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COVID-19: MIND THE UNCERTAINTY !

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THE TRIPLE COVID BLOW AND INITIAL STATE AID RESPONSE

The Covid-19 lockdowns have dealt a triple blow to economies worldwide. [1] First, they have damaged consumer and business confidence. Second, they have hit supplies by separating workers from productive assets and disrupting supply chains. Third, they have reduced demand by forcing households to stay home and by slashing the income of many.

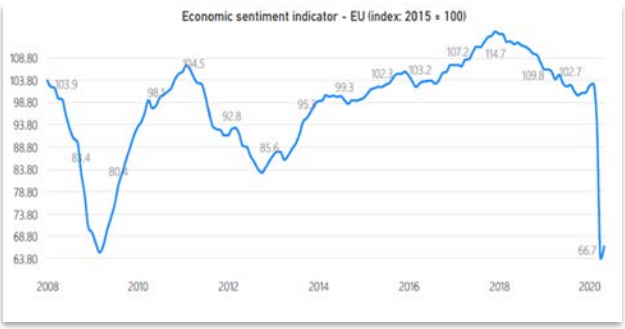
To limit the damage, protect the most vulnerable households, and preserve productive assets in affected industries, governments around the world have adopted expansive fiscal policies. In the EU, these measures have included increases in temporal unemployment benefits, temporary tax breaks for firms, loan guarantees, export guarantees, liquidity assistance and even lump-sum transfers to firms. For its part, the European Commission has reportedly approved – between February and May this year – around €2.2 trillion of Member State Aid measures to combat the impact of the virus. [2]

The first round of State Aid packages has mitigated the shock and immediate harm suffered by firms and households, and most commentators have welcomed the swift reaction of the EC and Member States. Nevertheless, commentators have also raised the issue of the risk of potentially severe distortions that State Aid policies could create if applied unevenly across EU member states.[3] There is also a risk of 'wars of attrition' between member states in providing support.[4] Others have warned that overzealous aid risks missing the rare opportunity to rid the economy of "zombie" firms which crowd out business opportunities for growth of their more efficient rivals.[5]

Its sudden onset and the force with which the pandemic brought the economy to a halt, likely justified the open-handed approach in the first round of policy responses. It seems, however, increasingly likely, given how hard some segments of the economy have been affected (e.g. tourism or the airline industry), that a second round of fiscal measures, including State Aid, will be required to avoid a long-lasting economic downturn.

In contrast to the first round, both the EC and Member States will need to calibrate the second round of policies more carefully in order to minimise the risk of distorting competition and to avoid introducing other inefficiencies that could defeat the very purpose of these measures. Alongside the warnings of the risks related to State Aid policy that other commentators have raised, we would like to add the need for the EC and Member States to consider the role of uncertainty in that round of policy design.

The Economic Sentiment Indicator for the EU decreased sharply after the outbreak of Covid-19 – what will the rebound look like? [Source: Eurostat, E.CA Economics]



[1] The views expressed here are of the authors and do not represent the opinions of E.CA Economics. We thank Hans W. Friederiszick, Vilen Lipatov, Massimo Motta, Damien Neven, Rainer Nitsche, Andrew Swan and Frank Verboven for helpful comments on an earlier version of this article. All errors are our own.

[2] Verwey, Maarten, Sven Langedijk and Robert Kuenzel, 2020. Next generation EU: A recovery plan for Europe. Vox CEPR Policy Portal.

[3] Motta, Massimo and Martin Peitz, 2020. "EU state aid policies in the time of COVID-19. Vox CEPR Policy Portal.

[4] Neven, Damien, 2020. The implementation of state aids control rules in the current crisis. A short comment. Forthcoming in the *Journal of Antitrust Enforcement*.

[5] Padilla, Jorge and Nicolas Petit, 2020. Competition policy and the Covid-19 opportunity. *Concurrences*.

The empirical evidence suggests that the relationship between uncertainty and the level of investment is generally negative, and that uncertainty can have a strong impact. The strength – in theory also the sign, as we later explain – of the uncertainty-investment relationship is determined in the interaction of several parameters of the business environment. Yet, aid policy-design choices can affect these parameters and the ways in which they interact. Bad choices may enhance the negative effect of uncertainty, while the right ones can mitigate it. If, therefore, one of the objectives of the aid policy is to enhance – or at least not curb – the propensity to invest, it is important to calibrate it with an understanding of the role of uncertainty.

