Prospects

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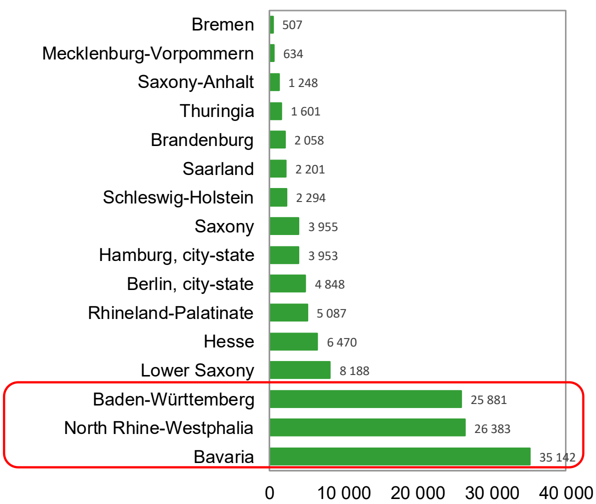
GERMANY – Impact of Covid-19

From the health crisis to managing the economic crisis

- **In many respects, the healthcare situation in Germany as it faces the coronavirus crisis is stronger than that of other European countries that have been hit harder by the epidemic. The number of people infected is certainly high, but deaths in Germany have remained more limited. Through its strategy of massive and targeted screening for infection and its proper medical infrastructure, the country has been able to handle this unprecedented health crisis. However, the epidemic is not over yet, and the spread is still sparse in the various regions.**
- **The first lockdown measures were issued by the Federal States at the beginning of March, and, by the 16th of that month, had become more uniform at the federal level. Massive closures of establishments like those recommended in France have been implemented, drawing a line between essential activities and others. All non-essential activities have been temporarily shuttered until 4 May, when gradual resumption of activity is expected to begin, while still ruling out any large gatherings of people.**
- **By analysing input/output tables, we can tentatively quantify the impact of the production shutdown on growth in the relevant sectors based on selected lockdown scenarios and the date for a phased restart of activities. And so, using this national accounting tool, we estimate that German growth could be reduced by 7 points of GDP in 2020, forecasting a major recession in the country.**
- **The fiscal responses for combating the devastating effects of the forced shutdown of a great many activities are judged to be up to the challenge: supporting businesses to keep them from failing, and protecting employees against massive lay-offs which could destabilise a large share of society. The cost of this economic support to the budget is €156bn or 4.5 points of GDP, but the cyclical damage resulting from this pandemic can be expected to generate an unprecedented public deficit in 2020, scuttling the fiscal austerity policy.**

Number of people with the Covid-19 virus



Sources : RKI, Crédit Agricole S.A.

Brief inventory of the health situation

As of 16 April, the Robert Koch Institute (RKI) counted more than 130,000 confirmed cases of coronavirus in Germany. This figure, which is viewed as high, is primarily the result of targeted and intensive screening of the population showing symptoms of the virus. The number of fatalities to date is 3,569, a rate of 2.7%. The largest number of deaths is observed in people over the age of 70 (86% of deaths), even though that age range accounts for just 17% of infections. The estimated

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number of people who have already recovered is more than 72,600.

All sixteen federal states are dealing with the spread of the virus, but three regions seem to be the focus of more cases: Bavaria, Baden-Württemberg, and North Rhine-Westphalia. Together they account for 67% of cases and 72% of deaths recorded, because they contain the cities with the highest population densities, including Stuttgart, Munich and Düsseldorf.

Key lockdown measures

The first measures to combat the spread of the virus were implemented on 9 March in the three main regions mentioned above and included cancellation of events with more than a thousand people, and self-isolation by those infected with the virus. Many states quickly decided to close schools and childcare centres (around 13 March), and Berlin prohibited gatherings of more than fifty people (14 March), closing bars, clubs and recreational spaces. On 21 March, Bavaria and Saarland imposed local curfews. While the first measures were taken locally, others had to be synchronised at the federal level to effectively combat the pandemic. Widespread closures of schools, childcare centres and many businesses came into effect on 16 March. Recreational and leisure activities, such as bars, clubs, theatres, museums, fairs, expos, cinemas and amusement parks have all had to close. Sports cannot be played in public or private facilities, and playgrounds are off limits. Lastly, shopping centres and "non-essential" points of sale are also closed. Operations still authorised include grocery outlets, pharmacies, pick-up and delivery services, service stations, banks and savings banks, post offices, laundries, newsagents and pet food shops. However, these must all meet strict sanitary, access and queue-avoidance requirements to stay open.

