, taking into account expenditure on health or energy, for example. "We are continuing our work and updating it regularly. One of our next steps will be to analyse the emergence from lockdown, which will make it possible to react better in the event of another crisis," David Bounie says. In other words, this work would allow better management of the economy if a second wave of the epidemic were to occur and lockdown restrictions re-imposed. ●

### Key points

- High-frequency bank card data can measure the nature of economic activity accurately and in close to real time, unlike conventional indicators published periodically by Insee, which are subject to revision.
- This data allows better management of economic activity by spatially identifying companies and consumers who are in serious difficulty.
- E-commerce has cushioned the shock induced by lockdown and the closure of many physical businesses.

# “THERE IS NOTHING OBJECTIONABLE ABOUT REPORTING INFORMATION REGARDING A DISEASE THAT IS DANGEROUS TO THE PUBLIC”

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Given the importance of testing measures to contain the Covid-19 pandemic, digital tools using a variety of models have been launched, sometimes hastily, by governments in many countries, based on local cultural and legal traditions. In France, there was passionate parliamentary debate regarding the Stop Covid contact tracing app, as well as considerable public mistrust. The issue, however, still remains topical in view of the problems related to storage of the data collected, but also in the event of a resurgence of the epidemic in the short term. In the following interview, Winston Maxwell, a researcher specialising in digital law, gives his analysis of the situation in France and abroad.

**ILB:** In the early stages of the pandemic, contact tracing apps appeared to be performing well in Asia, with countries such as Singapore and South Korea setting an example in their management of the health crisis. Can you describe the specific features of these countries?

**Winston Maxwell:** The two countries have had very different approaches. In Singapore, the TraceTogether app was dependent on people using it on a voluntary basis, as in France. And it didn't work well, because only 25% of the population downloaded it, whereas a rate of at least 60% would be needed for such a tool to be effective. In South Korea, it's a completely different story and it's very interesting to consider the South Korean case in relation to France. In 2015, South Korea was hit by an epidemic of MERS-CoV (Middle East Respiratory Syndrome Coronavirus). Even though the disease did not claim many lives, there was considerable political turmoil: the government was accused of amateurism and trial and error in dealing with the crisis. Later in 2015 a law was passed that changed the approach and established a new framework for dealing with major epidemics. This law provided for a series of interrelated measures, including one that allows the Minister of Health to order communication of data from mobile operators



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and bank card operators in order to trace the location of infected persons. This model is quite intrusive and not at all voluntary. Nevertheless, the South Korean legislation, which I have looked at with a view to drawing comparisons with France, is subject to robust safeguards and supervision by independent authorities. South Korea, unlike some of its neighbours, has strong privacy laws that are almost equivalent to the European GDPR (General Data Protection Regulation). The 2015 law created an effective toolbox which the authorities were able to use in fighting Covid-19. There was no trial and error, because the authorities already had a toolbox that had been fully debated in the context of the MERS epidemic.



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### Should France imitate the South Korean system?

**WM:** Debates are currently taking place in the French National Assembly to make a preliminary assessment of the crisis in France. Should we adopt a similar toolbox? I think a toolbox including digital tools would be helpful for mitigating a possible second wave of Covid-19 or another unrelated epidemic. Of course, it will have to be thought through and discussed on the basis of lessons learned in managing the Covid 19 crisis, and based on France's constitutional framework. It is unlikely that France would go as far as South Korea. It's hard to imagine a law in France permitting authorities to use bank card data. Such an approach would surely be considered disproportionate. Moreover, there are important cultural differences between the two countries. Given France's history, its citizens are particularly distrustful of tracking technologies operated by the state.

### You draw a parallel between the health crisis and the fight against terrorism. Why is that?

**WM:** Following the terrorist attack of 11 September 2001 in the USA and those in Paris in 2013 and 2015, new laws on security and intelligence were adopted with the aim of combatting terrorism. In this context, there were heated debates on how to strike the right balance between public security and individual privacy. Today, we have arrived at a point of equilibrium for anti-terror measures, thanks to a number of court decisions, and the establishment of institutional safeguards to prevent abuse. In the fight against pandemics, we don't yet have the same level of maturity.

