CONSEIL NATIONAL
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Report

The effects of the Covid-19 crisis on productivity and competitiveness

Second report

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THE EFFECTS OF THE COVID-19 CRISIS ON PRODUCTIVITY AND COMPETITIVENESS

Second report

President

Philippe Martin

Members

Olivier Blanchard, Laurence Boone, Gilbert Cette,
Chiara Criscuolo, Anne Epaulard,
Sébastien Jean, Margaret Kyle, Xavier Ragot,
Alexandra Roulet, David Thesmar

Authors

Vincent Aussilloux, Dimitris Mavridis
Adam Baïz, Matthieu Garrigue

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FOREWORD

This is the second report from the National Productivity Board (NPB). It focuses on the productivity and competitiveness consequences of the unprecedented economic and social crisis generated by Covid-19.[1] As a reminder, most Eurozone members have set up a productivity board. These boards have established a network responsible for monitoring the evolution of productivity and competitiveness, its determinants, and the economic interactions between member states. The aim is better coordination of economic policies within the euro area. The Covid-19 crisis has shown the importance of such coordination.

This report presents a thorough comparison and in-depth analysis of the emergency and recovery plans announced by European countries. Their potential impact on current imbalances in the euro zone is estimated. Faced with a foreseeable wave of bankruptcies, the report proposes several options to avoid the exit of viable and productive firms. Finally, the report devotes a chapter to the question of France's mediocre performance in terms of skills acquired in formal education and in lifelong learning institutions. The low level of skills observed in France has serious consequences for its productivity.

This report benefited from significant in-depth work by the *rapporteurs* – Vincent Aussilloux, general rapporteur and Dimitris Mavridis ; as well as from Adam Baïz, Matthieu Garrigue, Amandine Brun-Schammé (France Stratégie), Alexandre Bourgeois, Matthieu Lequien (Insee), Noémie Lisack (Banque de France), Paul Cusson (Directorate General of the Treasury), Sébastien Grobon (Dares) – whom I would like to fully thank on behalf of the entire NPB for their commitment and professionalism.

This report was written in a situation of unprecedented crisis in which economists found themselves under heavy pressure. I would therefore particularly like to thank the members of the NPB who speak here in total independence from economic and political pressure and who shared their thoughts on the consequences of the Covid-19 crisis.

[1] See our first report : CNP (2019), *Productivité et compétitivité : où en est la France dans la zone euro ?*, July. Available in English : NPB (2019), *Productivity and competitiveness: where does France stand in the euro zone?*

These specialists in macroeconomics, productivity, innovation, international trade and the labor market, like last year, nourished the work of the NPB with the diversity of their expertise.

We produced this report as we are in the midst of the Covid-19 crisis. The analysis of its economic consequences can therefore only be preliminary and modest. Many questions remain unanswered and will need to be re-analyzed in future NPB reports.

Philippe Martin

President of the National Productivity Board

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The productivity effect of the current crisis

The current crisis is unlike any other previous recession. Its suddenness, magnitude, world-wide synchronicity and its heterogeneous sectoral impact make it unique. It is different in nature: the shock comes from outside the economic sphere, affecting both the supply and demand sides of economic activity. This crisis also differs from previous ones given the unprecedented scale of emergency support measures. In 2020, France announced emergency and recovery measures amounting to 7.6% of its GDP. The ceiling of public support reaches 17% of GDP when counting all liquidity and state-guaranteed loans. The forecasted public deficit is 11.3% of GDP in 2020, the financing of which has been facilitated by an accommodating monetary policy of equally unprecedented scope from the European Central Bank.

During the first lockdown, economic activity fell much more than wage employment. The INSEE forecasts a 9% drop in GDP but only a 2.3% drop in salaried employment. These figures show a significant retention of labour by employers, aided by their recourse to job retention measures, which can be interpreted as a sharp drop in labour productivity. This fall in productivity translates into new costs to fight the epidemic, and higher unit costs from reduced production capacity. Yet the sectors most affected are rather those characterized by relatively low labour productivity - and frequent in-person social interactions, such as hospitality, tourism, personal and domestic services. In the short-run, aggregate productivity may increase, but this will be due to a composition effect as low-productivity sectors are more heavily affected. This composition effect is not expected to be permanent.

The dramatic fall in productivity in the most affected sectors will probably be transitory, as the vaccination roll-out has started. However, the crisis could still have lasting consequences on productivity. This is especially true if the crisis affects some of the forces that drive productivity in particular innovation (through lower R&D investment for example) and the reallocation of economic activities. One of the critical challenges of economic policy today is to prevent the economic impact of the health crisis from becoming a persistent trauma, in particular with regards productivity.

Under normal circumstances, the “exit” of the least efficient companies contributes to productivity and growth. It allows the development of more efficient companies and the arrival of new ones. In times of severe crisis, however, this reallocation mechanism may be less effective, leading to the collapse of an unusual number of productive firms.

The rise in bankruptcies during usual recessions, with large-scale job losses and financial hardship, is associated with a significant and avoidable waste of resources. Companies often have specific contractual relationships that are costly and difficult to replace. This disorganizing effect is particularly present today because of important network effects magnifying sectoral shocks, and because of the integration of some firms into increasingly complex and globalized value chains. The recession of 2020, in certain industrial sectors, could lead to a failure of subcontractors to produce strategic components.

The crisis led to a paradoxical situation: so far, bankruptcies are down 36% for all businesses and 29% for SMEs, compared to 2019. Emergency and recovery packages maintained many businesses in a “hibernation” stage, thus explaining the drop in bankruptcies. This disconnection between the severity of the crisis and the reduction in bankruptcies may raise the concern that public money is supporting unviable companies. Our empirical analysis suggests however, that current insolvencies (even in smaller numbers) are determined as usual by lower levels of productivity and by corporate debt. Business failures in the most vulnerable sectors are more numerous than in other sectors. Still, public aid (job retention schemes, state aid, guarantees, etc.) has absorbed a large part of the shock. This hibernation was necessary, and effective. Indeed, our empirical analysis strongly suggests that the government measures have so far prevented the bankruptcies of productive firms.

In the forthcoming debate on the necessary withdrawal of support measures, it will be essential to obtain proper data and to compare the respective risks. This report proposes the following prioritisation of these risks.

1. A first risk is that of suffering a large number of bankruptcies of productive or “systemic” companies with a knock-on effect on value chains. So far, this risk has been reduced by state aid in the form of guaranteed loans and sectoral business support measures.

2. A second risk consists in over-protecting already established and unproductive firms, thus creating “zombies” that can narrowly avoid bankruptcy because of a combination of low interest rates and public aid. Such a situation would prevent the reallocation of capital, skills, and market shares towards more productive companies. This risk is moderate today, and the observed decrease in

bankruptcies will have little impact on productivity. In the long term, however, it is important not to artificially support unviable companies once activity has resumed.

We consider that currently, the first risk far outweighs the second. But the latter should guide the conditions for the withdrawal of public support measures more than the issue of their cost to public finances.

The hibernation of a large number of companies was made possible by liquidity measures. Yet, the cost of these measures is a considerable increase in their debt. When the process of defaults returns to normal, debt will invariably put these companies at risk or prevent them from investing and innovating. In both cases, productivity and growth will be affected. Our estimates suggest that the additional accumulated debt and lower productivity (because of persistent constraints on their activity) could generate a 26% increase in defaults for the most affected retail sectors over the 2021-2022 period. This would come on top of the catching-up of “normal” insolvencies that did not take place in 2020 of the order of 30%, and which should not be interpreted as a failure of the public support to companies.

To avoid the exit of viable and productive enterprises, we propose several options that will involve, to varying degrees, the state, private creditors, and banks. The aim is to ensure the separation between viable and non-viable enterprises. The question of restructuring certain debts will arise as early as 2021 because liquidity measures, or even lengthening debt maturity, will not be sufficient to avoid inefficient defaults. It also seems reasonable to focus aid on the sectors that have suffered the most.

Among the existing companies, some are likely to be liquidated because their activity is not viable. For those that have remained viable, the debt accumulated during the Covid phase may pose a danger. Two cases are possible: first, the firm is unable to repay its debt, which may lead it to be liquidated; second, the firm is technically solvent but over-indebted, which limits its incentives to invest. In both cases, despite the viability of the firm, excess debt destroys value and may durably reduce productivity. It leads to excessive liquidations of viable firms or reduces profitable investment, particularly in R&D.

Liquidity measures alone (such as lengthening maturities) will not be enough to prevent the failure of some viable companies. The only solution is to reduce the company's indebtedness, since it is the excess debt specific to the year 2020 that destroys value. Five options are possible from this point of view:

1. Allowing re-negotiation between the company and its creditors. In theory, maintaining debt at a high level leads to a destruction of value: reducing it therefore leads to an increase in the value of the company. The creditor and the entrepreneur therefore have a vested interest in this type of restructuring.
2. Imposing a haircut on the creditor. This is what a commercial judge may do in insolvency proceedings.
3. Encouraging the creditor to accept a haircut, using public subsidies.
4. Proposing a refinancing of the debt by the state in exchange for an equity stake in the company's capital.
5. Proposing a refinancing of private investors' debt with debt financed or guaranteed by the state, which corresponds to equity loans.

In terms of efficiency, the first four solutions are well-founded, as they reduce the company's debt. The fifth solution leaves the company's indebtedness unchanged. Thus, while job retention schemes or state aid have prevented an explosion of indebtedness, state-guaranteed loans or equity loans, even if they prevent an excessive short-term increase in defaults, do not solve the problem. Solutions 4 and 5 are by far the costliest for the state, while solutions 1 and 2 cost the state nothing. Solution 3 involves a lower subsidy than in cases 4 and 5 because it is accompanied by a reduction in debt: the creditor, therefore, absorbs part of the loss.

Overall, Options 1 (direct renegotiation) and 3 (subsidised renegotiation) are the most effective. Option 1 is the least costly for the state and allows full internalisation by private actors of the consequences of the decision to liquidate or keep the company alive. Therefore, it avoids problems of misallocation of resources. It could be encouraged with a campaign to promote conciliation procedures, upstream of collective proceedings. Despite the measures already taken in this direction, companies are still reluctant to go through the Commercial Court, even upstream of genuine collective proceedings. A communication campaign in the specialized media and with the auditors would make it possible to promote conciliation, show its simplicity, and remove the stigma attached to the idea of renegotiating debts. The circumstances are exceptional: over-indebtedness because of the COVID crisis is not a management fault.

Incentivising debt haircuts using public subsidies is also a good approach (option 3). It leads to a real debt reduction at a lower cost for public finances. By engaging private actors, it allows an optimal choice between liquidation and continuation of viable enterprises. The public subsidy avoids the blocking of the procedure by senior

creditors. As with commercial real estate during the second wave, it would be possible to provide an incentive through a tax credit to the creditor who agrees to a reduction in his debt. It could be targeted at sectors that have been subject to administrative closures.

For a certain number of companies, it is the state that has lent the most of what they owe through public guaranteed loans, or through the deferral of tax and social security contributions. In this case, the state must act as a responsible and flexible creditor, granting debt reductions where necessary to enable the company to develop, or even survive if it is viable. This may imply a transformation of these debts into shares; it is also in the interest of the entrepreneur. It is entirely reasonable to imagine that the state could become a minority shareholder in several companies, as long as a gradual exit plan is foreseen. This option should not be ruled out, nor should it lead to a general questioning of the repayment of debts to public institutions or guaranteed loans.

To implement this strategy in an enlightened way, it is important to improve the quality of information to the public and to decision-makers about business difficulties. More resources must be made available through the public statistics system to monitor company restructuring in real time. Moreover, it is crucial to implement a detailed and sectoral monitoring of corporate debt by distinguishing between the different types of debt: fiscal, social, banking and inter-companies (such as supplier credit). It is important to precisely quantify the financial situation of companies at a very detailed sectoral level to better target support, prepare the exit from emergency measures, and identify the necessary debt reductions.

Finally, the crisis could also have some positive effects on productivity. Because of the crisis, companies have been forced to experiment with new organisational modes, and new technologies that could have beneficial results. The most emblematic evolution from this perspective is the development of telework. But its impact on productivity and employee well-being is still incompletely understood, especially in France.

Emergency measures, recovery packages, and imbalances in the euro area

Within the Eurozone, the economic shock linked to the pandemic is uneven, as it affects more severely countries that were initially more fragile. The current crisis threatens to increase the imbalances within the eurozone, because it is more pronounced in countries with higher public debt and a deteriorated current account. Despite those initial fragilities, all countries succeeded in launching a comprehensive fiscal response to the crisis through emergency plans and automatic stabilisers.

The initial situation of the euro zone is the same as the one analysed in the 2019 French NPB report: a large current account surplus for the zone as a whole, driven by a few countries, together with imbalances within the zone itself. We had concluded the 2019 report by underlining the risks that these imbalances present to the eurozone. We considered that the imbalances originated from a deficit of demand coming from countries with exceptionally high trade surpluses, most of all Germany and the Netherlands. The recovery plans could have been an opportunity for a coordinated reduction of these imbalances. It is thus both legitimate and helpful to analyse how the Covid-19 shock as well as the policy responses could affect these imbalances.

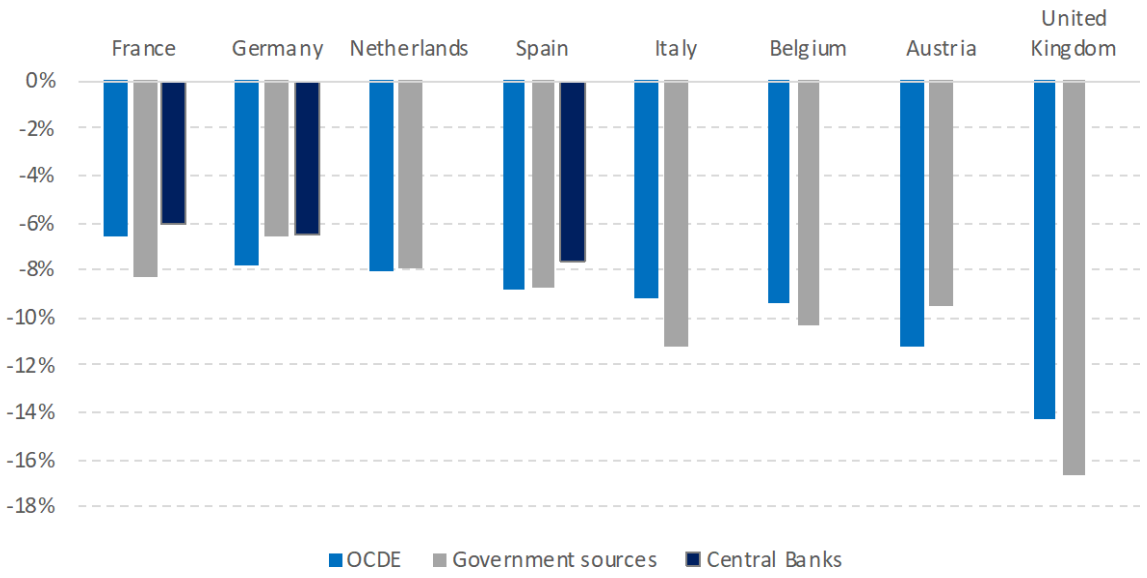
Eurozone countries have implemented measures to protect economic activity (mainly emergency support), and measures to encourage reallocation within their economies (mainly through the recovery plans). It is not possible at this stage to quantify the effects of the stimulus packages on current accounts and on the competitiveness of euro area countries. However, several stylized facts emerge from a comparative analysis, highlighting the differences in both the amount and the objectives of these plans.

The shock of the crisis is expected to marginally reduce the current account surplus of the euro area between 2019 and 2020. In itself, this reduction in the imbalance is not bad news, even if interpreted as a temporary reduction. This slight reduction in the overall imbalance conceals important heterogeneities. In the short term, the deterioration of the current account balance is slightly less pronounced in countries where it was already in surplus. These current account movements can be explained by the different sectoral specialisations of the countries, and by contrasting sectoral developments in the year 2020. In the short term, current account imbalances within the euro area should be slightly accentuated by the crisis. In the longer term, current account developments will depend chiefly on the characteristics of the fiscal measures adopted by governments, and their respective impact in the coming years on demand and supply, and thus on the imports and exports of individual countries.

The measures taken at the onset of the crisis, notably by the European Central Bank (ECB), were successful in the sense that all eurozone countries, even those with high public debts, were able to increase their budget deficit. Automatic stabilizers, and emergency measures taken by governments, played an unprecedented role. In the euro area, the projected budget deficit in 2020 is correlated with the depth of the recession. The change in the budget balance between 2019 and 2020 is an imperfect yet relevant measure of the country's fiscal support: it is the sum of automatic stabilizers and emergency plans. This 2020 fiscal response will be of an unprecedented scale, even if it is not yet fully known, since the figures differ between OECD, central bank and government forecasts (see Figure 1). In France it should be between 6 and 8.3

points of GDP. In Germany, it should range between 6.5 and 7.8 points of GDP, and in the Netherlands about 8 points of GDP. Spain, Italy, and especially the United Kingdom outside the euro zone should experience even higher increases in budget deficits. By this measure, France's budgetary response in 2020 is below the average observed in Europe's six largest economies.

Figure 1 – Change in government's budget balance between 2019 and 2020, in GDP points, according to three different sources

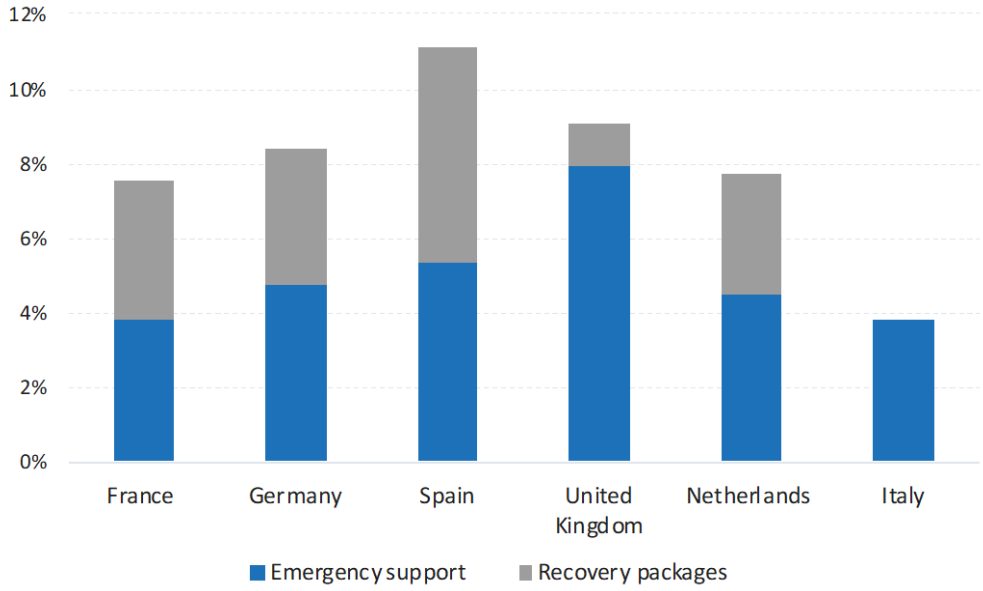


Sources: OECD, December 2020 forecasts, government announcements and central bank forecasts.

We created a detailed list of the measures announced in the various emergency and recovery packages in European countries. Our work was painstaking given the sheer number and scale of the measures presented by governments. Since these are largely announcements at this stage, it is necessary to make sure that these announcements are translated into actual spending.

When aggregated, the fiscal packages of the eurozone countries in response to the crisis, both emergency and recovery plans, are massive. Figure 2 illustrates some of the differences between countries. Larger amounts were announced in Spain (11.1% of GDP), and the United Kingdom (9.1% of GDP) compared with Germany (8.4% of GDP) or France (7.6% of GDP).

Figure 2 – Announced emergency and stimulus plans, excluding liquidity measures, in GDP points

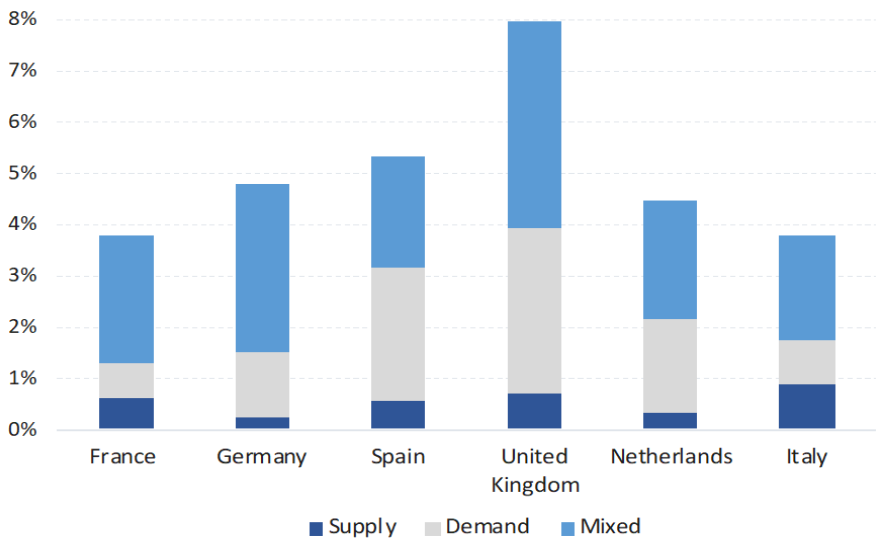


Note: the amounts correspond to the amounts announced on 17 December 2020 for France, and on 15 or 20 November for the other countries (see details in the text and annexes).

Source: General Directorate of the Treasury; NPB restatements and calculations

The available information shows that there are only small differences between countries in the distribution of their support to supply and demand. This is an important finding. Such differences could have affected trade balances, with demand measures favouring imports and supply measures favouring exports. It should be noted, however, that Spain and the United Kingdom are proposing more demand-oriented measures. However, most of the measures are mixed, supporting both. A major example is the widely deployed job retention schemes, which can be seen as measures that help both the supply side (by supporting companies' cash flow) and the demand side (by supporting household income). This preponderance of mixed measures should not be surprising considering the mixed nature of the crisis itself, affecting both the supply and demand sides of economic activity.

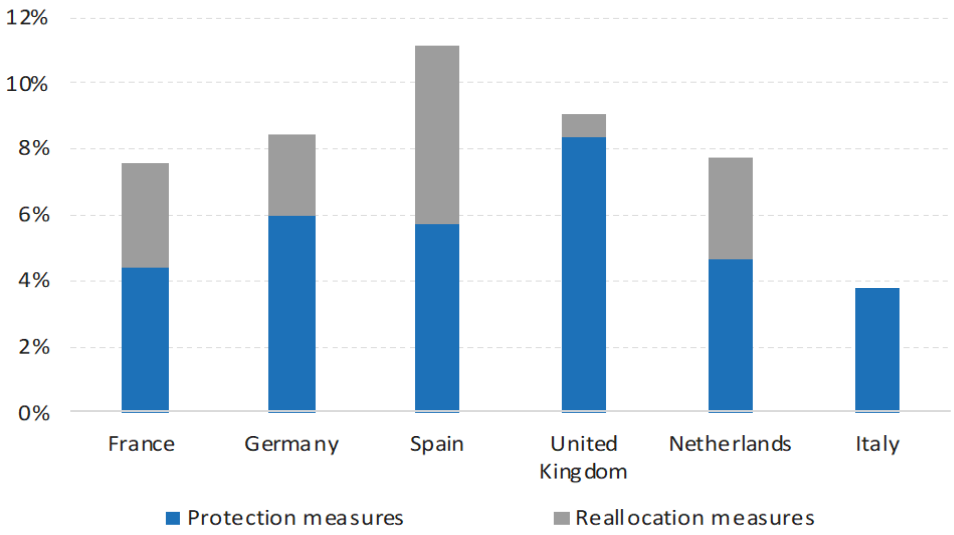
Figure 3 – Supply and demand sides measures in emergency plans in GDP points



Source: General Directorate of the Treasury; NPB restatements and calculations.

We found that it was more relevant to distinguish between measures aiming at protecting the economy (households and enterprises) in the short term, and those whose purpose is to promote the reorientation and reallocation of the economy to increase productivity, competitiveness or environmental sustainability in the long term.

Figure 4 – Protection and reallocation in emergency and recovery plans in GDP points



Note: the amounts indicated are spread over 2020 and 2023 for most countries.

Source: General Directorate of the Treasury; NPB restatements and calculations

The policy response to the crisis is fairly balanced between protection and reallocation measures, except for the UK (Italy has not yet announced its recovery plan, hence the absence of reallocation measures). However, given the uncertainty around the evolution of the pandemic and economic situation, additional protective measures will probably be announced in 2021. This is less likely the case for reallocation measures. France, so far, has chosen to emphasize spending on reallocation. However, the amounts announced on protective measures remain higher than on reallocation measures, as is the case in other countries. Overall, all countries made a similar choice of focusing the immediate budgetary support mainly on protection measures. These take the form of aid to SMEs, the self-employed, health expenditure and job retention schemes. These measures represent 92% of all emergency and stimulus measures announced by the United Kingdom, and 71% in Germany. By contrast, Spain, France, and the Netherlands presented strategies that are more balanced between protection and reallocation measures. Reallocation measures account for 49% of the overall effort in Spain, 42% in France, and 40% in the Netherlands. These three countries are distinguished by a relatively more focused strategy on long-term reallocation schemes than on short-term protection schemes. Only France and Germany include a significant proportion of protection measures in their recovery plans, with 13% and 20% of total protection expenditure coming from recovery plans respectively.

At this stage, emergency and recovery plans do not have characteristics from which a clear impact on the medium-term internal imbalances of the euro area can be inferred. This is hardly surprising. The fiscal response at the national level was strong all over Europe and the unprecedented fiscal package adopted by the European Council this summer, « Next Generation EU » is an important step towards addressing potential divergence in the Eurozone. By allocating more funds to countries most affected, the EU Recovery and Resilience Facility has chosen the right strategy but two concerns remain. First, there is no explicit objective in the Facility to reduce Eurozone current account imbalances. Second, there is no coordination of national fiscal plans to prevent that they may actually increase pre-existing current account imbalances.

The objective of a coordinated reduction of the internal imbalances in the current accounts of the euro area countries, still considered important, has not influenced the decision-making process for the euro area budgetary plans. Such coordination, if it had existed, would have prompted recovery plans that would have been more targeted on measures to increase domestic demand in countries with a surplus. The lack of coordination of stimulus plans to reduce eurozone imbalances constitutes a missed opportunity. A major risk in the coming years is that countries with current account surpluses will be the first to reduce their fiscal stimulus.

Skills and productivity

In the third chapter, we address the issue of France's skills level and its relationship with productivity. Compared to other European countries, the level of skills observed in France is mediocre, when looking at the working-age population as well as the children and youth in school. Its schooling system is also less successful at reducing human capital inequalities. As a consequence, human capital inequalities are higher between adults, and the level of skills is particularly low for those with few skills, compared to other European countries.

Although work productivity is high in France, the poor performance in the initial acquisition of skills has a negative consequence on labour market participation. Until recently, there was a lack of emphasis on lifelong learning, on vocational training, and a lack of targeting to those who need it the most, such as the unemployed and the least qualified. The high structural unemployment rate in turn translates into a loss of skills for those far away from the labour market.

Since human capital is the main driver of productivity gains, the country faces two major challenges. The first is to reduce educational inequalities beginning at an early age. The second is to increase the recourse to lifelong learning and targeting the least qualified individuals. Recent reforms have been undertaken to this effect, though it is still too early to measure their effects.

In order to fully take advantage of the change in the demand for skills, France needs to ensure it has a well-functioning, well-targeted and agile life-long training system. This will be crucial to support the industrial changes resulting from the crisis and the policies taken in response. As an example, the renovation of buildings to make them energy-efficient (a policy actively supported by the recovery plan) will require new skills that are in short supply.

Our analysis also highlights the significant risk of loss of human capital linked to the closure of schools during the first lockdown, as well as difficulties in integrating young people into the labour market after their training. The school closures during the spring lockdown caused a delay in the acquisition of skills, particularly among the most socially fragile students. The experiences of previous crises show that this delay will not be caught up unless measures are specifically introduced for this purpose and it becomes a clear policy objective, especially for the most disadvantaged. Similarly, difficulties entering the labour market, combined with reduced opportunities and long-term unemployment will have long-term effects on productivity, and thus growth and living standards unless targeted measures to correct them are implemented.

These findings are made in the context of a polarization of employment: the share of middle-skilled jobs has fallen at the expense of highly skilled ones, and to a lesser extent, lower-skilled ones. This polarization is more pronounced in larger metropolitan areas, thus accentuating territorial differences. It is also found between companies. Compared to other OECD countries, in France, highly qualified workers are proportionally more present in the most productive companies. In the years to come, there is a real risk that the polarization of jobs will continue, including at the geographic level. The skills sought are increasingly either highly cognitive or non-routine: that is, they rely on non-cognitive skills such as autonomy, management and communication, now essential for productivity gains. To reduce the risk that further increases in polarization hurt those with lower skills, the country should ensure it has a well-targeted and agile lifelong learning system that can empower its citizens to make the most of the changing demand for skills.

CHAPTER 1

COVID AND PRODUCTIVITY

The Covid-19 pandemic has caused the most sudden and deepest global recession since the Second World War.[1] According to the OECD's 2020 December forecast, global GDP is expected to contract by 4.2% in 2020.[2] GDP is expected to contract by 5.8 per cent in developed countries, 7.5% in the euro zone and 9.1% in France. By comparison, the 2009 financial crisis caused GDP to contract by 4.5% in the euro zone, "only" 2.9% in France and 0.1% worldwide.[3] The 1993 and 1975 recessions in France did not lead to a contraction of more than 1% of GDP.

The current crisis is different from all past recessions. It differs in its scale and suddenness: the global economy was put on a synchronised pause in March 2020, and a second time, to a lesser extent, in the autumn. It also differs in its nature, by reducing both the supply and demand sides of economic activity. The sectoral heterogeneity is also striking. In France, on the eve of the second lockdown in October 2020, economic activity had recovered on average 96% of the pre-crisis level, but some services, such as catering, tourism, in-person services or the

[1] Bergeaud *et al* (2020) present GDP trends since the end of the 19th century for several developed countries. They show that no developed country outside the war period will have experienced a recession of a magnitude comparable to the current one, in terms of GDP contraction in a given year.
[2] Source : OECD (2020), "OECD Economic Outlook, December 2020", OECD Economic Outlook: Statistics and Projections.
[3] Source: International Monetary Fund, World Economic Outlook database, accessed 13 October 2020.

production of transport equipment are likely to be durably affected.[1] Finally, this crisis is characterised by the scale of the emergency support measures for the economy: in 2020, France has announced emergency support measures for up to 468 billion euros (21% of GDP).[2] The public deficit is forecasted at 11.3% of GDP, the financing of which will be facilitated by unprecedented decisions by the European Central Bank.[3] By comparison, the 2009 crisis led to a public deficit in France of around 7.2% in 2009. The scale of the stimulus measures, in addition to the emergency measures, is also unprecedented. An equally unprecedented policy response was the European Commission's issuance of debt on behalf of the EU, to finance a European recovery plan worth 750bn euros.

This chapter examines the long-term effects of this crisis on productivity, taking into account all its characteristics, its suddenness, scale, and the policy responses. The chapter starts by reviewing the mechanisms by which recessions affect productivity and the long-term growth path. Past recessions were more gradual, less severe and affected different sectors. Understanding the transmission mechanisms of the crisis can help in designing better policies to encourage the recovery and mitigate negative impacts on productivity. This chapter recalls what the experience of past crises teaches us about the expected effects of recessions on productivity. However, this lesson needs to be taken with caution because of the singularity of the current crisis. For this reason, this chapter also offers a first analysis of the effects of the Covid-19 crisis on productivity, with a specific focus on the issue of corporate failures.

[1] See Insee, Point de conjoncture of 2 December 2020. This heterogeneous profile of economic recovery is common to all countries, and was called "the 90% economy" by *The Economist* in an article of 16 September 2020, "Is the world economy recovering?".

[2] Source: General Directorate of the Treasury, Ministry of the Economy and Finance. The measures to support activity break down into three parts. The first, "Loan guarantees and similar", amounts to 327 billion euros. The second, "Deferral of charges and similar", amounts to 76 billion euros. The third, comprising budgetary aid such as partial activity and health expenditure, amounts to €64.5 billion.

[3] According to the Economic, Social and Financial Report 2021 annexed to the draft 2021 Finance Act.

1. Reallocations during "normal" recessions: a review of existing literature

1.1. Schumpeterian "*cleansing*": a positive side-effect of recessions

According to Schumpeter (1939), the least productive firms are more likely to go bankrupt during recessions.[1] These bankruptcies liberate human and capital resources for other firms using them more efficiently, in line with the emergence of new practices. Recessions thus *accelerate* the creative destruction process. This acceleration in the reallocation of resources leads to an increase in productivity after the recession. This is called the *cleansing effect*. Recessions would not be a "good" thing but would *at least* have a positive effect by accelerating the selection of the most efficient firms. The presence of this effect is still debated in the literature, as well as the existence of other counterbalancing effects.

During recessions, a well-documented increase in bankruptcies is normally concentrated in the least productive enterprises.[2] During the Great Recession between 2008 and 2009, the annual bankruptcy rate in the United States rose from 11.8% to 13.5%.[3] Recessions are associated with increased reallocation of jobs within the manufacturing sector[4], and is a major source of productivity gains.[5] This reallocation can take place in a number of ways: between companies within the same sector; between different sectors; or within companies themselves.

The relationship between reallocation and productivity gains is strengthened during recessions, according to a study focusing on the manufacturing sector in the United States.[6] This last study analyzes productivity, growth and bankruptcy rates for all

[1] This concept was later formalised by Aghion and Howitt (1992), who are at the origin of a new generation of so-called endogenous growth models. Contrary to the models developed until then, where growth is driven by the addition of innovation and knowledge to the existing stock, these so-called neo-schumpeterian models introduce the idea that new innovations can replace old ones, which forces firms to innovate in order not to disappear and obtain a temporary monopoly rent.

[2] Blanchard and Diamond (1990) find that the cyclicality of job destruction is more pronounced than job creation.

[3] Osotimehin S. and Pappadà F. (2017), "Credit frictions and the cleansing effect of recessions", *The Economic Journal,* vol. 127(602), June, pp. 1153-1187.

[4] Davis and Haltiwanger (1992) measure the effects of recessions on intra-industry reallocation and productivity increases. A review of these effects is presented in Philippe Aghion *et al.* (2020), *Le Pouvoir de la destruction créatrice,* Paris, Odile Jacob.

[5] Collard-Wexler and DeLoecker (2015) show that a large part of the productivity gains in the steel industry in recent decades have taken place through this reallocation.

[6] Foster L., Grim C. et Haltiwanger J. (2016), " Reallocation in the great recession: Cleansing or not? ", *Journal of Labor Economics*, vol. 34(S1), p. S293-S331.

manufacturing establishments between 1976 and 2011. The result is that during recessions, the bankruptcy rate increases more for the least productive firms, and growth differences increase with the most productive firms.[1] The process of reallocation between sectors alone could explain more than half of the productivity gains[2] and it increases by around 50% during recessions. As a general rule, the sectoral reallocation phenomenon alone would lead to an increase in aggregate productivity growth of a quarter more than its normal trend during recessions.

This study also shows that recessions have a significant cleansing effect of the least productive companies, which exit the market in a higher proportion than in normal times. However, the authors find that during the last recession, in 2009, this effect was slightly less pronounced.

In France, the 2008 crisis led to a 40% increase in bankruptcies, although there is a great deal of heterogeneity by sector and by firm's age, with the youngest firns being most heavily affected.[3] This is a result shared with other countries and generally observed during different recessions. The post-crisis period of 2008 was characterised by a greater reallocation than in the previous period.[4] The reallocation effect of market shares and market entries is responsible for more than three quarters of productivity gains in France (Figure 1) and has partially offset the negative contribution of sustainable companies to productivity gains. This is confirmed by a study covering the period 2011-2017[5]: the process of creative destruction has strengthened slightly after the crisis, while the contribution of permanent companies has significantly decreased. The creative destruction process allowed productivity growth to remain positive during the years 2010.

[1] Under normal circumstances, the difference in growth rates between an establishment one standard deviation below and above the average is about 11 percentage points, and the difference in bankruptcy rates is 4 percentage points. During recessions, these differences increase considerably. Indeed, their results indicate that these differences increase even more for younger firms.

[2] Foster L., Haltiwanger J. et Syverson C. (2008), " Reallocation, firm turnover, and efficiency: Selection on productivity or profitability? ", *American Economic Review*, vol. 98(1), p. 394-425.

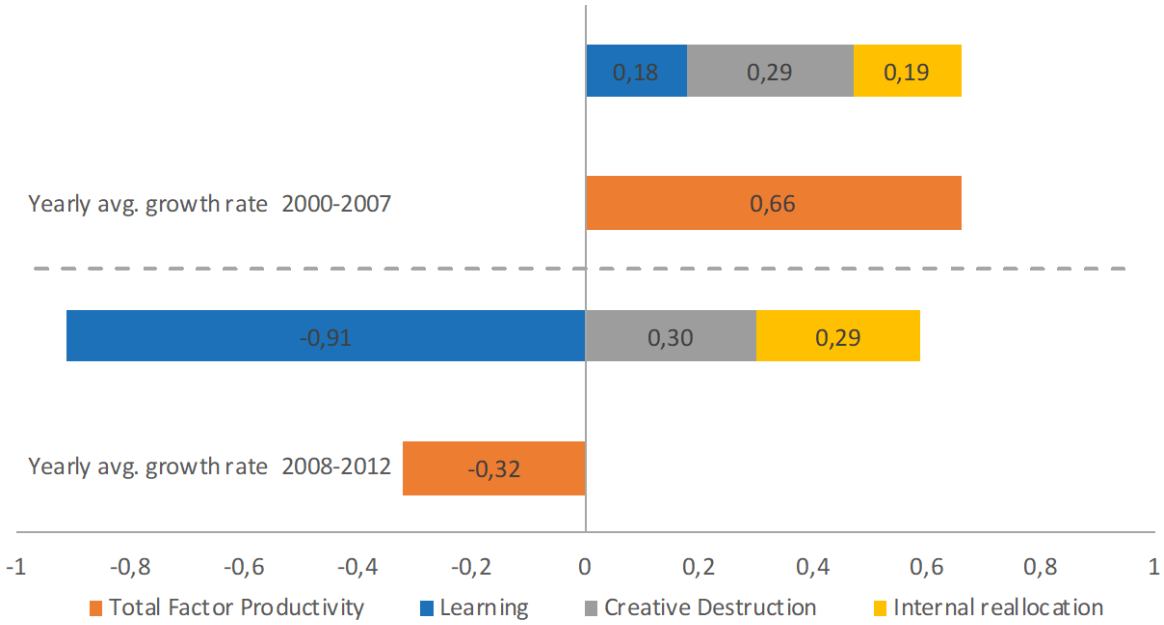
[3] Fern D., Golfier C., Horny G. and Kremp E. (2013), "What was the impact of the 2008 crisis on business failure? "*Économie et Statistique*, No. 462-463, pp. 69-97.

[4] Ben Hassine H. (2017), "Croissance de la productivité en France : le rôle de la réallocation des parts de marché entre entreprises", *La Note d'analyse,* n° 57, France Stratégie, July.

[5] David C., Faquet R. and Rachiq C. (2020), "Quelle contribution de la destruction créatrice aux gains de productivité en France depuis 20 ans?", *DG Treasury Working Paper*, No. 2020/5 October.

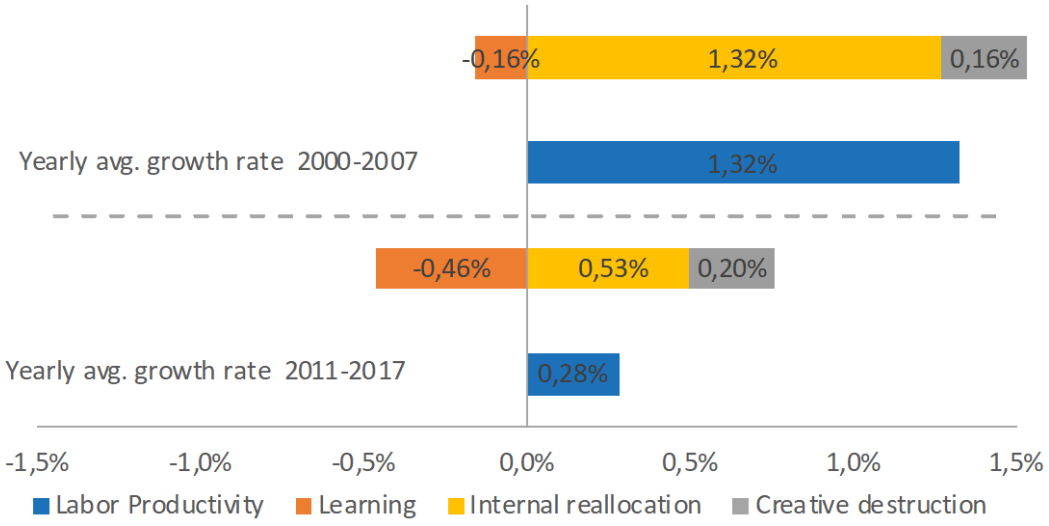
Figure 1 – Decomposition of productivity gains

1a - Total factor productivity



Source: Ben Hassine H. (2017), "Croissance de la productivité en France : le rôle de la réallocation des parts de marché entre entreprises", La Note d'analyse, *n° 57, France Stratégie, juillet*

1b - Labour productivity



Source: David C., Faquet R. and Rachiq C. (2020), "Quelle contribution de la destruction créatrice aux gains de productivité en France depuis 20 ans?", DG Treasury Working Paper, *No. 2020/273, December*

1.2. Other effects counterbalance Schumpeterian cleansing

Numerous works challenge the idea that recessions pave the way for future expansions through an increase in the pace of reallocation. Although the *cleansing* of the least productive firms during recessions has a positive effect, other mechanisms have negative effects on resource allocation and productivity.