Estimated impact on growth

Using the input/output table (*see box*) taken from the national accounts, we can form simple scenarios of the duration and scope of the production shutdown in the sectors affected by the lockdown measures, to determine what the impact will be on the country's total value added.

Our scenarios of production shutdown by sector are based on statements by the government about sectors subject to restrictions and those authorised to stay open because they are considered essential to smoothly running the country, as well as information reported by the various producers' associations on the scope of current and projected shutdowns. The restrictive measures went into effect on 16 March, and, for a large part of the businesses involved, should begin to be phased out on 4 May. So, we estimate that the shock to production in these sectors has spread across a period of about two months. This is true of the automotive, machinery and equipment, textile and air transport sectors, for which we have assigned a 100% shock to operations during this time. Retail and wholesale businesses are impacted by a 50% drop in production, and the electrical equipment sector by a mere 30%. However, some segments like leisure, event planning, and food and lodging services are still projected to stay closed until 31 August, bringing their shutdown period to five and a half months. For these businesses, we have estimated a complete or 100% shutdown over the relevant period. The table below shows a summary of the main sectors impacted (out of 72 sectors reviewed) with their weighting in the country's value added, the presumed production shock and the estimated impact in points of GDP on each of the sectors. For the German economy as a whole, these various shocks are expected to cost approximately 8% in value added in 2020. The direct impacts of the forced business shutdown account for nearly 6.6% of the decline, while the side effects of its repercussions on intermediate consumption used in the other sectors are more limited. These estimates reveal that the scope of the expected shock to growth is quite a bit higher than the recession during the 2009 crisis, where the country saw a 5.6% drop in GDP.

Main sectors impacted	Shock duration (months)	Production shock (%)	Mains weight in VA	Estimated impacts in GDP points
Motor vehicles	2	100%	8%	-1,1%
Machinery	2	100%	4,9%	-0,6%
Wholesale trade exc. motor veh	2	50%	4,0%	-0,4%
Metal products	2	100%	1,5%	-0,3%
Retail trade exc. motor veh.	2	50%	3,7%	-0,3%
Accommodation and food services	5,5	100%	2,5%	-0,7%
Repair of machinery and equip.	2	100%	0,6%	-0,1%
Electrical equipment	2	30%	1,8%	-0,1%
Travel agency	5,5	100%	0,8%	-0,2%
Textiles,wearing	2	100%	0,6%	-0,1%
Air transport services	2	100%	0,4%	-0,1%
Sporting, recreation services	5,5	100%	0,4%	-0,1%
Total estimated impact on GDP				-8,0%

Therefore, the estimated growth shock is unprecedented in the post-war period, and the German government's measures show the need to shore up the economy to avoid cascading bankruptcies and the resurgence of mass unemployment, which has not been seen in more than a decade.

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The input-output model

The availability of input-output tables widely popularised the use of the Leontief Model[1]. Expressed on multiple scales[2], the model makes it possible to measure the impact of a rise or fall in the demand for a product compared to the total output of a nation's economy. It permits the simultaneous inclusion of the direct effects linked to the change in final demand for the product in question as well as the domino effects of this change in demand generated by inputs to production to all other sectors. This method therefore seems appropriate for making an estimate of the impact of production halt because of the lockdown imposed in connection with the public health crisis impacting the member states of the Eurozone. Using the production approach, it also allows simulations that make it possible to determine the different magnitudes of the shock based on assumptions about the duration and scope of the lockdown.

The analysis relies on the Input-Output Table (I/OT) derived from the national accounts. Constructed based on the current account asset-liability balance, the I/OT provides an overview of cross-sector linkages based on symmetrical tables of inputs to production by product or by industry. In addition to inputs to production, the I/OT brings together, for each industry and for the total volume of production of the national economy, the components of gross value added (GVA), the inputs and outputs, product supply and demand and the composition of supply and use.

