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The macroeconomic spillover effects of the pandemic on the global economy

Emanuel Kohlscheen, Benoît Mojon and Daniel Rees

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Emanuel Kohlscheen
emanuel.kohlscheen@bis.org

Benoît Mojon
benoit.mojon@bis.org

Daniel Rees
daniel.rees@bis.org

The macroeconomic spillover effects of the pandemic on the global economy

Key takeaways

- *Given the historical persistence of economic activity, the reduction of GDP due to confinement measures is likely to drag on over several quarters. The total GDP shortfall could be as much as twice that implied by the direct initial effects of confinement.*
- *This persistence reflects in part two types of spillovers across countries. One is due to the risk that uncoordinated confinements lead to repeated virus outbreaks and confinements across the globe. Another is the more traditional trade and financial integration interlinkages.*
- *Economic spillovers and spillbacks across the major economic blocs are large. There is no immunity from the economic effects if the epidemic is controlled in only one or two regions. Countries should adopt confinement, border control and macroeconomic policies that internalise these global considerations.*

Introduction

The spread of the coronavirus (Covid-19) is an unprecedented shock to the global economy. The virus and the confinement measures to limit the number of patients that need intensive care have put large parts of the global economy on pause for several weeks. In addition, there is the risk that, until a vaccine or an efficient treatment is developed and distributed globally, countries may undergo additional waves of contagion after they recover from the initial effects of the pandemic.[1]

We simulate the propagation of the Covid-19-induced slowdown with a simple model of the global economy. The model is a global Bayesian Vector Autoregression (BVAR) model with five major economic blocs: the United States, China, the euro area, "other advanced economies" (OAE) and "other EMEs" (OEM).[2] These economies interact. Each of them causes spillovers to, and responds to spillbacks from, the other four blocs.

The economic consequences of the virus will depend on a number of factors, including: the direct effects of confinement measures to limit its spread; the required duration of these measures; the extent to which the direct economic effects persist and magnify; and the size of spillovers and spillbacks across regions. Our model has little to say about the direct effects of confinement measures which have, in any case, been extensively discussed elsewhere. Where it adds value, particularly compared with estimates based on mechanically adding up the costs of shutting down individual segments of the economy, is in

[1] See Ferguson et al (2020). The 1918 Spanish flu pandemic occurred in three waves, approximately three to six months apart. The second wave was the one that hit strongest.

[2] See Appendix A for a description of the model.

shedding light on the *multiplier* effects of an initial slowdown in activity, the likely *persistence* of the slowdown, and the extent to which developments in one economic region will *spill over* to others.

Accordingly, rather than forecast the precise size of the slowdown, we present estimates for a range of plausible assumptions about the direct impact of confinement measures on GDP. We also consider scenarios where the initial measures cannot prevent a second wave of infections. Given the unprecedented nature of the virus and policy responses, it is possible that the direct effect of the confinement policies could be either smaller or larger than the range of estimates that we present. However, because the economic mechanisms in the model are likely to apply regardless of the size of the initial hit to economic activity, the results are useful to illustrate the compounding of the initial drop in economic activity through spillover channels.

An economic simulation of a global pandemic

To simulate the economic effects of a global pandemic, we look at the effects of an initial "shock" that in isolation would lower GDP in every region of the world. This represents the direct effects of confinement policies to limit the spread of the virus. After the initial impulse, we allow the model to trace out the subsequent evolution of economic activity, reflecting the historical relationships between economic variables observed in the data, including the spillovers and spillbacks between regions of the world.