Recessions destroy contractual relationships that are costly to rebuild

Without contradicting a *cleansing effect*, other mechanisms indicate that the rise in bankruptcies during recessions – leading to large-scale job losses and financial hardship – is associated with a significant and avoidable waste of resources.

Companies often have specific contractual relationships that are both costly and difficult to replace.[1] For example, contracts between companies (suppliers, services, etc.) determine their long-term investments. Research and development costs can be specific to the contractual relationship, and thus viewed as *sunk costs*. Finally, relations between companies take time to reach a level of fluidity and complementarity that has a positive effect on productivity. The breakdown of these links when a company fails and the costs of re-establishing contractual relations prevent the rapid reallocation of resources.[2] During recessions, an excess of destruction is observed compared to what would be optimal, as the creation of new enterprises is not sufficient to re-establish new contractual relations.

This *disorganisation* effect is particularly present today. The closure of certain industrial suppliers had important network effects which amplified sectoral shocks.[3] The

[1] Caballero, R. J. et Hammour M. L. (1998), "The macroeconomics of specificity", *Journal of Political Economy*, vol. 106(4), p. 724-767 ; Caballero R. J. et Hammour M. L. (2005), "The cost of recessions revisited: A reverse-liquidationist view", *The Review of Economic Studies*, vol. 72(2), p. 313-341.

[2] Blanchard and Kremer (1997) analysed the great recession following the collapse of the Soviet Union, which caused a disorganization of production. Complex production networks depend on specific contractual relations between firms with few possible alternatives. Blanchard and Kremer's analysis suggests that the transition led to a greater fall in activities dependent on complex production chains and international trade. Their results show that specific contractual relations between firms are costly to put in place, and have a major impact on complex production chains.

[3] See for example on the Covid crisis, Baqaee D. and Farhi E. (2020), "Supply and demand in disaggregated keynesian economies with an application to the Covid-19 crisis". Magerman G., De Bruyne K., Dhyne E. and Van Hove J. (2016), "Heterogeneous firms and the micro origins of aggregate fluctuations", *ECARES Working Papers,* 2016-35, Université libre de Bruxelles, for a complete modelling of inter-enterprise relations on Belgian data, which highlights a strong granularity of the economy. Similarly, Foerster *et al* (2019) develop a model in which sectors are linked by intermediate consumption and capital goods. They then calculate a more than proportional contribution of manufacturing industries to aggregate productivity gains; Foerster A., Hornstein A., Sarte P.-D. and Watson M. W. (2019), "Aggregate implications of changing sectoral trends", *NBER Working Paper Series,* No. 25867, May.

recession in 2020, in some industrial sectors, could lead to the failure of subcontractors producing hard-to-replace components. These failures are all the more likely if these subcontractors are located in countries where they have not received public aid, and have knock-on effects through the increasingly globalized value chains.

Firms that go bankrupt are not always the least productive

The increase in bankruptcies during recessions has motivated the idea that recessions have a cleansing effect for the economy. A negative demand shock should, a priori, drive the least efficient firms out of the market, allowing resources to be reallocated to the most productive. But is it really the least productive firms that go bankrupt in a crisis?

Credit constraints mitigate the cleansing effect

The *cleansing effect* is based on the implicit assumption that markets efficiently select the most productive firms. However, several studies show that the probability of firm failure depends not only on their productivity but also on their access to credit. Barlevy (2003) studies the consequences of credit frictions on resource allocation during recessions. He shows that credit frictions can lead to the opposite of the *cleansing effect* during recessions.

Two studies based on French data confirm the fundamental role of credit constraints on the probability of bankruptcy. Musso and Schiavo (2008) find that credit constraints significantly increase the probability of bankruptcy. Their results indicate that firms in the most financially constrained quintile have a 16 per cent lower probability of "survival" than others. Fougère *et al.* (2013) also confirm these results. They find that payment delays and cash flow difficulties disproportionately affect SMEs. During recessions, these delays are longer, commercial credit between companies is more risky and SMEs are the first to suffer from this via a considerable increase in their probability of bankruptcy.

Carreira and Teixeira (2016) use Portuguese administrative data, follow companies from 2004 to 2012, and compare start-ups and bankruptcies before and after the crisis. Their results show that credit constraints change the selection of firms that fail. Some high-productivity firms go bankrupt if their assets are not sufficient, while other low-productivity firms survive if their capital base is strong enough. On the other hand, credit constraints may prevent the creation of new productive firms[1].

[1] Osotimehin S. and Pappadà F. (2017), *op. cit.*

The combination of a recession and credit constraints is likely to generate a destructive process with long-term negative impacts on productivity, contrary to the *cleansing effect*.

"Infant deaths": young and productive enterprises in danger of bankruptcy

Recessions have a disproportionate effect on the probability of failure of young companies. For example, during the 1984 recession in the United States[1], the exit rate for companies more than 10 years old fell from 0.35% to 0.37%, while the exit rate for companies less than one year old fell from 1.35% to 3.42%.

A study on France confirms this risk for the youngest companies.[2] The crisis could have a U-shaped effect: its effects could be more negative for the youngest and the oldest companies. In the manufacturing industry, 45% of bankruptcies of young companies (two years or less) are due to the crisis, while this proportion is less than 40% for companies between three and six years old. Similar results appear in the construction sector.

In another study on France[3], the authors find that the effects of firm performance (productivity, profitability) are stronger for mature firms and that the effects of market structures (concentration, turbulence) are stronger for young firms. Their results suggest that while the Schumpeterian selection effect does exist, the selection process is more "severe" for young firms.

Experiences in other countries support the idea of a strong bias in favour of the survival of already long-established enterprises, irrespective of their productivity. For example, in Japan, during a decade of slow growth, mature and unproductive Japanese firms remained in the market, while the probability of exit for younger firms increased more than for others[4]. A strong anti-schumpeterian effect is therefore found precisely during a recession or lasting stagnation.

Disproportionate bankruptcies of start-ups play an important role in the allocative effect. Start-ups tend to appear unproductive in the short term, but have the potential to reveal

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[1] Ouyang M. (2009), "The scarring effect of recessions", *Journal of Monetary Economics,* vol. 56(2), March, pp. 184-199.

[2] Fern D., Golfier C., Horny G. and Kremp E. (2013), "What was the impact of the 2008 crisis on business failure?", *Économie et Statistique*, No. 462-463, pp. 69-97.

[3] Bellone F., Musso P. et Quéré M. (2006), "Productivity and market selection of French manufacturing firms in the nineties", *Revue de l'OFCE*, 2006/5 (97 bis), June, p. 319-349.

[4] Nishimura K. G., Nakajima T. et Kiyota K. (2005), "Does the natural selection mechanism still work in severe recessions?: Examination of the Japanese economy in the 1990s", *Journal of Economic Behavior and Organization*, vol. 58(1), p. 53-78.

high productivity in the future. Recessions that destroy start-ups weaken the economy, preventing innovative new businesses from reaching their full potential.

This negative effect is the opposite of the conventional *cleansing* effect, although both effects occur through the exit of unprofitable companies. Therefore, the overall impact of recessions on resource allocation depends on the relative size of these three competing effects: the *cleansing effect*, the bankruptcy of more productive firms due to credit constraints, and the "infant death" effect. Policy makers should try to address and reduce these last two mecanisms.

Managerial quality also has an important role in cushioning cyclical shocks and reducing their effect on productivity. A recent study examines the impact of managerial quality on employment, value added, productivity and wages in recession[1]. The authors find that during downturns, firms with better managerial quality choose to preserve employment at the expense of real wages. A positive impact on employment goes hand in hand with a positive impact on output levels. For example, labour productivity increases slightly, by about 5 per cent five years after the recession, relative to firms with lower managerial quality. This effect is realized because managerial quality would succeed in preserving employment and total production.

The increasing share of zombie companies: a questioning of the effectiveness of the remediation process

The weakening of the *cleansing effect* can be linked to the existence of so-called zombie firms. These are unproductive, often older companies whose financial costs exceed their operating income for at least three consecutive years.[2] The existence of these firms results in a retention of capital and labour that can hinder the development of other enterprises and reduce the entry of new competitors. There is an intertemporal trade-off for governments between sustaining activity and employment in the short term, and optimally directing productive resources so that the growth path is not diminished in the long term.

An important question is whether the increase in private debt observed during the Covid-19 crisis will lead to an increase in zombie companies, and *ultimately to a* drop in productivity[3]. Jordà *et al.* (2020) stress the central role of the quality of corporate

[1] Cette G., Lopez J., Mairesse J. et Nicoletti G. (2020), "Economic adjustment during the Great Recession: The role of managerial quality", *NBER Working Paper Series*, n° 27954, October.

[2] Ben Hassine *et al* (2019), *op. cit.*

[3] Jordà Ò., Kornejew M., Schularick M. and Taylor A. M. (2020), "Zombies at Large? Corporate Debt Overhang and the Macroeconomy", *CEPR Discussion Paper,* DP15518, December.

default procedures in avoiding zombification of the economy. Countries with less efficient bankruptcy resolution processes may suffer a greater negative impact from the crisis-related increase in business indebtedness with a consequent negative impact on productivity over time due to lower investment. Indeed, a study of 13,000 French companies shows that during a recession, the companies with the greatest financial constraints are those that reduce their R&D spending the most, which is [1]the source of future productivity growth.

2. The specificity of the Covid-19 crisis

The literature review in the previous section suggests that recessions are not only situations that eliminate low-productivity companies, but also that jeopardise productive albeit financially fragile enterprises. In short, recessions do not essentially constitute efficient processes of reallocation that guarantee post-crisis productivity gains. The Covid-19 crisis is also very different from previous crises, in particular because: 1) it is itself a productivity shock; 2) it hit sectors very heterogeneously; 3) administrative measures imposed a shutdown of productive enterprises. Analysis of the impact of the Covid-19 crisis on productivity must therefore take these specificities into account.

2.1. The sectoral heterogeneity of the crisis and its effect on productivity

The Covid crisis constitutes a productivity shock

During the first lockdown, economic activity declined much more than wage employment. Taking the year 2020 as a whole, INSEE[2] forecasts a 9% decrease in GDP and a 2.3% fall in wage employment. This indicates a significant employee retention by employers, which is promoted in particular by resorting to *chômage partiel* (‘partial unemployment’). In October 2020[3], around one quarter of firm managers in manufacturing sectors stated that their workforce is relatively high compared to their current level of activity. In the short term, this implies a sharp downturn in labour productivity. This decline in productivity translates itself into new costs, for example to fight the epidemic (masks, new procedures, etc.) and higher unit costs due to reduced production capacity (e.g. reduction in the number of tables served in a restaurant). The

[1] Aghion P., Askenazy P., Berman N., Cette G. et Eymard L. (2012), "Credit constraints and the cyclicality of R&D investment: Evidence from France", *Journal of the European Economic Association*, vol. 10(5), p. 1001-1024.

[2] Insee (2020), Point de conjoncture, 15 December.

[3] Insee (2020), Point de conjoncture, 17 November.

impact of the health crisis on productivity was described by INSEE as follows: “for 46% of services companies, 40% of which in the manufacturing sector and 56% of the ones in the construction industry, all surveyed in October, health protection measures reduce productivity, leading to major organisational difficulties”. However, this productivity shock is very heterogeneous depending on the sector. In October, employee retention and the fall in labour productivity is, according to INSEE, particularly widespread in the accommodation and catering sectors and the transport equipment manufacturing industry, industries in which companies that consider their workforce to be high with respect to their activity represent more than half of employment.

An economy at 90% of its capacity but a heterogeneous sectoral allocation

Following lockdowns in spring, some sectors strongly recovered, while the impact on other industries will be lasting. This dynamic will have composition effects on productivity, either transitory or persistent depending on the duration of the crisis and the physical distancing constraints put in place to combat the spread of the virus.

Among industries, this heterogeneity is particularly strong. The *Banque de France* monitors activity within the different sectors and documents the heterogeneity of the effects of the crisis. Figures 2 and 3 show that within industries, the pharmaceutical, chemical and food processing sectors have returned to activity close to pre-crisis levels. Capacity utilisation rates are relatively high, and business prospects are encouraging. On the other hand, in the automobile, transport and steel sectors, the forecasts for the level of activity are well below (80%) the level considered normal.

Within market services, this heterogeneity is just as strong (see Annex 2). Catering and accommodation, which are the most exposed sectors to the constraints of physical distancing, are at very low levels of activity and activity forecast. At the same time, other market services are witnessing a sharp increase in activity: this is particularly the case in the information and communication sector, as the demand for its services increases with the needs of remote working.

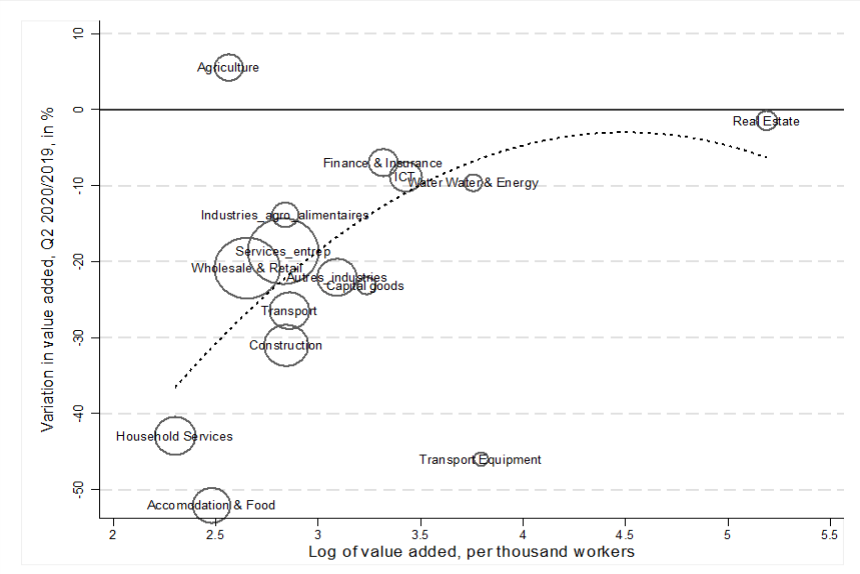
According to an INSEE economic survey[1], in October 2020, almost half of companies consider that health protection measures reduce their productivity. This survey also highlights the heterogeneity of the crisis by sector. In two sectors – accommodation and catering and the transport equipment industry – more than 50% of companies consider that their workforce is relatively high with regards to current activity.

[1] Insee (2020), *Point de conjoncture,* 17 November.

A composition effect on productivity

The sharp decline in activity concentrated in certain sectors could in the short term lead to a change in aggregate productivity by composition effect. The fall in activity has not been limited to services with low labour productivity, services typically requiring strong social interactions, as the example of the transport equipment sector shows. In contrast, the agricultural sector, a sector with low labour productivity, has been rather resilient to the crisis. Figure 2 suggests nonetheless that, with the exception of these two sectors, the decline in activity in the second half of 2020 (compared to the second half of 2019) was more pronounced in sectors with lower labour productivity. The accommodation and catering as well as the household services sectors have thus been very strongly affected and are also sectors with low value added per worker. In the short run, the sectoral composition effect of the crisis will therefore tend to work in favour of aggregate productivity[1]. In return, the more labour-intensive sectors are however most affected. It is difficult to know, however, whether this sectoral composition effect will be persistent, a scenario which does not seem the most likely. On the other hand, the issue of reallocation between companies within sectors as a result of business failure may be more important.

Figure 2 – Labour productivity and impact of the crisis by sector



Reading note: the size of the circles is proportional to employment in the sector. The dashed line is a quadratic regression weighted by industry employment.

Source: INSEE; France Stratégie calculations

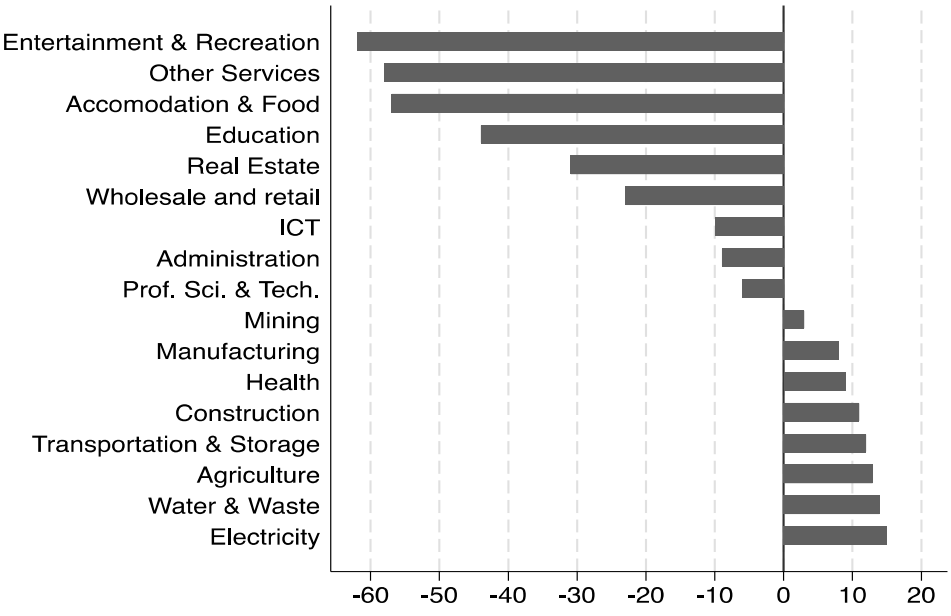
[1] The same observation is made by Bloom N., Bunn P., Mizen P., Smietanka P. and Thwaites G. (2020) on Great Britain. It is the less productive sectors that are most affected in the Covid crisis.

SMEs in certain sectors particularly affected

Gourinchas *et al.* (2020) estimate the impact of the Covid-19 shock on business failures, focusing on small and medium-sized enterprises (SMEs) in 17 countries. SMEs are particularly important: in the European Union, they account for 99.8% of all enterprises, 65% of private sector employment and 54% of private sector gross output. They are also particularly vulnerable to demand shocks. Their survival depends on their access to financing, that is their ability to face situations of insufficient liquidity (income and reserves) when bearing expenses. If financing dries up, they risk bankruptcy, even if they are solvent.

In order to document the fiscal cost of SME support measures, as well as their benefits, the authors begin by calculating a sector-specific demand shock, which allows the construction of scenarios of anticipated bankruptcies for SMEs (in the absence of support measures). This shock is presented in Figure 3, which shows that in 2020, the crisis is reallocating aggregate spending: spending falls sharply in services such as culture, entertainment and recreation, and rises in other sectors such as transport and storage, electricity, waste and water management.

Figure 3 – Estimates of the magnitude of the demand shock, by sector



Reading note: The authors' simulations indicate that the demand shock would be -60% in the entertainment and recreation sector and +20% in the transportation and storing sector.

Source: Gourinchas et al. *(2020)*

This great heterogeneity has effects on bankruptcy prospects of SMEs in each sector, which is proxied by SMEs illiquidity rate. Note that illiquidity rate is an imperfect approximation of the bankruptcy rate, as most firms can borrow in lack of liquidity. The authors use a dynamic model of business creation and bankruptcy to calculate the increase in the expected failure rate as a result of the crisis. The variation presented in column 3 of the Table 1 below shows the increase in the bankruptcy rate by sector between the rate in normal economic phase (column 1) and in phase of Covid-19 crisis (column 2).

Their results imply that in the sectors most affected by the crisis, the rate would rise sharply for SMEs in absence of support measures. This is the case, for example, in the culture and events sector, where this rate could have been multiplied by three in absence of emergency measures. In the case of France, all sectors combined, the average SME bankruptcy rate of 9% in a normal year could have reached 17% in absence of emergency measures.

Table 1 – Estimated difference of SME bankruptcy rates by sector as a result of the crisis in absence of support measures

	(1) Non-Covid	(2) Covid-19	(3) Difference
Agriculture	9,44	13,52	4,08
Extractive industries	12,50	36,03	23,54
Manufacturing industries	8,48	16,73	8,25
Production and distribution of electricity, gas, other.	9,35	11,31	1,96
Production, water supply, sanitation, waste management	6,72	9,65	2,93
Construction	7,97	10,19	2,21
Wholesale and retail trade, repair of motor vehicles and motorbikes	9,12	18,21	9,10
Transport and storage	7,64	13,28	5,63
Accommodation and catering	13,15	38,59	25,44
Information and communication	10,00	15,92	5,92
Real estate activities	11,61	17,38	5,76
Professional, scientific and technical activities	10,24	18,85	8,60
Public administration	8,32	19,39	11,06
Education	10,86	30,04	19,18
Human health and social action	7,74	11,22	3,48
Arts, entertainment and recreation	12,95	36,55	23,60
Other service activities	12,80	31,42	18,62

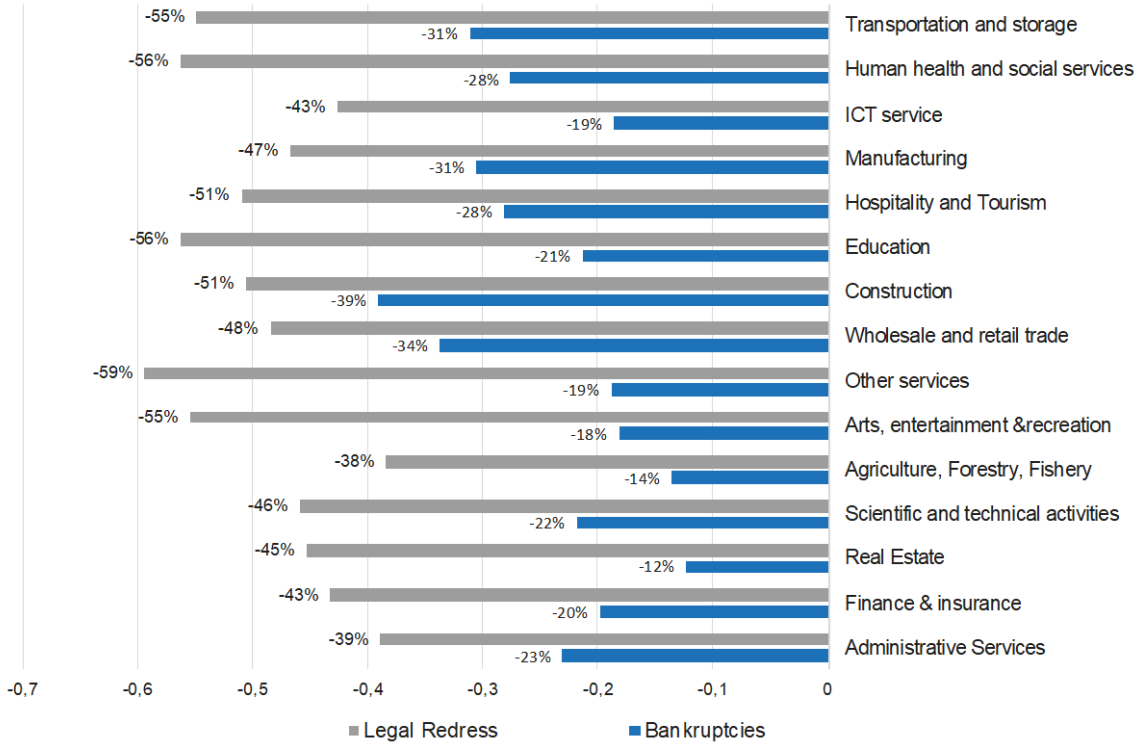
Reading note: the authors' simulations indicate that the annual bankruptcy rate of businesses in the accommodation and catering sector is 13% in normal times, and that it would increase to 38% in the Covid-19 period in the absence of aid.

Source: Gourinchas et al. *(2020)*

2.2. In France, as in neighbouring countries, the number of business failures has fallen sharply with the pandemic

The cumulative number of company liquidations and turnarounds is and remains at the end of the third quarter abnormally low compared to 2019, which was already a year with low figures (see Figure 4). The fall compared to 2019 is very significant: - 35.9% for all companies and - 29% for SMEs (10-249 employees). There are no big differences between sectors: the accommodation and catering sector sees a drop as strong as the manufacturing sector (see Figure 2). On the other hand, the proportion of liquidations among figures of collective procedure initiations has marginally increased in 2020 compared to 2019, yet about two thirds of collective procedure initiations remain liquidations for the smallest enterprises and only one third for SMEs.

Figure 4 – Change in the cumulative number of initiated collective procedures on week 45



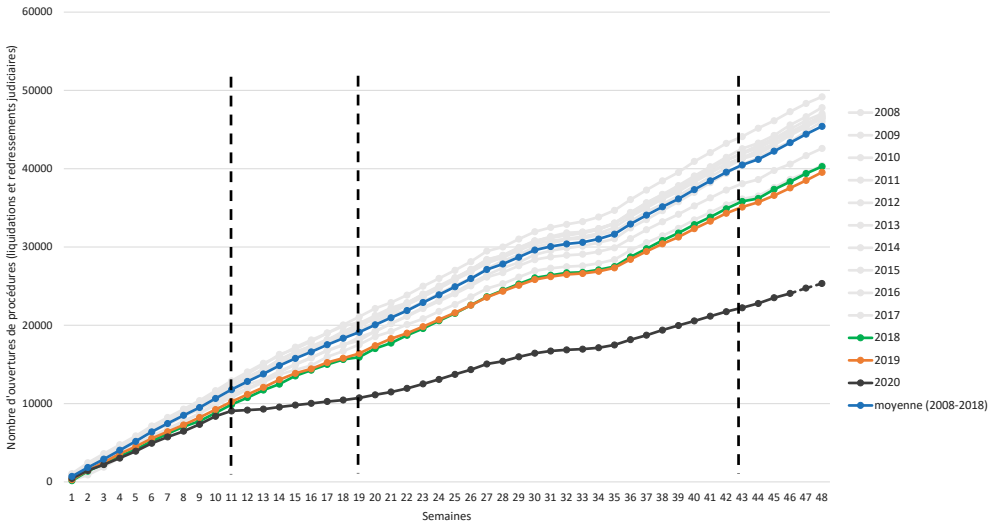
Source: Cros, Epaulard and Martin (2020), based on FARE and BODACC database up to 8 December 2020 stabilised until the end of the 45th week

There has been no acceleration or catching up since September, while such an acceleration at the start of the academic year could have been expected. In fact, from August 24 onwards, came to an end the measure that allowed a company not to be considered – from a legal point of view – in a state of suspension of payments if they were not in such state on March 12. This strongly suggests that public interventions

(State guaranteed loan (PGE), *chômage partiel*, etc.) and measures taken by banks (moratoria) are more allowing companies in difficulty to maintain themselves rather than technical issues that explain this paradoxical dynamic.

Although international comparisons are difficult regarding corporate bankruptcy procedures, it appears that similar situations are found in the United Kingdom and Germany. Figures published in the United Kingdom[1] show a number of bankruptcies in the third quarter of 2020 at 39% below the figures in the same quarter of 2019, and a 9% fall compared to the second quarter of 2020. In Germany, where the obligation to declare insolvency was suspended from the 1st of March, the number of companies declaring insolvency in the first half of 2020 was about 10% lower than in the first half of 2019[2]. In Germany too, there does not seem to be any catching up, with -19% more cases opened in July 2020 than in 2019 for the same month. In the United States, a study published at the end of September[3] shows a different situation, where a significant drop in direct liquidations coincides with a substantial increase in "Chapter 11" bankruptcies, especially for larger companies; this is interpreted by the authors of the study as a sign of difficulties in access to the courts for small businesses[4].

Figure 5 – Cumulative sum of initiated collective procedures (receivership and judicial liquidation)



Source: BODACC publications until 08 December 2020, stabilised until the end of the 45th week and enriched with data from the weekly publications of the Banque de France until the end of the 4th week. See Cros, Epaulard and Martin (2020)

[1] UK Insolvency Service Quarterly, October 2020.
[2] Destatis Press release n° 394, 8 October 2020.
[3] Wang J., Yang J., Iverson B. and Kluender R. (2020), "Bankruptcy and the COVID-19 crisis". .
[4] The so-called Chapter 11 procedure corresponds to the safeguard procedure in France.

In the short term, the pause in business bankruptcies does not jeopardise the creative-destruction process

Is the decrease in corporate bankruptcies leading to the emergence of zombie firms? Zombie firms are companies that have low productivity and are incapable in the long term of generating profits, but which survive on the market thanks to the granting of loans with low interest rates. The creation of such firms would have a negative impact on the Schumpeterian reallocation mechanism of creative destruction and thus, in the long run, on the productivity of the French economy.

Company exits are a non-negligible component of labour productivity growth: over the period 2011-2017, around 40% according to a study by the Ministry of the Economy[1] . The reason is that companies in liquidation or receivership have lower productivity – measured here by their value added per worker – than those that survive. If a 30% decline in exits were to continue (which is very unlikely), labour productivity gains would increase from an average of 1.7% per year between 2011 and 2017 in the merchant sector (according to the Ministry of Economy study) to about 1.5% per year. The fall in the number of bankruptcies – especially if it is temporary as we anticipate – should not have a major impact on long-term productivity of the French economy.

Another legitimate fear concerns the “sorting” of enterprises in the failure process. This sorting could be less effective because of the crisis situation and the aid provided. Both low and high-productivity firms could find themselves forced into liquidation.

We have empirically analysed this question[2] by estimating the parameters that best predict the probability of business failure in France this year relative to the previous year. We therefore studied these parameters over the period from the 1st of March to the 1st of October 2020 comparing the same period in 2019 and selecting companies with at least 1 employee or more for which financial information is available. Our sample is therefore large, with 1.1 million companies. We show that:

– For these companies, the probability of failure *via* legal proceedings over 8 months from March to October was of 0.71% in 2019 and 0.43% in 2020. This is the paradox of the reduction of bankruptcies mentioned above;

[1] David C., Faquet R. and Rachiq C. (2020): "What contribution has creative destruction made to productivity gains in France over the last 20 years?", *DG Treasury Working Paper*, No. 2020/05.

[2] See the preliminary working paper by Mathieu Cros, Anne Épaulard and Philippe Martin to be published: "*Will Schumpeter Catch Covid...*". See also Mathieu C., Épaulard A. and Martin P. (2020), "Les défaillances d'entreprises dans la crise Covid-19 : zombification ou mise en hibernation ?", *Focus du CAE*, no. 51, December.

- Even in the current situation of crisis and with fewer business failures, factors that best predicted the likelihood of a company finding itself in legal proceedings are almost identical to those prevailing in 2019. Within a given sector, the more productive an enterprise is (as measured by value added per worker two years earlier), the lower the probability of failure. On the other hand, the accumulation of debt (measured with respect to total assets) and in particular bank debt increases this probability. The age of the enterprise reduces it, as well as its size (number of employees);
- Our conclusion is therefore that the measures put in place by the government have – up till now – made it possible to prevent productive enterprises (with high value added per worker) from going bankrupt. Companies that fail in 2020 remain less productive and more financially fragile, as in 2019.

We have also conducted an analysis focusing on the wholesale and retail trade sector, that is trade in its broader sense: for example, car dealerships, restaurants or hairdressers that are not included in the trade sector as defined by INSEE are included here in our analysis, as are beauty salons or funeral services. In this broadly defined wholesale and retail trade sector, the failure rate from March to October was 0.44% in 2020, while it was 0.65% over the same months in 2019, a drop of nearly 33% in business failures. This closer look on businesses allows better understanding of how the combination of the Covid-19 shock (drop in turnover) and public aid played a role on influencing the risk of failure. Indeed, the Covid-19 shock was very heterogeneous according to types of business: some were very badly affected (restaurants for example) and others much less so (groceries for example). We measure the Covid-19 shock by the variation in bank card spending between 2020 and 2019 at the aggregate level of the different trade sectors[1]. If the State did not support businesses most affected by the shock, the size of the fall in bank card spending (-61% for travel agencies, +23% for tobacco shops and +18% for bakeries)[2] would be expected as being the most important factor in predicting the risk of failure

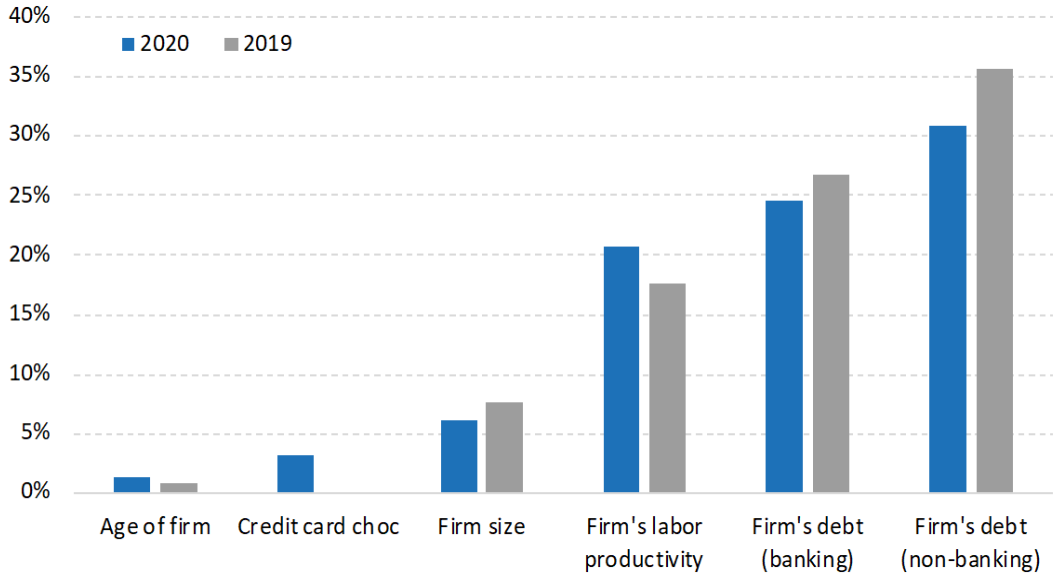
[1] These sector-level aggregated data come from the *Groupement des cartes bancaires CB, Groupement d'intérêt économique*. They have already been used by the CAE, see Bounie D., Camara Y., Fize É., Galbraith J., Landais C., Lavest C., Pazem T. and Savatier B. (2020), "Dynamiques de consommation dans la crise : les enseignements en temps réel des données bancaires", *Focus du CAE,* n° 49, October and Martin P., Pisani-Ferry J. and Ragot X. (2020), "Une stratégie économique face à la crise", *Note du CAE,* n° 57, July. They are also used by INSEE. We would like to thank the *Groupement des cartes bancaires CB* for this partnership within the framework of the Digital Finance Chair.

[2] The turnover shock as we measure it is an approximation. Indeed, the use of credit card payments increased sharply during the pandemic because of the protection offered by contactless payment compared to cash. More importantly, the shift to credit card payment may have been heterogeneous across sectors. The shift has probably been greater for shops where average purchases are of a few euros, as in bakeries for example.

and in any case, much more important than business-specific factors (its productivity or debt). On the other extreme side of crisis management, if the state had fully absorbed the differences in the Covid-19 shock between sectors in 2020, firms in the most affected sectors (at given productivity and debt levels) would not have a higher probability of failure.

The econometric analysis carried out shows that so far, the reality, lies between the two extremes but closer to a situation in which public aid has very strongly absorbed the impact of the Covid-19 shock on the risk of failure. Indeed, even if a given trade within a sector more strongly affected by the Covid-19 shock has a higher risk of failure, it remains that it is its individual weaknesses (low productivity and high debt) that best predict (as in 2019) its risk of failure. This suggests that the targeting of support to businesses has so far been effective. The respective contribution of the different factors – those specific to the individual performance of the firm such as its productivity and debt and the Covid-19 shock for which they are not liable – is given in Figure 3.

Figure 6 – Contribution of various factors to the risk of failure in 2019 and 2020



Reading note: in 2019 figures, by including the ratio of bank debt to corporate assets among the explanatory variables for failure allowed for the explanatory performance of the econometric model to be more effective by 25% compared to a model where all the other variables listed here are present, as well as sector effects.

Source: Cros, Epaulard and Martin (2020). Model created from collective proceedings data from BODACC publications (processed by authors) and individual data and characteristics from FARE 2017 and 2018, enterprises of 1 to 249 employees.

This analysis suggests that public interventions helping businesses have saved, at least temporarily, a very large number of businesses, some of which would not have survived even in a normal year. The aid has helped to prevent efficient companies from going bankrupt.

Scenarios of a sharp increase in business failures in 2021

A sharp increase in the opening of proceedings in commercial courts is anticipated in the coming months. Existing simulations (Gourinchas *et al.*, DG Trésor and OFCE)[1] all predict a very sharp increase in SME bankruptcies compared with the years 2018 and 2019, up to 25% for example in the accommodation and catering sector. However, these simulations do not take into account all support measures put in place. It is therefore difficult at this stage to anticipate when and to what extent the wave of failures will occur.

Here, we suggest a simple method based on our econometric model, considering that the increase in bankruptcies to be expected in the trade sector for 2021 would be the sum of three effects:

- the catching up of "normal" failures that did not take place in 2020 compared to 2019;
- the decline in activity on average over the period 2020-2021;
- the additional debt that companies will have accumulated.

For the last two effects, we focus on wholesale and retail trade firms in a broad sense and consider three plausible scenarios depending on the impact of the Covid-19 shock on the productivity and indebtedness of trade firms:

- The least affected enterprises in trade would experience a 3% decline in labour productivity, but their debt levels would remain unchanged eventually;
- Enterprises mildly affected would experience a 6% decline in labour productivity and a 2.5 percentage point increase in their debt ratio (all debts, i.e. bank, tax and social security debt and supplier debt), for example from 20% to 22.5%;
- Heavily affected companies would see labour productivity fall by 12% and their debt ratio by 5 percentage points (e.g. from 20% to 25%).

[1] Gourinchas P-O., S. Kalemli-Ozcan, V. Penciakova and N. Sander (2020), "Covid-19 and SME Failures", *IMF Working Paper,* No. 27877, September; Guerini M., L. Nesta, X. Ragot and S. Schlavo (2020), "Dynamique des défaillances d'entreprises en France et crise de la Covid-19", *OFCE Policy Brief,* No. 73; RESF 2021.

How can these three scenarios be justified? Concerning the drop in productivity, the idea is that all businesses in the trade sector have faced a drop in labour productivity, because of periods of closure, the imposition of barrier gestures and a drop in demand – may they be the only factors considered. For firms moderately affected by the shock, the decline in labour productivity would be of 6%, which is roughly equivalent to the expected cumulative annual growth decline over the period 2020-2021[1]. Regarding the least affected firms, the impact on labour productivity would be twice less (-3%) and twice as great for the most affected ones (-12%).

Concerning the increase in indebtedness, to calibrate a plausible shock, we observed the distributions of state-guaranteed loans at the end of November 2020 as published on the Etatlab website and calculated what increase in the debt ratio this corresponded to by using the companies' balance sheets. The State Guaranteed Loan (PGE) alone would correspond to an increase in the debt ratio of 2.5 points in certain sectors of trade. On this basis, we constructed three scenarios. In the worst-case scenario, the debt ratio at the end of the second lockdown would increase by 5 points compared to the situation at the end of 2019 due not only to the PGE, but also to the tax and social debts accumulated with the deferrals of payments granted and possible delays in paying suppliers. For the least affected firms, the debt ratio would not increase due to the combination of the lockdown periods and the partial catching up of activity. Finally, companies that are moderately affected would see their debt ratio (all debts combined) increase by 2.5 percentage points over the level at the end of 2019. To give an idea of the magnitude of the simulated debt shocks, the debt ratio in the trade sector in its broader sense, which averaged 40%, would remain unchanged for the least affected trade firms and 45% for the most affected firms.

Using the econometric model estimated for the year 2019 on companies of the trade sector (still according to our broad definition), the additional failures to be expected at the end of the Covid-19 crisis in companies of trade would range from +2.2% for the least affected sectors and up to more than 25% in the trade sectors most affected by the Covid-19 crisis (see table below).

[1] In the Finance bill presented at the end of November 2020, the government forecasts a negative growth rate for the French economy in 2020 (-11%) followed by a rebound of around 6% in 2021, i.e. an average annual growth rate over the two years of around -3%.

Table 2 – Three plausible scenarios for firms of trade sectors and increase in failure rates (%)

Sectors	little affected	midly affected	badly affected
Declining labour productivity	-3 %	-6 %	-12 %
Impact on the number of bankruptcies	+2,3 %	+4,8 %	+9,9 %
Increase in the debt ratio	+0 pt	+2.5 pt	+5 pt
Impact on the number of bankruptcies	0 %	+6,9 %	+14,4 %
Total **Impact on the number of bankruptcies**	**+2,3 %**	**12,1 %**	**25,7 %**

Note: the joint impact of the two shocks ('Total') is different from the sum of the effects of each of the two aforementioned shocks. On the one hand, some firms fail irrespective of the shock, while on the other hand firms that do not fail as a result of just one of the two shocks become insolvent when both shocks (productivity and debt) are experienced simultaneously.

Source: Cros, Epaulard and Martin (2020). Model created from collective proceedings data from BODACC publications and individual data and characteristics from FARE 2017 and 2018, enterprises with 1 to 249 employees.

All in all, if we add the additional bankruptcies to be expected in 2021 due to the catching up phenomenon linked to the very low number of business failures in 2020, the failure rates would be much higher in trade in 2021 than those observed in 2019.

Table 3 – Covid-19 catch-up and crisis: failure rates in 2021 (%)

Sectors	little affected	moderately affected	badly affected
Bankruptcy rate 2019 (1)	1,1 %	1,1 %	1,1 %
Bankruptcy rate 2020 (2)	0,7 %	0,7 %	0,7 %
Bankruptcy rate 2021 = (1) + (3) + (4)	1,53 %	1,63 %	1,78 %
Catching up for 2020 (3) = (1) - (2)	0,4 %	0,4 %	0,4 %
Surplus from Covid-19	0,03 %	0,13 %	0,28 %

Source: Cros, Epaulard and Martin (2020)

The scenarios developed here are very exploratory and cannot be considered as forecasts. The impact of the Covid-19 crisis on business failures will indeed depend on a number of factors that are at this stage still difficult to estimate.