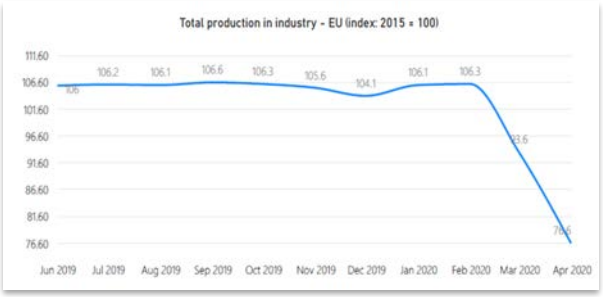
THE STRONG INCREASE IN UNCERTAINTY INDUCED BY COVID-19 HAS CAUSED DELAYS IN INVESTMENT PLANS

The present crisis seems to be different from other recent crises given the high level of Covid-induced uncertainty for households and businesses alike. If an effective vaccine becomes available soon, the economy may return to normal almost as quickly as it came to a standstill. If it does not, additional lockdowns may be necessary, which could have long-lasting structural effects on the economy, triggering a potentially painful transition to what would become the new "normal". Between these extremes exists a range of intermediate scenarios. Little is known on how likely each of these scenarios are. The present situation seems indeed like an archetype of uncertainty. [6]

The index of economic policy uncertainty spiked in Belgium with the spread of the virus. [Source: see footnote 6; E.CA Economics]

Covid-19 has not only directly affected investment and consumption by forcing governments to adopt measures that have separated workers from productive assets and many households from a source of income. It has also had an indirect, and potentially equally important, effect through this strong increase in uncertainty. Baker, Bloom and Terry argue that as much as half of the Covid-19-related output contraction in the US may have come from Covid-induced uncertainty.[7] A survey of firms in Belgium found that the vast majority are postponing investment for the same reason.[8] More generally, empirical studies suggest that uncertainty tends to delay firms' investment plans and reduce household consumption.[9]

The index of total production in the EU countries fell sharply between February and April 2020. With that, investments went down too. [Source: Eurostat; E.CA Economics]



While empirical studies suggest a negative relationship between the propensity to invest and the level of uncertainty, in theory the sign of the relationship is ambiguous. Depending on the parameters that characterise the firm and its business environment, it can be either positive or negative.[10]

One class of theories that find a negative uncertainty-investment relationship assumes that investors are averse to risk. Such investors require a higher expected return on their investment – and therefore may invest less – as uncertainty increases. The effect of uncertainty is stronger if in addition to risk aversion we assume that firms operate a technology with decreasing returns to scale. Another class of theories assumes risk-neutral investors and constant returns to scale. In these theories, the sign and strength of the relationship between uncertainty and investment is determined by the degree of market power and the extent to which investments can be recovered in future bad states of

[6] For more information on the Economic Policy Uncertainty Index for Belgium, see Algaba, Andres, Samuel Borms, Kris Boudt and Jeroen Van Pelt, (2020). The economic policy uncertainty index for Flanders, Wallonia and Belgium. Research note.

[7] Baker, Scott R., Nicholas Bloom, Steven J. Davis and Steven J. Terry, 2020. COVID-induced economic uncertainty. NBER Working Paper No. 26983.

[8] See https://www.nbb.be/en/articles/heavy-consequences-coronavirus-crisis-belgian-firms-has-led-huge-delays-investment.

[9] Besides Bloom et al. (2020), both Bloom (2009) and Guiso and Parigi (1999) provide evidence that higher degrees of uncertainty may have a negative impact on the economic activity in the short-term. See Bloom, Nicholas, 2009. The impact of uncertainty shocks. *Econometrica*, 77(3): 623–685, and Guiso, Luigi and Giuseppe Parigi, 1999. Investment and demand uncertainty. *Quarterly Journal of Economics* 114(1): 185–227.

[10] Abel, Andrew B. and Janice C. Eberly, 1994. A unified model of investment under uncertainty. *American Economic Review* 84(5): 1369–1384; Caballero, Ricardo, 1991. On the sign of the investment-uncertainty relationship. *American Economic Review* 81(1): 279–288.

the environment in which a firm operates.[11] Henceforth, we focus on the latter class of theories as they have interesting implications for State Aid policy.

THE COMBINATION OF MARKET POWER AND IRREVERSIBILITY OF CAPITAL CAN RESULT IN INVESTMENT DELAY AS UNCERTAINTY INCREASES

For risk-neutral firms operating a constant return to scale technology, a necessary condition for a negative sign of the relation between uncertainty and investment is that investments are irreversible (or at least not recoverable in full). Irreversibility constrains the ability to redeploy capital in bad states of the economy and thus establishes a link between the expected marginal returns on investments today and tomorrow. An example of an uncertain environment with irreversible investments could be a mining firm facing the choice between starting the mining of a deposit today and delaying the decision until the future. The firm is uncertain about the future evolution of the price of ore. If it waits for the resolution of some of that uncertainty, the firm may avoid a costly mistake, while still preserving the flexibility to start mining operation in the future. The value of this flexibility – that is, of delaying the mining operations – increases as uncertainty increases. If, however, investments were easily reversible, the firm would not have to postpone them to preserve its future flexibility with respect to capital stock. In this case, the value of the "real option" to delay investment and decide on its level later once uncertainty has been resolved would be zero.

While irreversibility is a necessary condition, it is not *sufficient* for a negative sign of the relationship between uncertainty and investment level.[12] Irrespective of whether the investments are irreversible or not, the relationship between uncertainty and the propensity to invest remains *positive* for a risk-neutral firm operating constant returns to scale technology in a highly competitive market. This is because with constant returns to scale and in conditions of perfect (or nearly so) competition, the profit function is convex in price.[13] For a convex profit function, a mean-preserving increase in price uncertainty always raises the expected return on a marginal unit of capital, which increases the investment level.