For the record, the impact analysis based on the inputs and outputs is made possible by the technology matrix[3] which determines the quantity of inputs for production required to produce a product unit by an industry. Assumed to be constant[4], it is expressed as follows:

Let A denote the technology matrix n by industry, which contains all the technology coefficients a_{ij} such as:

$$a_{ij} = \frac{ci_{ij}}{P_j}$$

$$\Leftrightarrow$$

$$\frac{intermediary\ consumption\ of\ product\ i\ by\ branch\ j}{Output\ of\ branch\ j}$$

Let this denote a production function that is linear and homogeneous

$$Output = intermediary\ consumption$$
$$+$$
$$final\ demand$$

while the total production of each good or service x_n is equal to the sum of the products of its technology matrices and inputs to production to which final demand is added. You can then determine the production of each industry based on the following set of equations:

$$x_n = a_{n1}x_1 + .. + a_{ni}x_i + .. + a_{nn}x_n + f_n$$

This set of equations is reflected at the matrix level by:

$$X = Ax + F$$

where X is production, A the technology matrix and F final demand.

Demand is therefore expressed as follows:

Let I denote the identity matrix, $F = [I - A]X$

The definition of the inverse of a matrix allows the production matrix to be expressed:

$$X = [I - A]^{-1}F$$

The inverse technology matrix $[I - A]^{-1}$ is also called the Leontief matrix L.

$$L = [I - A]^{-1}$$

The Leontief model can be used to measure the direct and indirect impacts of a demand shock on production by taking the impacts on the industries producing the inputs for production into consideration as follows:

$$\Delta X = L * \Delta F = L * (F_1 - F_0)$$

where F_1 denotes demand after a shock to the upside or downside, F_0 the initial demand and ΔX the impact on production.

Post-shock production is equal to:

$$X_1 = \Delta X + X_0$$

X_1 will be the change in production directly caused by the change in final demand, and also indirectly by the variation in the production of inputs generated by the change in production caused by the change in final demand.

[1] Leontief, W.W., 1936. "Quantitative input and output relations in the economic systems of the United States". The Review of Economic Statistics, pp.105-125

[2] It can be geographical, local, regional, national and even international thanks to the Trade in Value-Added (TiVA) database provided by the OECD.

[3] For a more detailed demonstration, see: Miller, R.E. and Blair, P.D., 2009. Input-output analysis: foundations and extensions. Cambridge University Press. pp.25

[4] The determination of output coefficients relies on the assumption that the output function used to determine input requirements is linear and homogeneous of degree 1, and also stable.

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The government's financial aid packages

Faced with the forced closure of entire swaths of the country's economy, the German government has introduced a strategic support plan, referred to as a "protective shield" for businesses and employees. Its three main pillars include less stringent conditions for the use of short-time work measures, fiscal aid for businesses and, lastly, liquidity assistance to companies through the state-owned development bank KfW.

Easing the conditions for access to short-time work

The short-time work benefit can be activated once 10% of employees are affected by a significant reduction in their working hours, compared to the usual 30% threshold. There is no need to dip into working-time accounts, or even to use exceptions to the industry-wide agreements before making use of short-time work (normally, the law requires that businesses use all available means to avoid short-time work, so this is a relaxing of the traditional scheme). Amid the coronavirus crisis, the use of short-time work is retroactive to 1 March and will extend until 31 December 2020 (normally the scheme cannot exceed one year). Moreover, employers must inform the employment agency (*Agentur für Arbeit*) that they are reducing working hours. Employers are responsible for calculating and advancing the short-time work benefit, which the agency reimburses after approving the requests. Lastly, social security contributions on the portion that concerns employees under the short-time work scheme that must be paid only by employers (normally 50%) will be fully reimbursed by Germany's federal employment agency (*Bundesagentur für Arbeit*). Employees on short-time work are entitled to 60% of their net pay and benefits package, and those who have one or more children at home will get 67% of their salary. Temporary workers can also collect the short-time work benefit (which is not usually the case). Employees keep their social security net in the form of health insurance, pensions, long-term care insurance, occupational injury insurance and unemployment insurance. The purpose of the measures relaxing the rules governing access to short-time work is to protect as many jobs as possible, as was the case during the 2009 crisis. During that period, short-time work measures covered nearly 1.5 million people who experienced an average 30% reduction in their activity. Preliminary March 2020 data from the federal employment agency shows that nearly 470,000 businesses filed an application for short-time work, compared to an average of 56,000 applications filed per month during the 2009 crisis. The number of people affected could be triple 2009's figure, and their activity is likely to be cut to virtually nothing in some sectors, such as hotels and restaurants.