First of all, our scenarios for commercial enterprises implicitly assume that there will be no third lockdown, which we cannot be certain of today.

Another unknown variable is the nature of the business support measures that may be implemented by the State to delay or even limit the number of bankruptcies. However, it remains that public aid that helps maintain business liquidity - loans, deferral of tax and social security charges, etc. - results in increases in business debt which eventually is the main factor in triggering business failures. Liquidity assistance delays the failure of certain businesses but by increasing their debt, the risk of future failure is increased. If the aim of public intervention is to avoid the bankruptcy of companies that were financially healthy before the Covid-19 crisis, a reduction in corporate debt will be necessary.

The econometric model used is crude:

- in particular, it does not take into account “general equilibrium” effects. In the case of business bankruptcies, these effects can be of two kinds: on the one hand, an increase in bankruptcies can lead to the weakening of businesses through contagion effects (customers and suppliers) and, on the other hand – and this plays in the sense of a “general equilibrium” effect – the effects of the “general equilibrium”. Conversely, a company can benefit from the difficulties of its competitors;
- there is a phenomenon of endogeneity in the econometric model which is difficult to deal with and which potentially leads us to overestimate the additional failures due to the Covid-19 crisis. The fact that the debt ratio is correlated with the probability of bankruptcy may result from an inverse causality: a poorly performing company that grows slowly and makes little or no profit ends up accumulating debts. These debts lead it to bankruptcy, but their accumulation is more the symptom than the cause of the firm's problems. In the current situation, the increase in debt resulting from the Covid-19 crisis is of a different nature. It is a witness to the shock and not a symptom of the deterioration of a firm's ability to make profits and repay its debt. Taking into account the labour productivity of enterprises partly reduces this problem of endogeneity, but imperfectly because it does not fully reflect the performance of enterprises and their ability to generate profits.

2.3. Economic policy trade-offs

When the number of business failures will increase with a potential catching up effect – as we anticipate, it will be essential to avoid two types of errors. First, that well-performing companies fail, particularly because of their debt accumulated during the

crisis; and second, that poorly-performing companies are rescued. Because in both cases, aggregate productivity will be reduced.

In the short term, the first type of error is more serious than the second. The imperfect targeting of aid that avoids the failure of well-performing companies is done today at the price of maintaining poorly performing or unviable companies. A gradual withdrawal of measures or a gradual tightening of access conditions will make it possible to effectively restart the reallocation process. If the increase in bankruptcies in the coming months is only a catch-up to a more normal situation (i.e. around 30%), this should not be interpreted as a failure of the business support policy. A political difficulty will be, moreover, that strong pressure will be exerted on the government to ensure that even this catching up is avoided. Delaying the exit of aid to businesses does not, however, seem to us – again, in the current situation – to be a major risk.

In the debate that will inevitably emerge on the necessary withdrawal of support measures, it will be important to properly measure and compare the respective risks: the risk of weakening the economic fabric; the risk to the productivity of the French economy; the risk to public debt implied by the cost of the measures. At this stage, the first aforementioned risk seems for us to be the most serious and so far, implemented interventions allowed to avoid it, and it is only when this risk is ruled out that support measures will have to be gradually reduced. We consider that in order to reduce the risk of failures of viable but highly indebted companies, excess corporate debt will have to be addressed, which will require a restructuring of certain debts contracted during the crisis both with the State and with private creditors. The risk to productivity is secondary today, but it should not be neglected and should guide the modalities of the withdrawal of measures more than the issue of public debt.

It now seems legitimate to focus aid on the sectors that have suffered the greatest shock. In the current period, we consider that the trade-off should favour support to companies, even if imperfectly targeted. Rather than the “zombification” of companies, we must speak of “hibernation” insofar as the support will have to remain temporary. From this point of view, avoiding a bottleneck in commercial courts would allow any degradation of the necessary reallocation process. Staggering the withdrawal of support measures will be thus important in order to avoid deadlines that could lead to such a congestion.

3. Managing the looming wave of debt restructuring

3.1. A framework for analysis

Among the existing companies, some are destined to be liquidated because their activity is not viable. For those that have remained viable – in the sense that their future business remains profitable in the absence of debt – the debt accumulated during the Covid phase may represent a danger. Two cases are possible: firstly, the firm is unable to repay its debt, which may lead it to be liquidated; secondly, the firm is technically solvent but over-indebted, which limits its incentives to invest. In both cases, despite the viability of the firm, excess debt destroys value: it prevents profitable investment or induces excessive liquidations.

Liquidity measures will not be sufficient. Those introduced at the heart of the crisis – the State Guaranteed Loan (PGE), the payment delays granted by the URSSAF – have enabled companies to avoid defaulting on payments, but they do not prevent debt from accumulating. Generally speaking, over-indebtedness is detrimental to investment because creditors capture most of the returns from it: it discourages the firm's development when it does not push the entrepreneur out of business.

The only solution is to reduce the company's indebtedness, since it is debt that destroys value. Five options can be considered:

1. allow renegotiation between the company and its creditors. In theory, keeping the debt at a high level leads to a destruction of value: reducing it leads therefore to an increase in the value of the company. As the size of the cake increases, the creditor and the entrepreneur have everything to gain from this type of restructuring – they do not in principle need financial incentives from the state. This is the intuition of the Coase theorem;
2. impose on the creditor an arbitrary reduction of his claim – a haircut. This is in a sense what the commercial judge can do in collective proceedings[1];
3. encourage, by means of a subsidy, the creditor to accept a reduction in the debt;
4. suggest a refinancing of the debt by the State, in exchange for a share in its capital;

[1] Data on the content of restructuring plans in collective proceedings in France are scarce. A review of the files of the safeguard and receivership adopted at the Paris Commercial Court for the period 2010-2016 shows that in more than 70% of cases there is no debt remission (haircut) but simply a rescheduling of payments over periods of 8 to 10 years (see Despierre et al., 2018).

5. to offer refinancing by debt financed or guaranteed by the State of the debt of private investors – in a way, participative loans.

In terms of efficiency, Options 1 to 4 are well placed, as they reduce the company's debt. Option 5 leaves the company's indebtedness unchanged. Thus, while *chômage partiel* measures or the Solidarity Fund have prevented an explosion of indebtedness, state-guaranteed loans or participative loans, even if they prevent too great an increase in insolvencies in the short term, do not solve the problem: they may ultimately contribute to over-indebtedness and a sluggish recovery.

These options are listed in order of cost to the State. Options 4 and 5 are by far the most expensive. The creditor receives the full-face value of the debt (the amount that had to be repaid), an amount much higher than the value of the debt (the actual value is lower because of the probability of default). The creditor therefore wins in the transaction at the expense of the State. Options 1 and 2 are free of charge. Options 2 does not cost the State anything but requires a modification of private contracts - which normally only judges can implement. Option 3 involves a lower subsidy than in cases 4 and 5 because it is accompanied by a reduction of the claim: the creditor therefore absorbs part of the loss.

Conversely, from the creditor's point of view, Options 4 and 5 are the most remunerative, since they emerge unscathed from the crisis. Options 1, 2 and 3 are value-creating compared to the current situation (which would impose a destruction of value through underinvestment or inefficient liquidation), but this value creation is lower than options 4 and 5 because the creditor agrees to reduce the value of its claim.

To this simplistic analytical framework, a few key factors should be added:

- outright renegotiation, although benefiting, in theory, the contractor and the creditor, may not succeed in practice. Most of the time, the creditor has a liquidation bias: his claim generally enables him to recover the proceeds of the liquidation as a priority. Junior creditors and the entrepreneur risk losing everything, but this is not his business. That is why Options 2 or 3 are generally preferable to Option 1. In addition, there are other obstacles to the use of conciliatory proceedings. They are not always known by MSEs; or they may be experienced as stigmatising, as they involve legal proceedings and recourse to a judge. To encourage the use of this route, the government could provide more information on these procedures, and send a signal that in the Covid period, this type of procedure is not stigmatising;
- in certain high-risk cases, the senior creditor must take an equity stake. It may be reluctant for regulatory reasons (banks). This pushes towards Option 3 (subsidising the *haircut*) compared to Option 1 (renegotiation of claims);

– Restructuring is not always the best Option (liquidation may be preferable). Massively subsidising creditors (Options 4 and 5) leads to keeping non-viable businesses alive. This logic pushes towards Option 1, which ensures maximum internalisation of restructuring costs by both parties. On the other hand, Options 4 and 5 are bad from this point of view, since they lead to the survival of companies that would have good reasons to disappear because the public authorities do not have the necessary information to carry out the right targeting.

3.2. Economic policy options

Encouraging conciliation

Overall, this discussion suggests that Options 1 (direct renegotiation) and 3 (subsidised renegotiation) are the most effective. Option 1 is the least costly for the State and allows full internalisation by private actors of the consequences of the decision to liquidate or keep the company alive. It therefore avoids problems of misallocation of resources.

It could be implemented with a campaign to promote conciliation procedures, upstream of the collective procedure. A number of measures have already been taken, such as the transmission of information on late payments by the statutory auditors to the commercial courts or the possibility for the conciliator to grant certain creditors a super-privilege in exchange for additional financing on their part. But companies are still reluctant to go through the Commercial Court door, even before a genuine collective procedure. A communication campaign in the specialised media and with the auditors would make it possible to promote conciliation, to show how simple it is and to remove the stigma attached to the idea of renegotiating one's debts. The circumstances are exceptional: over-indebtedness due to the COVID crisis is not a management fault.

Subsidize certain debt restructurings

In the absence of renegotiations, Option 3 of subsidising debt reduction is a good approach. A relatively low cost to public finances, it achieves real debt reduction – not just maturity adjustment. By engaging private actors, it allows an optimal choice between liquidation and continuation of viable enterprises (see Philippon, 2020). The public subsidy avoids the blocking of the procedure by senior creditors. This logic was recently discussed by Blanchard *et al* (2020) and Greenwood *et al* (2020)[1] .

[1] Blanchard O., Philippon T. et Pisani-Ferry J. (2020), "A new policy toolkit is needed as countries exit COVID-19 lockdowns", *PIIE Policy Brief*, n° 20-8, Perterson Institute for International Economics, june; Greenwood R.,

This is the spirit of the proposal made by Greenwood, Iverson and Thesmar (2020)[1], which is to reward with a tax credit the creditor who agrees to a reduction of his debt. This proposal was implemented in commercial real estate during the second wave. Under this new scheme, property owners receive a tax credit equal to 50% of the November rent in exchange for waiving the rent. In the same vein, one could imagine a tax credit of 50 euros for every 100 euros abandoned by private creditors. This tax credit would take place outside of collective proceedings, and would avoid the stigma of bankruptcy or receivership. It could be targeted at sectors that have been the subject of administrative procedures such as tourism, catering or events.

The renegotiation subsidy makes private creditors and the state contribute to the restructuring. State intervention is necessary because private creditors – often banks – are reluctant to take a share of the company's equity, partly for organisational reasons (it is not their core business) and partly for regulatory reasons (prudential regulation, as bank capital is scarce in the short term). The participation of creditors is necessary in order to ensure that the sorting between viable and non-viable companies is done by informed actors (banks). Options 4 and 5, apart from being very expensive for the state, do not allow for this sorting.

Private creditors can bear these costs, especially if these measures are restricted to SMEs. The reason is that even in Europe, SME lending accounts for a small share of banks' balance sheets (Gourinchas et *al.*, 2020[2] , Greenwood *et al.*, 2020, for the same calculation in the US). According to the EBA, the European Banking Authority, loans to SMEs account for only 8% of bank balance sheets in France, a relatively small weight. Giving up 10% of the face value of these loans would therefore cost 0.8% of bank assets, i.e. less than one year's profit in a normal year. Moreover, the main share of additional debt in 2020 comes from state-guaranteed loans for which banks bear only 10% of the losses in the event of non-repayment. Moreover, given the very high level of the financial market and the commitment of central banks to keep rates low for a long time – especially in Europe – banks themselves have significant access to the equity market. If necessary, the state can organise collective recapitalisation, as during the financial crisis, in order to minimise the stigma associated with recourse to equity financing.

Iverson B. et Thesmar D. (2020), "Sizing corporate restructuring in the COVID-19 crisis", *Brookings Papers on Economic Activity.*

[1] Greenwood R., Iverson B. and Thesmar D. (2020), *op. cit*.

[2] Gourinchas P.-O., Kalemli-Ozcan S., Penciakova V. and Sander N. (2020), "COVID-19 and failures", *NBER Working Papers Series,* No. 27877, September.

Accepting in certain cases a reduction in the debt contracted with the State

For a certain number of companies, the bulk of the overindebtedness stems from debt incurred during Covid-19, in the form of tax or social security debt (with the URSSAF in particular) or PGEs. Even if the PGEs were granted by commercial banks, they are covered by a 90% public guarantee. In this case, and in particular for sectors that have been administratively closed, the State must act as a responsible and flexible creditor, granting debt reductions where necessary to enable the company to develop or even survive - when it is viable, of course. This may imply a transformation of these debts into shares, but it is in the interest of both the entrepreneur and the State – Coase's theorem is also valid when the debt comes from the State. It is quite reasonable to imagine that the State could become a minority shareholder in a certain number of companies, even if a gradual exit plan is planned. This option should not be ruled out, but neither should it lead to a general questioning of the repayment of debts to public institutions or guaranteed loans.

Improving information to the public and decision-makers on business difficulties

More resources must be made available through the public statistics system to monitor company restructuring in real time. Currently, data are available quickly but with little detail (no information on financing, on the balance sheet of the enterprises concerned). In the era of big data, it should be possible to monitor in real time the cash flow and the structure of the financial (and fiscal) debt of companies at a granular level (sectoral, regional). It is important to precisely objectify the financial situation of companies at a very fine sectoral level in order to better target support, prepare the exit from emergency measures and identify the necessary debt reductions.

4. Other specificities of the current crisis

The first section of this chapter has shown that recessions have several and coexisting contradictory effects on productivity. This section attempts to explain the productivity developments that could take place in the medium term as a result of the current crisis. This evolution would be due to a combination of four different mechanisms.

A first and most important mechanism will come from the fact that certain sectors have been durably affected and their activity will be considerably reduced in the medium term. While previous recessions have particularly affected industry and the production of capital goods (high productivity sectors), the Covid-19 crisis is different. The most affected sectors are in services, such as recreation, catering, accommodation, tourism and household services activities. These are lower-productivity sectors. There will

therefore be a positive, compositional effect, on aggregate productivity. Some highly productive sectors have also seen a potentially lasting decline in activity: exports from the aeronautics sector and the production of transport equipment have fallen sharply. It is unlikely that these sectors will recover a pre-crisis level of activity in the short term.

A second effect on productivity will come from the bankruptcy of the least productive enterprises within each sector, and the Schumpeterian reallocation explained at the beginning of this chapter. But these effects can be negative on productivity if credit constraints prevail and if, in the end, the bankrupt firms are more productive firms with liquidity or even solvency problems.

A third effect could come from the increase in corporate indebtedness and the decline in their investment spending, particularly in R&D, which will ultimately negatively affect their productivity.

A fourth effect on productivity will result from the reorganization of companies and the innovations they may deploy in the management of their resources. As a result of the crisis, companies have been forced to experiment with new organisational methods and new technologies that could have a positive impact on productivity. The most emblematic evolution from this point of view is certainly the development of telework. We present a review of the use of telework and its potential impact on productivity in the medium term.

4.1. Prevalence of teleworking

The lockdowns and the health crisis have led to a massive and forced increase in telework. Around 40% of employees teleworked this year in France[1]. In October 2020, 19% of employees were teleworking at least one day a week, compared to 3% in 2017. This use of teleworking has had a clear positive effect on productivity in the short term, by allowing the continuity of certain service activities.

Before the crisis, the use of telework already varied greatly according to countries, occupations, sectors and companies[2]. This strong variation suggests that in the face of the sudden and constrained rise of telework, there is scope for it to establish itself permanently at a higher level than before the crisis.

[1] DARES (2020), "Activity and employment conditions of the workforce during the Covid-19 health crisis: Flash survey", December.

[2] Criscuolo C., Nicoletti G., Gal P. et Leidecker T. (2020), " Productivity gains from teleworking in the post COVID-19 era: How can public policies make it happen? ", OECD Policy Responses to Coronavirus (COVID-19), septembre.

There is a strong variation by country

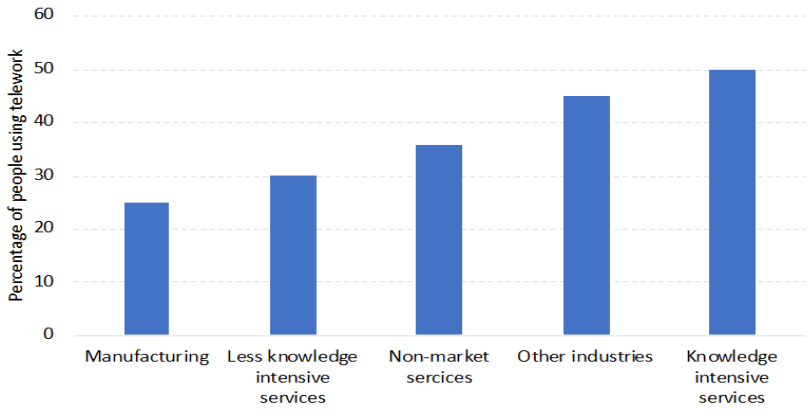
The prevalence of telework varies considerably across countries, sectors, occupations and company characteristics. It is more common in developed countries, in the most highly educated professions, in occupations where face-to-face contact is not essential, and in large organizations.

Numerous studies published this year have calculated the percentage of jobs that could be done entirely by telework, by country. A fine study analyses the tasks required by occupation and thus calculates the occupations for which telework is possible (Dingel and Neiman, 2020). The authors confirm that the prevalence of telework increases with GDP and especially with the share of so-called knowledge-intensive jobs, such as managerial functions. For France, 37% of jobs could be carried out from home[1], which is confirmed by other studies[2].

A sectoral variation by trade and company size

The sectoral variation in the jobs that can be teleworked is significant. Some occupations, such as programmers, lawyers and managers, can have up to 100% teleworking jobs. At the other extreme, industrial trades, such as construction or transportation, do not lend themselves to telework. This sectoral variation naturally depends on the tasks to be performed. While many jobs today can be performed remotely thanks to new technologies, a physical presence is more likely to be required for many jobs in manufacturing, agriculture or hotels and restaurants.

Figure 7 – Prevalence of telework by sector



Source: OECD, Criscuolo et al *(2020)*

[1] Dingel J. I. and Neiman B. (2020), *op. cit.*
[2] Gottlieb C. *et al* (2020); Hensvik L. E. *et al (*2020); Mongey S., Philossoph L. and Weinberg A. (2020).

4.2. Productivity and teleworking

Increasing the use of telework can have several effects on productivity, some positive, some negative.

A decrease in land costs and restructuring to be expected

A first positive effect is that teleworking can lower costs by reducing real estate footprint. A study by the Banque de France has shown that real estate assets weigh heavily on business costs. Reorganisation could ease real estate constraints and free up resources that could increase productivity[1]. General equilibrium effects are also to be hoped for: several young companies are constrained in their growth by access to land. Lower property costs would therefore have both a direct effect on businesses by lowering costs and an indirect effect by facilitating the creation of new businesses.

A second positive effect, a corollary to the first, would be exerted via the company's restructuring effort. The restructuring of land could lead some companies to re-evaluate the location of their employees and reduce labour costs if these employees are located in lower-cost areas. The increase in teleworking could therefore lower both land and labour costs.

Conversely, a reduction in the weight of real estate in companies' balance sheets risks increasing their financial constraints and their difficulty in accessing credit, especially for smaller companies, as these assets are often used as collateral. Furthermore, a reduction in demand for real estate by companies is likely to have a lasting impact on the real estate and construction sectors, especially as the costs of conversion and adjustment to convert these buildings into housing for private individuals can be high.

Worker productivity will also be affected

The effect of telework on the productivity of employees is *a priori* heterogeneous, and depends on the tasks to be performed, the occupations considered, the sectors and the characteristics of the workers and their place of work. It is especially difficult to estimate it causally, as employees who choose to telework may have particular characteristics.

[1] Bergeaud A. (2020), *op. cit*.

In order to analyse the causal effect of telework on productivity, a study designed a controlled experiment[1]. In a call centre of a large travel agency, the company randomly allocated volunteer workers to a teleworking group and a control group continuing to work at the office. This nine-month experiment took place in China in 2011.

During this period, employee telework productivity increased by 13% compared to the control group, of which approximately 9% was due to an increase in the number of minutes worked per shift (fewer breaks and sick days) and 4% to an increase in the number of calls per minute (attributed to a quieter working environment). Job satisfaction increased and turnover decreased, indicators of work performance that are also predictive of changes in productivity. This study finds positive effects, but can only be generalised to certain well-defined tasks that require relatively little information flow and creativity. Telework affects a much more heterogeneous population and its extension to other occupations could have adverse effects on productivity.

Another study, drawing on the experience of a public sector organisation in the UK, indicates that this increase in productivity may depend on the type of tasks performed[2]. The effect could be positive for creative jobs but negative for urgent and complex tasks. The authors find that productivity is higher when employees are in the same room and that the effect is stronger for urgent and complex tasks. They suggest that telework is unsuitable for tasks requiring face-to-face communication. This negative effect on productivity may be exacerbated in a situation – as at present – where telework has been imposed by circumstances.

A study modelling the effects of telework on productivity found that in several sectors, face-to-face communication is almost indispensable for the smooth running of the activity. The limitation of these interactions is similar to an increase in production costs. Koren and Peto (2020) thus construct a taxonomy of three types of jobs: first, those requiring intensive teamwork; second, those with frequent contact with customers; third, those performing tasks that require physical proximity. Applying their classification to existing trades, they predict that all sectors would be negatively affected by social distancing measures, and that the trades most affected would be those in the most urban areas.

Different surveys show that teleworkers generally have a particularly positive view of the flexibility of their working day organisation and the time saved in commuting to and

[1] Bloom N., Liang J., Roberts J. et Ying Z. J. (2015), "Does working from home work? Evidence from a Chinese experiment", *Quarterly Journal of Economics*, vol. 130(1), p. 165-218.
[2] Battiston D., Blanes J. and Kirchmaier T. (2017), "Is distance dead? Face-to-face communication and productivity in team", *CEP Discussion Papers,* n° 1473.

from work[1]. The increase in job satisfaction generally predicts productivity gains and lower turnover. However, teleworkers generally point to communication problems with colleagues, loneliness and increased difficulties in disconnecting from work as negative aspects. Finally, managerial supervision activities can be hampered by telework and increase co-ordination costs if the match with employees is not optimal.

In conclusion, there is potential for productivity gains that can be achieved through greater use of telework, even after the health crisis is resolved. This includes the potential for lower costs for companies restructuring to use less land and taking the opportunity to re-examine the location of their employees. These cost reductions could have a positive effect on the entry of new businesses previously constrained by land cost barriers.

Nevertheless, social distancing measures strongly reduce certain information flows. These are essential to the smooth running of the activity and, above all, to productivity gains. The intellectual professions, those of which that telework with most ease, are those for which, paradoxically, frequent contacts are required. A negative impact on productivity in the medium term is therefore to be expected.

The crisis has acted as an accelerator for the development of telework. Its impact on productivity and employee well-being is still poorly understood, particularly in the French context. This is why the Council of Economic Analysis (CAE) is going to carry out an experimental study in 2021.

5. A risk of loss of human capital?

5.1. A “lost generation”?

The cohort of young people entering the labour market during a recession faces harsher conditions. New entrants have less opportunities and their work experience does not catch up with previous cohorts’ over the course of their lives. This effect is documented in several studies and has recently been compared across countries[2].

In the United States, the cohort of university graduates entering the labour market during the early 1980s recession experienced lower wages compared to previous and

[1] https://lp.buffer.com/state-of-remote-work-2020.

[2] Wachter T. von (2020), "The persistent effects of initial labor market conditions for young adults and their sources", *Journal of Economic Perspectives*, vol. 34(4), p. 168-194.

subsequent cohorts.[1] This effect is sustained in the long-term: it was still observed even 15 years later. It is partly due to the fact that positions reached are lower ranked in hierarchies. Another recent study has extended the analysis to 37 years (1974-2011) and found similar results, but which would fade after a decade.[2] The same results are observed in Canada: university graduates entering the labour market during a recession start out with lower wages, positions with less responsibility and do not catch up with the previous cohort.[3] These effects are found in several countries and in studies covering different recessions.[4]

In Europe, where the labour market is more regulated and less unequal than in the United States, results could be different. Nevertheless, they were confirmed in all European countries studied: Germany, England, Austria, Spain, Norway, Sweden and the region of Flanders. Moreover, all fifteen similar studies on Europe confirm the same orders of magnitude of the effects that recessions have on the new cohorts.[5] On average, young people entering the labour market during a recession “lose” opportunities that translate into about 10%-15% lower wages for their first job. This effect fades only slightly after a decade.

In France, a study that tried to confirm these results found that crises are transmitted through a different mechanism[6]. Cohorts entering the labour market during recessions are rather penalized in the short term, due to a lower employment rate but not because of lower wages. The effect may fade over time. However, conducted studies on the previous recession do not yet allow such assertion on whether these effects are permanent or are to fade over time, due to the lack of temporal hindsight.

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[1] Kahn L. B. (2010), "The long-term labor market consequences of graduating from college in a bad economy", *Labour Economics*, vol. 17(2), p. 303-316.

[2] Altonji J. G., Kahn L. B. et Speer J. D. (2016), "Cashier or consultant? Entry labor market conditions, field of study, and career success", *Journal of Labor Economics*, vol. 34(S1), p. S361-S401.

[3] Oreopoulos P., von Wachter T., et Heisz A. (2012), "The short- and long-term career effects of graduating in a recession", *American Economic Journal: Applied Economics*, vol. 4(1), p. 1-29.

[4] Schwandt H. et von Wachter T. (2019), "Unlucky cohorts: Estimating the long-term effects of entering the labor market in a recession in large cross-sectional data sets", *Journal of Labor Economics*, vol. 37(S1), p. S161-S198.

[5] These studies cover Norway (Raaum and Røed, 2006; but also Liu, Salvanes and Sorensen, 2016), Sweden (Kwon et *al. ,* 2010), Austria (Brunner and Kuhn, 2014), Germany (Schmieder *et al.* 2020; and more recently Umkeher, 2019), Spain (Arellano-Bover, 2020, Fernandez-Kranz and Rodriguez-Planas, 2018), the United Kingdom (Belfield *et al.,* 2017), and the Flanders region (Cockx, 2016).

[6] Gaini M., Leduc A. and Vicard L. (2014), "Can we talk about "générations sacrifiées"? Entering the labour market in a period of poor economic conditions", *Économie et Statistique,* no. 462-463, January, p. 462-463.

The recession is not only affecting wages or career prospects of new entrants. Other studies find that young-labour market entrants have fewer children during a recesion[1] and suffer from an increased likelihood of divorce. Other negative effects are observed on self-reported health[2], well-being[3], mortality[4], and even on the reintegration of released prisoners[5].

All of these effects are particularly important for productivity. The effect on the labour market is not limited to new entrants: when the employment rate of the population falls, there is a generalised fall in work experience, with impacts on reallocation and productivity. Thus, using a job search model, Barlevy (2002) shows that recessions hinder the reallocation of workers from low to high productivity jobs and can thus exacerbate the misallocation of resources.

Cost of long-term unemployment

Another measure that has a direct impact on the economic and social costs of unemployment is the duration of unemployment spells. A period of unemployment that lasts is likely to transform cyclical unemployment into a structural phenomenon: workers lose human capital and drift away from the labour market (Blanchard and Summers, 1986).

5.2. Recessions and social cohesion

A large body of literature documents a negative relationship between volatility and long-term growth. In a study covering a panel of 92 countries over three decades, Ramey and Ramey (1995) show that countries with higher GDP volatility have lower long-term growth.[6] Different estimates confirm these results, including recent work.[7] Large

[1] Currie J., Schwandt H. et Wachter K. W. (2014), "Short- and long-term effects of unemployment on fertility", *Proceedings of the National Academy of Sciences of the United States of America*, vol. 111(41), p. 14734-14739.

[2] Maclean J. C. et Hill T. D. (2015), " Leaving school in an economic downturn and self-esteem across early and middle adulthood ", *Labour Economics*, vol. 37, p. 1-12.

[3] De Neve J.-E., Ward. G., De Keulenaer V., Van Landeghem B., Kavetsos G. et Norton M. I. (2018), "The asymmetric experience of positive and negative economic growth: Global evidence using subjective well-being data", *Review of Economics and Statistics*, vol. 100(2), p. 362-375.

[4] Maclean J. C. (2013), "The health effects of leaving school in a bad economy", *Journal of Health Economics*, vol. 32(5), p. 951-964.

[5] Schnepel K. T. (2018), "Good jobs and recidivism", *The Economic Journal,* vol. 128(608), February, pp. 447-469.

[6] Ramey G. et Ramey V. (1995), "Cross-country evidence on the link between volatility and growth", *American Economic Review*, vol. 85(5), December, p. 1138-1151.

[7] Aghion D., Angeletos G.-M., Banerjee A. et Manovac K. (2010), "Volatility and growth: Credit constraints and the composition of investment", *Journal of Monetary Economics*, vol. 57(3), april, p. 246-265.

economic fluctuations have a negative long-term effect on growth, particularly through the investment channel: increased uncertainty can durably affect the investment decisions of firms, and thus have an impact on growth.

Loss of social cohesion

Recessions also have potentially important consequences for social cohesion. Using US data from 1972 to 2006, Giuliano and Spilimbergo (2013) find that people who have experienced a recession at the age of 18 to 25 tend to have less faith in personal effort, a higher perception of inequality and less confidence in public institutions. Altindag and Mocan (2010) find from survey data from 69 countries around the world that personal experience of unemployment translates into negative views on the effectiveness of democracy and increases support for populist parties. The effect is more pronounced for the long-term unemployed and extends to individuals who do not experience unemployment themselves, but live in a country with high unemployment.

Conclusion

History teaches us that recessions affect long-term productivity through several mechanisms. A positive effect occurs through the acceleration of bankruptcies of the least productive companies and through reallocation of resources between companies, between sectors and restructuring within companies. The economy emerges “purged” from the least productive resource allocations. However, theoretical analysis tells us that recessions also lead to avoidable destruction of value. Credit constraints lead to the failure of too many new business start-ups. These constraints push too many young, high-growth, solvent and productive companies into bankruptcy. The entry of the youth into the labour market is also slowed down. A significant amount of human capital is either lost or never acquired. This has an impact on career opportunities and, in the long term, on productivity.

However, the current recession is of a different nature. Compared to previous downturns, it is more sudden, steeper and more heavily skewed towards certain sectors. Bankruptcies, which are traditionally a leading indicator of recessions, have been initially frozen by lockdowns. Emergency and stimulus policies targeted at SMEs subsequently reduced their numbers considerably. In this context, several risks coexist. Our report proposes to prioritise them as follows.

A first risk is allowing the bankruptcies of too many businesses. In the absence of public intervention, the French economy would have experienced the bankruptcies of too many major productive businesses. Entire sectors would have been endangered by

the disappearance of companies that are difficult to replace within value chains, or by the bankruptcy of large “systemic” companies. These would have had a knock-on effect on value chains, causing a breakdown in contractual relationships that would have been difficult to re-establish quickly. This scenario would also have negative effects on long-term productivity. This risk is increased by a peculiarity of this recession: it affects certain sectors more strongly than other recessions have been able to do before. The sectors concerned, such as aeronautics, will have to face major restructuring, and it is not clear that this will increase sectoral productivity. This risk has been avoided thanks to sectoral measures, emergency measures, state-guaranteed loans and the recovery plan.

A second risk exists when the first has been avoided: the propension of over-protecting well-established and unproductive companies. Certain large companies, known as “zombies”, narrowly avoid bankruptcy thanks to a mix of low rates, a comfortable market position and, at present, public aid. These companies prevent a reallocation of capital, skills and market shares towards more productive companies. In the short term during the recession, this risk is negligible because the resources freed up by these companies would not be easily reused in a context where most companies are facing a decline in turnover. In the long run, however, it is important not to artificially support unviable businesses once demand has recovered. It is important to return to a situation where the failure process is based on the performance and productivity of companies.

A third risk exists in the medium term. The increase in companies’ debts may jeopardize their future viability. The question of restructuring certain debts will arise as early as 2021. A mix of solutions should be considered to share the burden of these debts between private creditors, banks and the State.

Policy makers thus face a delicate trade-off. On the one hand, high levels of disruption and disorganization must be avoided, and the financing of start-ups must be ensured. On the other hand, it must be borne in mind that measures likely to keep less productive companies artificially alive, once growth has resumed, could slow down the reallocation process. Provided it is limited in time, a temporary slowing down of reallocation does not endanger long-term productivity growth.

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CHAPTER 2

EUROZONE IMBALANCES, EMERGENCY AND RECOVERY PLANS

The Covid-19 crisis had asymmetric effects on current account balances of eurozone countries. The policy response to this shock will also have an impact on these current account balances. Indeed, emergency plans immediately implemented during the crisis and more structural measures of the recovery plans will have consequences both on competitiveness trajectories of euro-area countries and on aggregate demand in individual countries. The initial situation of the euro area is as analysed in the 2019 NPB report[1]: a large current account surplus at the whole eurozone level driven by a few countries as well as imbalances within the area itself. We concluded the 2019 report by underlining the risks that these imbalances pose to the eurozone. It is therefore legitimate to ask nowadays how the shock of the Covid-19 pandemic in the different countries – but also the economic policy responses – could affect these imbalances.

This chapter first documents the heterogeneity of the Covid-19 shock and its macroeconomic consequences for the euro area countries. It then presents a comparison of the emergency and recovery plans. Euro area countries implemented at the same time measures to protect production (mainly through emergency measures) and measures to support reallocation within production (mainly via recovery plans). It is not possible, at this stage, to quantify the effects of recovery plans on current accounts and on the competitiveness of euro area countries. Nevertheless, several pieces of information emerge from the comparative analysis that follows, which already allows some conclusions to be drawn regarding the differences in both the amount and objectives of these plans.

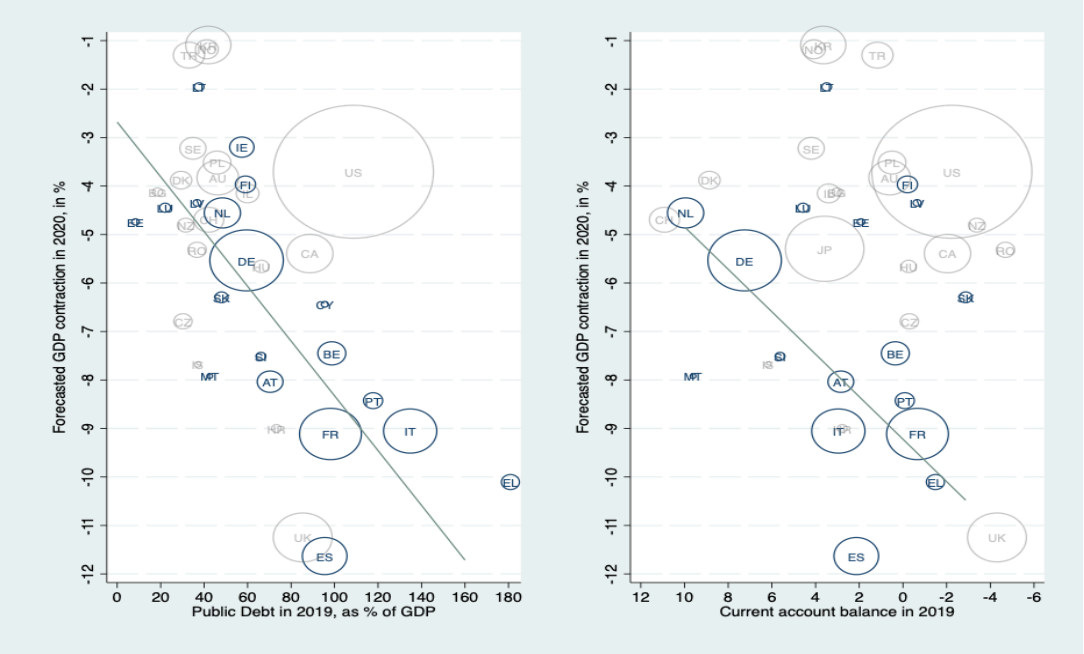
[1] NPB (2019), *Productivity and competitiveness: where does France stand in the euro zone?* first report.

1. A short-term increase in current account imbalances

1.1. Already fragile countries are the most affected

Without it being possible to identify any causal relationship, the economic shock linked to the pandemic affected more strongly euro area countries that were already the most fragile during the eurozone crisis, those with higher public debt and a more deteriorated current account (Figure 1). Forecasts of GDP growth in 2020 indicate that the Covid-19 shock hit Spain (-12%) and Greece (-10%) the hardest. France, Italy, Portugal, Austria and Belgium are expected to see their GDP fall by between 7 and 10 points in 2020. Conversely, the 2020 recession will be less pronounced in countries that had a large current account surplus before the crisis. Indeed, Germany, the Netherlands, Slovenia and Luxembourg, less affected so far by the Covid-19 crisis, are expected to experience a recession of around 6 GDP points.

Figure 23– The 2020 recession is more pronounced in eurozone countries that were initially more fragile

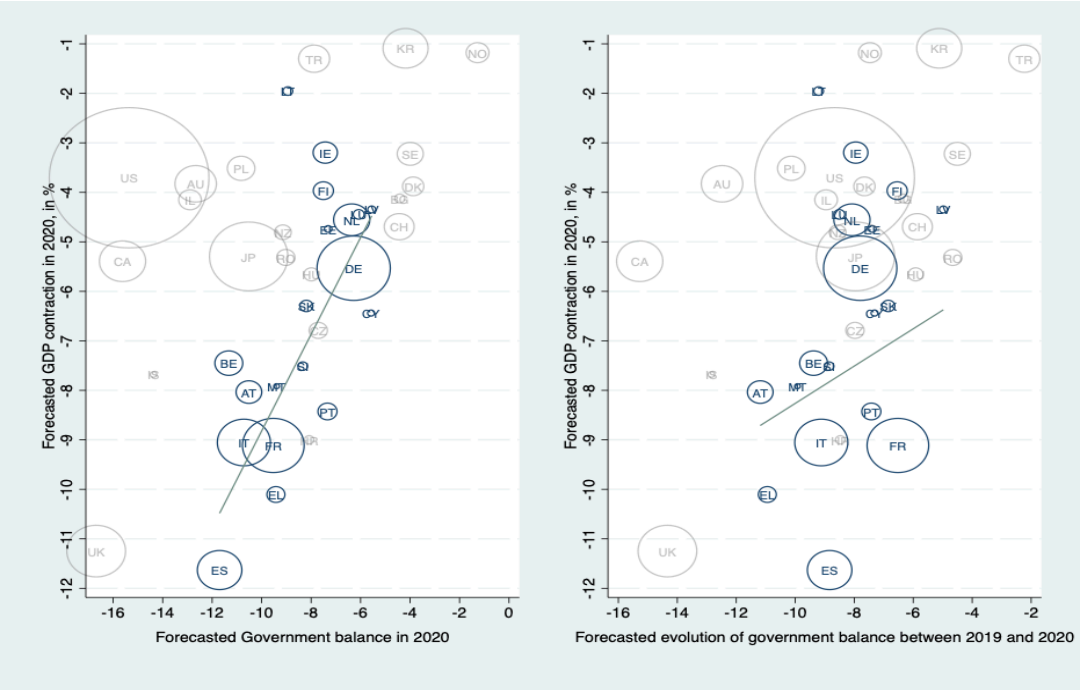


Reading note: the size of bubbles for a given country represents its real GDP at current prices in 2019. The blue bubbles are countries of the Eurozone. The line is a linear regression on eurozone countries exclusively, and weighted by the value of GDP in 2019.

Sources: OECD, December 2020 forecasts. For non-OECD countries: International Monetary Fund, World Economic Outlook, October 2020.

The change in the government's budget balance between 2019 and 2020 is an imperfect but relevant measure of the country's stimulus, as it is the sum of automatic stabilizers and emergency plans. The deterioration of the government's budget balance in response to the crisis has been unprecedented in all euro area countries. Two thirds of countries are expected to experience a deterioration in their balance between -7.3 and -9.3 GDP points. The widening of the deficit is expected to be of a similar magnitude (between 6 and 10 GDP points) in other OECD countries, both in Europe and the rest of the world. A few countries had a more pronounced stimulus response: in Canada, the United Kingdom and Australia, the projected change in budget balance is between 12 and 16 GDP points (Figure 2).

Figure 45– Link between the size of the recession and budget deficit in 2020

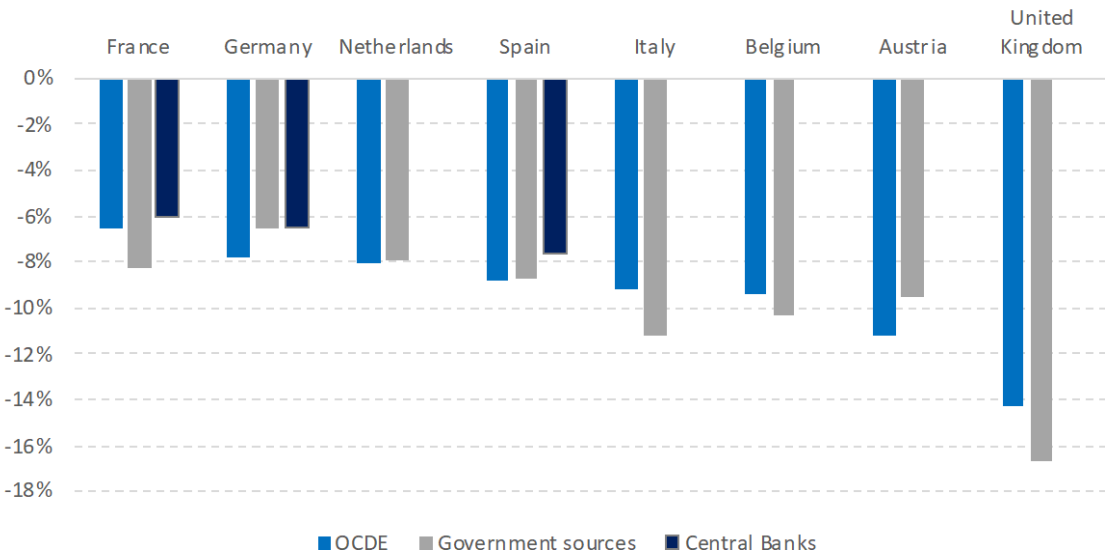


Reading note: the size of bubbles for a given country represents its real GDP at current prices in 2019. The blue bubbles are eurozone countries. The line is a linear regression on eurozone countries exclusively, and weighted by the value of GDP in 2019. The projected evolution of the budget deficit is calculated by subtracting the budget deficit in 2019 from the projected deficit in 2020. The graph on the left shows the correlation between the projected budget deficit in 2020 and the depth of the recession for the eurozone countries. A linear regression linking the deficit to the change in GDP indicates a correlation of 0.76 significant at 95% (the confidence interval is between 0.54 and 1). The graph on the right shows a much lower correlation between the change in the budget deficit between 2019 and 2020 and the depth of the recession. A linear regression on euro-area countries shows a correlation of 0.09 not significantly different from 0. A test of equality of the two coefficients rejects the null hypothesis of equality between the two coefficients.