### On what basis might France adopt an anti-epidemic "toolbox"?

**WM:** There has to be a balance between protecting public health, which is a strong constitutional right, and the protection of privacy, another competing right. There is nothing unusual about this balancing approach; it is a straightforward trade-off that is commonly

adopted in other areas, such as the fight against terrorism. However, as I said before, this trade-off needs to be debated, reflected in a law and tested by courts. In the context of the current pandemic, there has been little time for this kind of analysis and debate.

### Let's turn more specifically to France. Two systems were launched in May: the Covid contact system of the French Health Insurance and the SI-DEP screening system administered by Paris Hospitals. However, the collection of data is not subject to consent. Is this proportional and compatible with the regulations in force, in particular the GDPR?

**WM:** Consent to the collection of personal data is not always required. It is not necessary when the collection of data is necessary for an important public interest, as is the case with the Covid-19 pandemic. Moreover, the National Commission for Information Technology and Liberties (CNIL) has to be consulted and give an opinion, and this has been done. For many years France has required communication of data for certain contagious diseases (Zika, yellow fever, cholera, tuberculosis, etc.). If someone has the symptoms of any of these diseases, it will be reported by the doctor or laboratory making the diagnosis and the case will be registered by health authorities for the purposes of protecting public health. There is nothing objectionable about reporting information regarding a disease that is dangerous to the public. Especially since this practice is covered by medical secrecy and pseudonymisation of data.

### Nevertheless, the data for these two tools are hosted by an American company, namely Microsoft. Yet data legislation is very different on the two sides of the Atlantic. Are there any concerns about possible data leaks?

**WM:** I don't have the details regarding the use of Microsoft. I know that there is considerable controversy about Microsoft's hosting of a large French database – the Health Data Hub,

created in 2019. This database is intended for medical research using Big Data and contains very sensitive data. It is currently being debated because the United States does not have a good reputation in the protection of personal data, especially after the Snowden affair and the decision by the European Court of Justice in the "Schrems Safe Harbor" case. The US CLOUD Act is often cited as a specific threat, but here I am less concerned. The CLOUD Act allows a U.S. judge to order the disclosure of data hosted abroad as part of a criminal investigation. But this power is closely controlled constitutionally in the United States. The judge's powers are similar to those of a French judge. Finally, it should also be recalled that Microsoft received French certification as a health data hosting provider in 2018. I do not know the reasons why the government chose Microsoft for data hosting, but I imagine that data security was an important criterion.

### Following the health emergency, the Scientific Council recently recommended extending the storage period for this data to six months, as opposed to three months previously. Do you think this recommendation is justified?

**WM:** I don't have any specific comment to make on that. Here, too, the usefulness of this measure has to be weighed against the protection of personal data. In law, this approach amounts to testing the proportionality of a measure restricting individual freedom. This proportionality test is based on three criteria. The first implies that the curtailment of freedom is justified by a legitimate objective, in this case public health. The second requires the creation of a specific law that is transparent to the public. The third criterion is more complicated to assess, and includes the concepts of necessity and proportionality. Why is the measure implemented? How effective is it? What are the alternatives? Are there adequate safeguards? Clearly, this amounts to setting limits to ensure that the pursuit of one right (e.g. public health) does not completely override the other right →

(data protection). The two rights must coexist, with each right giving some ground to accommodate the other.

**France has made a technological choice based on data centralization for the Stop Covid app. What is your opinion?**

**WM:** France has chosen to have a fully controlled, all-French system, with centralized collection of pseudonymized data. Germany has decided on a decentralized system that is dependent on foreign technology. The French decision does not worry me at all.

**Prior to the launch of the Stop Covid app, you expressed scepticism about a voluntary tool of this kind. Why are you sceptical?**

**WM:** Making its use voluntary means that the app will be useless, as became apparent in Singapore several weeks after its introduction. Various studies estimated that an adoption rate of at least 60% was needed for such a tool to be effective, and if it was voluntary we were sure that percentage would not be reached. And

actual download figures in France confirm this.