Because the direct effect of confinement measures is uncertain, we report simulations for four alternative scenarios. These four combine two assumptions on the initial reduction of GDP and its shape. Size wise, the "less severe" scenario is one where the direct effect of confinement measures lowers GDP by 2.5%. The "more severe" scenario doubles the effect of the confinement measures, so that the initial direct hit to GDP is 5%.[3] This range is broadly consistent with external estimates of the effects of these measures for confinements that last one to two months, even if there is enormous uncertainty about the estimates.[4]

Turning to the shape of the scenario, we also consider two alternative profiles for the effectiveness of the containment measures. The first one, called the V-type shock scenario, shows a "best case scenario" in which a single wave of confinement measures is sufficient to contain the virus. Consistent with what we observed so far, we stagger the confinement measures across countries and regions as follows:

- In China, confinement hits GDP exclusively in Q1 2020
- In the euro area and OAE, confinement is spread equally in Q1 and Q2 2020
- In the United States and OEM, 25% of the confinement takes place in Q1 2020 and 75% in Q2 2020

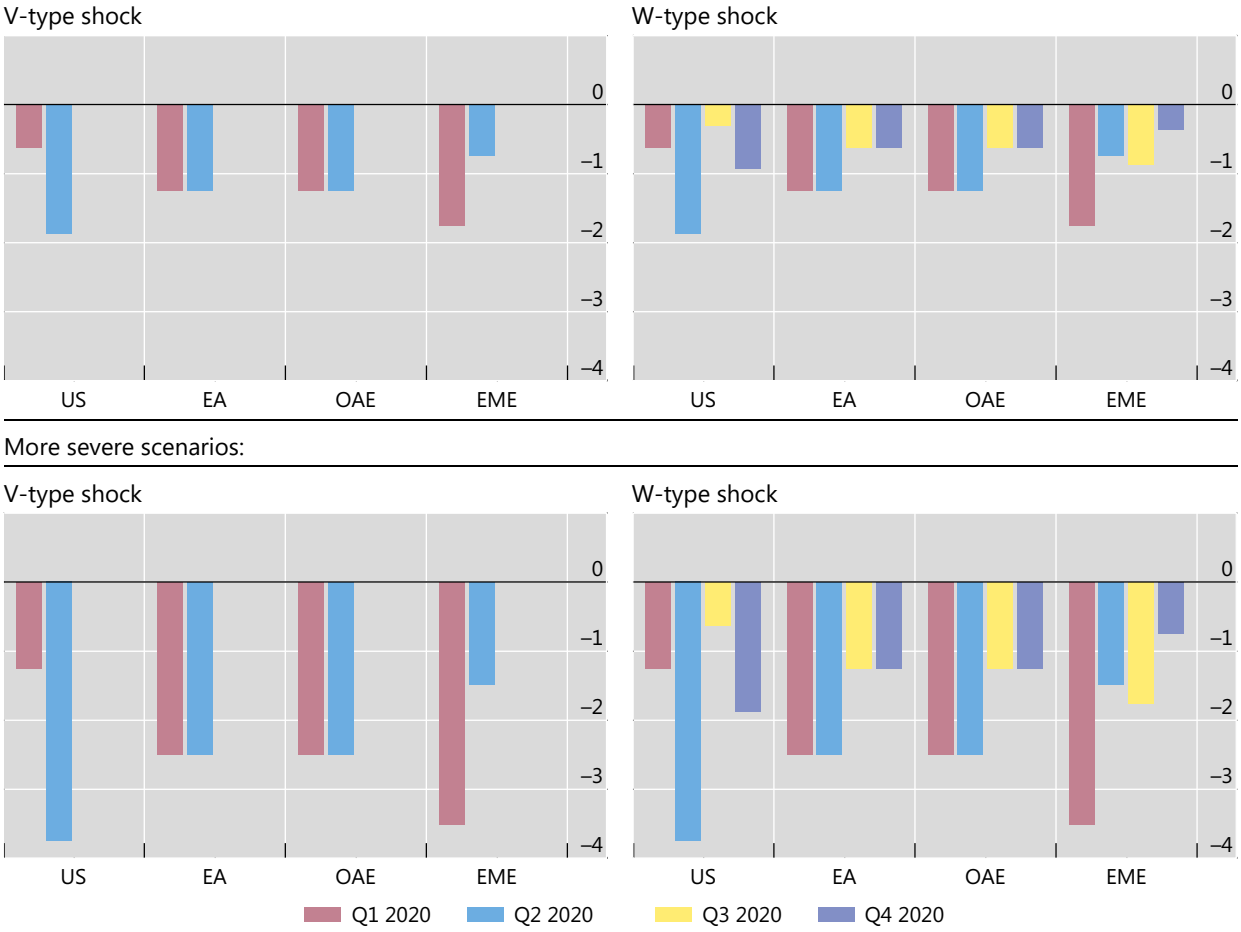
Unfortunately, in the absence of a vaccine or a treatment, we cannot rule out the possibility that the virus will re-emerge after the confinements are unwound. To account for this, we also consider a double wave pandemic (a W-type shock scenario). In this scenario, we assume that a second wave of confinement follows two quarters after the first wave. The exogenous effects of the second wave on domestic GDP are, however, only half as large as the first round. This reflects the possibility that countries "learn" and "calibrate" containment measures, so as to damage economic activity less than in their reaction to the first wave of the virus. Graph 1 shows the sequences of shocks for each of the four scenarios.