Sources: OECD, December 2020 forecasts. For non-OECD countries: International Monetary Fund, World Economic Outlook, October 2020.

Automatic stabilizers and emergency measures taken by governments have played their counter-cyclical role. Indeed, in the euro area, the projected budget deficit in 2020 is correlated with the depth of the recession. This correlation is less clear for the change in budget balance, which measures fiscal support in response to the crisis (Figure 2).

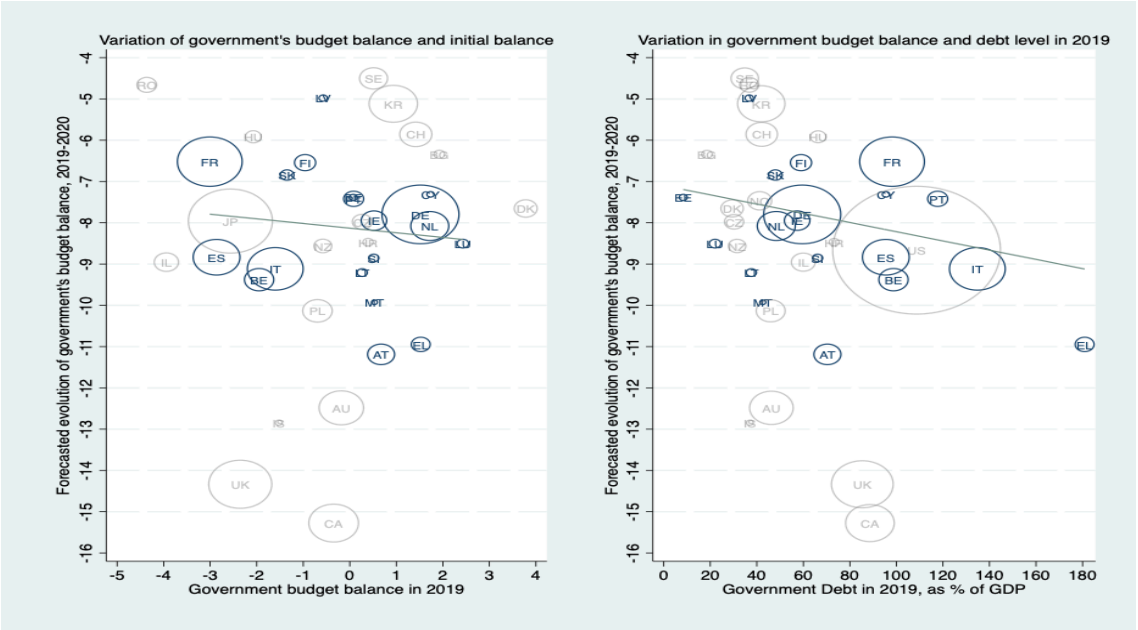
Figure 6– Projected change in the government budget balance from 2019 to 2020 as a percentage of GDP, according to three different sources



Sources: OECD December 2020 forecasts, central banks and government sources

The fiscal response to the crisis as measured by the increase in budget deficit in 2020 compared to 2019 (Figure 3) has been of unprecedented scale. This is the case for France, even if this response will be less significant than that of the other six largest economies in the euro area and especially the United Kingdom if the OECD forecasts are used. The change in the budget deficit would be larger than in Germany and the Netherlands, based on the most recent figures from government sources. On average, budget deficit will be 8.5% of GDP in 2020 according to OECD data, with no correlation either with the stock of public debt before the crisis or with the budget deficit in 2019 (Figure 4). Measures taken at the outbreak of the crisis, notably by the European Central Bank (ECB), have therefore been successful insofar that all euro-area countries, even those with high public debts, have been able to increase deficit. This is also the case for all developed countries (Figure 4), which shows that States today have no difficulty in financing these deficits.

Figure 78– Budgetary response to the crisis



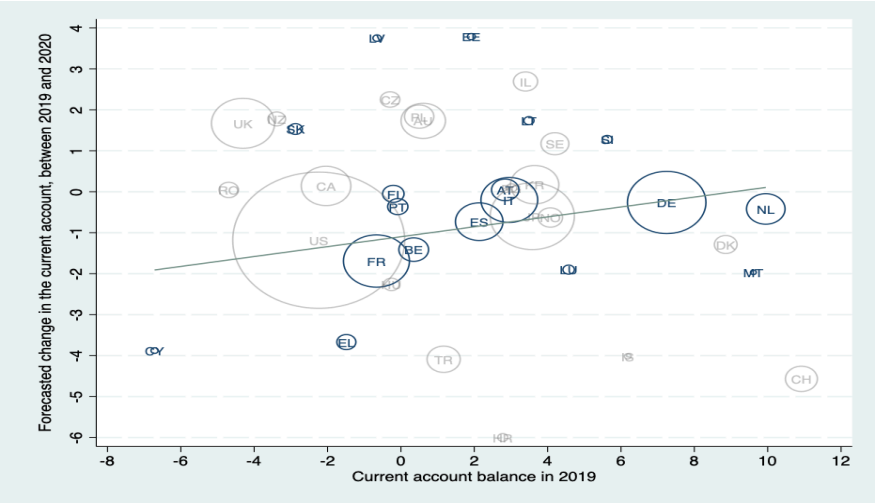
Reading note: the size of bubbles for a given country represents its real GDP at current prices in 2019. The blue bubbles are the eurozone countries. The line is a linear regression on eurozone countries exclusively, and weighted by the value of GDP in 2019. The projected evolution of the budget deficit is calculated by subtracting the budget deficit in 2019 from the projected deficit in 2020.

Sources: OECD, December 2020 forecasts. For non-OECD countries: International Monetary Fund, World Economic Outlook, October 2020.

1.2. Current account imbalances within the euro area are not expected to worsen significantly

The current account surplus of the euro area is expected to decline very slightly between 2019 and 2020. In the 2019 report, we considered this surplus was too high and reflected a deficit in demand for the whole zone. This reduction in the surplus is therefore not troublesome *per se*, even if we interpret it as a temporary reduction. However, behind this slight reduction in the overall imbalance, important heterogeneities persist. In the short term, the deterioration in the current account balance is slightly less pronounced in countries where current account was already in surplus (Figure 5). The causes of these current account movements vary across countries. They are explained by different sectoral specialisations and by contrasting sectoral developments in the year 2020.

Figure 910– In the eurozone, a barely perceptible deterioration in internal imbalances in the short term



Reading note: the size of the bubbles represents the country's real GDP at current prices in 2019. The blue bubbles are the eurozone countries. The line is a linear regression on eurozone countries exclusively, and weighted by the value of GDP in 2019. The projected evolution of the budget deficit is calculated by subtracting the budget deficit in 2019 from the projected one in 2020. The coefficient indicates a negative correlation of 0.28, but with a confidence interval between -0.58 and 0.02, thus not significantly different from 0 in a 95% t-test.

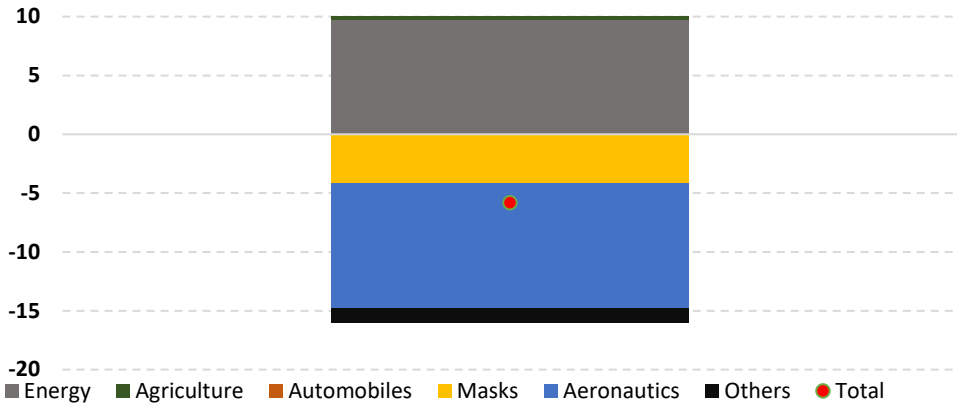
Sources: OECD, December 2020 forecasts. For non-OECD countries: International Monetary Fund, World Economic Outlook, October 2020.

Current account imbalances within the euro area are therefore expected to be only slightly amplified by the crisis in the short term. Countries with a large tourism sector will experience a clear-cut deterioration in their current account balance due to the sharp contraction of the sector in 2020. Among these countries, the deterioration of current account balance is particularly pronounced in Greece and Cyprus (-4 points of GDP). In major exporting countries, such as Germany and the Netherlands, the slight deterioration in current account balance is rather due to the contraction of exports of goods and services as a result of the global recession.

In France, the deterioration of the current account should be around 1.7 points of GDP in 2020. However, generally speaking, current account appreciates during a recession, because domestic demand and therefore imports fall proportionally more than exports when the crisis does not affect all countries simultaneously. Despite a recession of unprecedented magnitude, France will see its current account deteriorate due to its specialisation in exporting to sectors that are heavily impacted by the lockdown and the global nature of the recession.

At sectoral level, in France, the change in the balance on goods between the first half of 2019 and the first half of 2020 was mainly determined by three categories of goods (Figure 6). The balance on aeronautical goods deteriorated by €11 billion, from a surplus of €16 billion in the first seven months of 2019 to a surplus of €6 billion in the first seven months of 2020. This is a sharper decline than in Germany. Conversely, the deficit in the energy balance has been considerably reduced following the fall in oil prices: it has gone from a deficit of €26 billion in the first seven months of 2019 to a deficit of €17 billion in the first seven months of 2020. In addition, France recorded a deficit of more than €4 billion for surgical masks (after a deficit of only €150 million in the first seven months of 2019).

Figure 1112– Change in the composition of the French trade balance between the first seven months of 2019 and the first seven months of 2020 (in billions of euros)



Source: Eurostat; Directorate-General of the Treasury calculations

This deterioration in France's current account deficit results firstly from its negative trade balance (goods and services) but also from the deterioration in its primary income balance which went from a surplus of 29 billion euros over the first seven months of 2019 (surplus of 54 billion for the whole of 2019) to a surplus of 16 billion over the first seven months of 2020, i.e. a deterioration of 13 billion euros. Germany and the Netherlands, on the other hand, recorded an improvement in their primary income balance over this period of €5 billion and €9 billion respectively. The deterioration in France's primary income balance stems mainly from the decline in FDI income within the context of the crisis (-€8.4 billion), whereas the improvement of this balance in Germany and the Netherlands stems mainly from the balance of portfolio investment income. This diverse situation is to be linked to the importance of the stock of French FDI abroad, the second highest after the Netherlands as a percentage of GDP, and generally highly revenue-generating for the country.

2. A comparison of emergency and recovery measures in response to the crisis

While 2020 is not marked by a sharp widening of current account imbalances in the euro area, medium- and long-term developments may depend in particular on the characteristics of the fiscal measures taken by governments and their respective impact on supply and demand in the coming years. If these recovery packages were to differ significantly across countries, both in their size and nature, they could affect internal current account imbalances in the euro area. For example, if surplus countries were to pursue fiscal policies that were both more expansionary and more focused on demand rather than on strengthening competitiveness through supply-side measures, internal imbalances could be expected to narrow. The opposite scenario could increase these imbalances. This is why we believe it is important to analyze the extent and nature of these plans.

In response to the economic consequences of the health crisis, the European Council took the step of announcing an unprecedentedly large fiscal package, the EU Recovery and Resilience Facility. This recovery fund also aims at addressing potential divergence in the Eurozone, by allocating more funds to countries most affected by the recession.European governments have deployed a wide range of emergency and recovery measures in complement of this package, mainly in the form of subsidies, payment deferrals and public guarantees.

We detailed an original comparative survey of the different emergency and recovery measures in a number of European countries, based on government announcements. This work was made difficult by the sheer number and scale of measures taken by governments. Moreover, because these are essentially announcements at this stage, caution is called for as it will be necessary to check that they are translated into actual spending.

Due to the multiplicity and the heterogeneity of the mechanisms deployed, the analysis can help identify differences in government strategies designed to tackle the crisis. Without comprehensive information on the amounts actually spent, most of the figures shown in the remainder of this chapter correspond to the amounts announced, except for Figure 13.

The following statistics were compiled from data provided by the Directorate General of the Treasury and restated by the NPB. In order to verify the amounts and refine the breakdown, these data were compared with those from the IMF, the OECD and several national institutions (the High Council of Public Finance in France, the Office for Budget

Responsibility in the United Kingdom, the *Autoridad Independiente de Responsabilidad Fiscal* in Spain). At an aggregate level, international comparisons are consistent on the basis of these different sources. They allow comparisons of emergency and recovery plans for six countries: France, Germany, Spain, Italy, the United Kingdom and the Netherlands. Annex 3 provides details of all the measures considered for each country, and how they belong to each of the categories we have defined.

2.1. Aggregate amounts of emergency and recovery plans

At the most aggregated level, we distinguish between two categories of schemes: (a) fiscal measures (subsidies, tax credits, interest rate cuts, etc.) and (b) liquidity and guarantee measures (deferral of tax and social contributions, state-guaranteed loans, public guarantees of rent payments for vulnerable tenants, etc.). This first distinction avoids a recurring pitfall in the analysis of emergency and recovery packages. This pitfall consists in combining expenditures that have immediate effect, and guarantees with – in all probability – only limited impact on the budget balance in the coming years. Liquidity and guarantee measures are therefore dealt with separately in this chapter, and the descriptive statistics presented thereafter relate only to immediate and definitive fiscal measures in the sense that there are no repayments expected from the economic agents benefiting from them.

We observe important differences in the relative amounts of these packages between countries.[1] The largest response was observed in Spain, where its government announced a global effort (emergency and recovery) equivalent to 11.2% of its GDP, i.e. €138.6 billion, €66.7 billion of which in emergency measures and €71.9 billion under its recovery plan. Then comes the United Kingdom, with an announced effort equivalent to 9.1% of its GDP, or €229 billion, most of which attributable to emergency measures (€201.1 billion). Germany also announced a very substantial effort, equivalent to 8.4% of its GDP, i.e. €289.2 billion, €164 billion of which is for emergency measures (4.8% of its GDP) and €124.8 billion for its recovery plan (3.6% of its GDP).

France has undertaken measures of a slightly more moderate amount, equivalent to 7.6% of its GDP (€185 billion). In this respect, two features are worth highlighting. On the one hand, France is characterised by announcements of emergency measures on a smaller scale than all the other countries in the sample, with 3.8% of its GDP (93

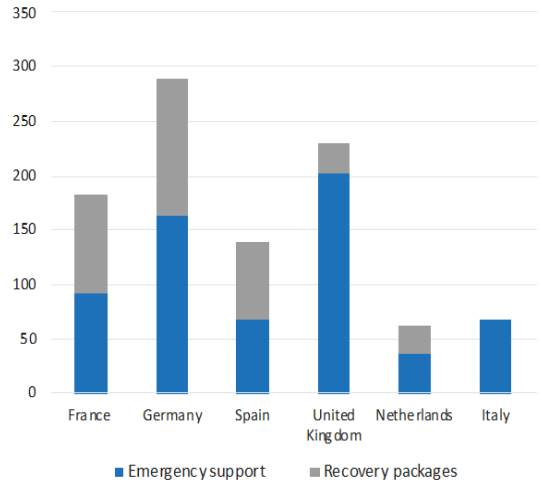
[1] The aggregated amounts of the national emergency and stimulus packages correspond to the amounts announced on 17 December 2020 for France, and on 15 or 20 November for the other countries. The measures announced are more or less spread out over time depending on the country: until the end of 2021 at the most for the emergency measures, until the end of 2023 at the most for the stimulus measures.

billion) against 8% in the United Kingdom, 5.4% in Spain, 4.8% in Germany, 4.5% in the Netherlands and 3.8% in Italy. On the other hand, in comparison with Germany, the French recovery plan is characterised by a slightly higher amount (3.8% of its GDP compared with 3.6% in Germany) but with, *a priori*, a more spread out implementation over time (four years compared to only two in Germany). However, the French recovery plan provides for more immediate disbursements whereas the German recovery plan provides for innovation-related measures, which take longer to implement. As discussed in the previous section, however, in assessing the scale of the response, it is necessary to take into account economic stabilizers, which are particularly important in France.

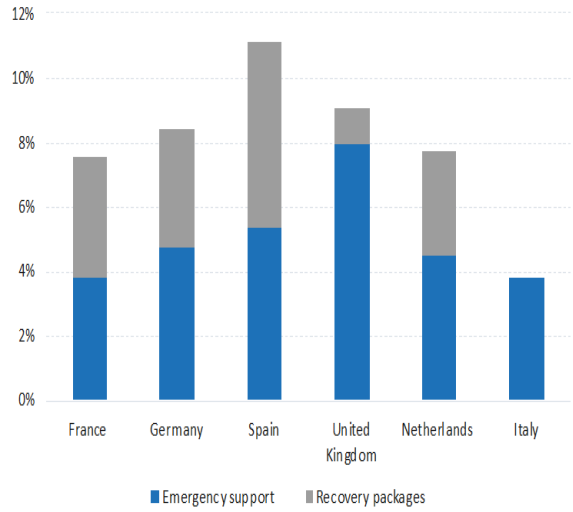
While the United Kingdom (1.1% of GDP) presents a relatively modest recovery plan compared to France and Germany, Italy is an exception as it has not yet announced a recovery plan to complement its emergency measures.

Figure 7 – Amount of announced immediate fiscal emergency measures and recovery plan by country, excluding liquidity and guarantee measures and excluding automatic stabilizers

a) In billions of euros



b) As a percentage of GDP



Note: the aggregate amounts of the national emergency and recovery packages correspond to the amounts announced on 17 December 2020 for France and on 15 or 20 November for the other countries. The measures announced are more or less spread out over time depending on the country: until the end of 2021 at the most for the emergency measures, until the end of 2023 at the most for the stimulus measures (see details in the annexes).

Source: Directorate General of the Treasury; NPB restatements and calculations.

2.2. A comparison of the content of emergency and recovery measures

Support to Supply, to Demand, and mixed support

The distinction between supply-side and demand-side measures is often used in economics. A third category of "mixed" measures can be considered for measures whose effects are considered affecting both simultaneously.

Thus, fiscal measures falling into the "Supply" category are those such as exemptions from social security contributions and corporation tax, emergency aid and subsidies for companies in difficulty (excluding aid for VSE-SMEs, the self-employed and self-employed entrepreneurs). One point worth emphasising here, is that most of support packages to businesses deployed by the various countries are aimed primarily at SMEs, VSEs, self-employed workers and freelancers (following the example of the Solidarity Fund in France). This aid not only plays a role in supporting the continuation of the activity, but also provides a substitute income for entrepreneurs experiencing a sharp fall in income. Therefore, it would not be correct to consider these aids as only supply-side measures. Hence, all aid specifically aimed at SMEs, VSEs, self-employed workers and freelancers are included in the "Mixed" category. Only aid and subsidies intended for mid-sized and large companies or addressed by default to all companies regardless of their size are included in the "Supply" category.

Fiscal measures falling into the "Demand" category are those designed to support the income of households and vulnerable persons (such as the extension of social benefits), measures to stimulate consumption (such as VAT cuts) or health expenditure (purchase of medical equipment, increased medical staff costs linked to recruitment and increased working hours, etc.).

The "Mixed" category includes aid to SMEs, VSEs, self-employed workers and freelancers (for the reasons mentioned earlier), as well as expenditure allocated to public financing for *chômage partiel* or partial unemployment schemes, the objectives of which are not only to support demand, but also to maintain production capacity at the end of the crisis.

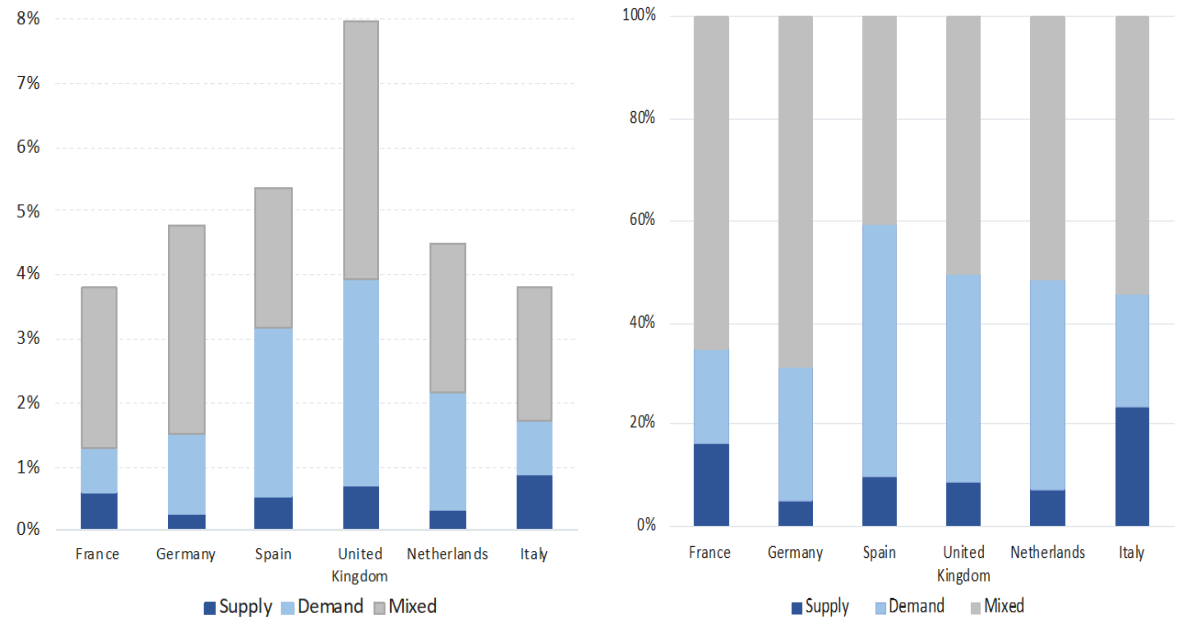
As far as emergency measures are concerned, all countries except Spain converge on an immediate effort mainly focused on partial activity schemes as well as aid to SMEs, VSEs and the self-employed (included in the "Mixed" category). These schemes represent up to 69% of the effort in Germany, 65% in France, 55% in Italy, 52% in the Netherlands and 51% in the United Kingdom.

This is followed by demand mechanisms, which account for 49% of fiscal emergency measures in Spain, 41% in the United Kingdom and the Netherlands. The proportion of emergency measures to support demand is more limited in France (19%) and Italy (22%).

Finally, emergency measures to support supply come third in almost all countries (except Italy), with 5% of the emergency effort in Germany, 7.4% in the Netherlands and 9% in the United Kingdom.

Figure 8 – Emergency plan allocation strategy by country

a) In GDP points **b) Standardised distribution**



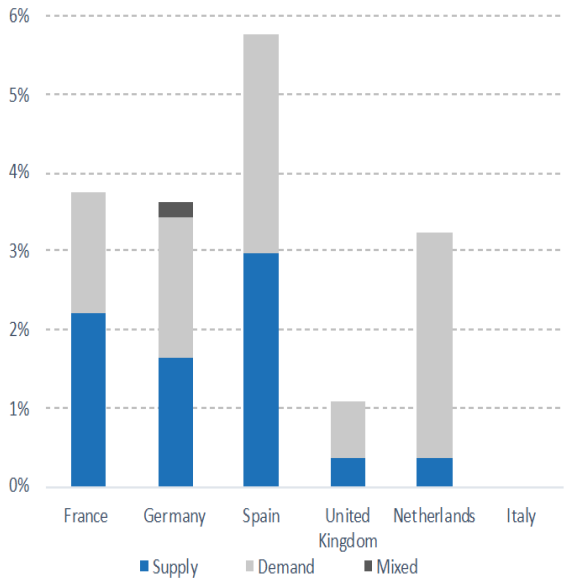
Note: the amounts indicated are spread over 2020 and 2021 for most countries.

Source: Directorate General of the Treasury; NPB restatements and calculations.

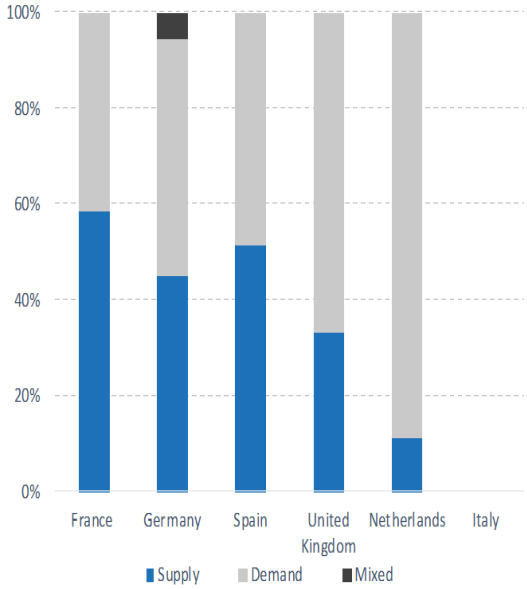
As far as recovery packages are concerned, there are two distinct groups of countries. On the one hand, the United Kingdom and the Netherlands, for example, have recovery plans that are overwhelmingly demand-driven (89% of the total amount for the Dutch plan, 69% for the UK plan). On the other hand, Spain, Germany and France present recovery plans that are more balanced between supply and demand measures. Germany and Spain, for example, are allocating around 49% of their stimulus spending to support demand, followed by France (42%). It is also notable that UK recovery measures (1.1% of GDP) are much smaller than those of its European neighbours.

Figure 9 – Strategies for allocating stimulus packages by country

a) In GDP points



b) Standardised distribution



* Italy has not yet announced a recovery plan as of 15 November 2020.

Note: the amounts indicated cover the years 2020 to 2023 depending on the country.

Source: Directorate General of the Treasury; NPB restatements and calculations.

The distinction between supply and demand measures has its limits however, for at least two reasons. On the one hand, the breadth of the "mixed" category limits the lessons that can be learned in terms of possible impacts on current account balances since it captures a significant proportion of emergency spending. On the other hand, the allocation of many items of expenditure – partial unemployment, infrastructure investments, subsidies to SMEs, etc. – to the "mixed" category limits the lessons that can be drawn in terms of possible impacts on current account balances, since it captures a significant proportion of emergency expenditure. In the end, the classification "supply measures - demand measures" is interesting but too often remains subject to room for interpretation. Moreover, difficulty in classifying supply and demand is perhaps not surprising in the context of the Covid-19 crisis, which combined demand and supply shocks. When commercial activities are closed or restricted by administrative decisions, this can be considered to be both a demand and a supply shock, and it is therefore not surprising that support measures dealing with such shocks are also mixed measures. This mixed nature of many measures is found in many countries. For this reason, in the remainder of the chapter, our analysis is based on a distinction between "Protection" and "Reallocation" measures. We believe this distinction is more objective, suitable and appropriate for this current recession.

Protection and reallocation measures

We classify the measures announced into two groups. In the first group we have measures that aim to protect businesses and households against the risks associated with the economic and pandemic situation (bankruptcies, reduction in income, lack of access to healthcare, etc.). In the second group, we have measures aiming to change the allocation of resources in the economy to promote a recovery in a more structural way, by improving the competitiveness of enterprises or accelerating the energy transition.

This distinction between “protection” and “reallocation” measures also allows us to compare the temporal profile of national emergency and recovery strategies. Indeed, protective measures are generally of a cyclical nature, in that they aim to smooth out the fluctuations generated by the health crisis in the short term. In contrast, reallocation measures, although they may have short-term effects, are more structural in nature and aim to increase medium- to long-term growth potential and sustainability.

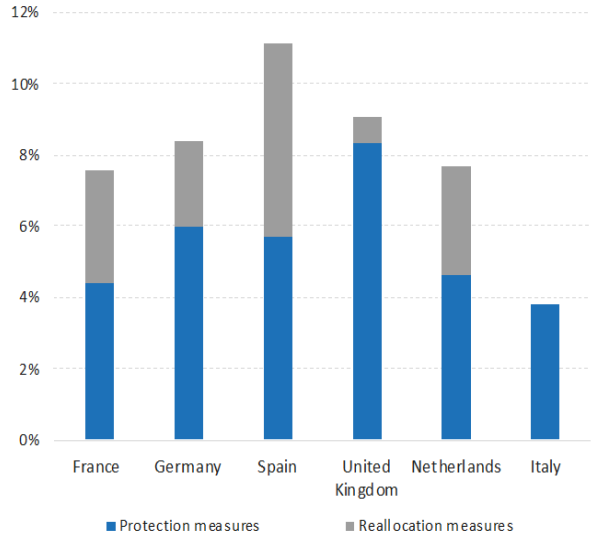
Thus, in the “protection” category are included partial unemployment measures, aid for SMEs, VSEs and the self-employed, exemptions from social security contributions and health care expenditure. In the “Reallocation” category are measures to support innovation, investment in infrastructure or measures to promote energy transition.

Generally speaking, all countries except Spain are converging on an immediate fiscal effort, mainly focused on protective measures, in the form of support to SMEs, VSEs and the self-employed, health expenditure or partial unemployment schemes. This type of measure represents 92% of all emergency and recovery measures announced by the United Kingdom (8.4% of GDP) and 71% in Germany (6% of GDP). The extreme case of Italy, where 100% of the immediate fiscal effort is devoted to protection measures, is explained by the absence of a recovery plan in that country at the time of writing. Indeed, the vast majority of reallocation measures are contained in recovery packages, while protection measures are mostly deployed as part of emergency measures.

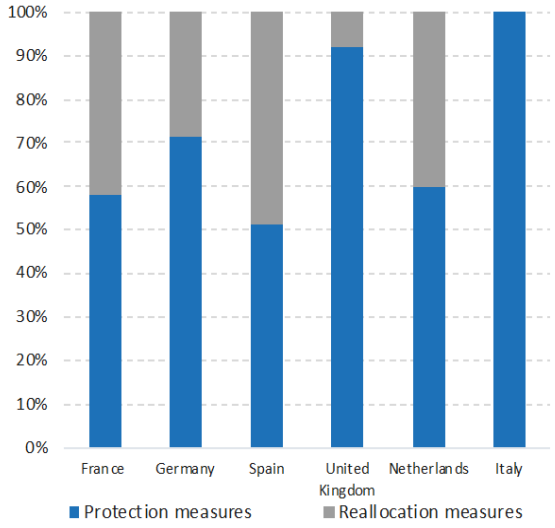
In contrast, Spain, France and the Netherlands present more balanced strategies between protection and reallocation measures. Reallocation measures account for 51.5% of the overall effort in Spain (i.e. 5.7% of GDP), 42% in France (i.e. 3.2% of GDP) and 40% in the Netherlands (i.e. 3.1% of GDP). It is therefore interesting to note that these three countries stand out from the others by a strategy that is relatively more focused on long-term reallocation arrangements than short-term protection.

Figure 10 – Time-based emergency and recovery strategies by country

a) In GDP points



b) Standardized distribution



Source: Directorate General of the Treasury; NPB restatements and calculations.

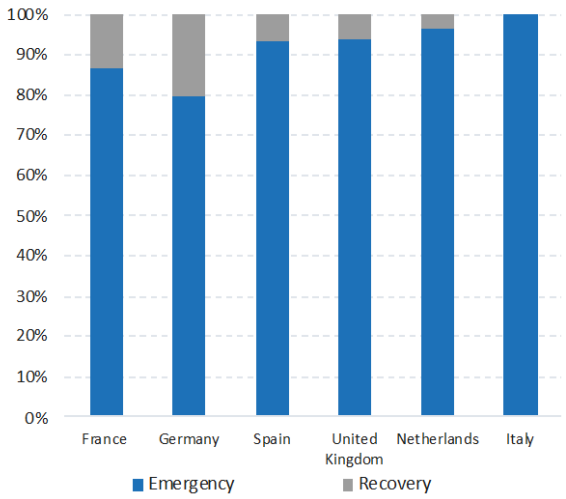
Generally speaking, protection measures are largely the result of emergency measures, while reallocation measures are almost exclusively contained in recovery plans. This statistical observation is entirely consistent with the various government announcements, since recovery plans are designed to complement emergency measures so that recovery is placed under a more sustainable framework.

Thus, 94% of total protection expenditure is spent on emergency measures in the United Kingdom, 97% in the Netherlands and 93% in Spain. Only France and Germany include a significant proportion of protection measures in their recovery plans, with respectively 13% and 20% of total protection expenditure set out in recovery plans respectively.

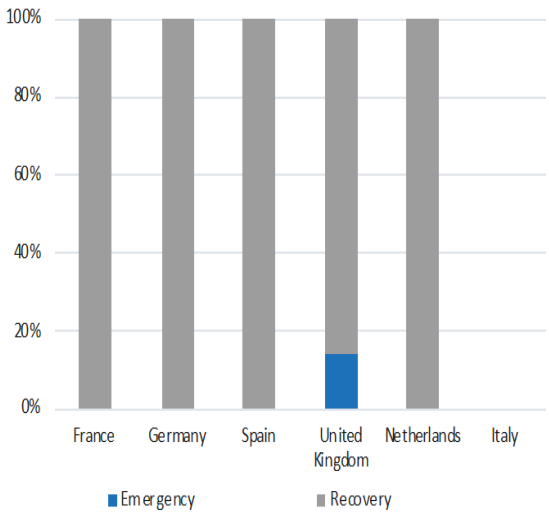
With regard to reallocation measures, the situation is even clearer. This type of measure is thus exclusively contained in the recovery plans in France, Germany, Spain and the Netherlands. Only the United Kingdom includes part of its reallocation expenditure in its emergency packages (14% of total reallocation expenditure). This is largely due to the small size of the UK's recovery plan, relative to its emergency measures and the recovery plans submitted by the other countries. As noted earlier, Italy has not yet submitted a recovery plan and as such is a special case in the analysis.

Figure 11 – Origin of protection and reallocation measures by country

a) Protection measures



b) Reallocation measures



* Italy has not yet announced a recovery plan.

Source: Directorate General of the Treasury; NPB restatements and calculations.

2.3. Comparative analysis of liquidity and guarantee measures

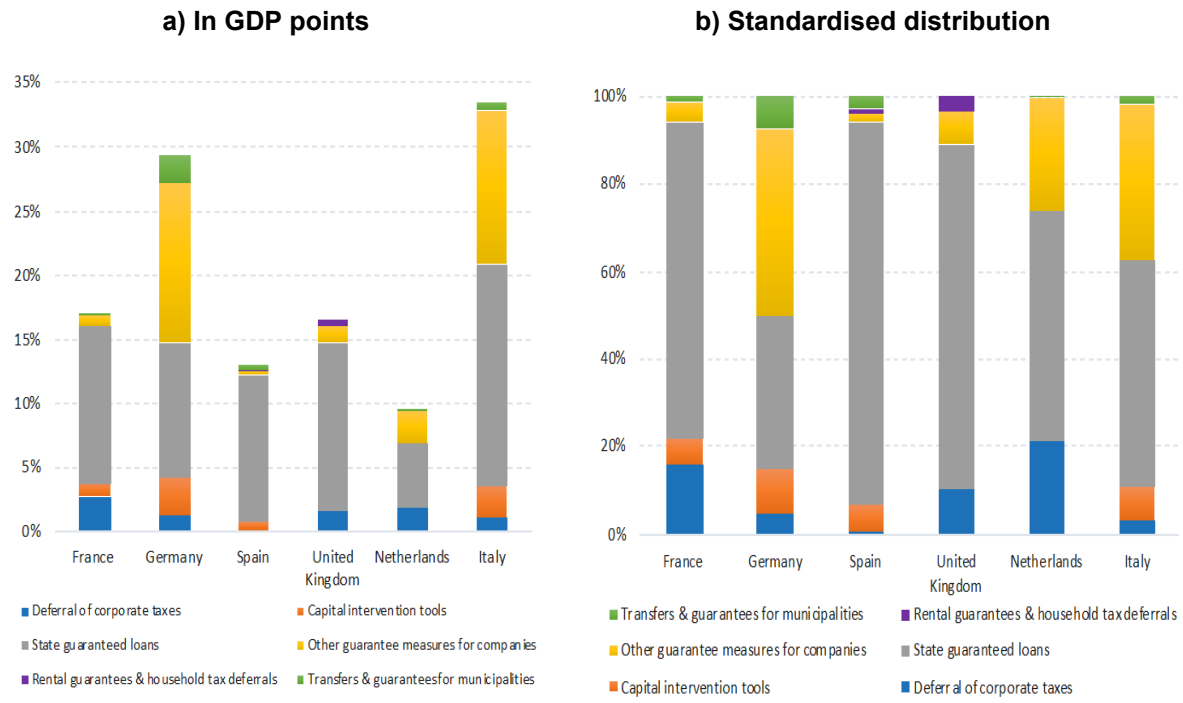
Although announced as a complement to fiscal measures (emergency and recovery) to achieve similar objectives, the liquidity and guarantee measures are nevertheless radically different from them. While the former constitutes a fiscal effort with an immediate and definitive effect on the budget balance, the latter constitutes on the contrary either a fiscal effort that will be repaid in the near future (this is the case, for example, tax deferrals), or a deferred fiscal effort conditional upon application of potential beneficiaries (this is the case for the various guarantee measures such as the State-guaranteed loan).

Because of their respective characteristics, combining these two categories of measures would constitute an analytical error resulting in a considerable overestimation of the real fiscal effort of States. By analysing liquidity and guarantee measures separately, several notable trends can be observed.

Overall, significant differences exist between the different countries. While Italy (33% of GDP) and Germany (29% of GDP) announced very large amounts for this type of scheme, the other countries, particularly Spain (13%) and the Netherlands (9%) deployed more limited amounts. The figures are 17% for France and 16.5% for the United Kingdom. On the other hand, there is a convergence in their allocation, since

most of the amounts announced are allocated to the state-guaranteed loan scheme in most countries.

Figure 12 – Amount and composition of announcements on liquidity and guarantee measures



Source: Directorate General of the Treasury; NPB restatements and calculations.

2.4. Comparative analysis of amounts disbursed as of 27 November 2020

While the amounts announced give an indication of the approximate size of the emergency and recovery packages, only the amounts actually spent will have a measurable impact on the budget balance in 2020. However, as things stand, information on these amounts is still rather incomplete.

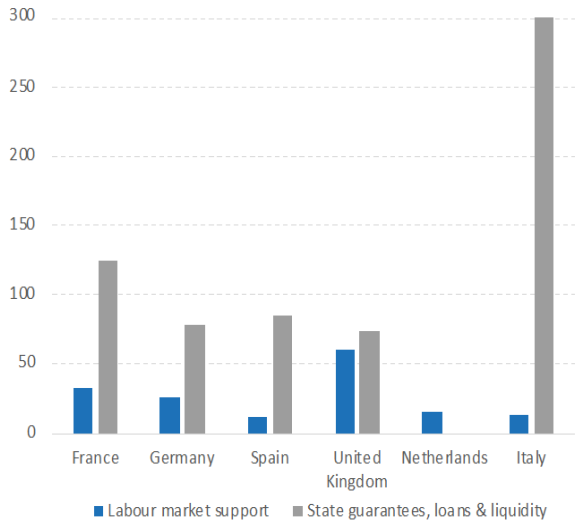
Thus, the data provided by the Directorate General of the Treasury provides information on disbursements made under two categories of measures. On the one hand, “labour market” measures include partial unemployment schemes as well as aid to SMEs, VSEs and the self-employed. Guarantees and similar measures, on the other hand, are essentially composed of the State-Guaranteed Loan and other guarantee measures.

In this respect, as of 27 November, the UK has already spent €60.5 billion (2.4% of GDP) on labour market measures. This is followed by the Netherlands (€15.3 billion or

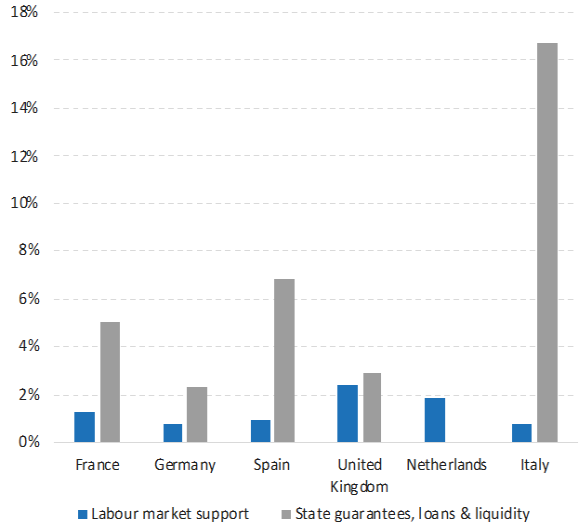
1.9% of GDP), France (€32.3 billion or 1.3% of GDP), Spain (€12 billion or 1% of GDP), Germany (€26.7 billion or 0.8% of GDP) and Italy (€13.6 billion or 0.8% of GDP). As far as public guarantee measures are concerned, Italy had already mobilised €300 billion, i.e. 16.8% of its GDP. It is followed by Spain (6.8%), France (5%), the United Kingdom (2.9%) and Germany (2.3%). Information is not available for the Netherlands.