Fiscal aid measures

To support business liquidity and solvency, the federal government has deferred tax payments for companies that are struggling to meet them. It has also allowed prepayments to be rescheduled if a taxpayer's income for the current year is lower than the previous year's. Finally, it has decided to waive penalties for late tax payment until 31 December 2020 for people infected with the coronavirus.

Massive support for business liquidity

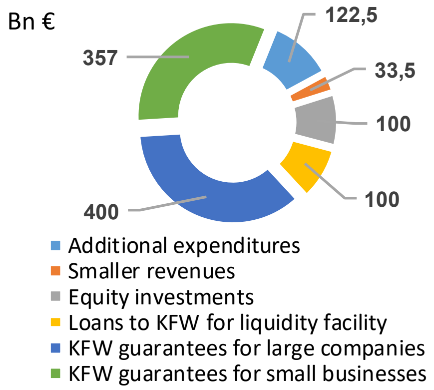
The assistance package provided to businesses can be divided into two categories. First, there is a €50bn "solidarity fund for small businesses and self-employed or freelance workers", providing a single three-month subsidy to cover companies' operating costs. This aid is centralised in the Länder (federal states) and can be combined with programmes already in place at the local level. Freelancers and businesses with up to five employees will receive up to €9,000. Freelancers and businesses with up to 10 employees (full-time equivalent) will receive up to €15,000. Freelancers also have easier access to basic social assistance to ensure their livelihood and guarantee their housing. The income threshold for claiming the social minimums is suspended for a period of six months, and the payment of benefits is being accelerated. Furthermore, a €1 billion aid programme to provide cash to VSEs and freelancers through the state-owned development bank KfW has been created.

Next, a fund earmarked for large corporations, the "Economic Stabilisation Fund", has been established. It is developed around three focal points: a €400bn framework of state guarantees to make it easier for businesses to refinance on the capital markets; €100bn in recapitalisation measures to increase the capital base and ensure solvency for businesses; and, finally, a loan package of up to €100bn to refinance the KfW's special programmes. This system is open to businesses with balance sheet assets of over €43m and over €50m in revenue. In addition, eligible companies must have more than 249 employees, and use of these measures is limited to the end of 2021. Finally, the recapitalisation measures may be subject to conditions, specifically in terms of executive pay, dividend distribution and the use of State funds by these companies.

The need to abandon a balanced budget

To deal with the scope of the expected economic shock, the German government has deployed unprecedented financial resources of nearly €156bn, or 4.5% of GDP in 2020. This includes the cost of the solidarity fund for small businesses and self-employed or freelance workers, which is €50bn or 1.4 points of GDP. A €69bn package is earmarked for social assistance to families, short-time work and tenant protection. People placed on short-time work will collect a family allowance supplement, as will those who have suffered a loss of income due to the closure of childcare facilities and schools. Moreover, the federal government is releasing an additional €3.5bn to purchase protective equipment for hospitals, support research in the development of a vaccine and repatriate Germans on holiday who are stranded abroad. These additional expenses total €122.5bn, added to a €33.5bn reduction in tax revenue due to 5% lower growth in 2020 (based on the scenario applied by the government in preparing this supplementary budget). In total, the measures approved will impact the budget by €156bn, or 4.5 points of GDP (one-time, discretionary, non-renewable measures). The exceptional scale of the economic shock justifies abandoning the balanced-budget rule that Germany has imposed on itself since the 2009 crisis. Thanks to the spectacular recovery of its budget balance since 2009 and its surplus accumulated since 2014, Germany can approach an exceptional public deficit with greater confidence. ■

Germany: the budgetary response to the crisis



Sources : Ministry of Finance, Crédit Agricole S.A.

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