[3] The two scenarios are equivalent to an initial hit to GDP growth of –10% and –20% in annualised rates.

[4] For example, OECD (2020) estimates that the direct effects of a 45-day confinement would lower annual GDP by about 3%. INSEE (2020) estimates a 3% GDP loss for every month of confinement in France.

Local impulses on output[1]

In per cent — Graph 1



OAE = AU, CA, CH, GB, JP and SE; EME = BR, CN, ID, IN, KR and MX.

[1] This graph shows the sequences of shocks to the level of GDP that we apply to each bloc and scenario. Source: Authors' calculations.

Graph 2 (left-hand panel) shows the implied evolution of the level of GDP during the first eight quarters for each of the regions in our model. In the case of the more severe V-type scenario, the initial –5% impulse to output leads to a trough in the level of GDP of between 8.5% and 11% (below its baseline, ie its predicted level in the absence of the shock) in the second quarter of 2020. For the less severe scenario, the decline in GDP is half as large. In both cases, the decline in GDP is eventually around twice as large as the initial impulse, highlighting the powerful effect of multipliers and spillovers in propagating contractions in activity within and across economies.

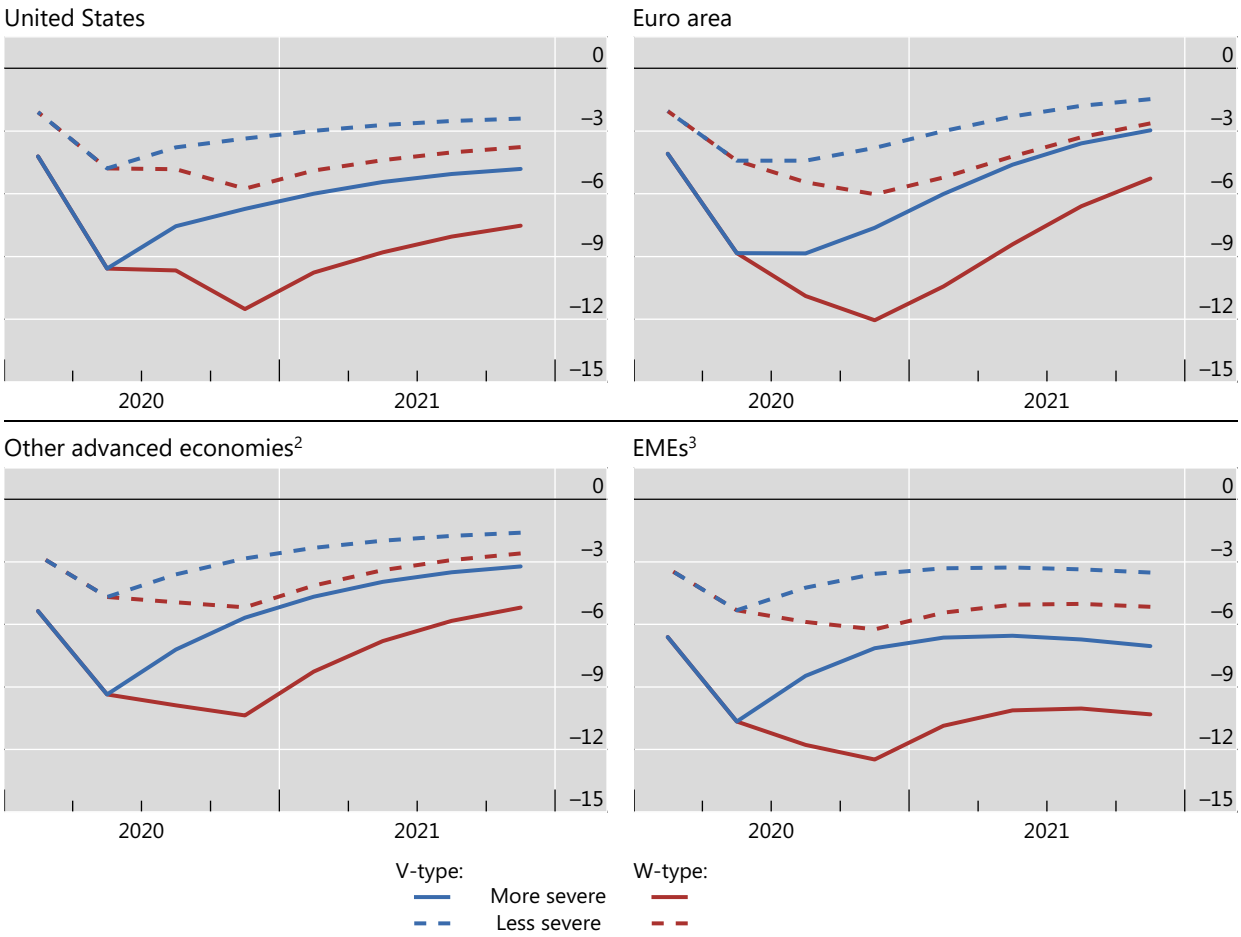
Even though we assume that containment measures are relaxed in the second half of 2020, the output losses for the V-type scenarios are protracted, and in all regions output in Q4 2020 is below its Q1 2020 level. On average, the full-year GDP loss due to the V-type shock would be between 1.5 and 2 times the initial impulse. The declines would be concentrated in the first half of the year, while the second half would be characterised by a recovery in growth rates. But the recovery is modest, and even in Q4 2021 the level of GDP in all regions would still be below what it would have been had the pandemic not occurred.

In the W-type scenarios, the weakness in economic activity persists for even longer. In most regions, GDP growth is negative throughout the 2020 calendar year and a sustained recovery would not begin until 2021, or around six months later than in the V-type scenarios.

GDP effects of the pandemic[1]

In per cent

Graph 2



[1] This graph shows the responses of GDP in the blocs of the VAR to the sequence of shocks shown in Graph 1. [2] AU, CA, CH, GB, JP and SE. [3] BR, CN, ID, IN, KR and MX. Source: Authors' calculations.

All these results assume that the behaviour of the economy can be approximated by the estimated model, which reflects the average relationships of the model variables as estimated between 1997 and 2019. On the basis of such estimates, the initial hit to activity from the virus and containment measures will translate into an inertial recovery. Although this assumption is unlikely to be strictly accurate, it is unclear in which direction its bias would be. On the one hand, because confinement measures reflect a deliberate policy of artificially lowering aggregate demand and supply, activity could bounce back more quickly than usual once the measures are relaxed.[5] On the other hand, because large global shocks could have non-linear effects on economic activity, including through the disruption of global value chains, higher risk aversion, hysteresis in labour markets or permanent changes in consumption patterns that our model does not take into account, our model could underestimate the size of the effects.