Figure 13 – Amounts spent under labour market measures and public guarantees

a) In billions of euros



b) As a percentage of GDP



Source: Directorate General of the Treasury; NPB restatements and calculations.

Nevertheless, this graph must be interpreted with great caution, for several reasons. Firstly, the figures it contains change quite rapidly and only reflect the amounts actually spent with an often-significant time lag. For example, amounts disbursed for partial unemployment schemes are recorded with a time lag of several weeks. On the other hand, the presence of several counter-intuitive results suggests possible inaccuracies (e.g. the low amounts disbursed by Germany or the very high amount of guarantees granted by Italy).

Conclusion

The crisis generated legitimate concerns over divergences within the euro area, especially regarding the widening of structural current account imbalances. We indeed observe that the crisis slightly amplified the internal current account imbalances between euro area countries. We believe that this impact is mainly of a short-term nature.

We think that it is more important to focus on the potential effect of the emergency and recovery plans both on the surplus of the euro area as a whole – considered excessive in our 2019 report – and on the imbalances within the euro area. In both cases, we considered that the imbalances originated from a deficit in demand in countries with very high trade surpluses, in particular Germany and the Netherlands. From this point of view, the debate on the consequences of the recovery plans is legitimate. These plans could indeed have been the opportunity for a coordinated reduction of these imbalances – a reduction that we called for in 2019. The fiscal response at the national level was strong all over Europe and the unprecedented fiscal package adopted by the European Council this summer, « Next Generation EU » is an important step towards addressing potential divergence in the Eurozone. However, it is difficult at this stage to consider that they will have a major impact on future internal imbalances of the euro zone. Similarly, if there were differences in the nature of the measures taken in these emergency and recovery plans, we do not consider that they would have a major impact on internal current account imbalances in the euro area anyway. However, this is a preliminary qualitative analysis which will have to be confirmed subsequently by more advanced quantitative analyses and also with data not based on spending announcements but actual disbursements. What is however noticeable at this stage, is that it should come as no surprise that the emergency and recovery plans would not have a clear impact on the medium-term internal imbalances of the euro area. The objective of a coordinated reduction in the internal current account imbalances of the euro area countries – which we still consider important – has not in fact driven the decision-making process of the euro area budgetary plans. If such coordination existed, it would have led to recovery plans more targeted on measures increasing domestic demand in countries with surpluses. This is therefore a missed opportunity from this point of view. By allocating more funds to countries most affected, the EU Recovery and Resilience Facility has chosen the right strategy but two concerns remain. First, there is no explicit objective in the Facility to reduce Eurozone current account imbalances. Second, there is no coordination of national fiscal plans to prevent that they may actually increase pre-existing current account imbalances. The uncoordinated nature of the recovery plans for reducing imbalances in the euro area is therefore worrying and the major risk in the coming years is that countries with current account surpluses will be the first to reduce their fiscal stimulus.

CHAPTER 3

SKILLS AND PRODUCTIVITY

Human capital is the main determinant of a worker's productivity. The positive relationship between human capital – understood as skills and the ability to acquire them – and productivity, is observed not only at the level of individuals[73], but also at the level of firms[74], countries[75] and even urban areas[76]. This relationship gains in precision when years of formal education are corrected by their quality, as measured by results in standardised tests[77].

Over the last half-century, the average level of education and skills of workers has risen considerably in France as in all OECD countries. Among the working-age population, the proportion of university graduates in France rose from 10% to 40% between 1975 and 2020. However, a sharp slowdown of this dynamic is in motion and, despite massive investments, a considerable proportion of people of working age do not yet master basic literacy and numeracy skills. These skills are strongly correlated with success in the labour market and worker productivity[78].

[73] This relationship is the basis of the labour economics literature, based on the work of Becker (1962) and Mincer (1974) who calculate private returns to education. See in particular Becker G. S. (1962), "Investment in human capital: A theoretical analysis", *The Journal of Political Economy,* vol. 5; Mincer J. (1974), "Schooling, Experience, and Earnings", *Human Behavior & Social Institutions, 2.*

[74] The link between a firm's stock of human capital and its productivity is well established. See, for example, Haltiwanger J. C., Lane J. I. and Spletzer J. (1999), "Productivity differences across employers: the roles of employer size, age and human capital", *American Economic Review,* 89(2).

[75] The relationship between human capital and country growth is widely documented, from the contribution of Mankiw, Romer and Weil (1992) to the recent efforts of Collin and Weil (2020).

[76] The relationship between the human capital of urban areas and their productivity has been extensively documented since Rauch (1993) and confirmed as causal, and not due to a selection effect, by Combes *et al.* (2012).

[77] Hanushek E. A. and Woessmann L. (2012), "Do better schools lead to more growth? Cognitive skills, economic outcomes and causation", *Journal of Economic Growth*, 17 (4).

[78] Kankaraš M. *et al.* (2016), "Skills matter: Further results from the survey of adult skills", OECD Skills Studies, OECD Publishing.

In the labour market, demand for skilled workers is significant to the point that returns to education have rarely been so high, in France as in most countries[79]. Private returns to education give an indication of the relative scarcity of workers' skills. The public returns to education are even higher, because a productive worker has a boosting effect on the productivity of others, and educational attainment is positively correlated with several social indicators, such as health. Investment in human capital is of crucial importance as it leads to a permanent increase in the productivity growth rate of an economy.

This chapter first reviews various findings on the level and evolution of workers' skills in France, but also on their use in the economy and their effect on productivity. It presents the results of a new study[80] by France Stratégie that analyses the evolution of labour productivity and the role of human capital in the slowdown in labour productivity in France and in OECD countries. Half of the slowdown in productivity growth over the last four decades is explained by the slowdown in the growth of human capital. These results do not highlight a French particularity: this slowdown in human capital growth is shared across OECD countries.

The chapter also presents results from preliminary studies showing an increasing concentration of skilled workers and the role of this concentration in productivity growth. This concentration takes place at two levels: at the level of firms, and at a geographical level. An ongoing OECD study thus identifies a French specificity: compared to other European countries, France has a significantly larger share of highly skilled workers in companies that are the most productive. Geographically, there is a higher growth of skilled employment in large urban areas, which accentuates the polarisation of employment and geographical divergences in productivity.

Poor use of skills available in the labour market could also affect productivity. We present a recent study[81] suggesting that the mismatch between workers' skills and those required in their jobs is not significantly different in France and other European countries.

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[79] Returns to education have increased over the last three decades, accentuating income inequality by level of education. A study by the Institute for Public Policy confirms that France is no exception, since these returns are measured by the cost of labour. See Bozio A., Breda B. and Guillot M. (2020), "Taxes and technological determinants of wage inequalities: France 1976-2010", Workshop Incidence and labour market effects of SSCs, vol. 29.

[80] Bruneau C. and Girard P.-L. (2020), "Trend Trends in Labour Productivity in France, 1976-2018", *Working Paper,* No. 2020-17, France Stratégie.

[81] Brun-Schammé A. and Rey M. (2021), "Une nouvelle approche de l'inadéquation des compétences", *Working Paper,* No. 2021-01, France Stratégie, January.

The chapter concludes with a discussion of the challenges and policies needed for developing the skills of future workers. Upskilling and reskilling is self-evident, as well as the development of a general skills set for all workers to facilitate lifelong learning. These policy objectives appear necessary, as the increasing automation of the economy has led to a considerable drop in the demand for routine and non-cognitive tasks. At the same time, demand for cognitive and non-routine tasks, which are difficult to automate, has increased and has become the driving force behind the growth of innovation. Improving workers' skills makes them more productive and innovative, but also and most importantly, more flexible and able to adapt to demands of the labour market.

1. Skills in France

The level of skills of the working-age population has increased progressively in France, as has productivity, over the last few decades. As in all developed countries, the proportion of qualified workers has been steadily increasing. However, this increase is slowing down, as a natural limit is being approached, with a large proportion of new entrants already attaining a higher education degree. Future skill gains are therefore to be found in the quality rather than the quantity of graduates.

Although skills are enriched throughout a person's life, the skills that young people acquire at school are an important foundation. There is however considerable room for improvement in this initial acquisition, as shown by comparisons between France and other developed countries in the level of skills acquired by young people.

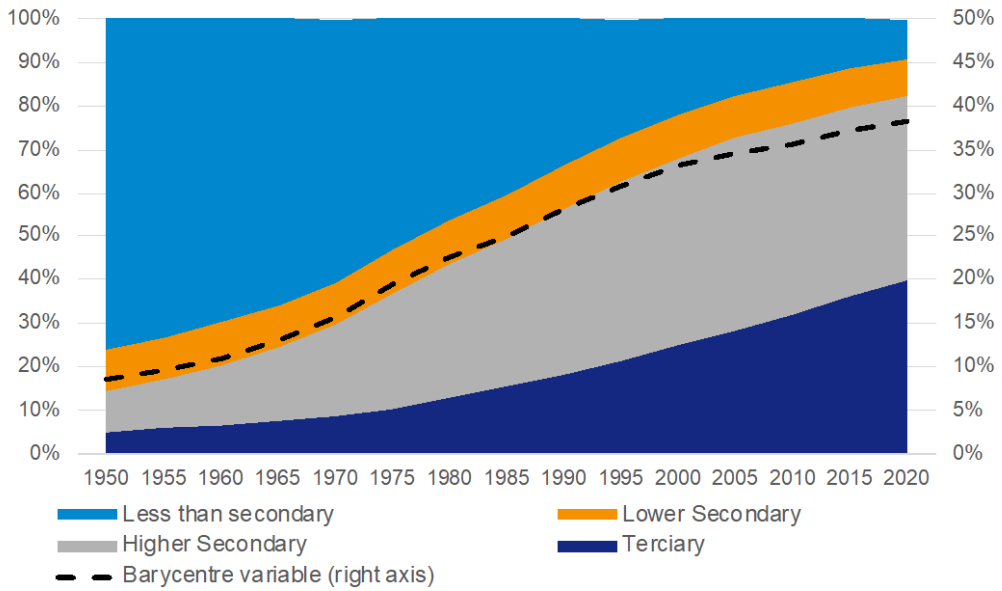
The positive influence of cognitive skills on productivity is known and quantifiable. Other types of skills, so-called non-cognitive skills, also have an important influence on productivity, as it has been recently documented.

The level of education of the working-age population in France has gradually increased over the generations. Between 1950 and 2020, the proportion of working-age adults having completed at least upper secondary education (CAP, BEP and baccalaureate) rose from 15% to over 80%. Among cohorts entering the labour market, this increase has continued but at a slower pace in recent years (see Figure 1). Among the working age population, the average number of years of education per person increased faster from 1960 to 2000 (1% per year) than from 2000 to 2020 (0.73% per year on average[82]). Beyond the average number of years of education, an alternative measure

[82] Calculations France Stratégie from the database of Lutz, Goujon *et al.* of the Wittgenstein Center for Human Capital.

of human capital, created with a barycentre function taking into account the level of diploma obtained, shows that the growth of this capital has been decelerating since the 1990s[83]. This phenomenon is natural and shared by all developed countries. There is less room for increase in the number of years of schooling when we are close to an entire generation reaching baccalaureate level as well as when the share in a generation carrying on to higher education is already significant.

Figure 1 – Distribution of educational attainment of the adult population (25-64 years old)



Note: upper secondary education includes the three general, technological and vocational baccalaureates, the CAP and the BEP.

Source of data: Goujon et al. (2016), NPB calculations.

1.1. The skills of the present: adults in France perform below expectations

The *Programme for the International Assessment* of *Adult Competencies* (PIAAC) aims to provide a survey as complete as possible of the skills present in the labour force. It also aims to understand how these skills are used at work and how they are affected by education, training and learning experiences. Finally, it aims to estimate the relationship between skills and variables such as wages, employment, economic growth, productivity and social well-being. This survey was conducted in 2012 in

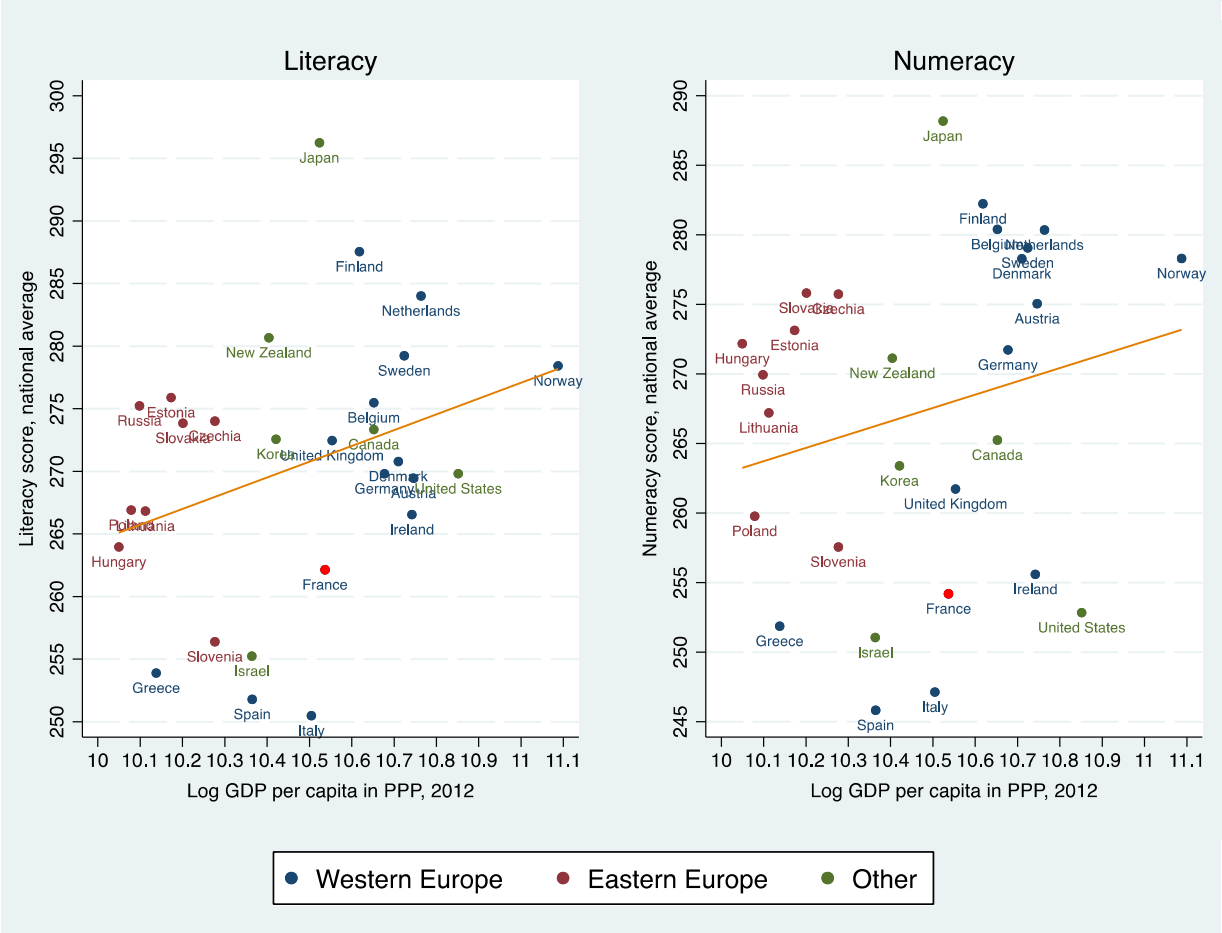
[83] See Bruneau and Girard (2020), *op. cit.*

several OECD countries and, like the PISA survey, is intended to be repeated at regular intervals. The next one will take place in 2022.

Adults in France have lower levels of skills compared to other countries

The first notable finding for France is the low overall average of adult skills (see Figure 2). The scores are presented on a 500-point scale. In France, the average numeracy score is 254 points, compared to 272 for Germany, 280 for the Netherlands, and 269 for the OECD average. Literacy scores in France are also among the lowest for European OECD countries. Within the EU, only Spain, Italy, Greece and Slovenia have lower scores. These differences are statistically significant and of a non-negligible magnitude. Given its level of economic development, one would expect France to have a higher level of skills, by at least 15 points, in both areas.

Figure 2 – Adult skills: national averages and GDP per capita



Source: OECD for PIAAC scores and World Bank for the level of GDP per capita in purchasing power parity for the year 2012, the year of the PIAAC test; NPB calculations

A particularly low level for adults with lower skills

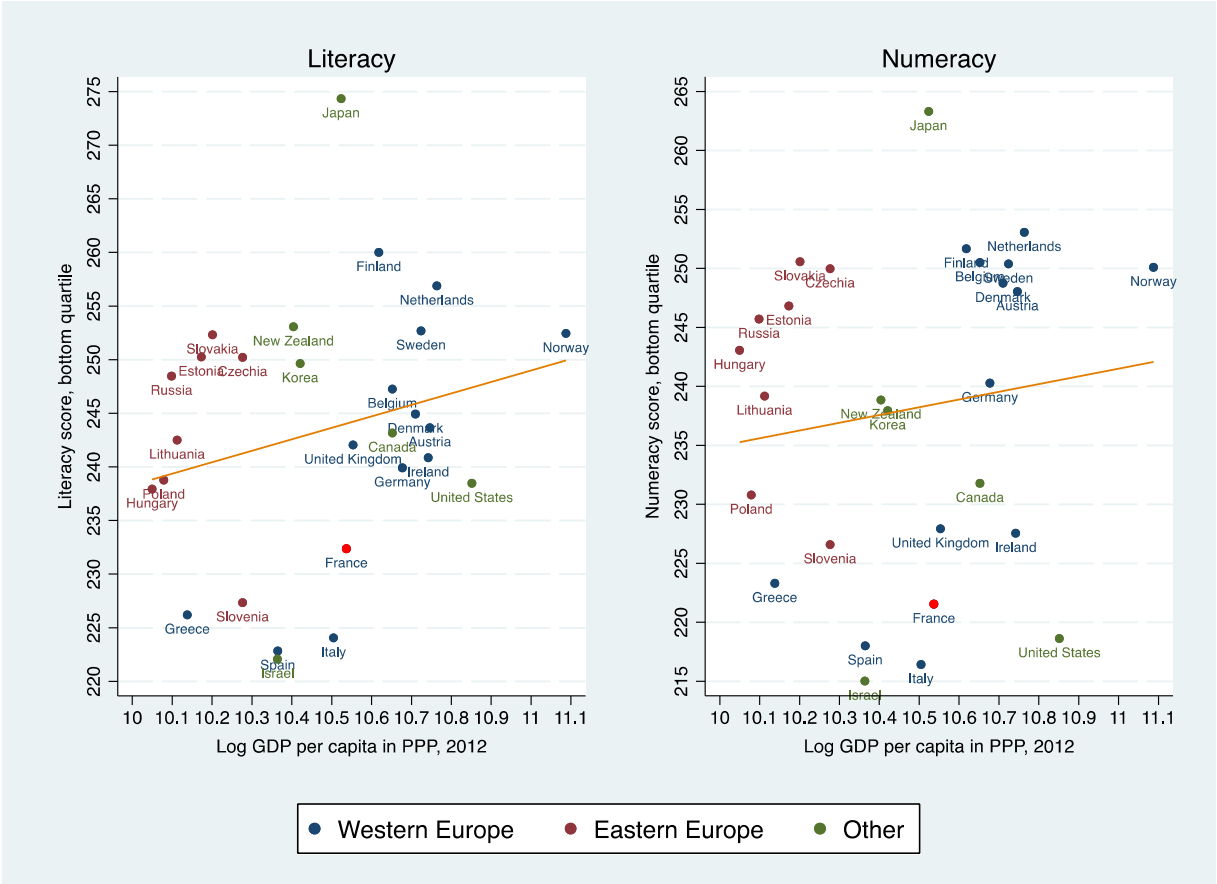
A higher proportion of adults with low skills is found in France than in other European countries. The OECD classifies the scores in six levels, corresponding to the skills acquired. In France, 21.6% of adults (16-65 years old) have a low level of writing skills: 5.3% are classified as below level 1 and 16.2% in the level 1 group (Figure A1 in Annex 4)[84]. These results are below the average for the 24 OECD countries (15.5% in total). Only Italy (27.7%) and Spain (27.5%) have higher proportions of adults at or below level 1.

In view of France's economic development, one would expect the skill level of adults to be higher, especially among the adults with low levels of skills. Figure 3 presents the level of skills for adults in the bottom quartile of skills, and the level of economic development. The skills of adults in the lowest quartile in France are well below those observed in most European countries, and below the level expected level given the country's development.

The Figure shows that there is a group of ten European countries with an income level similar to France, but in which the skills of the bottom quartile of adults are much higher than in France. These countries are Germany, Austria, Belgium, the Netherlands, Sweden, Norway, Finland and Denmark, as well as the United Kingdom and Ireland. The level of skills observed in the *bottom* quartile of these countries is even comparable to the *average* level of skills in France. In Eastern European countries, the lowest skill quartile is also considerably higher than the one observed in France.

[84] Level 1 involves, for numeracy, knowing how to perform simple (one-step) mathematical operations requiring counting, or performing basic arithmetic operations, such as understanding simple percentages like 50% and simple graphical or spatial representations. In literacy, Level 1 involves recognition of basic vocabulary that determines the meaning of sentences.

Figure 3 – Skill levels of adults in the lowest skill quartile



Reading note: the lowest 25th percentile numeracy skills score in France is 222, compared with 252 in Finland and 240 in Germany, with a level of per capita income comparable to France. Eastern European countries are shown in burgundy, Western European countries in dark blue, and the others in green. The orange line corresponds to a linear regression, which shows a weak positive relationship between the level of economic development and the skills score of the lowest quartile of the country.

Source: OECD for PIAAC scores and World Bank for the level of GDP per capita in purchasing power parity for the year 2012, the year of the PIAAC test; NPB calculations

France stands out for several other features

A second notable characteristic of France is that the age profile of skills is slightly more pronounced. In all OECD countries, PIAAC scores decline steadily with age, starting in the 25-34 age group. In France, young adults are close to the OECD average skills, while older adults are well below this average. The gap between young adults and older adults is considerably higher in France than in other OECD countries, as shown in Figure A3 in Annex 4, a result also noted by INSEE (2018).

The skills of older adults (over 45 years old) are therefore particularly lower in France than in other OECD countries. Some of this difference can be explained by the large number of adults who do not attain the so-called basic skills. Figure A2 in the Annex confirms this gap: adults in the lowest skill quartile in France have a level well below that of their counterparts in OECD countries. The gap observed is greater for adults over 45 than for adults under 45.

This observation may be due to poorer initial training when these adults were trained. But it may also be linked to the fact that, in France, there is less recourse to lifelong learning for workers with lower skill levels. The lifelong learning system in France has, until recently, been directed more towards those already in employment than towards the unemployed and people trying to enter the professional world[85]. Adult learning does not make up for the delays that are already present at the end of formal education. However, until recent initiatives in this area, it was not particularly targeted at the less skilled, whereas other European countries use vocational training and lifelong learning as an instrument to promote better labour market outcomes for the less skilled.

A third particularity is the relationship between skill level and salary, which appears to be weaker in France. Indeed, the wage structure is more compressed than in other European countries.[86] This compression may mechanically lower the return on skills, and thus reduce the incentives for individuals to invest in their skills.

1.2. The skills of the future: the disappointing performance of the youth

Academic skills are in line with the OECD average

The Programme for International Student Assessment (PISA) is a triennial OECD survey that assesses the skills of 15-year-old students. These measures of skills are harmonised and allow comparison both across countries and over time. The tests measure several aspects: reading literacy, mathematics, science and “across-the-board” skills.

There is a strong link between the skills acquired by pupils at the age of 15 and those measured later in their working life. A recent study matched students’ PISA test results

[85] On this subject, see the report by Estelle Sauvat (2018), *Accelerating investment in skills in France by mobilising European financial instruments*, report no. 2018-092R.

[86] Verdugo, G. (2014). The great compression of the French wage structure, 1969-2008. Labour Economics, 28, 131-144.

in 2000 with PIAAC results as adults in 2012.[87] The correlation between the two tests is very high. The results indicate a strong persistence of literacy skills between the ages of 15 and 27.

In France, the average student score has remained remarkably stable over the last twenty years. It is just above the OECD average in all areas studied. On average across the three domains, students in France rank 14th in Europe, and 24th overall in the OECD. Student performance in all three domains is comparable to that observed in Belgium, Germany, Switzerland or Portugal.[88] It is significantly below the skills acquired in the Scandinavian countries, the United Kingdom, Ireland and Poland.[89] In all the domains studied, Japan, South Korea and Canada score significantly higher than France.

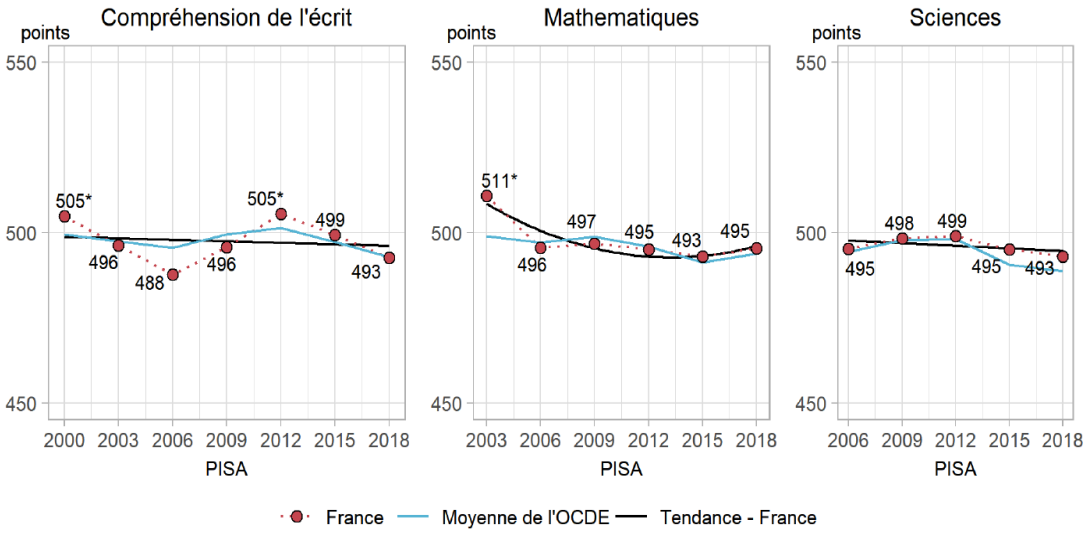
A different organisation carries out international standardised comparisons assessing students' competences focusing solely on mathematics and science. This is TIMSS (*Trends in Mathematics and Science Study*), which assesses students younger than PISA: those in CM1 (equivalent to Year 5 in the UK and fourth grade in the USA) and in their third year of secondary school (*quatrième,* i.e. 9-and-14-year-olds). The study is carried out every four years, and the last one was finalised in 2019. The results of this last wave show that the results of CM1 students are at the bottom of the scale in Europe (Figure 5). These results had also been observed in the 2015 survey, and are therefore not explained by a particularly bad year: they definitely capture a considerably lower level for CM1 pupils across the entire distribution of scores. The relative position of the score for third-year secondary pupils in France is similar to that of CM1 pupils, and the positions are the same for both mathematics and science.

[87] Albæk K. (2017), "Skill-persistence and the impact of post-compulsory education on skills-evidence from a linked PISA-PIAAC data set".

[88] OECD (2018), *PISA 2018 Results,* Volume I, Table I.4. The average proficiency of students in reading literacy in France is 493, 495 in mathematics and 493 in science. On average, France is ranked 24th out of the countries taking part in the PISA tests, and 14th in Europe. Several European countries have statistically significant higher scores in all three domains (notably Finland, Estonia, Poland, Sweden and the United Kingdom). Other countries have significantly higher scores than France in two of the three domains (e.g. Denmark, the Netherlands and Slovenia). Outside Europe, several countries have higher scores in all three areas, including Japan, South Korea, Canada, Hong Kong, Singapore and Taiwan.

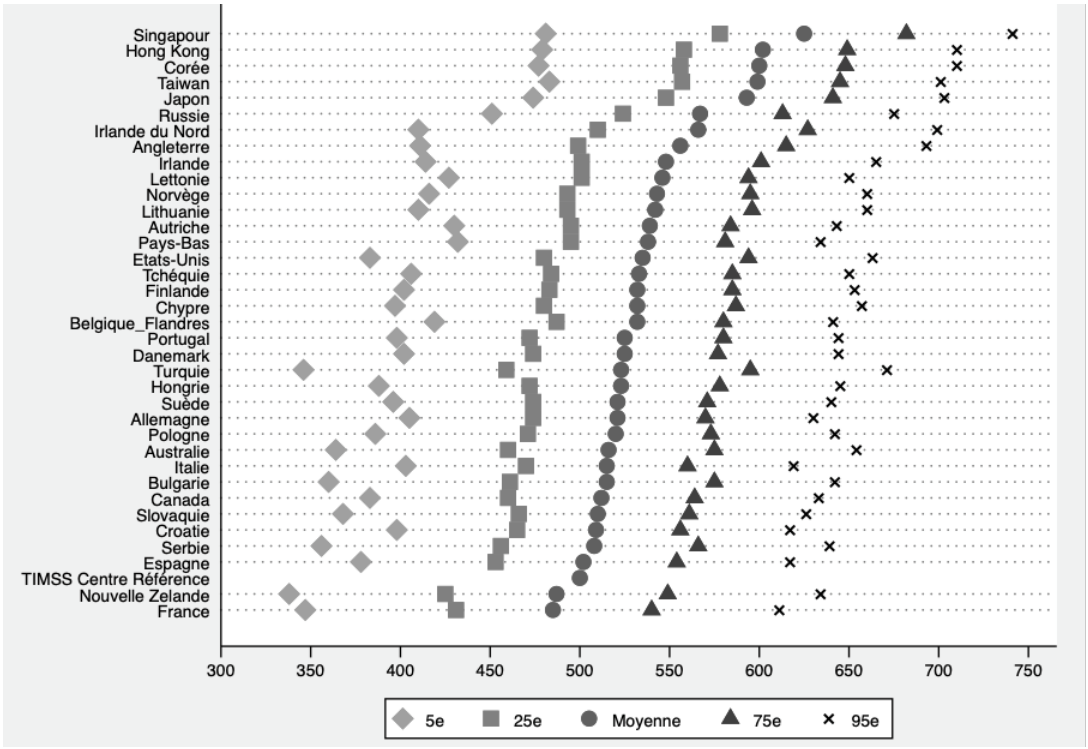
[89] OECD (2018), *PISA 2018 Results,* Volume I, Table I.4.

Figure 4 – PISA test results in France and OECD average



Source: OECD, PISA 2018. PISA database, Table I. B1.10, I. B1.11 and I. B1.12

Figure 5 – Scores of CM1 students in mathematics, 2019, TIMMS study



Reading note: the average score in mathematics is 485 in France, 521 in Germany and 556 in the UK. Pupils at the top 75th percentile have a score of 540 in France, compared with 570 in Germany and 615 in the United Kingdom.

Source: TIMMS, Survey 2019

Greater inequality of skills and student achievement

France is one of the OECD countries where the link between parental socio-economic status and test performance is the strongest. According to the results of the 2018 PISA tests, students from the highest socio-economic quartile score an average of 107 points higher than those from the lowest quartile. This gap is among the largest in the OECD, where it averages 89 points. It is also more pronounced in France than in countries with comparable test averages. This effect of socio-economic status is also stable over time, with the same size of results being found in each new wave of PISA tests. The OECD has developed an index of students' economic, social and cultural status: it explains almost a quarter of the variation in test scores for France, compared with less than 15% in neighbouring European countries[90]. In a recent report[91], the French Council of Economic Analysis (CAE) emphasises the strong social determinism in France, with some students excelling and on another side many students struggling.

These inequalities translate into both a lack of opportunities and underachievement. PISA tests show that in most countries, even in the most disadvantaged schools, some pupils manage to acquire skills that place them in the top quartile of results. On average, one in ten disadvantaged students in OECD countries manage to place themselves in the top quarter of their country's performance. In Australia, Canada, Estonia, Ireland, the Netherlands, the United Kingdom and Canada, more than 13% of disadvantaged students perform in the top quartile. This percentage is 10% in Germany and 9% in Switzerland. In France it is only 8% (Figure 6).

Another particularity of France is the impact of stereotypes linked to the social environment. The OECD (2020) notes that students from disadvantaged backgrounds have lower ambitions than might be expected given their academic performance. In France, among students performing well in PISA, one in five does not plan to enrol in higher education when they come from a disadvantaged background, whereas this proportion is very low when they come from an advantaged background.

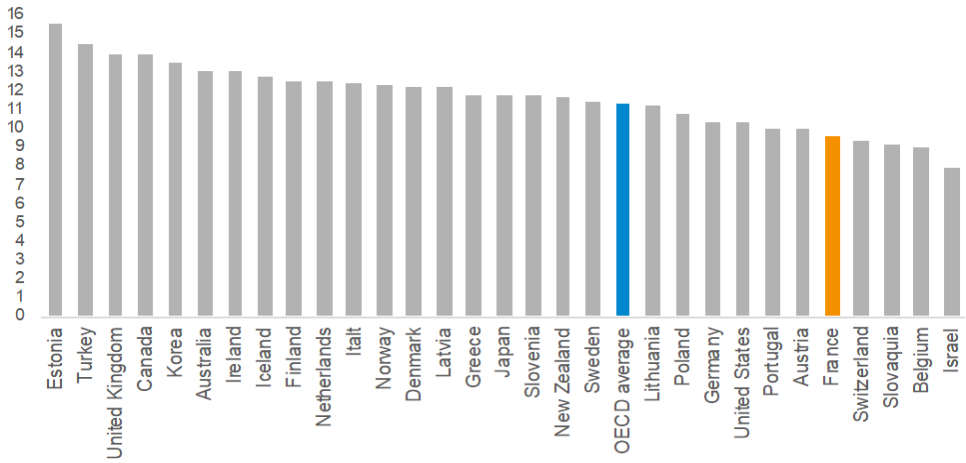
Gender stereotypes are also more pronounced in France. The OECD (2020) notes that "among the best-performing students in mathematics or science, one boy in three in France wants to work as an engineer or scientist at the age of 30, while only one girl in six plans to enter this type of profession. These differences are less marked in other

[90] In Germany, this index explains 17% of the variations.
[91] Algan Y., Huillery E. and Prost C. (2018), *Trust, Cooperation and Autonomy. For a 21st century school, Les Notes du Conseil d'analyse économique,* No. 48, October.

European countries. Only 6% of boys, but almost no girls in France, wish to work in professions related to information and communication technologies (ICT)*".*

Socio-economic disparities are therefore reproduced by the school system in France. Other countries face similarly high inequalities, but their education systems manage to increase the skills of disadvantaged students and open the doors to higher education to a greater proportion of children from disadvantaged families. The OECD identifies a number of aspects specific to France and said to contribute to a skills acquisition deficit. These include a higher concentration of lower-performing students in lower-performing institutions, such as vocational colleges (*lycées professionnels*).

Figure 6 – Socially disadvantaged students are less likely to attain high academic achievement in France than in other countries



Reading note: this graph presents a measure of social mobility. It shows the proportion of disadvantaged pupils scoring in the top quartile of test scores. For example, in France, 9.5% of pupils in the most socially disadvantaged 25% manage to score in the top 25%. In the United Kingdom, this proportion is 14%.

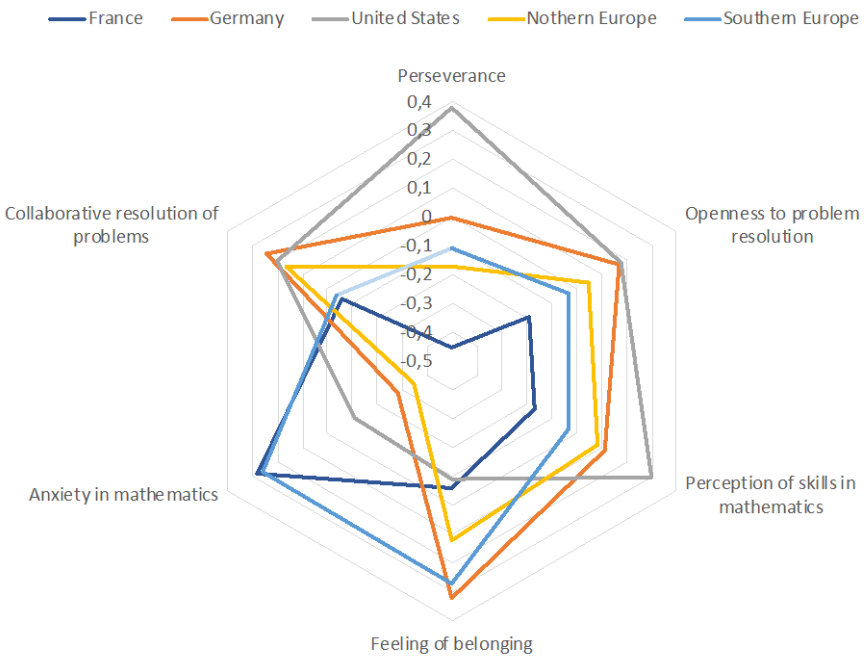
Source: OECD (2018) - PISA 2018 (Volume I)

Gaps in non-cognitive skills, equally important for productivity

The non-cognitive skills of schoolchildren in France are well below those observed in the average of OECD countries, as indicated in a report by the CAE[92]. Compared to comparable countries, French schoolchildren are less perseverant, less open to problem solving, have a poorer perception of their performance in mathematics and are more anxious. They have a lower sense of belonging to the group and they are less open to collaborative problem solving.

[92] Algan Y., Huillery É. and Prost C. (2018), *op. cit.*

Figure 7 – A significant gap in the acquisition of non-cognitive skills



Source: Algan, Huillery and Prost (2018), based on OECD PISA 2012 data

The CAE's report links these findings to educational practice. For example, students in France receive less support from teachers and have less personalised teaching. There is reportedly less room in France for cooperative work, "in favour of teaching that emphasises individual work combined with an anxiety-provoking evaluation system that perpetuates performance gaps".

School closures during the first lockdown have had a likely permanent impact on skills acquisition

Lockdowns have resulted in the widespread closure of schools around the world, and thus to a reduction in learning. Distance learning has helped to mitigate this decline, but has not fully compensated for the closure of schools. There is an ongoing debate as to whether the effects will be permanent or temporary, and to what extent they will be determined by the social background of students.

Beyond the measurable effects on student learning, these school closures may have affected other dimensions related to skills acquisition, such as the willingness to continue studying, the risk of dropping out and the strength of the link to the schooling system. If proven, these effects may be longer term than the more easily measurable consequences on skills acquisition.

Several similarly traumatic experiences in the past may help anticipate these long-term effects. For example, the polio pandemic in the United States in 1916 also led to school closures. According to one study, twenty years later, the cohort of 14- to 17-year-olds in the most affected states had achieved a significantly lower level of educational attainment than the previous cohort.[93]

Other examples drawn from the experiences of the Second World War[94] or various natural disasters[95] confirm that the interruption of normal schooling has lasting and more pronounced negative effects for initially disadvantaged children. After the earthquake in Pakistan in 2005, massive aid was targeted at the affected families. In a follow-up survey four years after the school closures, the findings were unequivocal: despite the social support, and under economic conditions similar to those of the families spared, children affected by the school closures scored significantly lower on standardised tests than other children.[96]

The depreciation of prior learning is also accentuated when schools are closed, as shown by the loss of learning observed among disadvantaged pupils during normal summer holiday periods. [97]

An as-yet unpublished study measures this loss of learning due to lockdown from March 2020 in the Netherlands[98]. The study is instructive because it covers more than 350,000 schoolchildren in a country where schools closed for a relatively short period of time (8 weeks) and with a high degree of technological readiness for distance learning. National examinations were held before and after the closure. The authors were therefore able to follow the pupils' progress and compare it with the previous three years. Their results show an average learning loss of about 3 percentile points, which is equivalent to almost 0.1 standard deviation. The results are very similar per age group and per subject tested. However, losses are up to 55% higher among students

[93] Meyers K. et Thomasson M. A. (2017), "Paralyzed by Panic: Measuring the Effect of School Closures during the 1916 Polio Pandemic on Educational Attainment", *NBER Working Paper Series*, 30.
[94] Ichino A. et Winter-Ebmerr R. (2004), "The Long-Run Educational Cost of World War II", *Journal of Labor Economics*, 22(1), p. 57-87.
[95] Studies are available following major floods in Thailand, Hurricane Katrina in 2005 in the United States, and earthquakes in Turkey and Pakistan in 2005. Thamtanajit K. (2020), "The impacts of natural disaster on student achievement: Evidence from severe floods in Thailand", *The Journal of Developing Areas, 54*(4). Priesthood B. (2012), "When the saints go marching out: Long-term outcomes for student evacuees from hurricanes Katrina and Rita", *American Economic Journal: Applied Economics*, *4*(1), pp. 109-135.
[96] Andrabi T., Daniels B. et Das J. (2005), "Human capital accumulation and disasters: Evidence from the Pakistan earthquake of 2005", *RISE Working Paper*, *20*(039), May.
[97] Alexander K., Pitcock S et Boulay M.C., eds (2016), *The summer slide: What we know and can do about summer learning loss*, Teachers College Press.
[98] Engzell P., Frey A. et Verhagen M. (2020), "Learning inequality during the COVID-19 pandemic", p. 1-45.

whose parents are less well educated. The average learning loss is equivalent to one fifth of a school year, almost exactly the period during which schools were closed. In other words, students make little or no progress when learning from home.

In the United States, during school closures, a Harvard University project tracked the hours of mathematics classes conducted at a distance, differentiating postal codes according to their position in the distribution of income[99]. This monitoring shows that school closures mainly have a negative effect on the acquisition of skills by students in disadvantaged neighbourhoods, while those in advantaged neighbourhoods seem to be less affected.