**More generally, digital tools and artificial intelligence (AI) have not always lived up to expectations during this pandemic. How might they evolve in order to reconcile public interest and privacy?**

**WM:** It is true that AI has revealed its limitations and has been somewhat disappointing. It failed to see the Covid-19 pandemic coming, even though it is supposed to be a great tool for prediction. This is a lesson to remember. Machine learning is very good at predicting highly repetitive small events, but bad at predicting infrequent major events. This is because there are not enough historical examples for the algorithm to work with and learn from. This is a good reminder of the inherent limitations of this technology. One possible area for improvement is hybrid AI techniques, which are of interest to many researchers. There are a number of projects underway that involve surrounding neural networks with a knowledge base – for example, in epidemiology. This technique would help

guide the algorithm in its predictions. The idea sounds simple, but implementing it is complicated, because it brings together two areas of AI that are traditionally separate. On the one hand, there is machine learning, which is statistical and probabilistic. And on the other, there is symbolic AI, focussed on logic, rules, expert systems and knowledge bases. Ideally, we would like to be able to combine the best of the two techniques. Research along these lines is being explored at Télécom Paris.

**In conclusion, while AI has shown its limitations in predicting the epidemic, could it not still be of use in combatting the economic crisis?**

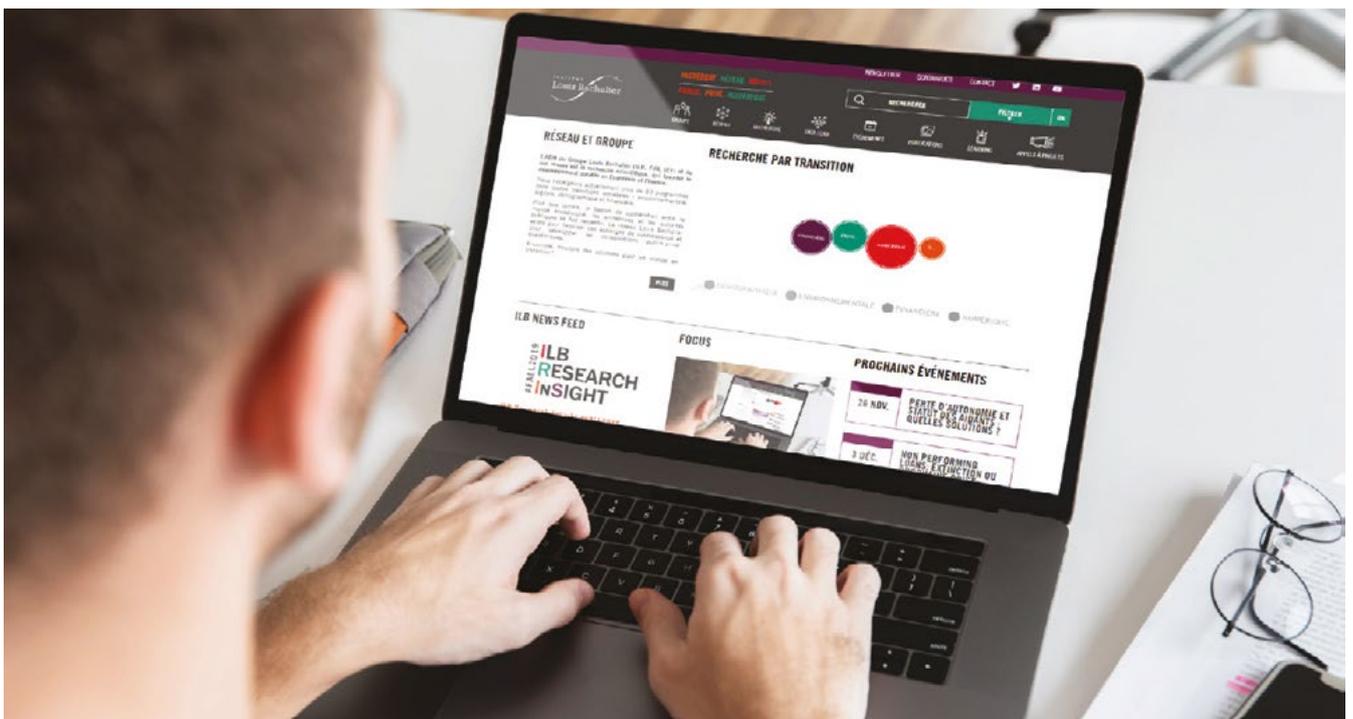
**WM:** Absolutely. Within the framework of the Digital Finance Chair, Professor David Bounie is using Big Data techniques to study the evolution of spending patterns in France, before, during and after the Covid crisis (see previous article). These studies will enable better targeting of public actions to help the country emerge from the crisis. ●



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