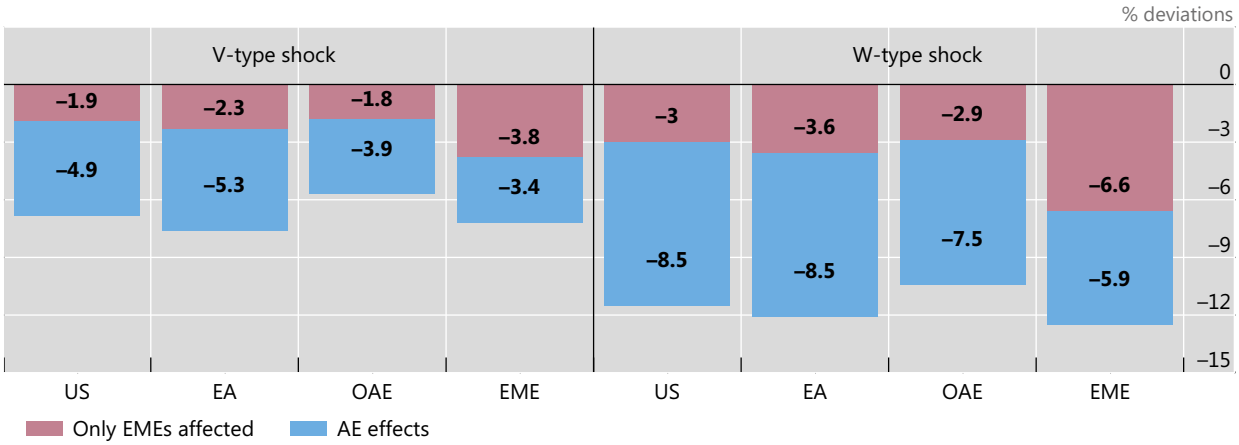
[5] Our approach could also overstate the economic effects of the virus if the historical individual country shocks that we identify in the data include "global" shocks that affect many economies simultaneously, as we will be double-counting those shocks.

Spillovers and spillbacks

The above results assume that the severity of the virus is similar throughout the world. That is, the direct initial shock is of similar size everywhere, although distributed differently between Q1 and Q2. An important question is how much of the decline in GDP is due to the domestic effects of the virus on economic activity, and how much reflects spillovers and spillbacks from weaker economic conditions overseas? Relatedly, how much smaller might the economic consequences be for a region that successfully limits the spread of the virus domestically, if other economies still experience a severe outbreak?

We address these questions in two steps. First, we simulate the model assuming (the counterfactual) that the virus directly affects only China and OEM, while advanced economies are spared. Graph 3 shows the key results of this exercise for a "more severe" scenario.[6] The red bars in Graph 3 show the output losses in Q4 2020 if the virus affects only EMEs. These show the direct effect of the virus on the EMEs, and the spillovers from EMEs to advanced economies. The blue bars show the difference between this exercise and the estimates for the "more severe" scenarios shown in Graph 2.

Covid-19: Global economic spillovers are large[1] Graph 3



OAE = AU, CA, CH, GB, JP and SE; EME = BR, CN, ID, IN, KR and MX.

[1] This graph shows output in Q4 2020 relative to the benchmark with no additional shocks. Figures represent per cent deviations from the baseline without shocks. The red bars represent the magnitude of the effects if only emerging market economies are directly impacted by the pandemic. The blue bars represent the additional effect if advanced economies are also impacted.

Source: Authors' calculations.

The results point to large spillovers in both directions. In case of a W-type shock, for instance, the loss of output (relative to the benchmark without the virus shock) in EMEs would be only between half-to-two-thirds as large if only EMEs are were affected by the virus. For advanced economies, spillovers from EMEs account for between 25 and 30% of the GDP shortfall in Q4 2020. These spillovers would be larger for the euro area, for which exports account for a larger share of GDP, than for the United States.