In France, the lockdown increased the skills gap

During a lockdown, inequalities in learning conditions are strongly linked to living conditions. Socially disadvantaged students had less favourable conditions as they were less able to work online, had less access to a laptop and less access to their own room[100].

The Evaluation department (DEPP) of the French Ministry of Education published results from follow-up tests carried out on children in *CP* (UK Year 2, US 1st grade), *CE1* (UK Year 3, US 2nd grade) and *sixième* (UK Year 7, US 6th grade). These tests are reliable because they are exhaustive and have been carried out on all the students in their cohort. The study measures the consequences of the lockdown in terms of learning, by comparing the levels observed in September 2020 with those of the two previous years. The results show contrasting trends, but mainly a deterioration in the skills of the most disadvantaged students.

When entering CE1 (UK Year 3, US 2nd grade), these effects are very marked (Figure 8). The trend in previous years showed an overall improvement in results, and a reduction in the inequalities between socially advantaged schools and those classified as Priority Education Networks (REP). As a result of the lockdown, negative developments were observed in seven of the eight areas tested in French. The gaps have widened between REP schools and the others. According to the DEPP, “the generation that experienced lockdown enters CE1 with less affirmed achievements than the generation that preceded it and which had not experienced lockdown [...] Gaps in education according to the sector in which the pupils are enrolled are greater,

[99] Zearn is a programme normally used in schools to complement classroom instruction with lessons on an internet platform. During school closures, students were encouraged to continue their lessons on Zearn. The results are available on https://tracktherecovery.org/.

[100] Barbara M.-A. (2020), "Inégalités de conditions de vie face au lockdown", Trésor Eco, No. 264, August, Ministry of the Economy and Finance.

especially for pupils in REP+, among this generation that experienced lockdown than in the generation that preceded it".

The results are more nuanced for pupils entering the first year of secondary school (*sixième* = UK Year 7, US 6th grade). The study does not show a drop in scores in French and mathematics in 2020 compared to previous years. This is important news after the imposed lockdown. Nevertheless, the previous years showed a trend of improving scores, and this trend has receded. Moreover, the trends are more positive for the more socially advantaged sectors, and while disparities between sectors are stable in French, they have increased for mathematics (Figure 9).

We need to keep in mind that while, overall, pupils do not seem to have been penalised by the period of distance learning, this is less true for the most socially fragile. Differences in mathematics scores between schools have increased with lockdown. In addition, a higher level of skills than that of the previous cohort had been predicted without the pandemic. There therefore appears to be a negative but not very visible effect because the counterfactual scenario is not observed.

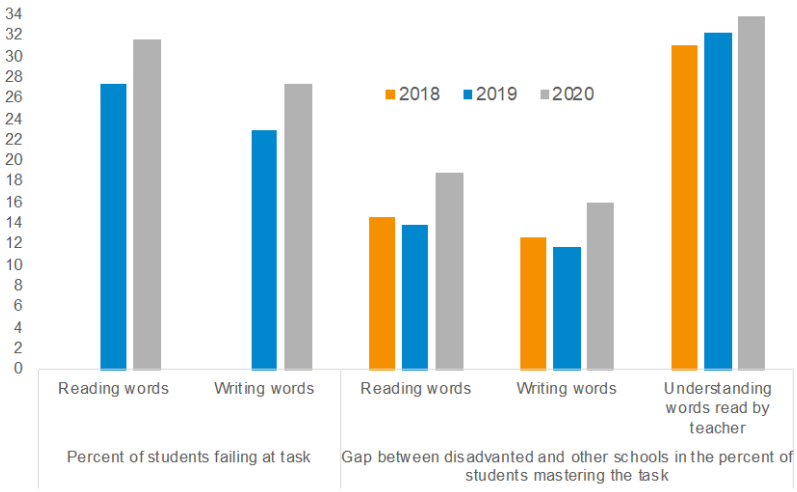
A European Commission study has produced a *low* estimate of the loss of learning associated with school closures during lockdown[101]. In France, six weeks of lessons were lost. During this period, primary school pupils should have had 180 hours of actual learning. Distance learning and home-working hours provided 96 hours of learning, so students missed 84 hours, assuming that the effectiveness of one hour is the same at school and at home. These lost hours correspond to more than 9% of the total hours of instruction time during the school year. Schoolchildren would therefore need the equivalent of three weeks of classes to catch up. According to an estimate of the effect of learning hours on acquired skills, these lost hours would result in a drop of 14 per cent drop of a standard deviation, or about 14 points on the PISA skills scale. Among other measures, the European Commission study recommends making up for lost hours through an increase of face-to-face instruction time.

Foreign and previous experiences suggest that the learning delays observed today in France as a result of lockdown will be persistent. They will result in lower skills for all affected schoolchildren, with a negative effect on future productivity. These delays will not be made up unless they are made a stated objective of education policy. It would

[101] Di Pietro G., Biagi F., Costa P., Karpiński Z. et Mazza J. (2020), *The Likely Impact of COVID-19 on Education: Reflections based on the Existing Literature and Recent International Datasets*. *Publications Office of the European Union, Luxembourg* (Vol. EUR 30275). https://doi.org/10.2760/126686.

therefore be wise to consider policies with the specific objective of ensuring that skills not acquired as a result of Covid-19 are caught up.

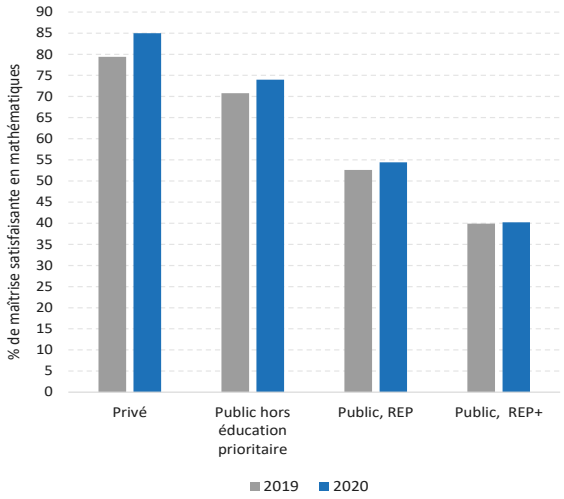
Figure 8 – Effect of lockdown on the acquisition of skills of pupils entering CE1 (UK Year 3, US 2nd grade) in September 2020



Reading note: the proportion of CE1 pupils who do not master the writing of words increased from 22.9% to 27.4% between 2019 and 2020. The gap between the proficiency rate observed in priority (REP) and non-priority (non-REP) education establishments increased from 11.8% to 16.1% between 2019 and 2020.

Source: Ministry of Education, Foresight and Performance Evaluation Directorate. 2020 assessments: initial results

Figure 9 – Level of mathematics when entering the first year of secondary school, by type of institution



Definitions: REP institutions are those in the priority education network, i.e. those with more significant social difficulties. REP+ establishments group together REPs located in isolated districts or sectors with the greatest concentration of difficulties in the territory.

Source: Ministry of Education, Foresight and Performance Evaluation Directorate. 2020 assessments: first results.

2. The link between skills and productivity

The growth rate of hourly labour productivity has been progressively declining over the last 50 years, in France as in most developed countries. [102] According to the OECD, annual labour productivity growth was 4.3 per cent in France in the 1970s, 3.1 per cent in the 1980s, 1.8 per cent in the 1990s, and has stagnated at 0.9 per cent since then. The same trend is observed in most developed countries.

This trend is concerning: without labour productivity growth, incomes cannot increase sustainably. Other sources of productivity growth have their limits: capital accumulation has diminishing returns and total factor productivity is also affected by labour productivity. Improvements in living standards depend to a large extent on labour productivity growth.

An extensive literature on economic growth shows that human capital is the main determinant of productivity[103]. Differences in the level of human capital still account for a large part of the income gap between countries today[104]. Other factors, such as the quality of institutions, capital accumulation, innovation and the functioning of markets, are also important. However, human capital, i.e. people's education and skills, their attributes that increase their productivity, remains the main determinant of the level of a country's income per capita. Human capital in turn affects the health of the population, the quality of institutions, the functioning of markets and innovation, and its increase produces a virtuous circle that increases labour productivity.

2.1. The role of human capital in the productivity slowdown

The role of human capital in the slowdown of labour productivity has been analysed in a recent study of France Stratégie.[105] The study breaks down the different sources of labour productivity gains. It confirms that human capital is the main driver of productivity gains, contributing to more than three quarters of gains between 1976 and 2018. The slowdown in the rate of growth of human capital is hinted as being the main source of the productivity slowdown in France. Between 1976 and 1986, the growth of human capital contributed 2.2 percentage points to the strong productivity growth of 3.4% on

[102] NPB (2019), *Productivity and competitiveness: where does France stand in the euro zone? op. cit.*
[103] A review of the literature is presented in Krueger A. B. and Lindahl M. (2001), "Education for Growth: Why and for Whom", *Journal of Economic Literature,* 39 (4), pp. 1101-1136.
[104] Hanushek E. A. et Wößmann L. (2010), "Education and Economic Growth", *International Encyclopaedia of Education*, 2, p. 121-126.
[105] Aussilloux V., Bruneau C., Girard P.-L. and Mavridis D. (2020), "Le rôle du capital humain dans le ralentissement de la productivité", *Note de synthèse,* France Stratégie, December.

average per year. Its contribution then fell to 1.9 points per year between 1986 and 1993 for 2.1% annual productivity gains. It further declined to 1.2 points between 1986 and 1993 for 1.9% of productivity growth. Since 2004, its contribution has fallen to only 0.6 points per year, resulting in a drop in productivity gains, which are now increasing by only 0.7% per year.

The relative plateau reached in terms of years of educational attainment of an age group – a level that previously increased rapidly, cohort after cohort – thus explains 59% of the slowdown in productivity in France over the entire period.

Box 1 – Presentation of the growth model

To isolate the contribution of different factors to the evolution of labour productivity, a long-term growth equation is estimated. The study uses time series techniques to identify structural breaks in the growth rate, and to associate them with explanatory factors.

The equation is derived from a standard growth model with human capital, known as the augmented Solow model. The model is used to analyse productivity growth differentials between countries, over a long period of time, based on structural determinants[106]. The level of productivity is thus explained by (i) the propensity to invest in productive capital, measured as the ratio between non-real estate investment and added value, (ii) the stock of human capital, (iii) the growth rate of the working-age population, and (iv) technical progress, represented by an affine function of time. This approach makes it easy to incorporate breaks in the equation.

The model leads to the following specification of long-term productivity, y_t^{LT} :

$$y_t^{LT} = \theta_0 + \theta_1 f(t) + \theta_2 \ln(s_{Kt}) + \theta_3 ln(q_t) + \theta_4 \ln(h_t) + \theta_5 \ln(n_t + g + \delta)$$

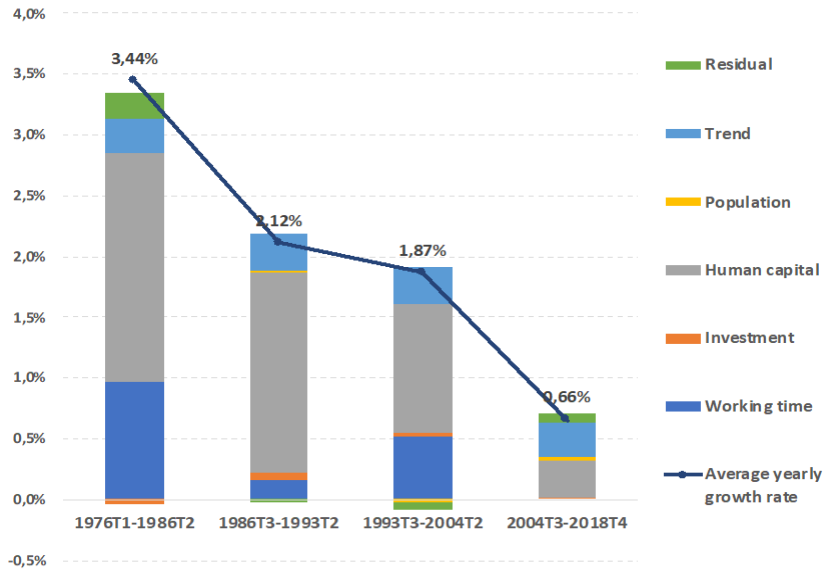
The variable $ln(S_{Kt})$ stands for physical capital investment (excluding real-estate), $ln(q_t)$ is the human capital stock, $ln(h_t)$ is the average number of hours worked per worker (employed or self-employed). The term $ln(n_t + g + \delta)$, is the convergence of long-term productivity towards its steady state. It is assumed that only n_t, the growth rate of the population aged 15-64 changes over time, while $g + \delta$, the growth rate of technical progress and the rate of depreciation of the physical capital stock, respectively, are assumed to be constant, as is customary. According to a standard approach, total factor productivity, which is unobservable, noted A_t is modelled as a deterministic function of time $f(t)$, θ_0, measuring an initial

[106] For a more detailed presentation, see Catherine Bruneau and Pierre-Louis Girard (2020), "Trend Trends in Labour Productivity in France, 1976-2018", Working Paper, No. 2020-18, France Stratégie, December.

technological level. This model follows the estimates proposed by Arnold *et al.* (2007) and Thévenon *et al.* (2012). The period studied covers the years 1976-2018 on the basis of quarterly data for four European countries.

In order to test the relevance of the model and the capacity of the determinants to explain the evolution of productivity over the last forty years, a so-called error-correction analysis is jointly developed. The aim is then to highlight the existence of a long-term equilibrium characterised by the lasting relationship between the level of productivity and its determinants (the long-term equation mentioned above) and to validate the existence of a convergence process towards this equilibrium.

Figure 10 – Contribution of structural factors to labour productivity growth



Note: The growth rate presented here is the average annual growth rate of hourly labour productivity between each sub-period.

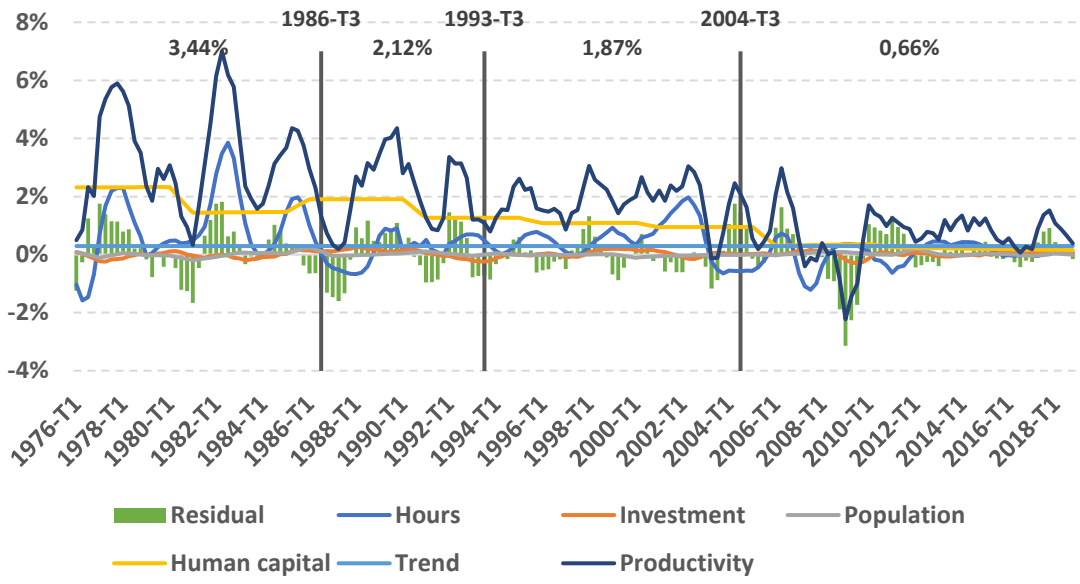
Source: Bruneau C. and Girard P.-L. (2020), op. cit.

Projections of the of human capital stock were used to estimate the evolution of productivity growth over the next decade.[107] On this basis, and by freezing the contributions of the other determinants to their average over the 2004-2018 sub-period, the trend in labour productivity growth would remain at the level observed over this sub-period, i.e. 0.7 per cent annual growth.

[107] See Lutz W. , Goujon A. , KC S. : Stonawski M. and Stylianos N. (2018), *Demographic and Human Capital Scenarios for the 21st Century: 2018 assessment for 201 countries*, Publications Office of the European Union, European Commission, Joint Research Centre.

This important contribution of human capital to the aggregate productivity growth slowdown is not unique to France. The same analysis was conducted on Germany and on the United Kingdom, leading to similar results. In the case of Germany, the same major contribution of human capital, which has been declining since the early 2000s and partly explains the slowdown in labour productivity, can be observed. In the United Kingdom, while a contribution from human capital can be found in a similar order of magnitude to that found for the other two countries, it is not possible to explain this decline in productivity growth in the early 2000s. The behaviour of firms in a flexible labour market with many atypical contracts is often highlighted, but without a robust demonstration. The studies also highlight the potential importance of aggravating factors related to the 2008 crisis, such as increased uncertainty and the impact on the financial system, but the debate remains open and the UK productivity puzzle is often mentioned[108].

Figure 11 – Breakdown of the annual growth rate of labour productivity, the French economy as a whole, 1976-2018



Note: the growth rate of hourly labour productivity is decomposed between the contributions of each of its determinants, in the absence of structural breaks. Human capital stock is calculated from the database of Goujon *et al.* (2016). The histogram gives the share of the productivity growth rate that is not explained by the model. A positive residual means that labour productivity has grown faster than its determinants, and vice versa if the residual is negative. These contributions are calculated in partial equilibrium: the approach is only interested in the direct relations between the variables retained and does not take into account possible interaction and externality effects with the rest of the economy.

Source: INSEE and Goujon et al. (2016) data, France Stratégie calculations.

[108] See Barnett A., Batten S., Chiu A., Franklin J. and Sebastia-Barriel M. (2014), " *The UK productivity puzzle*", *Bank of England Quarterly Bulletin*, vol. 54(2).

2.2. The rising concentration of skills

In the most productive companies

The skills composition of a firm has an important effect on its productivity. A large body of literature aims at understanding the degree of complementarity and substitutability of skills within organisations[109]. Some economists suggest that the performance of certain companies may rely heavily on a few "superstar" employees, whose presence would have a disproportional effect on overall productivity. [110] Empirical studies that seek to demonstrate this theory focus solely on the role of CEOs.[111] Although the theory of a disproportionate effect of some superstar employees is probable, the empirical studies are not generalizable.

Another vision is defended by Michael Kremer in his "O-ring" model. The production function of a company is similar to that of a chain which depends on its "weakest link"[112]. Market forces would create firms with differing productivity between them, but with homogeneous levels of skills inside the firm, since having a higher productivity worker would be offset by the weakest link. Productivity would therefore depend on the homogeneity of the skills in the firm.

The reality is probably halfway between these two extreme visions. Nevertheless, there is a theoretical debate on whether and how globalisation and technological innovation have changed the skill mix that maximises productivity within a firm.

Beyond the slowdown in productivity presented above, an increasing dispersion of productivity is observed between companies. This dispersion is observed between sectors at the leading edge and others with lower productivity growth. But above all, it also takes place between companies within each sector[113]. The OECD has launched a series of studies entitled "The Human Side of Productivity", which aims

[109] This effect depends mainly on the conception that one can have of the production function that characterises the functioning of the organisation.

[110] Based on the work of Rosen (1981), economists argue that certain functions have a very important effect on the whole organization. More recently, the "superstar" effect seems more important due to globalisation and the availability of NICTs. See Brynjolfsson E., Yu J. H. and Smith M. D. (2010), "Long tails versus superstars: The effect of IT on product variety and sales concentration patterns".

[111] Gabaix X. and Landier A. (2008), "Why has CEO pay increased so much? "*Quarterly Journal of Economics*, *123*(1); but also Malmendier U. and Tate G. (2009), "Superstar CEOs", *The Quarterly Journal of Economics,* 124.4, pp. 1593-1638.

[112] Kremer M. (1993), " The O-ring theory of economic development ", *Quarterly Journal of Economics*.

[113] See NPB 2019 report, page 58.

to analyse and compare the composition of skills between the most and least productive firms.

The most productive companies have several particularities. First, compared to their competitors, they have workers with higher levels of education in occupations requiring more skills. Second, they have higher managerial quality and greater use of training. Finally, these companies have high levels of intangible investments, such as organisational capital, training, R&D and patents, or the intangible value of the brand and its quality signal. These investments allow them to increase their productivity through real “frontier innovations”. On the other hand, there are companies whose productivity is close to but lower than the productive frontier; they increase productivity by successfully adopting organisational or technological innovations made elsewhere[114].

To analyse the role of skills in productivity developments and dispersion, the OECD has adopted a granular approach, looking at the composition of skills at the company level. This approach decomposes the link between productivity growth on the one hand, and the skills present in the firm on the other. The aim of the exercise is to understand whether productivity growth comes from a better use of skills or from their better combination. Have the most productive firms become more productive by making better use of workers with the same skills? Or rather by a better combination of complementary workers with different skills? Do we see a more pronounced matching of the most skilled workers with each other in high value-added enterprises?

A high concentration of the most highly qualified employees in companies in France

The results of the OECD analysis point to several specificities of France[115]. In all countries, it is observed that the most productive firms have a higher proportion of highly skilled workers, when we examine their main characteristics such as size and sector of activity. However, this link between observed productivity and the skills present in the firm is more pronounced in France than in other European OECD countries.

To define skill levels, the OECD has classified occupations according to the average cognitive abilities of workers, as measured by the PIAAC survey. The OECD then

[114] Berlingieri G. *et al.* (2017), " Firm-level productivity differences: Insights from the OECD's multiprod project ", *International Productivity Monitor*, vol. 32, p. 97-115.
[115] Criscuolo C., Gal P. Leidecker T. and Nicoletti G. (2021, forthcoming), "The Human Side of Productivity", *OECD Global Forum on Productivity report.*

compared the most productive firms (defined as being in the top 20 per cent of productivity in their sector) to the so-called average firms (between the 40 and 60 percentiles of the distribution).

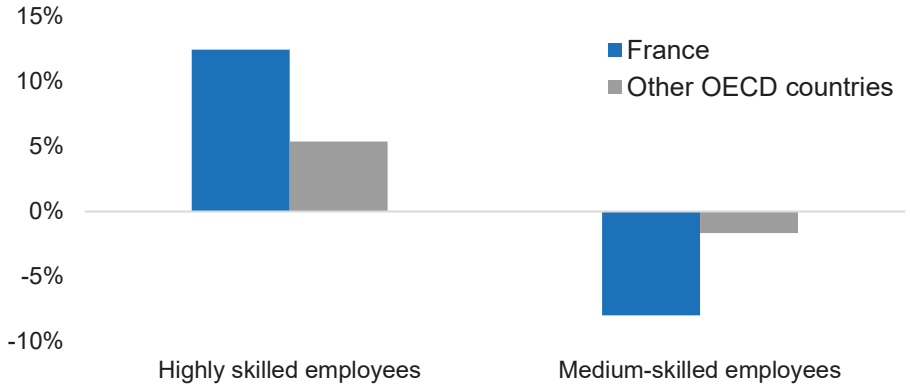
The analysis shows that in France, in companies with average productivity, around 18% of employees have an occupation belonging to the top 25% of the professions with the best scores in the PIAAC survey. In companies with top productivity, this percentage rises to 30%[116] (Figure 12). In other words, in the most productive firms, the workforce has a higher level of skills. In other OECD countries, the gap between the two types of companies is only 5 percentage points on average (21% versus 26%).

The concentration of higher-skills employees in the most productive firms is therefore more pronounced in France than in other OECD countries. Such a fact would not in itself be problematic, according to the economic literature. Indeed, the O-ring production model suggests that the optimal allocation of skills should match workers with equal skills. However, the analysis shows a very high concentration of skills in France. The relative scarcity of highly skilled workers in medium-productivity firms may have significant negative implications and should therefore *at least* be questioned.

A second result indicates that, for France, companies with average productivity could increase their productivity by 11% if their skill mix was similar to that of a company in the top 20%. This gain is lower in other European countries (Figure 13). Skills upgrading could be targeted at workers already present in the company – in other words, through in-service training.

[116] This difference of 12 percentage points is very high: it implies that the difference in skills between medium-sized and top companies is 70% in France, whereas it is 24% in the other countries analysed.

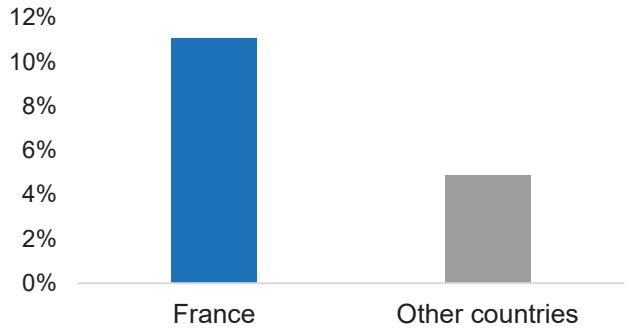
Figure 12 – Differences in the composition of skills in a high productivity company compared to a medium productivity company



Note 1: the best-performing companies are compared here to "medium" companies. The left-hand side shows that in the best-performing companies in France, employees with high skills represent 12 percentage points more of the workforce than in companies with average productivity. In other OECD countries, the difference is only 5 percentage points. The other countries considered by the OECD are Denmark, Germany, Hungary, Portugal and Japan.

Note 2: The best-performing companies in terms of productivity are defined as those in the top 20% of the productivity distribution in each cell broken down by sector of activity x year. The average companies are between the 40th and 60th percentile. The period is 2002-2015 for France and similar for other countries. The skill composition of companies is defined using occupations, based on the occupational classification in the PIAAC survey (OECD). High skills: top 25% of occupations; medium skills: middle 50% of occupations.

Figure 13 – Productivity gains of a median-productivity firm if its skill mix was that of a top 20% productivity firm



Reading note: This Figure shows the results of a counterfactual analysis using the results of company-level estimates between productivity levels and skill shares, controlling for detailed sector x year, fixed effects related to firm size, firm organisation (share of executives, relative wages, occupational diversity and prevalence of part-time work) and job composition (by age, gender and – if available – foreign worker groups). The counterfactual implies changing the skill composition of a medium-performing enterprise (in the 40-60th percentile of the productivity distribution) with that of a higher-performing enterprise (in the top 20%).

Source: Criscuolo C., Gal P., Leidecker T., and Nicoletti G. (2021, forthcoming), "The Human Side of Productivity", OECD Global Forum on Productivity report

The crucial role of managerial quality

Numerous studies have demonstrated the important role of managerial quality on the productivity of companies. Middle managers shape an important part of the production process. Through their managerial practices, they implement the operational aspects. Through their contribution in the selection, training, control and motivation of employees, they play a fundamental role in the internal organisation of the company. Moreover, the adoption of new technologies and new practices implies good management of knowledge flows and learning, in connection with external companies.[117] A widely quoted study estimates that managerial quality alone accounts for about one third of the differences in total factor productivity between companies and countries.[118]

A recent study of cotton mills in Japan shows that the companies being acquired have similar levels of productivity to the acquiring companies but are less profitable, due to different management practices. [119] After the takeover, these mills are characterised by a better utilisation of stocks and production capacity, and an increase in profitability at a given level of productivity.

The use of “good” managerial practices is strongly positively correlated with enterprise productivity in a wide range of countries[120]. These practices vary considerably from one company to another, and even within companies from one establishment to another.[121] Their importance would be enhanced in the most productive firms because they would have a greater effect on the most productive workers.[122]

Compared to other European countries, France suffers from a relative scarcity of high-skilled managers in medium-productivity companies. This scarcity may explain the lower productivity of these companies.

[117] Gibbons R. et Henderson R. (2012), " What do managers do? Exploring persistent performance differences among seemingly similar enterprises ", Harvard Business School.

[118] Bloom N., Sadun R. and Van Reenen J. (2017), "Management as a technology? "National Bureau of Economic Research, 22327, October.

[119] Braguinsky S., Ohyama A., Okazaki T. et Syverson C. (2015), " Acquisitions, productivity, and profitability: Evidence from the Japanese cotton spinning industry ", *American Economic Review*, *105*(7).

[120] Bloom N. et Van Reenen J. (2007), " Measuring and explaining management practices across firms and countries ", *Quarterly Journal of Economics*.

[121] OECD (2019), *The Human Side of Productivity: Setting the scene*.

[122] Bender S., Bloom N., Card D., Van Reenen J. et Wolter S. (2016), " Management practices, workforce selection and productivity ", National Bureau of Economic Research, 22101, mars.

A recent study examines whether managerial quality can reduce the negative impact of recessions on employment, added value, productivity and wages.[123] The authors use data at the sectoral level, for ten sectors covering eighteen countries over the period 2007 to 2015. Their results show a high, positive and significant impact of managerial quality. In countries and sectors with the best managerial practices, the effects of the crisis are less pronounced. And the greater the shock to the sector, the clearer this impact is.

An increasing polarisation and concentration of skills in the largest urban areas

Worker productivity and population density are strongly positively correlated. The tasks requiring learning and frequent intense interactions benefit the most from a large and dense pool of workers. Highly skilled workers with those characteristics thus seem to have a positive effect on other's productivity. This observation implies that the distribution of skills within the territory, or between companies, has an effect on productivity, via what are known as "knowledge externalities". Thus, in knowledge-intensive work, face-to-face interactions seem to have few close substitutes, which means that proximity is essential to productivity[124]. A highly qualified worker generally has a knock-on effect on the productivity of his or her colleagues through the transmission of knowledge.

A study of French conurbations shows that this agglomeration effect is very real: even when agglomeration costs are taken into account, the productivity surplus linked to density is measurable, and increases according to the cognitive intensity of the sector.[125]

The trend of the past few decades has been one of increasing geographical concentration of skilled employment. A simultaneous trend in polarisation of employment has occurred. This polarisation – the growth in the share of high-paying and low-paying jobs at the expense of medium-paying jobs – is a phenomenon observed over the last 30 years. Documented in the United States, in many European countries and even in developing countries[126], it has been confirmed in France by

[123] Cette G., Lopez, Mairesse, & Nicoletti (2020), " Economic adjustment during the Great Recession: The role of managerial quality ", *NBER Working Paper Series*, 27954.
[124] Gaspar J. et Glaeser E. L. (1998), " Information technology and the future of cities ", *Journal of Urban Economics*, also see Glaeser. & Resseger. (2010), "The complementarity between cities and skills", *Journal of Regional Science*.
[125] Combes P., Duranton G., Gobillon L., Puga D. et Roux S. (2012), " The productivity advantages of large cities: Distinguishing agglomeration from firm selection ", *Econometrica*, 80(6), p. 2543-2594.
[126] For the United States, see Autor *et al.* (2006). For European countries, see Goos et *al.* (2007, 2014).

several studies[127], but is reportedly asymmetrical. More specifically, in France, the rise in executive employment is accompanied by a decline in median-skilled jobs, but not by a rise in low-skilled jobs.[128]

One of the explanations for job polarisation is the "routinisation hypothesis". Information and communication technologies (ICTs) replace or automate routine tasks that were previously performed by medium-paid workers. Occupations that are difficult to automate would be found at the two extremes, those with high pay including tasks of a highly cognitive nature and those with lower pay such as personal services.

A second explanation is offshoring: companies replace the goods and services produced by medium-paid workers with imports[129]. However, polarisation is a phenomenon observed in all countries and at all stages of development[130].

The polarisation of employment in France has been documented in many ways. A recent study[131] shows that within companies, the share of employees using ICT intensively increased between 1994 and 2007. The authors introduce a measure of technological sophistication at company level - the share of workers in occupations related to ICT development, management, installation and maintenance. Their results show two trends. First, firms are increasing the share of these workers over time. Second, firms with higher ICT-intensive workers are growing faster than firms with lower ICT-intensive workers. These ICT workers are therefore a causal force of polarisation.

Larger urban areas experienced a more pronounced polarisation

The polarisation of employment appears to be heterogeneous in France. It has not affected all sectors or all urban areas in the same way. A recent study documents the phenomenon during the period 1994-2015, for all employment areas in France[132]. The authors classify professions according to the tasks required. They then analyse the

[127] At least four different studies focus on the polarization of employment in France: Harrigan *et al.* (2016), Jolly (2015), Albertini (2017), and Dares (2018).

[128] Jolly C. and Dherbécourt C. (2020), "Polarisation of the labour market: are there more low-skilled jobs? "*La Note d'analyse*, No. 98, France Stratégie, December. See also Goux D. and Maurin É. (2019), "Quarante ans d'évolution de l'offre et de la demande de travail par qualification. Technical progress, labour costs and social transformation", *Économie et Statistique,* No. 510-511-512, pp. 131-147.

[129] Malgouyres C. (2017), " The impact of Chinese import competition on the local structure of employment and wages: Evidence from France ", *Journal of Regional Science*, vol. 57(3), p. 411-441.

[130] ILO, *ILO Trends Econometric Models*, November 2016.

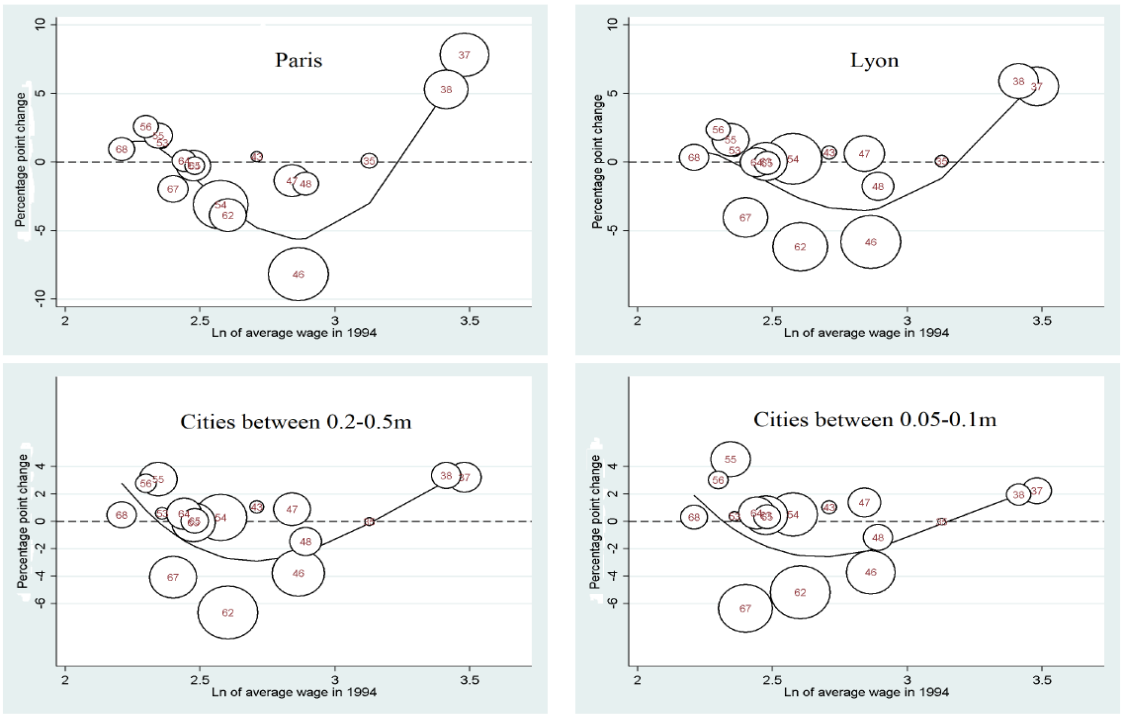
[131] Harrigan J., Reshef A. and Toubal F. (2020), "The march of the techies: Job polarization within and between firms", *Research Policy*, May.

[132] Davis, Mengus et Michalski (2020), "Labor Market Polarization and the Great Divergence: Theory and Evidence", CEPR Discussion paper Series, DP14623.

evolution of employment for routine and relocatable jobs. Their results show that the share of medium-paid jobs fell from 75% to 61%. They pinpoint the four occupations most at risk from automation and offshoring: supervisors and foremen; mid-level clerical workers; as well as skilled and unskilled industrial workers. The share of these occupations fell from about 41% to 29% of total hours worked in the economy over the period. A fifth occupation that experienced a large overall decline in the share of employment is that of intermediate-level employees, whose share in the labour force fell from 12.3% to 7.6%.

The authors find a marked difference of this trend according to the size of the urban area. Larger urban areas experienced a more marked loss of medium-paid jobs: these jobs are replaced at a rate of two to one by well-paying jobs, and vice versa in smaller cities. These results are presented in Figures 14 and 15. Studies on the United States find similar results, with polarisation increasing with population density[133]. However, we are not yet aware of studies documenting this polarisation in other European countries.

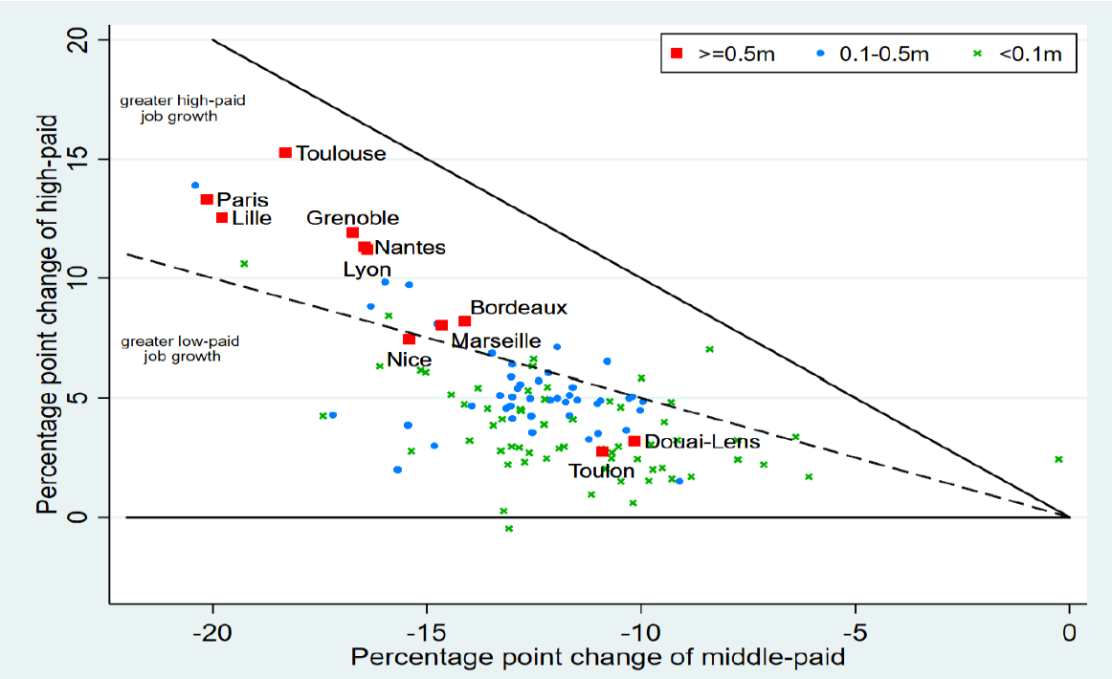
Figure 14 – Labour market polarisation in large urban areas



Source: Davis, Mengus and Michalski (2020), "Labor market polarization and the Great Divergence: Theory and evidence ", CEPR Discussion paper Series, DP14623

[133] Autor D. H. (2019), "Work of the past, work of the future", *National Bureau of Economic Research*, n° 25588.

Figure 15 – More pronounced polarisation in large urban areas



Source: Davis, Mengus and Michalski (2020), op. cit.

A skills mismatch that can affect productivity

In its 2019 report, the National Productivity Board put forward the skills mismatch as a possible explanation for the slowdown in productivity in France. The term "skills mismatch" refers to the sub-optimal use of an individual's skills in the activity he or she performs, whether it is an under-use of skills or a situation where skills are higher than required. This is important because the skills observed in France are lower than in neighbouring countries when individuals are compared within the same occupations (see Figure 15).

A recent study by France Stratégie proposes a new measure of skills mismatch, that takes into account both the heterogeneity of skills observed in professions and the training profiles of individuals.[134] The method defines an individual as being mismatched when her level of skills is outside a standard deviation from two medians: that of her profession and that of her training.

This method makes it possible to identify four types of individuals. Firstly, those whose skills score is close to the median score observed in both their occupation and their

[134] Brun-Schammé A. and Rey M. (2021), "Une nouvelle approche de l'inadéquation des compétences", *Working Paper,* No. 2021-01, France Stratégie, January.

training. Second, those whose skills score is in line with their training, but not with their profession. Third, those whose skill level is in line with their occupation, but not with their training. A fourth group of individuals includes those whose skills are far from those observed in their profession and in their training.

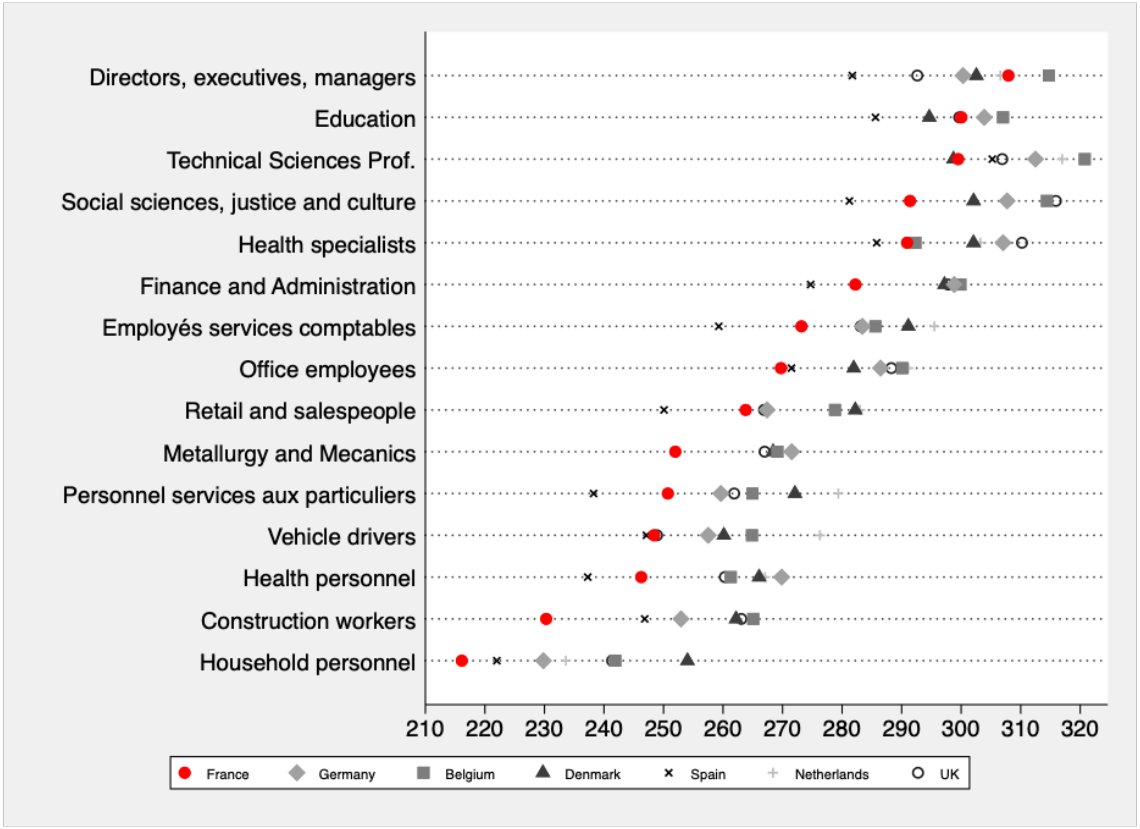
The study finds firstly that differences in skills scores between individuals decrease with the level of the degree. Unsurprisingly, the higher the degree, the more the degree "guarantees" a high skills floor.

It also appears that, within each profession, the average skills in France are lower than those observed in the majority of other European countries, with the exception of Spain (Figure 16). For example, skilled workers in metalworking, construction and mechanical engineering have an average skill level of 252 points in France, compared with between 268 and 272 points in Germany, Belgium, Denmark and the Netherlands. Similarly, within the intermediate occupations, finance and administration, the level of skills observed in France is 282 points, whereas it is 299 points on average in the four countries mentioned above. These differences are significant.

The results of the analysis of skills mismatches indicate that, in France, 11% of people in employment have skills that are mismatched with regard to their occupation, without this being the case in the training profile. In addition, 18% of people in employment present an apparent mismatch in terms of skills related to both their initial training and their profession. For these individuals, it may be that the traditional mechanisms for matching skills held (supply) with the skills required by the other (demand) have not worked properly. This mismatch is relatively stable at all levels of training observed: it occurs in both skilled and unskilled professions (Figure 17).

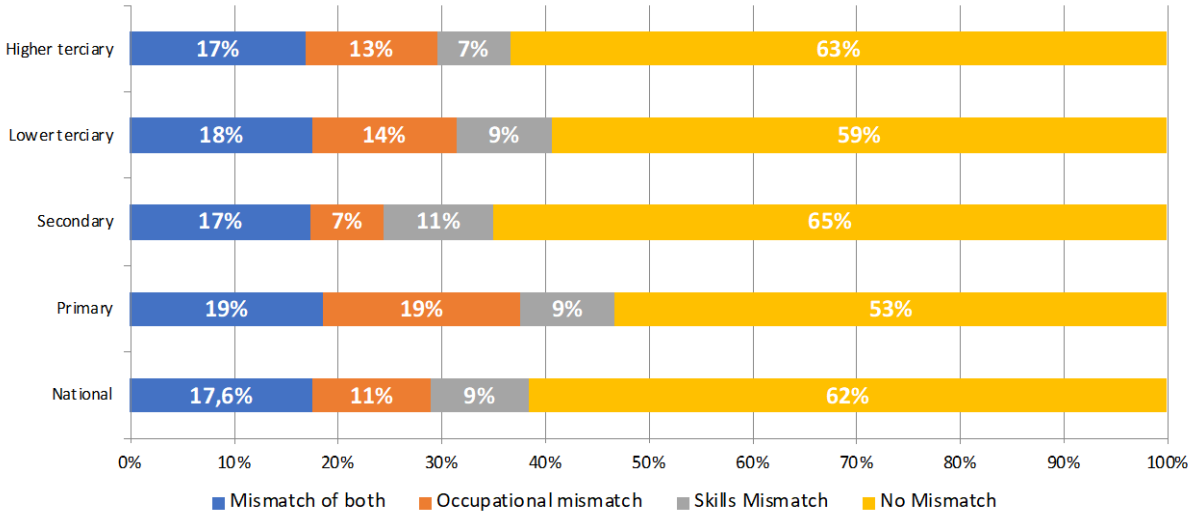
A comparison shows that the level of mismatch is close to what is observed among European neighbours (when data are available). These inconsistencies in skill levels may reveal an inappropriate positioning on the labour market, i.e. a mismatch of skills but also a need for training, particularly among the least qualified individuals. This measure does not, however, make it possible to make a link with lower productivity.

Figure 16 – Lower levels of skills observed in France in the majority of professions, compared to several European countries



Source: OECD PiAAC survey, calculations France Stratégie

Figure 17 – Types of skills mismatch observed in France, at national level and by degree



Source: PIAAC survey, OECD, calculations France Stratégie

Conclusion

This chapter presented a broad overview of skills in France, their evolution and their relationship to productivity. The following conclusions from this overview can be drawn.

Firstly, the average skills of adults in the French labour market are well below those observed in comparable European countries. This gap is largely due to the lower level of skills in the older adult population, as well as the average level of skills in the young, which is in itself a disappointing result for an advanced economy. Moreover, the school system in France achieves very heterogeneous results and reduces social inequalities considerably less than other European countries. These educational inequalities are reflected in the skills of adults. The proportion of adults with low literacy scores is one of the highest among OECD countries: 21.6 per cent compared to 15.5 per cent on average. The same applies to numeracy, with 28% of French adults scoring at or below the lowest level, compared with 19% on average in OECD countries. The consequence of this skills deficit and inequality is strongly felt in labour market participation. Moreover, France's high structural unemployment rate in turn affects skills inequalities, as a period of inactivity without appropriate training results in a loss of skills.

Second, although the proportion of university graduates increases each year, this increase is slowing down. Over the last four decades, two thirds of the slowdown in productivity in France can be explained by the slowdown in the increase in the number of university graduates. This is mainly due to the already high levels achieved by the latest cohorts. The is little room for growth in the number of years of education. In order to continue to raise the level of skills in France, it is necessary to improve the quality and inclusiveness of training and to act on lifelong learning.

A third observation concerns the paradox of vocational training and lifelong learning in France. Large sums of money are devoted to it overall, by the State and by companies. But compared to our European neighbours, these sums have until recently been less targeted towards the unemployed and people with lower productivity. This is despite the evidence that vocational training, when of good quality, is a major contributor to good labor market outcomes[135]. The use of lifelong learning in France has been more oriented towards already well-established workers [136]. This underinvestment in those who could benefit most has been diagnosed several times and has recently led to a major policy change. The government introduced the *Plan d'investissement dans les compétences* (PIC, Skills Investment Plan) in 2018. It targets low-skilled jobseekers

[135] Sauvat E. (2018), Accelerating investment in skills in France by mobilising European financial instruments.
[136] These findings are corroborated in the report on the vocational training of job seekers: Court of Auditors (2018), *La Formation des demandeurs d'emplois*.

and young people without qualifications as a priority. The amount invested in this programme is substantial (€15 billion). However, it is too early to measure its effects.

These observations are made in the context of a polarisation of employment, even if it is asymmetrical in France (no increase in the share of low-skilled jobs). Polarisation is stronger in the largest urban areas, thus accentuating geographical divergences. It is also found between companies. In France, highly qualified workers are proportionally more present in the most productive companies, when compared to other European countries. In the years to come, there is a real risk that the polarisation of jobs will continue, including geographically. The skills sought are either highly cognitive or increasingly non-routine, i.e. they call for non-cognitive abilities, such as autonomy, management and communication skills[137], which are now essential for productivity gains but are difficult to measure by cognitive tests.

The increase in productivity in France therefore depends on better skills acquisition. Some measures can do this in the short term, others may have a more structural effect. Thus, in the short term, skills can be improved through the use of lifelong learning, which is effective and targeted primarily at people in difficulty or undergoing retraining. Recent reforms implemented in France such as the Skills Investment Plan, the reform of vocational training and some reforms of the school system aim to move the country in this direction but it is still too early to fully assess their effectiveness. Other measures should aim to improve the basic skills of an entire generation, a reduction in educational inequalities and pedagogical reforms in order to make significant progress in the area of non-cognitive skills (teamwork, initiative). Educational reforms along these lines will result in improvements in human capital which will be certain, but not immediate, because of the time lag between the training of young people and their future productivity.

The flexibility of the training system will be needed to accompany the changes resulting from the crisis and the measures taken in response. For example, the renovation of buildings to make them more energy-efficient, and policy actively supported by the recovery plan, will require new skills. Another key short-term challenge is to correct the negative effects generated by the Covid-19 crisis. School closures during the spring 2020 lockdown have increased learning inequalities. Compared to previous years, a palpable delay is observed especially at younger ages, and especially for disadvantaged pupils. These learning delays will be felt throughout life unless measures are proposed to address them.

[137] Grundke R., Marcolin L. et Squicciarini M. (2018), " Which skills for the digital era? Returns to skills analysis ", *OECD Science, Technology and Industry Working Papers.*

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ANNEXES

ANNEX 1

THE NATIONAL PRODUCTIVITY BOARD

In September 2016 the Council of the European Union adopted a recommendation on the establishment of National Productivity Boards in each Member State of the euro area. These boards are in charge of analysing economic productivity and competitiveness levels and developments in comparison with the other Member States, as well as the policies likely to bear upon these two components. Competitiveness analysis encompasses cost and price trends and wage-setting along with non-price competitiveness aspects.

Established in France on 23 June 2018[1], the National Productivity Board (NPB) is based at France Stratégie. Chaired by the Deputy Chairman of the Council of Economic Analysis (CAE), Philippe Martin, it has 11 independent expert members. It performs independent analyses and constructively informs national dialogue on these subjects.

Organisation

The NPB produces an annual report and holds a consultation with the employers' and trade union organisations prior to its final adoption. Any opinions issued by these organisations on the report are appended thereto. The annual report also goes through a consultation process with the public and civil society groups.

The panel of experts may call on the competent government departments and bodies to conduct research and gain access to relevant information.

All European NPBs are organised into a network for the purposes of holding exchanges and, where applicable, comparing their analyses.

[1] See Decree of 21 June 2018.

Composition

The NPB is currently chaired by Philippe Martin for a two-year period which can be renewed.

In addition to its chair, the NPB has a panel of 11 economists who also sit for a two-year period that can be renewed:

- **Olivier Blanchard**, MIT and Peterson Institute for International Economics
- **Laurence Boone**, OECD
- **Gilbert Cette**, Université d'Aix-Marseille and Banque de France
- **Chiara Criscuolo**, OECD
- **Anne Epaulard**, Université Paris-Dauphine
- **Sébastien** Jean, CEPII and INRA
- Margaret Kyle, Mines ParisTech
- **Xavier Ragot**, OFCE and Sciences Po
- **Alexandra Roulet**, INSEAD
- **David Thesmar**, MIT Sloan School of Management

Team of rapporteurs

The NPB is supported by rapporteurs from the competent government departments:

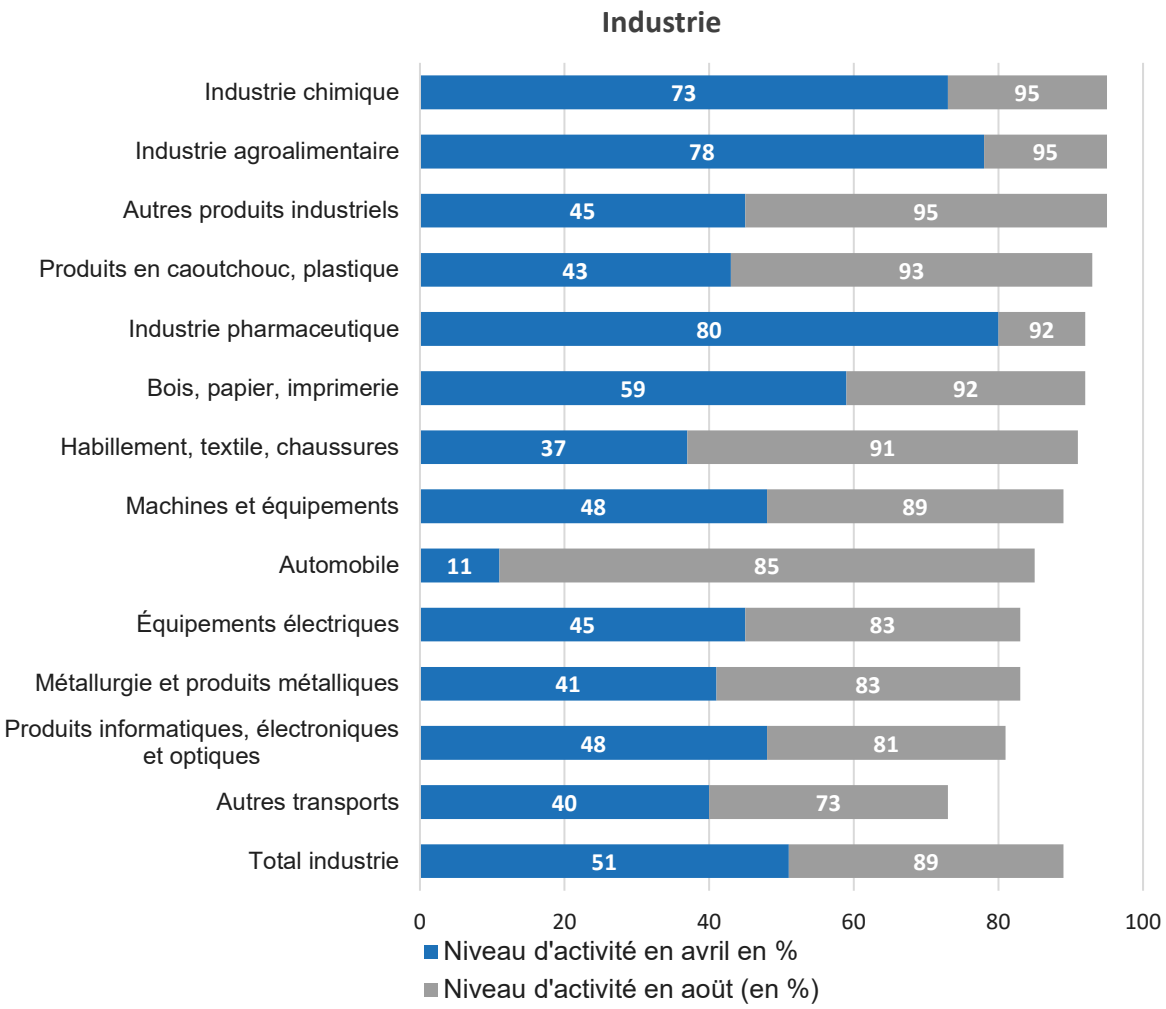
- **Vincent Aussilloux**, Chief Rapporteur, France Stratégie
- **Alexandre Bourgeois**, Insee
- **Amandine Brun-Schammé**, France Stratégie
- **Paul Cusson**, Directorate General of the Treasury
- **Sébastien Grobon**, Dares
- **Matthieu Lequien**, Insee
- **Noémie Lisack**, Banque de France
- **Dimitris Mavridis**, France Stratégie

ANNEX 2

SECTORAL VARIATIONS IN ACTIVITY

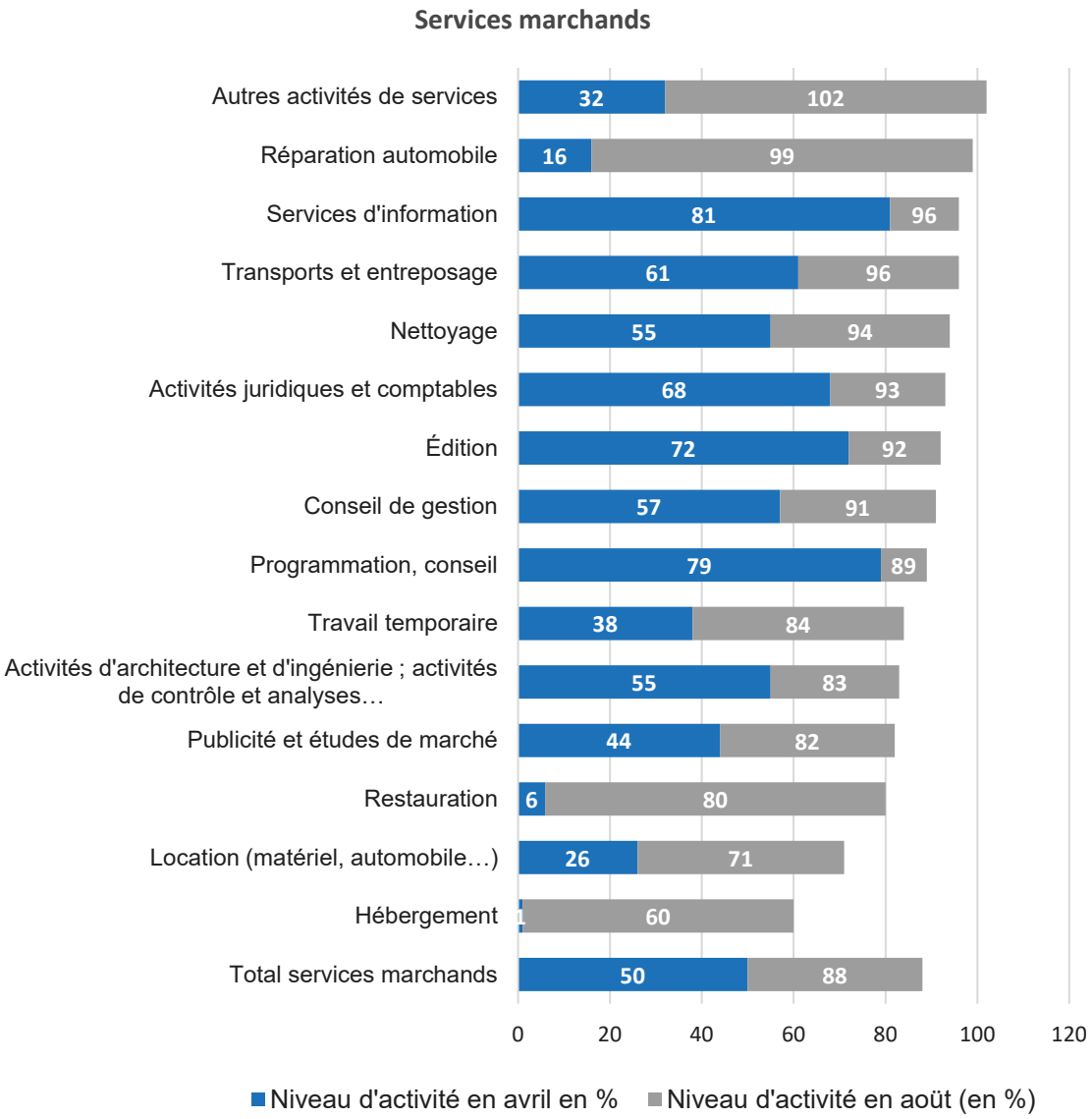
This Annex presents the heterogeneity of the economic rebound following the first containment.

Figure A1 – Level of activity compared to 100% (level considered normal)



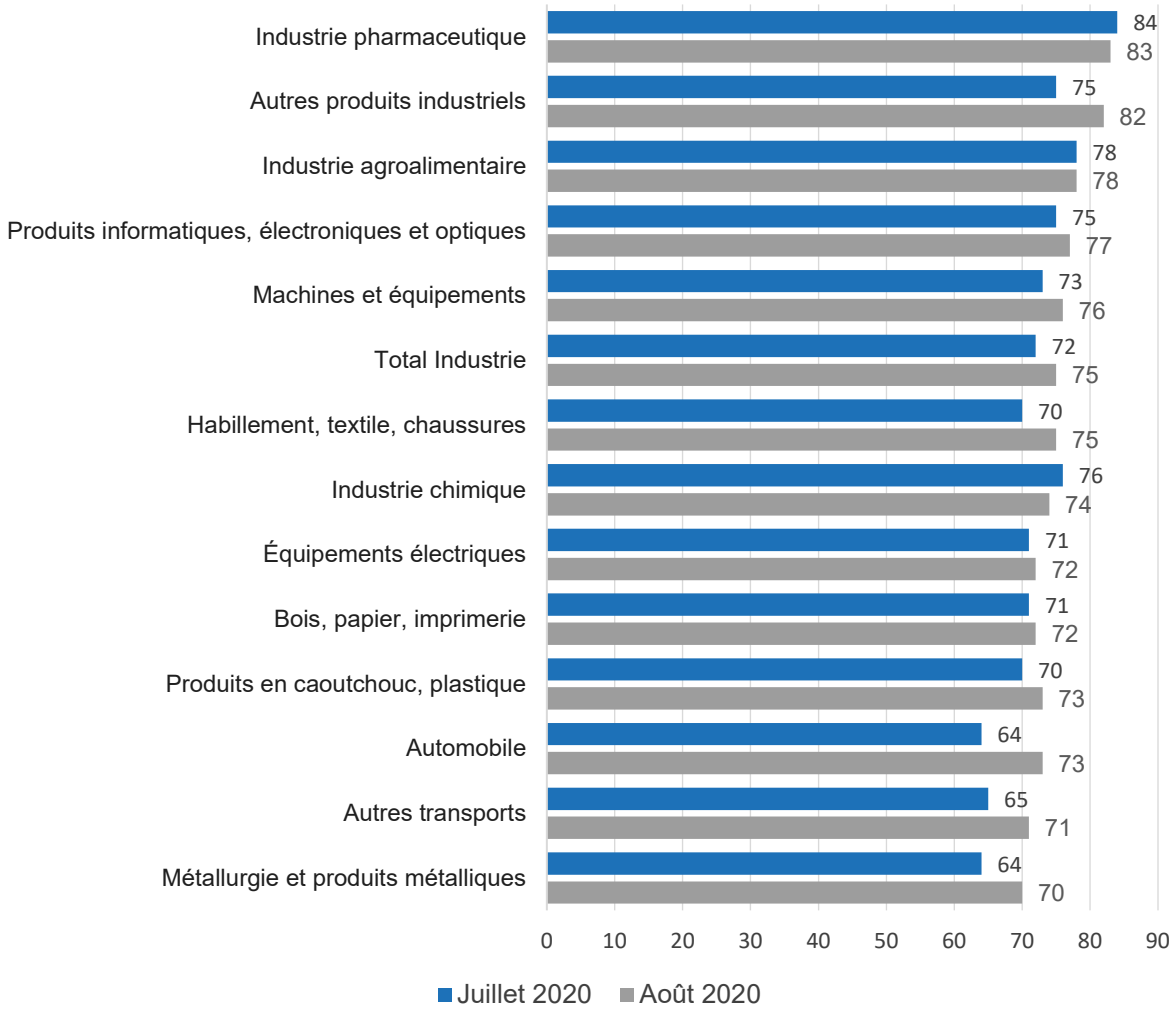
Source: Banque de France, Update on the French economy at the end of September 2020

Figure A2 – Level of activity compared to 100% (level considered normal)



Source: Banque de France, Update on the French economy at the end of September 2020

Figure A3 – Level of Capacity Utilization Rate



Source: Banque de France, Update on the French economy at the end of September 2020

ANNEX 3

COMPARATIVE TABLE OF EMERGENCY AND RECOVERY PLANS

In response to the economic consequences of the health crisis, European governments have deployed a wide range of emergency and recovery measures, in the form of budget support, payment deferrals and public guarantees. The following comparative table describes the general architecture of these measures for six European States: France, Germany, Spain, Italy, the United Kingdom and the Netherlands. This Annex presents the construction of this table, in order to facilitate its understanding.

Origin of the data

The data compiled comes from the monitoring notes periodically drawn up by the French Treasury, in collaboration with its regional economic services. In order to verify the amounts and refine the breakdown, these data were compared with those of the IMF, the OECD, the European think-tank Bruegel, several national institutions (the *Haut Conseil de Finances Publiques* in France*, the Office for Budget Responsability in the* United Kingdom, the *Autoridad Independiente de Responsabilidad Fiscal* in Spain).

Classification method

The different measures are broken down using a multi-level typology.

- At the most aggregated level, we distinguish between immediate and definitive budgetary measures (subsidies, tax exemptions, additional social benefits, etc.) and liquidity and guarantee measures (deferrals of tax-social obligations, state-guaranteed loans, etc.).

  It should be noted that immediate and definitive fiscal measures include both emergency measures and stimulus packages. Most governments (with the notable exception of Italy) have announced, alongside their emergency measures, a multi-

year recovery plan with a more structural focus. There is, however, a mix of emergency and recovery measures in the various plans announced.

- At a less aggregated level, several classification criteria are alternately used:
  - A first criterion makes it possible to distinguish between schemes aimed at supporting supply and schemes aimed at supporting demand. A "Mixed" category is reserved for schemes that combine effects on supply and demand;
  - a second criterion makes it possible to distinguish between safeguard schemes, which aim to cover households and businesses against the risks generated by the health crisis (bankruptcies, poverty, lack of access to healthcare and other public services, etc.), and reallocation schemes, which aim to change the allocation of resources in the economy to promote ecological transition, social cohesion or the competitiveness of businesses.
- At the most disaggregated level, we distinguish more finely between the different categories of schemes (tax measures, aids and subsidies, health expenditure, etc.).

This annex is divided into six parts (one for each country), detailing for each figure in the table the allocation of the amount and the source of the information. It begins with emergency measures and ends with a quick reference to sources relating to recovery plans.

Emergency measures

France

1) Immediate budgetary effort (€93.08bn)

Aid and subsidies for businesses (€6.8bn)

- **0.3 bn,** as part of a **plan to promote youth employment, in** particular via a bonus for hiring under-26s and assistance for employers of apprentices.
  Source: 4th Amending Budget Act of 24 November 2020
- **6.5bn** in **other credit facilities for companies** (sectoral liquidity measures, investment subsidies, etc.).
  Source: DG Treasury, Comparative Monitoring Note of 30 September 2020

Business support tax measures (€8bn)

- **5 billion**, provided for in the 3rd amended Finance Act of 30 July 2020, in the form of **exemptions from tax and employers' social security contributions,**

particularly for companies in the hotel and catering, culture, events, sports and air transport sectors.
Source: 3rd Amending Finance Act of 30 July 2020
DG Treasury, Comparative note of 30 September 2020

- **An** additional **€3bn,** in the form of an extension of **tax and employer's social security contribution exemptions.**
Source: 4th Amending Budget Act of 24 November 2020
DG Treasury, Comparative note of 30 September 2020

Public health expenditure (€12.83bn)

- **10bn**, as provisions for **exceptional healthcare expenditure to** cope with the epidemic, notably to finance the purchase of equipment and surgical masks, daily allowances and exceptional bonuses for healthcare staff.
Source: 1st and 2nd amended finance acts
DG Treasury, Comparative note of 13 November 2020

- An additional **€2.4bn**, with the advancement to December of the **second part of the Ségur de la Santé**.
Source: 4th Amending Budget Act of 24 November 2020

- **0.43bn** additional **€0.43bn** in medical equipment purchases for 2021.
Source: Finance bill for 2021, version adopted in final reading by the National Assembly

Household income support measures (€4.25bn)

- **0.9bn,** as part of the **exceptional solidarity aid for the** benefit of 4 million precarious households.
Source: 2nd Amending Finance Act of 25 April 2020

- **An** additional **€1.1bn, as an extension of the exceptional solidarity aid**.
Source: 4th Amending Budget Act of 24 November 2020

- **0.5 billion, under an exceptional assistance** plan for **people with disabilities**.
Source: 4th Amending Budget Act of 24 November 2020

- **0.25bn**, under an **emergency accommodation** plan.
Source: 4th Amending Budget Act of 24 November 2020

- **1.5bn,** as part of an extension until the end of the health crisis of **compensation payments to the unemployed**.
Source: 2nd Amending Finance Act of 25 April 2020

Partial activity devices (€34.2bn)

- **31 billion,** as part of the public financing of the **partial activity scheme**.
Source: 3rd Amending Finance Act of 30 July 2020
DG Treasury, Comparative monitoring note of 30 September 2020

- An additional **€3.2bn in** public funding for the **partial activity scheme**.
  Source: 4th Amending Budget Act of 24 November 2020
  DG Treasury, Comparative monitoring note of 13 November 2020

Aid for SMEs, VSEs, self-employed workers and the liberal professions (€25.5bn)

- **8 billion, under the solidarity fund** for SMEs, VSEs and the self-employed.
  Source: 3rd Amending Finance Act of 30 July 2020
  DG Treasury, Comparative monitoring note of 30 September 2020
- **An** additional **€10.9bn from** the **solidarity fund.**
  Source: 4th Amending Budget Act of 24 November 2020
- **1bn,** as **additional exceptional aid for self-employed people, shopkeepers and restaurant owners**.
  Source: 2nd Supplementary Budget Act of 25 April 2020
- **5.6 billion,** as part of a solidarity fund re-subscription for 2021.
  Source: Finance bill for 2021, version adopted in final reading by the National Assembly

2) Liquidity and guarantee measures (€405.7bn)

Direct tax and social security contribution deferrals (€52bn)

- **52bn, maturity deferrals for direct taxes and** corporate **social charges.**
  Source: DG Treasury, Comparative Monitoring Note of 30 September 2020

Other tax and similar carry-forwards (€14.5 billion)

- **0.5bn**, in respect of a **carry forward of previous losses to the** corporate tax **base.**
  Source: 3rd Amending Finance Act of 30 July 2020
  DG Treasury, Comparative monitoring note of 30 September 2020
- **14 billion,** as part of an **early repayment of tax credits,** provided for in the 2nd amended Finance Act of 25 April 2020.
  Source: 2nd Amending Finance Act of 25 April 2020
  DG Treasury, Comparative monitoring note of 30 September 2020

Capital intervention tools (€21bn)

- **20bn**, for a fund enabling the **recapitalisation of strategic companies in difficulty.**
  Source: 2nd Amending Finance Act of 25 April 2020
  DG Treasury, Comparative monitoring note of 30 September 2020
- **1bn**, for **capacity building of the economic and social development fund,** which provides repayable loans and advances to companies in difficulty.
  Source: 2nd Amending Finance Act of 25 April 2020

State-guaranteed loans (€300bn)

- **300 billion**, under the State-guaranteed loans scheme.
  Source: 1st Amending Budget Act of 23 March 2020

Other guarantee measures in favour of companies (€15bn)

- **10bn, for** public reinsurance of credit insurance outstandings.
  Source: 1st Amending Budget Act of 23 March 2020
- **5bn**, as part of the increase in the ceiling for short-term export credit insurance.
  Source: 2nd Amending Finance Act of 25 April 2020

Transfers and guarantees for the benefit of local authorities (€3.2bn)

- **3 billion in advances and compensation to local authorities**.
  Source: 3rd Amending Finance Act of 30 July 2020
  DG Treasury, Comparative monitoring note of 30 September 2020
- **0.2bn** for AFD's **lending operations in Overseas France.**
  Source: 3rd Amending Finance Act of 30 July 2020
  DG Treasury, Comparative monitoring note of 30 September 2020

Germany

1) Immediate budgetary effort (€164.2bn)

Business support tax measures (€8.25bn)

- **3.35 billion,** in the form of **exemptions from production taxes and social security contributions introduced** by the federal government.
  Source: German Stability Programme, April 2020
  The stability programme indicates an anticipated tax revenue loss of €33.5 billion, without specifying which proportion comes from emergency measures and which proportion results from a contraction in the tax base. Using the French example, emergency tax measures account for around 10% to 15% of the tax revenue shortfall (€8bn / €70-80bn). We therefore attribute 10% of tax revenue reductions to emergency tax measures implemented by the federal government, i.e. €3.35 billion.

- **3.41 billion in production tax and social security contribution exemptions introduced** by the Länder.
  Source: German Stability Programme, April 2020
  The stability programme indicates an anticipated tax revenue loss of €34.1 billion, without specifying which proportion comes from emergency measures and which proportion results from a contraction in the tax base. Using the approximation described above, 10% of the tax revenue shortfall is attributed to the emergency tax measures introduced by the Länder, i.e. €3.4 billion.

- **1.49bn in production tax and social security contribution exemptions set up** by municipalities.
  Source: German Stability Programme, April 2020
  The stability programme indicates an anticipated tax revenue loss of €14.9 billion, without specifying which proportion comes from emergency measures and which proportion results from a contraction in the tax base. Using the approximation described above, 10% of the tax revenue shortfall is attributed to emergency tax measures implemented by municipalities, i.e. €1.49bn.

Public health expenditure (€24.1bn)

- **3.5bn**, **for urgent health expenditure** and the financing of vaccine research, included in the 1st amended finance law.
  Source: DG Treasury, Comparative Monitoring Note of 30 September 2020
- **5.9bn under the "Hospital" law,** designed to strengthen the resources of the health system.
  Source: DG Treasury, Comparative Monitoring Note of 30 September 2020
- **14.7bn in other health spending by the** Federal State and the Länder.
  Source: DG Treasury, Comparative Monitoring Note of 27 November 2020
  The note indicates a total amount of €24.1bn for health expenditure. This amount probably includes the two items of expenditure mentioned above, i.e. 3.5 + 5.9 = €9.4 billion in total. The remaining amount of health expenditure is therefore estimated at 24.1 - 9.4 = €14.7 billion.

Household income support measures (€18.8bn)

- **9 billion,** paid out by the Länder as part of the various **support measures for vulnerable households**.
  Source: German Stability Programme, April 2020
  The stability programme indicates a total amount of 18 billion in aid and subsidies granted by the Länder. In the absence of an exhaustive and quantified inventory of these measures, it is agreed that they are divided equally between measures to support VSE-SMEs (€9 billion) and measures to support vulnerable households (€9 billion).
- **2.1bn**, **in the form of assistance with the payment of housing and heating costs set up by the** municipalities.
  Source: German Stability Programme, April 2020
- **7.7bn, as part of an extension of unemployment benefits** (which can be combined with an income from activity, following the example of the RSA in France) for the benefit of self-employed workers and auto-entrepreneurs seriously affected by the health crisis.
  Source: DG Treasury, Comparative Monitoring Note of 30 September 2020

Aid for VSE-SMEs, self-employed workers and the liberal professions (€81bn)

- **25 billion under the rescue fund for the self-employed and VSEs,** provided for in the rescue plan contained in the 1st amended finance law.
  Source: German Stability Programme, April 2020
  DG Treasury, Comparative monitoring note of 30 September 2020
  The total amount indicated is €50bn, but this also includes the sums paid under the scheme to cover the fixed costs of SMEs, estimated at €25bn.
- **25 billion,** as part of a scheme to cover the fixed costs of SMEs.
  Source: German Stability Programme, April 2020
  DG Treasury, Comparative monitoring note of 30 September 2020
  The total amount indicated is €50 billion, but this also includes the sums paid out in income support for self-employed workers, self-entrepreneurs and employees of SMEs, estimated at €25 billion.
- **22 billion in additional aid for VSEs and the self-employed** announced on 14 November 2020 by the federal government.
  Source: Treasury's comparative monitoring note of 27 November 2020
- **9 billion in aid to VSEs and the self-employed** paid by the Länder.
  Source: German Stability Programme, April 2020
  The stability programme indicates a total amount of 18 billion in aid and subsidies granted by the Länder. In the absence of an exhaustive and quantified inventory of these measures, it is agreed that they are divided equally between measures to support VSE-SMEs (€9 billion) and measures to support vulnerable households (€9 billion).

Partial activity devices (€32bn)

- **32 billion** for **partial activity schemes**, financed outside the federal budget by the Federal Labour Agency ("*Bundesagentur für Arbeit").*
  Source: DG Treasury, Note of 30 September 2020

2) Liquidity *and guarantee measures (€994,7bn)*

Direct tax and social security contribution deferrals (€32.7bn)

- **32.7bn in respect** of **maturity deferrals for direct taxes and** corporate **social charges.**
  Source: DG Treasury, Comparative Monitoring Note of 27 November 2020
  The total amount of expense carry-forwards indicated in the note is €45.7 billion, from which must be deducted deferred payment of import VAT (€5 billion), carry-forwards of deficits on the corporate income tax base (€2 billion) and, finally, the tools for the decreasing over-amortization over 2020 (€6 billion).