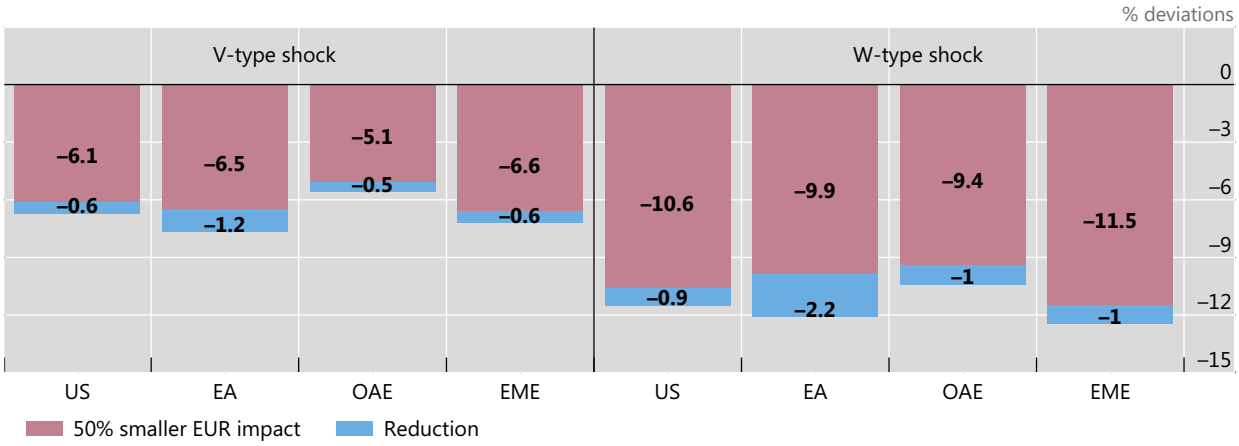
In the second step, we simulate another scenario to illustrate the extent to which an economy can insulate itself from the economic consequences of the virus in the absence of effective containment measures abroad. In this scenario, we consider that the effects of containment measures on euro area GDP are halved, ie the domestic GDP shock is –2.5% instead of –5%. But the shock still hits other regions in the model by –5%. Graph 4 shows the results of this exercise. Once again, spillovers are substantial. In particular, for the euro area, the decline in GDP after four quarters would still be 6.5% relative to the benchmark without the negative demand shock in the case of a V-type scenario, and 9.9% for a W-type

[6] In the less severe scenario, the declines in output are half as large. However, the relative contribution of spillovers and spillbacks to the contraction in GDP is the same as in the more severe scenario.

scenario, even though the initial impulse to domestic GDP is only –2.5%. These relatively small improvements in economic outcomes reinforce the importance of international cooperation in designing policies to limit the spread of the virus and combat its economic consequences.

Domestic mitigation alone is ineffective[1]

50% percent reduction of shock in EA — Graph 4



OAE = AU, CA, CH, GB, JP and SE; EME = BR, CN, ID, IN, KR and MX.

[1] This graph shows output in Q4 2020 relative to the benchmark with no additional shocks. Figures represent per cent deviations from the baseline without shocks. The red bars represent the magnitude of the GDP effects if the initial impact in only the euro area is halved.

Source: Authors' calculations.

Conclusion

The key message from the simulations presented here is that the economic spillovers and spillbacks of pandemic-type recessions are very large.

International coordination of macroeconomic policies is crucial at two levels. First, uncoordinated confinements raise the possibility that the virus will re-emerge sequentially across the globe. This would mean repeated confinements and their associated heavy toll on economic activity. Second, even a country that engineers a domestic policy package that successfully limits its domestic slowdown will not be immune from insufficient or ineffective policies put in place in other parts of the world. No one can hide from the consequences of a pandemic, and unilateral macroeconomic policies are doomed to fail.

On a much more positive note, our model reflects only the "average" endogenous monetary and fiscal responses in each country as estimated from 1997 to 2019. Policy packages unveiled so far are much larger than those. Additionally, some countries have also taken crucial actions to preserve existing employment relations and avoid widespread firm-closures and bankruptcies. This should help to limit the downturn in aggregate demand and assist firms to restart production rapidly. That said, as we are in uncharted waters, it remains to be seen how spending responds when economies are still under lockdown.

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