Capital intervention tools (€102bn)

- **100 billion,** for equity investments in strategic companies, as part of the economic stabilisation fund.
  Source: German Stability Programme, April 2020
  DG Treasury, Comparative note of 30 September 2020
- **2bn,** under a venture capital programme for start-ups.
  Source: DG Treasury, Comparative note of 30 September 2020

State-guaranteed loans (€357bn)

- **357bn** of loans guaranteed by the State through the public bank KfW, provided for in the 1st amending finance law adopted on 27 March 2020.
  Source: DG Treasury, Comparative note of 30 September 2020

Other guarantee measures in favour of companies (€430bn)

- **30bn,** of public reinsurance on outstanding credit insurance, provided for in the 1st amended finance law adopted on 27 March 2020.
  Source: DG Treasury, Comparative note of 30 September 2020
- **400 billion,** in guarantees on market instruments (bonds) and bank loans, via the economic stabilisation fund.
  Source: German Stability Programme, April 2020
  DG Treasury, Comparative note of 30 September 2020

Transfers and guarantees to local authorities (€73bn)

- **73 billion,** as an additional guarantee of the liabilities of the Länder.
  Source: DG Treasury, Comparative note of 30 September 2020

Spain

1) Immediate budgetary effort (€66.7bn)

Aid and subsidies for businesses (€0.26bn)

- **0.26bn,** for measures promoting vocational training and youth employment.
  Source: Monthly monitoring of the AIReF's 2020 stability objective, 13 november 2020
  DG Treasury, Comparative monitoring note of 27 November 2020

Business support tax measures (€6.35bn)

- **6.35 billion,** in the form of an exemption from social security contributions for companies benefiting from short-time working.
  Source: Monthly monitoring of the AIReF's 2020 stability objective, 13 november 2020
  DG Treasury, Comparative monitoring note of 27 November 2020

Public health expenditure (€13.28bn)

- **1.4bn,** as an initial credit to the Ministry of Health to finance exceptional health system expenditure.
  Source: Monthly monitoring of the AIReF's 2020 stability objective, 13 november 2020
  DG Treasury, Comparative monitoring note of 27 November 2020
- **2.8bn,** for measures to support local authority health spending.
  Source: Monthly monitoring of the AIReF's 2020 stability objective, 13 november 2020
  DG Treasury, Comparative monitoring note of 27 November 2020
- **0.08bn,** for new health spending by the central government.
  Source: Monthly monitoring of the AIReF's 2020 stability objective, 13 november 2020
  DG Treasury, Comparative monitoring note of 27 November 2020
- **9bn** of additional healthcare expenditure included in the €16bn Covid fund.
  Source: Monthly monitoring of the AIReF's 2020 stability objective, 13 november 2020
  DG Treasury, Comparative monitoring note of 27 November 2020

Household income support measures (€16.05bn)

- **0.3bn,** under an extraordinary social fund dedicated exclusively to the consequences of Covid-19.
  Source: Monthly monitoring of the AIReF's 2020 stability objective, 13 november 2020
  DG Treasury, Comparative monitoring note of 27 November 2020
- **0.3bn,** as exceptional support for the payment of rents to vulnerable tenants.
  Source: Monthly monitoring of the AIReF's 2020 stability objective, 13 november 2020
  DG Treasury, Comparative monitoring note of 27 November 2020
- **0.1bn,** in aid to vulnerable tenants as part of the Housing Plan.
  Source: Monthly monitoring of the AIReF's 2020 stability objective, 13 november 2020
  DG Treasury, Comparative monitoring note of 27 November 2020
- **1.35 billion,** as part of a standard "incapacity for work" benefit for infected persons.
  Source: Monthly monitoring of the AIReF's 2020 stability objective, 13 november 2020
  DG Treasury, Comparative monitoring note of 27 November 2020
- **14bn,** in State transfers to finance additional services related to Covid-19.
  Source: Monthly monitoring of the AIReF's 2020 stability objective, 13 november 2020
  DG Treasury, Comparative monitoring note of 27 November 2020

Measures to stimulate household consumption and investment (€0.25bn)

- **0.25bn,** in subsidies for energy efficiency renovations in housing, as part of the RENOVE plan.
  Source: Monthly monitoring of the AIReF's 2020 stability objective, 13 november 2020
  DG Treasury, Comparative monitoring note of 27 November 2020

Other open credits and public expenditure excluding government health (€3.3bn)

- **2bn,** as part of the additional education expenditure deployed by the central government, included in the €16bn Covid Fund.
  Source: Monthly monitoring of the AIReF's 2020 stability objective, 13 november 2020
  DG Treasury, Comparative monitoring note of 27 November 2020
- **1.3bn,** for the implementation of the health protocol in education, deployed by the autonomies.
  DG Treasury, Comparative monitoring note of 27 November 2020

Aid for VSE-SMEs, self-employed workers and the liberal professions (€9.4 billion)

- **5.3bn,** as an exceptional benefit for self-employed workers whose activity has been affected by the state of health emergency.
  Source: Monthly monitoring of the AIReF's 2020 stability objective, 13 november 2020
  DG Treasury, Comparative monitoring note of 27 November 2020
- **2.7 billion,** in the form of contribution exemptions for self-employed workers whose activity has been affected by the state of health emergency.
  Source: Monthly monitoring of the AIReF's 2020 stability objective, 13 november 2020
  DG Treasury, Comparative monitoring note of 27 November 2020
- **1.4bn,** as part of the direct aid measures for VSE-SMEs and the self-employed deployed by the autonomies.
  Source: Monthly monitoring of the AIReF's 2020 stability objective, 13 november 2020
  DG Treasury, Comparative monitoring note of 27 November 2020

Partial activity devices (€17.8bn)

- **17.8 billion,** under the ERTE short-time working schemes.
  Source: Monthly monitoring of the AIReF's 2020 stability objective, 13 november 2020
  DG Treasury, Comparative monitoring note of 27 November 2020

2) Liquidity and guarantee measures (€161.6bn)

Direct tax and social security contribution deferrals (€0.699bn)

- **0.351 billion,** under a six-month moratorium on social security contributions.
  Source: Monthly monitoring of the AIReF's 2020 stability objective, 13 november 2020
  DG Treasury, Comparative monitoring note of 30 September 2020
- **0.339 billion,** in respect of a deferral of social security debt repayments.
  Source: Monthly monitoring of the AIReF's 2020 stability objective, 13 november 2020
  DG Treasury, Comparative monitoring note of 30 September 2020
- **0.009 billion,** in respect of a six-month deferral of interest on tax debt.
  Source: Monthly monitoring of the AIReF's 2020 stability objective, 13 november 2020
  DG Treasury, Comparative monitoring note of 30 September 2020

Capital intervention tools (€10bn)

- **10bn,** under a solvency and recapitalisation support fund managed by SEPI.
  Source: Monthly monitoring of the AIReF's 2020 stability objective, 13 november 2020 DG Treasury, Comparative monitoring note of 30 September 2020

Loans guaranteed by the State (€141.7bn)

- **100bn** of **public guarantees** on ICO bank loans.
  Source: Monthly monitoring of the AIReF's 2020 stability objective, 13 november 2020 DG Treasury, Comparative monitoring note of 30 September 2020
- **40bn** of **public guarantees on ICO bank loans,** for investments focused on the ecological and digital transition.
  Source: Monthly monitoring of the AIReF's 2020 stability objective, 13 november 2020 DG Treasury, Comparative monitoring note of 30 September 2020
- **0.78bn** in **guarantees to promote the liquidity of** companies in the cultural sector.
  Source: Monthly monitoring of the AIReF's 2020 stability objective, 13 november 2020 DG Treasury, Comparative monitoring note of 30 September 2020
- **0.2bn** in **guarantees to promote the liquidity of businesses** in the tourism sector.
  Source: Monthly monitoring of the AIReF's 2020 stability objective, 13 november 2020 DG Treasury, Comparative monitoring note of 30 September 2020
- **0.731bn** in **additional loan programmes** reserved for the tourism sector for digitisation and internationalisation projects.
  Source: Monthly monitoring of the AIReF's 2020 stability objective, 13 november 2020 DG Treasury, Comparative monitoring note of 30 September 2020

Other guarantee measures in favour of companies (€3bn)

- **1bn**, under a **risk guarantee fund for** SMEs.
  Source: Monthly monitoring of the AIReF's 2020 stability objective, 13 november 2020 DG Treasury, Comparative monitoring note of 30 September 2020
- **2 billion** in **guarantees for exporting SMEs** via the CESCE.
  Source: Monthly monitoring of the AIReF's 2020 stability objective, 13 november 2020 DG Treasury, Comparative monitoring note of 30 September 2020

Rental payment guarantees for vulnerable tenants (€1.2bn)

- **1.2bn guarantee for vulnerable tenants**, deployed by the public bank ICO.
  Source: Monthly monitoring of the AIReF's 2020 stability objective, 13 november 2020 DG Treasury, Comparative monitoring note of 30 September 2020

Transfers and guarantees for the benefit of local authorities (€5bn)

- **5 billion,** in **transfers to compensate for the decrease in revenue of the** autonomias.
  Source: Monthly monitoring of the AIReF's 2020 stability objective, 13 november 2020 DG Treasury, Comparative monitoring note of 30 September 2020

Italy

1) Immediate budgetary effort (€67.9bn)

Aid and subsidies for businesses (€9.5bn)

- **3.3 billion,** to **support businesses in sectors severely affected** by the crisis.
  Source: "Cura Italia" Decree of 13 March 2020
  DG Treasury, Comparative monitoring note of 30 September 2020
- **6.2 billion** in **"non-refundable contributions"**, i.e. subsidies and aid to companies in difficulty.
  Source: "Rilancio" Decree of 15 May 2020
  DG Treasury, Comparative monitoring note of 30 September 2020

Business support tax measures (€6.4bn)

- **2 billion in** tax credits on amounts spent on recapitalisation of Italian companies.
  Source: "Rilancio" Decree of 15 May 2020
  DG Treasury, Comparative monitoring note of 30 September 2020
- **2.4bn in** tax and contribution reductions for firms in the most affected sectors.
  Source: "Rilancio" Decree of 15 May 2020
  DG Treasury, Comparative monitoring note of 30 September 2020
- **2 billion in** tax cuts to help companies adapt to new health requirements.
  Source: DG Treasury, Comparative Monitoring Note of 30 September 2020

Public health expenditure (€9.5bn)

- **3.2bn**, in provisions for **exceptional healthcare expenditure to** cope with the epidemic, notably to finance the purchase of equipment and surgical masks as well as daily allowances for healthcare staff.
  Source: "Cura Italia" Decree of 17 March 2020
  DG Treasury, Comparative monitoring note of 30 September 2020
- An additional **€3.3bn to strengthen the health system in the** face of the prospect of a new wave.
  Source: "Rilancio" Decree of 15 May 2020
  DG Treasury, Comparative monitoring note of 30 September 2020
- An additional **€3bn**, provided for in subsequent decrees, notably the decree of 27 October intended to deal with the 2nd wave.
  Source: DG Treasury, Comparative Monitoring Note of 30 September 2020

Household income support measures (€5.5bn)

- **3 billion,** as an **emergency income for** precarious workers, including undeclared workers.
  Source: "Cura Italia" Decree of 13 March 2020

DG Treasury, Comparative monitoring note of 30 September 2020
The total amount indicated by the Treasury is €37.5bn, but this also includes the sums allocated to finance short-time working (around €25bn), income support for the self-employed (around €7bn) and extended unemployment benefit (around €2.5bn). The share allocated to emergency income alone is estimated at around €3 billion.

- **2.5 billion, in respect of the extension of compensation payments and the financing of exceptional redundancy payments,** provided for by the *"Cura Italia"* decree and supplemented by the following decrees.
  Source: "Cura Italia" Decree of 13 March 2020
  DG Treasury, Comparative monitoring note of 30 September 2020
  The amount indicated by the Treasury is €37.5 billion (for the entire "integration fund"), but this also includes the sums allocated to finance short-time working (around €25 billion), income support for the self-employed (around €7 billion) and the new emergency income for precarious workers (around €3 billion). The share allocated to the extension of unemployment benefits is estimated at €2.5 billion.

Aid for VSE-SMEs, self-employed workers and the liberal professions (€12bn)

- **7 billion in income support for self-employed workers,** provided for by the *"Cura Italia"* decree and supplemented by the following decrees.
  Source: "Cura Italia" Decree of 17 March 2020
  DG Treasury, Comparative monitoring note of 30 September 2020
  The amount indicated by the Treasury is €37.5 billion (for the entire "integration fund"), but this also includes the sums allocated to finance partial unemployment (around €25 billion), extended unemployment benefit (€2.5 billion) and the new emergency income for precarious workers (€3 billion). The share allocated to income support for the self-employed is estimated at around €7bn.

- **5 billion in subsidies** granted to VSE-SMEs, as provided for in particular by the *"Rilancio"* decree.
  Source: "Rilancio" Decree of 15 May 2020
  DG Treasury, Comparative monitoring note of 30 September 2020

Partial activity devices (€25bn)

- **25 billion under the integration fund for compensation for short-time working**, provided for by the *"Cura Italia"* decree and supplemented by the following decrees.
  Source: "Cura Italia" Decree of 13 March 2020
  DG Treasury, Comparative monitoring note of 30 September 2020
  The amount indicated by the Treasury is €37.5bn, but this also includes the sums allocated to income support for the self-employed (around €7bn), extended unemployment benefits (around €2.5bn) and the new emergency income for precarious workers (around €3bn). The share allocated to partial unemployment benefit alone is estimated at around €25 billion.

2) Liquidity and guarantee measures (€597.6bn)

Direct tax and social security contribution deferrals (€19.1bn)

- **6bn, maturity deferrals for direct taxes and corporate social charges.**
  Source: "Cura Italia" Decree of 13 March 2020
  DG Treasury, Comparative monitoring note of 30 September 2020
- **6.6bn**, **additional deferrals for direct taxes and** corporate **social charges.**
  Source: "Rilancio" Decree of 15 May 2020
  DG Treasury, Comparative monitoring note of 30 September 2020
- An additional **€6.5bn** under the new measures announced on 8 August 2020.
  Source: DG Treasury, Comparative Monitoring Note of 30 September 2020

Capital intervention tools (€44bn)

- **44 billion**, under the **public fund to support the recapitalisation of strategic companies in difficulty (managed by Cdb).**
  Source: "Rilancio" Decree of 17 May 2020
  DG Treasury, Comparative monitoring note of 30 September 2020

State-guaranteed loans (€310bn)

- **100bn** in bank loans via the SME Guarantee Fund.
  Source: "Cura Italia" Decree of 13 March 2020
  DG Treasury, Comparative monitoring note of 30 September 2020
- **200 billion** in bank loans via the SACE Fund, as provided for in the "Liquidita" decree of 8 April 2020.
  Source: "Liquidita" Decree of 8 April 2020
  DG Treasury, Comparative monitoring note of 30 September 2020
- **10 billion,** under a "Fonds Patrimoine" scheme managed by the Italian Caisse des Dépôts.
  Source: "Rilancio" Decree of 17 May 2020
  DG Treasury, Comparative monitoring note of 30 September 2020

Other guarantee measures in favour of companies (€215bn)

- **200 billion** in bank loans via the Export Business Support Fund.
  Source: DG Treasury, Comparative Monitoring Note of 30 September 2020
- **15 billion** in additional guarantees for bank liabilities.
  Source: DG Treasury, Comparative Monitoring Note of 30 September 2020

Transfers and guarantees for the benefit of local authorities (€9.5bn)

- **9.5 billion**, in **transfers, advances and compensation to local authorities**.
  Source: "Liquidita" Decree of 8 April 2020
  DG Treasury, Comparative monitoring note of 30 September 2020

United Kingdom

1) Immediate budgetary effort (£182.85bn or €201.14bn)

Aid and grants for businesses (£2.75bn)

- **1.25bn** in support for innovative companies.
  Source: DG Treasury, Comparative Monitoring Note of 30 September
- **1.3bn,** as part of an additional aid plan for the cultural sector, announced on 8 July 2020 in parallel with the recovery plan.
  Source: Report on the Sustainability of Public Finances, Office for Budget Responsibility (July 2020)
  DG Treasury, Comparative Follow-up Note of 30 September
- **0.2bn,** as part of public coverage of sickness benefits for businesses, particularly SMEs.
  Source: DG Treasury, Comparative Monitoring Note of 30 September

Business support tax measures (£13.5bn)

- **12.2 billion,** under a one-year suspension of business taxes.
  Source: Report on the Sustainability of Public Finances, Office for Budget Responsibility (July 2020)
  DG Treasury, Comparative Follow-up Note of 30 September
- **1.3bn,** in respect of a deferral of the entry into force of *off-payment rules in the* private sector.
  Source: DG Treasury, Comparative Monitoring Note of 30 September

Public health expenditure (£53.5bn)

- **7.5bn** in spending on hospitals to increase reception capacity and strengthen care for vulnerable people.
  Source: Report on the Sustainability of Public Finances, Office for Budget Responsibility (July 2020)
  DG Treasury, Comparative Follow-up Note of 30 September
- **4.5 billion,** for additional expenditure by local authorities and decentralised administrations.
  Source: Report on the Sustainability of Public Finances, Office for Budget Responsibility (July 2020)
  DG Treasury, Comparative Follow-up Note of 30 September
- **25.1bn** in additional health spending, announced on 8 July 2020 in parallel with the recovery plan.
  Source: DG Treasury, Comparative Monitoring Note of 30 September
- **16.4bn,** as part of the additional health spending announced on 24 September 2020.
  Source: DG Treasury, Comparative Monitoring Note of 30 September

Household income support measures (£11.6bn)

- **0.8bn** in exceptional public subsidies for charities.
  Source: Report on the Sustainability of Public Finances, Office for Budget Responsibility (July 2020)
  DG Treasury, Comparative Follow-up Note of 30 September
- **1.5bn,** as part of additional aid measures in favour of households, announced on 8th July 2020 in parallel with the recovery plan.
  Source: DG Treasury, Comparative Monitoring Note of 30 September
- **9.3bn,** as part of an increase in social minima, resulting from the support plan of 11 March 2020 and an update in July 2020.
  Source: DG Treasury, Comparative Monitoring Note of 30 September

Measures to stimulate household consumption and investment (£1bn)

- **1bn,** as part of an extension from September to December of the VAT cuts announced in the recovery plan.
  Source: DG Treasury, Comparative Monitoring Note of 30 September

Public investment (£2.3bn)

- **1bn,** as part of a plan to improve London's transport system.
  Source: Report on the Sustainability of Public Finances, Office for Budget Responsibility (July 2020)
  DG Treasury, Comparative Follow-up Note of 30 September
- **1bn,** under a school pick-up scheme.
  Source: Report on the Sustainability of Public Finances, Office for Budget Responsibility (July 2020)
  DG Treasury, Comparative Follow-up Note of 30 September
- **0.3bn,** for the construction of cycle and pedestrian routes.
  Source: Report on the Sustainability of Public Finances, Office for Budget Responsibility (July 2020)
  DG Treasury, Comparative Follow-up Note of 30 September

Other appropriations and public expenditure excluding government health (£5.8bn)

- **3.7 billion,** in respect of the additional costs incurred by the temporary nationalisation of several companies to ensure the continuity of the rail service.
  Source: Report on the Sustainability of Public Finances, Office for Budget Responsibility (July 2020)
  DG Treasury, Comparative Follow-up Note of 30 September
- **2.1 billion,** under the other public service expenditure provided for in the "*Economic Summer Update"* plan of 8 July 2020.
  Source: Report on the Sustainability of Public Finances, Office for Budget Responsibility (July 2020)
  DG Treasury, Comparative Follow-up Note of 30 September

Aid to VSE-SMEs, self-employed and professionals (£39.4bn)

- **15.2 billion** in payments made to autoentrepreneurs.
  Source: Report on the Sustainability of Public Finances, Office for Budget Responsibility (July 2020)
  DG Treasury, Comparative Follow-up Note of 30 September
- **14.2 billion** in grants to companies, particularly SMEs.
  Source: Report on the Sustainability of Public Finances, Office for Budget Responsibility (July 2020)
  DG Treasury, Comparative Follow-up Note of 30 September
- **10bn,** as a further extension of the VSE-SME support and short-time working schemes.
  Source: Report on the Sustainability of Public Finances, Office for Budget Responsibility (July 2020)
  DG Treasury, Comparative Follow-up Note of 30 September

Partial activity schemes (£53bn)

- **50bn,** provided for in the support plan of 11 March 2020, supplemented by the March and April announcements, as part of the funding of the *Job Support Scheme for financing* short-time working.
  Source: Report on the Sustainability of Public Finances, Office for Budget Responsibility (July 2020)
  DG Treasury, Comparative Follow-up Note of 30 September
- An additional **£3bn**, resulting from the 24 September 2020 announcements, as part of an extension of the *Job Support Scheme to* finance short-time working.
  Source: DG Treasury, Comparative Monitoring Note of 30 September

2) Liquidity and guarantee measures (£379.8bn or €417.8bn)

Other tax and related carry-forwards (£38 billion)

- **38bn,** as part of a deferral of VAT payments to the second half of 2020.
  Source: DG Treasury, Comparative Monitoring Note of 30 September

State-guaranteed loans (£300bn)

- **300bn** of public guarantees under the Coronavirus Business Interruption Loan, Coronavirus Large Business Interruption Loan and Bounce Back Loans schemes.
  Source: DG Treasury, Comparative Monitoring Note of 30 September

Other guarantee measures in favour of companies (£30bn)

- **30bn**, under an unlimited programme for the purchase of large corporate bonds by the Bank of England.
  Source: DG Treasury, Comparative Monitoring Note of 30 September

Deferral of household tax liabilities (£11.8bn)

- **11.8bn,** in respect of an extension of the deadline for *self assessment* tax.
  Source: DG Treasury, Comparative Monitoring Note of 30 September

The Netherlands

1) Immediate budgetary effort (€36.3bn)

Aid and subsidies for businesses (€2.67 billion)

- **2.67bn,** as emergency support for businesses forced to close due to health measures.
  Source: DG Treasury, Comparative Monitoring Note of 27 November

Public health expenditure (€4.7bn)

- **4.7bn** in exceptional healthcare expenditure, provided for in the "Alivio 1" rescue plan of March 2020, which was subsequently completed.
  Source: DG Treasury, Comparative Monitoring Note of 27 November

Household income support measures (€0.175bn)

- **0.175 billion** in benefits paid to parents of young children (childcare assistance in particular).
  Source: DG Treasury, Comparative Monitoring Note of 27 November

Other open credits and public expenditure excluding government health (€10bn)

- **10 billion,** under other credit facilities and public operating expenditure.
  Source: DG Treasury, Comparative Monitoring Note of 27 November

Aid for VSE-SMEs, self-employed workers and the liberal professions (€8.75bn)

- **2.45bn** in subsidies paid to VSE-SMEs in difficulty.
  Source: DG Treasury, Comparative Monitoring Note of 27 November

- **3.8bn**, in support of auto-entrepreneurs.
  Source: DG Treasury, Comparative Monitoring Note of 27 November

- An additional **€2.5 billion** in aid to SMEs, VSEs and the self-employed for the fourth quarter.
  Source: DG Treasury, Comparative Monitoring Note of 27 November

Partial activity devices (€10bn)

- **10bn,** as part of the public financing of the *"NOW"* partial activity schemes provided for in the "Alivio 1" rescue plan of March 2020.
  Source: DG Treasury, Comparative Monitoring Note of 27 November

2) Liquidity and guarantee measures (€76.5bn)

Direct tax and social security contribution deferrals (€16.4bn)

- **16.4 billion,** in respect of expense carry-forwards to companies.
  Source: DG Treasury, Comparative Monitoring Note of 27 November

State-guaranteed loans

- **40bn** of public guarantees on loans granted to companies under the "Alivio 1" plan.
  Source: DG Treasury, Comparative Monitoring Note of 27 November

Other public guarantees in favour of companies

- **10 billion**, under an export credit guarantee programme.
  Source: DG Treasury, Comparative Monitoring Note of 27 November
- **10 billion** in supplier guarantees.
  Source: DG Treasury, Comparative Monitoring Note of 27 November

Transfers and guarantees for the benefit of local authorities (€0.135bn)

- **0.135bn**, in **transfers, advances and compensation to local authorities, notably loans to the overseas territory of Curaçao**.
  Source: DG Treasury, Comparative Monitoring Note of 30 September 2020

Recovery Measures

All the aggregate amounts mentioned under the recovery plans come from the comparative note drawn up by DG Treasury on 27 November. The breakdown between supply and demand as well as the different sub-categories also comes from this note. The "Mixed" category contains the amounts included in the government announcements of the recovery plans (and in DG Treasury's note of 27 November), but not in the "supply-demand" breakdown made by DG Treasury in its note of 27 November. The details of the aggregate amounts have been established using the press kits relating to the various recovery plans.

France

Source: Press kit released by the French government

1) Protective measures (€14.2bn)

- **0.3bn,** as part of measures to preserve threatened R&D jobs.
  Source: Press kit released by the French government

- **1.6bn,** in support measures for cultural industries and sectors.
  Source: Press kit released by the French government
- **7.6bn,** for long-term partial activity measures.
  Source: Press kit released by the French government
- **2.7 billion,** in the form of apprenticeship assistance, professionalization contract and civic service.
  Source: Press kit released by the French government
- **1.1bn,** in the form of a recruitment bonus for young people aged 16 to 24.
  Source: Press kit released by the French government
- **0.1bn,** as a bonus for hiring disabled workers.
  Source: Press kit released by the French government
- **0.6bn,** as part of an increase in the back-to-school allowance and the university meal voucher scheme to €1.
  Source: Press kit released by the French government
- **0.2bn,** in support of associations helping vulnerable people and the development of emergency accommodation.
  Source: Press kit released by the French government

2) Reallocation measures (€77.5bn)

- **6.7bn,** for energy renovation measures for public buildings, private housing, social housing and VSE/SMEs.
  Source: Press kit released by the French government
- **1.25bn,** for measures to promote biodiversity and combat artificialisation (water networks, urban renewal, strengthening resilience, etc.).
  Source: Press kit released by the French government
- **1.2bn,** for decarbonation investments in industry.
  Source: Press kit released by the French government
- **0.5bn,** for investments in the circular economy and short circuits (modernisation of sorting centres, investments in recycling and reuse...).
  Source: Press kit released by the French government
- **1.2bn,** for measures related to agricultural transition (acceleration of the sector's transition, plan for protein independence, renewal of agricultural equipment, etc.).
  Source: Press kit released by the French government
- **0.25bn,** for port greening measures and investments in fishing, aquaculture and the fish trade.
  Source: Press kit released by the French government

- **8.58bn,** for measures to develop infrastructure and green mobility (strengthening the resilience of electricity networks, developing day-to-day mobility, developing the rail network, greening the State's vehicle fleet, etc.).
  Source: Press kit released by the French government
- **8.2 billion,** for investments in green technologies (development of green hydrogen, support for nuclear power, support for innovation in the aeronautics and automotive sectors, etc.).
  Source: Press kit released by the French government
- **20bn,** in respect of a reduction in production taxes.
  Source: Press kit released by the French government
- **6.565bn,** as part of measures to improve the country's technological sovereignty (support for the development of key markets, aid for innovation, support for the space sector, securing critical supplies, etc.).
  Source: Press kit released by the French government
- **1.885bn,** for the digital upgrading of the State, territories, TWAs, SMEs and VSEs.
  Source: Press kit released by the French government
- **0.832bn,** in respect of anticipated orders within the framework of the "aeronautics" plan.
  Source: Press kit released by the French government
- **1.3bn,** for the improvement of support measures for young people towards employment or business creation.
  Source: Press kit released by the French government
- **0.05bn,** as part of new support measures for boarding schools of excellence.
  Source: Press kit released by the French government
- **1.6bn,** to strengthen training in the professions of the future.
  Source: Press kit released by the French government
- **1.9bn,** to strengthen vocational training systems (investment in skills, digitalisation of training, strengthening France Compétences' support resources, etc.).
  Source: Press kit released by the French government
- **2.95bn,** for investments in support of the research sector.
  Source: Press kit released by the French government
- **6bn,** in public investment in the health sector, as part of the second part of the Ségur de la Santé.
  Source: Press kit released by the French government
- **0.05bn,** to support health security and vaccine research projects.
  Source: Press kit released by the French government

- **6.5 billion,** for investment projects in favour of territorial cohesion (digital development in the regions, support for local development actions, renovation of city centre shops, etc.).
  Source: Press kit released by the French government

3) Liquidity and guarantee measures (€8.747bn)

These measures are deducted from the overall amount recorded as budgetary measures.

- **3bn,** under the Bank of the Territories' recovery plan, made up of loans and advances.
  Source: Press kit released by the French government
- **3 billion,** as part of a scheme to strengthen the equity capital of VSEs, SMEs and ETIs.
  Source: Press kit released by the French government
- **2.5bn** for Bpifrance's new Climat products.
  Source: Press kit released by the French government
- **0.247bn,** in respect of Business France's actions and export support and guarantee measures.
  Source: Press kit released by the French government

Germany

Source: Press kit released by the German government

1) Protective measures (€41.59bn)

- **20bn**, as a result of a reduction in VAT rates from 19% to 16% and 7% to 5%.
  Source: Press kit released by the German government
- **5.3 billion**, under the 2021 Social Guarantee, intended to finance additional social expenditure without increasing social security contributions.
  Source: Press kit released by the German government
- **1bn,** as part of a support programme for the cultural sector.
  Source: Press kit released by the German government
- **4 billion,** as part of a plan to support housing and heating expenses in addition to the municipalities.
  Source: Press kit released by the German government

- **5.9bn,** under a solidarity pact with municipalities, consisting of a lump-sum grant for municipalities' investment expenditure.
  Source: Press kit released by the German government
- **0.34bn,** in respect of the federal government's contribution to the rise in the costs of supplementary pension schemes in the former GDR.
  Source: Press kit released by the German government
- **4.3 billion,** as part of a one-off bonus of €300 per child.
  Source: Press kit released by the German government
- **0.75bn,** as a relief contribution for single parents.
  Source: Press kit released by the German government

2) Reallocation measures (€83.25bn)

- **11 billion**, as part of a reduction in the "EEG" tax on the price of electricity in order to improve the competitiveness of companies.
  Source: Press kit released by the German government
- **0.3bn,** as part of the addition of an option to corporation tax for partnerships to improve their competitiveness.
  Source: Press kit released by the German government
- **0.1bn,** for the extension of an employee profit-sharing scheme.
  Source: Press kit released by the German government
- **10bn,** to advance various public investment projects (security, digitisation of the administration, armaments, etc.).
  Source: Press kit released by the German government
- **0.7bn,** as part of an investment plan to improve the resilience of Germany's forest heritage (digitisation, modernisation of machinery, etc.), and to promote the emergence of a more modern wood industry.
  Source: Press kit released by the German government
- **0.1bn,** as part of a national climate protection initiative.
  Source: Press kit released by the German government
- **2.5bn, as a** one-off increase in regularisation funds, used to finance local public transport.
  Source: Press kit released by the German government
- **0.15bn,** as part of an investment plan for sports facilities.
  Source: Press kit released by the German government
- **1bn,** as part of a capacity expansion plan in the field of kindergartens, crèches and childcare facilities.
  Source: Press kit released by the German government

- **2 billion,** as part of a school digital pact to modernise teaching tools.
  Source: Press kit released by the German government
- **0.5bn,** as part of a plan to support in-company training schemes.
  Source: Press kit released by the German government
- **1bn,** as part of a tax aid for R&D.
  Source: Press kit released by the German government
- **1bn,** in support of non-academic research organisations.
  Source: Press kit released by the German government
- **0.3bn,** in support of digitisation and sectoral coupling.
  Source: Press kit released by the German government
- **2.2 billion,** as tax aid for the purchase of a clean motor vehicle.
  Source: Press kit released by the German government
- **2 billion,** as a bonus to promote green investments by the automotive industries and their suppliers.
  Source: Press kit released by the German government
- **0.2bn,** in aid for the ecological conversion of the associations' vehicle fleets.
  Source: Press kit released by the German government
- **2.5bn,** for the installation of a new network of charging stations for electric vehicles.
  Source: Press kit released by the German government
- **5bn,** as part of a plan to support investment in the expansion and electrification of the rail network.
  Source: Press kit released by the German government
- **0.15bn,** for the modernisation of railway stations.
  Source: Press kit released by the German government
- **1.2bn,** for investment in a programme to modernise the bus and lorry fleet.
  Source: Press kit released by the German government
- **1 billion,** in support of the development of maritime transport infrastructures.
  Source: Press kit released by the German government
- **1bn**, for the modernisation of the aircraft fleet.
  Source: Press kit released by the German government
- **7 billion,** for the development of a green hydrogen industry.
  Source: Press kit released by the German government
- **2 billion,** in direct foreign investments of public origin, to set up green hydrogen production infrastructures to complement the above-mentioned hydrogen strategy.
  Source: Press kit released by the German government

- **2 billion,** as part of a programme for the ecological renovation of public buildings.
  Source: Press kit released by the German government
- **0.3 billion,** as part of a modernisation of administrative registers of all kinds.
  Source: Press kit released by the German government
- **3 billion in** financial support for the development of digital networks in the territories.
  Source: Press kit released by the German government
- **1bn,** as part of an aid for digitisation of SMEs and VSEs.
  Source: Press kit released by the German government
- **2 billion,** as part of an increase in resources allocated to research on artificial intelligence.
  Source: Press kit released by the German government
- **2 billion,** as part of a programme to develop quantum computer technologies.
  Source: Press kit released by the German government
- **2 billion,** as part of a programme to develop 5G and 6G technologies.
  Source: Press kit released by the German government
- **5 billion,** for the modernisation and development of the federal mobile communication infrastructure.
  Source: Press kit released by the German government
- **0.5bn,** as part of an increase in the resources allocated to the "Smart City" municipal investment programme.
  Source: Press kit released by the German government
- **0.5bn,** for the creation of a research centre on digitisation and technology to promote Germany's digital sovereignty.
  Source: Press kit released by the German government
- **4 billion,** under a public health investment pact, aimed at supporting health spending by the Länder and municipalities.
  Source: Press kit released by the German government
- **3bn,** under a "hospital programme", financing modern emergency capacities, better digital infrastructure, etc.
  Source: Press kit released by the German government
- **1bn,** as part of an investment programme in favour of German independence in the production of medical equipment and products...
  Source: Press kit released by the German government
- **0.75bn,** as additional support for R&D in the field of vaccines.
  Source: Press kit released by the German government
- **1bn,** for the constitution of a national reserve of medical equipment in the event of natural or health disasters.
  Source: Press kit released by the German government

- **0.3bn,** for investment in infrastructure to improve animal welfare in experimentation centres.
  Source: Press kit released by the German government

3) Liquidity and guarantee measures (€14.4bn)

These measures are deducted from the overall amount recorded as budgetary measures.

- **5 billion,** as a deferral of import sales tax.
  Source: Press kit released by the German government
- **2 billion, in** respect of tax loss carrybacks.
  Source: Press kit released by the German government
- **6bn, in respect** of declining balance depreciation for wear and tear with a factor of 2.5 for movable and fixed assets.
  Source: Press kit released by the German government
- **0.9bn, under** a loan programme for non-profit organisations.
  Source: Press kit released by the German government
- **0.5bn,** as part of an increase in the resources of the Regional Economic Structures Improvement Fund (€0.5bn).
  Source: Press kit released by the German government

Spain

Source: Press kit released by the Spanish Government

1) Protective measures (€4.9bn)

- **4.1bn,** under a national care and employment plan: development of remote assistance and care networks for dependent people, development of reception facilities for the elderly, better care for victims of domestic violence, new model for reception of asylum seekers, reform of several professional integration schemes...
  Source: Press kit released by the Spanish Government
- **0.8bn,** as part of a plan to support the culture and sports sectors, which have been massively affected by the health crisis.
  Source: Press kit released by the Spanish Government

2) Reallocation measures (€67bn)

- **11.2bn,** under a new urban and rural agenda: investments in favour of sustainable mobility, public transport development programmes, energy renovation plans for housing and public infrastructure, works to modernise supply logistics chains, etc.
  Source: Press kit released by the Spanish Government

- **8.9bn,** under a programme to strengthen the resilience of infrastructures and ecosystems: investments to promote biodiversity, preservation of coastal areas and water resources, resilience of transport networks and infrastructures...
  Source: Press kit released by the Spanish Government

- **6.4bn,** for investments linked to the energy transition: deployment of renewable energy production facilities, energy development of territories, integration of renewable energies in construction projects and in many productive sectors, - development of a hydro-electric power generation sector, promotion of smart production networks, roadmap on the sectoral integration of renewable hydrogen...
  Source: Press kit released by the Spanish Government

- **3.6 billion,** as part of a programme to modernise public administration: digitisation of services, staff training, energy improvements in public buildings, strengthening cyber security on online networks, strengthening and modernising the resources allocated to the judicial system, etc.
  Source: Press kit released by the Spanish Government

- **12.3 billion,** for the modernisation of the industrial fabric and SMEs, particularly in the services sector: digitisation of the value chain, development of cloud systems, microelectronic technologies, measures to support business productivity and the attractiveness of the Spanish territory for foreign investors, development of sustainable tourism solutions, etc.
  Source: Press kit released by the Spanish Government

- **11.9bn,** under an agreement for science, innovation and the strengthening of the health system: development of artificial intelligence in the productive fabric, support for R&D, renewal of the health system's capacities and infrastructures, constitution of a strategic reserve of health products/pharmaceuticals, etc.
  Source: Press kit released by the Spanish Government

- **12.7bn,** for investment in the education system and continuing training: strategic plan to promote vocational training, development of digital skills (schools, - universities, companies, etc.), modernisation and flexibility of educational pathways, etc.
  Source: Press kit released by the Spanish Government

Italy

Italy has not announced a recovery plan at the moment.

United Kingdom

Source: Press pack released by the British government

1) Protection measures (£11.4bn)

- **6.1 billion,** as a job retention bonus paid to companies.
  Source: DG Treasury, Comparative Monitoring Note of 30 September
- **2.3bn in** support for employers of apprentices and young people aged 16-24.
  Source: DG Treasury, Comparative Monitoring Note of 30 September
- **2.5bn,** as a temporary reduction in VAT from 20% to 5% for hospitality and tourism.
  Source: DG Treasury, Comparative Monitoring Note of 30 September
- **0.5bn,** as an incentive for consumption in the restaurant sector.
  Source: DG Treasury, Comparative Monitoring Note of 30 September

2) Reallocation measures (£13.9bn)

- **1.3bn,** in respect of a reduction in stamp duty on the purchase of a property.
  Source: DG Treasury, Comparative Monitoring Note of 30 September
- **5.6 billion,** under an investment plan, notably in ecological mobility infrastructures.
  Source: DG Treasury, Comparative Monitoring Note of 30 September
- **2 billion**, under an energy efficiency renovation plan for private buildings.
  Source: DG Treasury, Comparative Monitoring Note of 30 September
- **2 billion,** under an energy efficiency renovation plan for public buildings.
  Source: DG Treasury, Comparative Monitoring Note of 30 September
- **3 billion,** as part of a plan for the "Ecological Revolution" presented in November 2020: hydrogen, the nuclear sector, electric mobility, carbon capture and storage, etc.
  Source: Press pack released by the British government
  The amount communicated by the UK government is £12 billion. However, according to the Treasury and a number of specialist websites such as Business Green, only £3 billion of the £12 billion is new spending.

The Netherlands

Source: Comparative note drawn up by DG Treasury on 27 November 2020

1) Protective measures (€1.3bn)

- **1bn,** as part of measures to improve household purchasing power.
  Source: DG Treasury, Comparative Monitoring Note of 27 November

- **0.3bn**, for measures designed to provide care for vulnerable people.
  Source: DG Treasury, Comparative Monitoring Note of 27 November

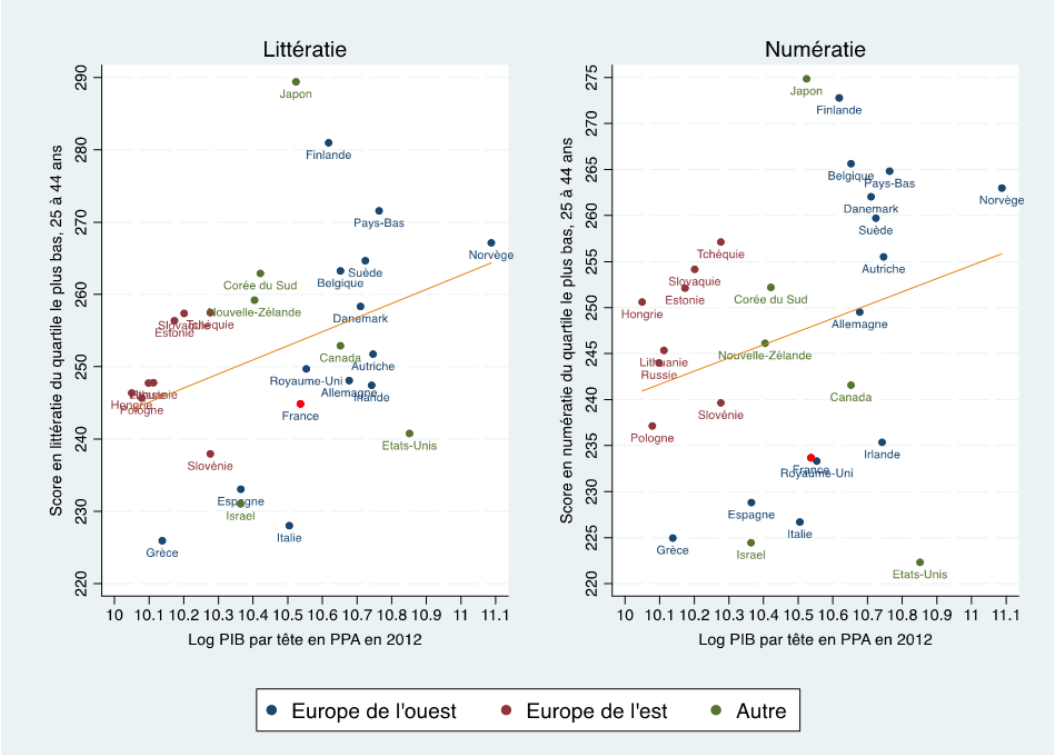
2) Reallocation measures (€24.9bn)

- **22 billion,** under various public investment programmes: digitisation programme for businesses and administrations, energy transition, development of green mobility....
  Source: DG Treasury, Comparative Monitoring Note of 27 November
- **0.9bn,** in support of R&D expenditure.
  Source: DG Treasury, Comparative Monitoring Note of 27 November
- **2 billion,** as part of tax measures designed to improve business competitiveness.
  Source: DG Treasury, Comparative Monitoring Note of 27 November

ANNEX 4

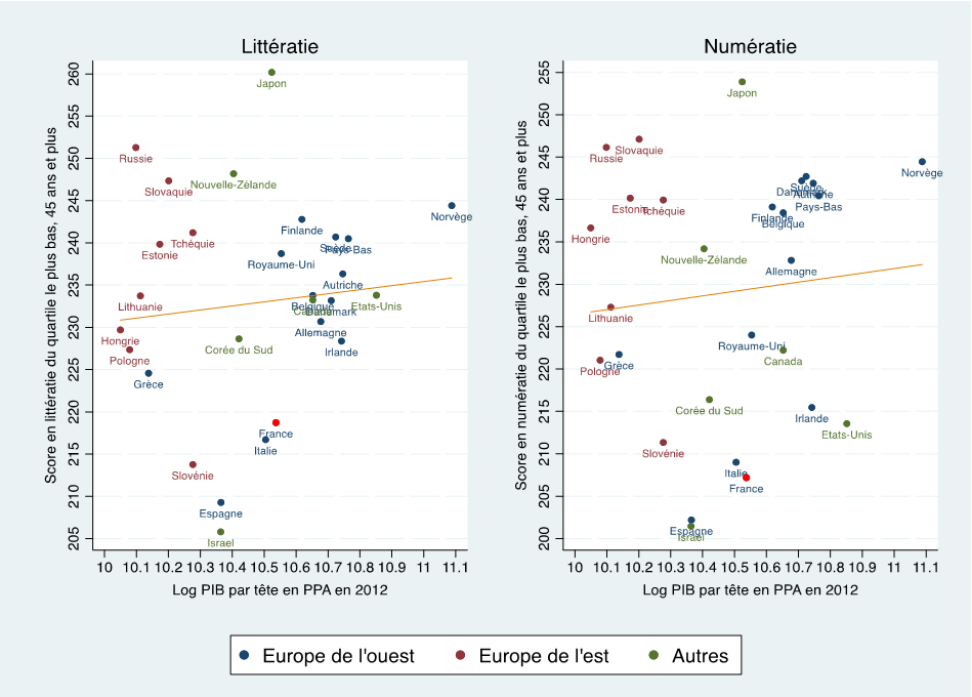
DISPERSION OF ADULT SKILLS

Figure A1 – Literacy and numeracy, adults (25 to 44 years old)



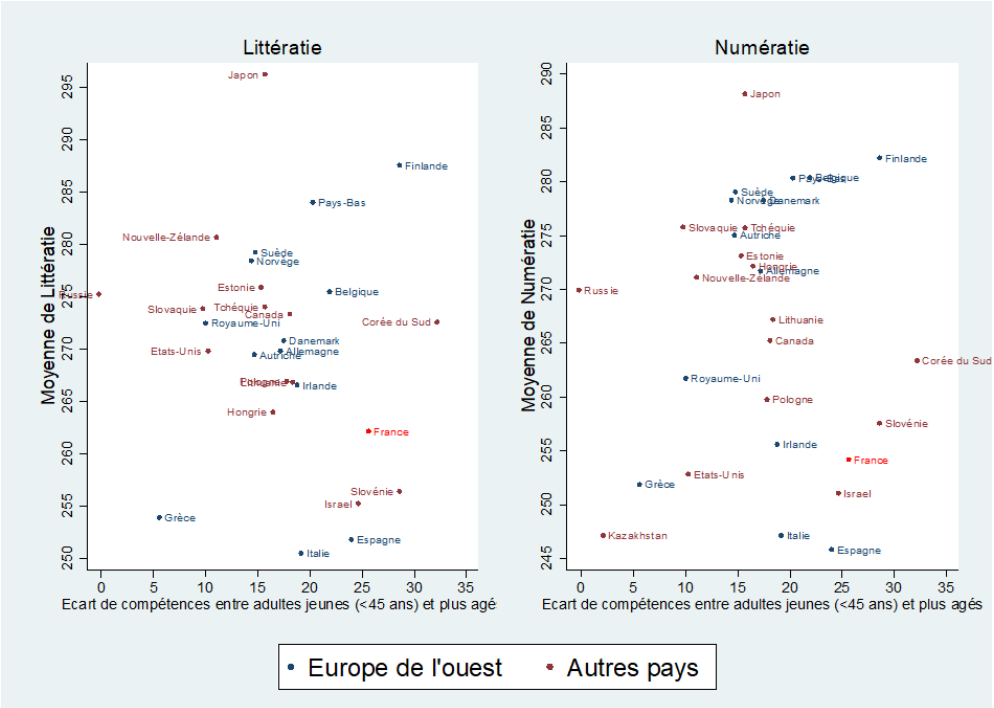
Source: OECD

Figure A2 – Literacy and numeracy, adults (45 years old and more)



Source: OECD

Figure A3 – Skills gap between adults less than 45 years old and older adults



Source: OECD

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