The sign of the relationship between uncertainty and investment level turns from positive to negative when we add sufficient market power in addition to the assumption of irreversible (or, more generally, not fully recoverable) investments. Indeed, economists like McDonald and Siegel, Arrow, Bernanke, Dixit and Pindyck have shown that uncertainty over future demand can reduce current irreversible investment for a monopolistic firm.[14] The intuition for the sign reversal is roughly this: a firm operating in a highly competitive environment – that is, one that faces a highly elastic residual demand – cannot affect price much by adjusting its output. With constant returns to scale, this implies that the profitability of future investments does not depend – or does not depend much – on the level of past investments. The option value of delaying the investment is then zero (or small) and the relation between uncertainty and the propensity to invest is non-negative. In contrast, as demand becomes less elastic, the firm would have to reduce its price to expand output. This reduction in price means that an increase in investment today will curtail the expected marginal profitability of future investments. If the curtailment effect is sufficiently strong, the relationship between uncertainty and the propensity to invest today will turn from positive to negative. A further increase in market power enhances the negative relationship further.[15]

TO AVOID UNNECESSARILY DELAYING INVESTMENT IN THE PRESENTLY HIGH LEVEL OF UNCERTAINTY, AID PROGRAMS SHOULD AVOID SETTING UP HURDLES TO THE REDEPLOYMENT OF FAILED INVESTMENTS AND SHOULD PRESERVE COMPETITION

A first important implication of the interplay between investment irreversibility and market power is this: State Aid policy should not come with conditions that significantly enhance the degree of the irreversibility of investments – be it in human or physical capital. Earmarks to aid packages, such as environmental goals or employment commitments, could reduce the effectiveness of State Aid and other expansive fiscal policies if they limit the extent to which firms can recover their investments in bad states or more generally, when the future reveals that these investments have not been justified.[16]

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[11] For a detailed discussion of the different theories on the relationship between uncertainty and investment, see Bloom, Nicholas, 2014. Fluctuations in uncertainty. *The Journal of Economic Perspectives* 28(2): 153–175.

[12] Abel and Eberly (1994).

[13] The intuition for the convexity of profit function under constant returns to scale and perfect competition is as follows: if the output price rises by some multiple, while the input prices (and combination in which the firm employs them) do not change, the revenue will rise by the same multiple. This implies a linear relationship between price and profits. However, the firm can always adjust the combination of inputs to a more optimal combination as the output price changes (giving rise to convexity of the profit function).

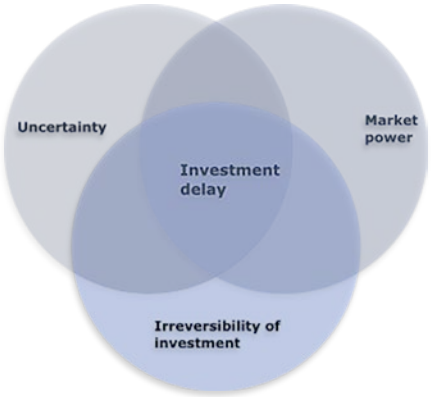
[14] McDonald, Robert and Daniel Siegel, 1986. The value of waiting to invest. *Quarterly Journal of Economics* 101(4): 707–728; Arrow, Kenneth J., 1968. Optimal capital policy with irreversible investment. In *Value, capital and growth, essays in honor of Sir John Hicks*, ed. J.N. Wolfe; Bernanke, Ben S., 1983. Irreversibility, uncertainty and cyclical investment, *Quarterly Journal of Economics* 97(1): 85–106; Dixit, Avinash K. and Robert S. Pindyck, 1994. *Investment and Uncertainty*. Princeton University Press.

[15] Guiso and Parigi (1999) report empirical evidence for the theoretical prediction that higher degrees of market power can enhance the relationship between uncertainty and the investment level.

[16] For example, the State Aid package worth EUR 7 million for Air France is linked to e.g. the condition to reduce CO2-emissions. See e.g. https://www.dw.com/en/lufthansa-mulls-options-as-air-france-state-aid-strings-revealed/a-53325173.

The second implication is that, in order to avoid (exacerbating) the negative relationship between uncertainty and investment, State Aid measures should be calibrated in a way that preserves competition – within and across borders. Indeed, economic theory teaches us that in the present context, further loss of competition would cause harm not only for the standard reasons, as many commenters have highlighted, but also because it would reinforce the potential negative effect of uncertainty on the propensity to invest.

Together, high levels of uncertainty, irreversibility of investments and market power can result in investment delay. A well-designed policy aims to minimise the scope for interaction of these three factors.



At the same time, the inverse relation between market power and uncertainty does not necessarily justify a more stringent merger control. This is because broad-reaching and harsher merger enforcement could inordinately restrict the options for firms to recover investments in the future, (further) enhancing the degree of irreversibility and thus curtailing investments through the mechanism described above.[17]

Concerning irreversibility of investments, the recently expanded Temporary Framework may be taking a step in the wrong direction. This is because the Framework prevents beneficiaries of recapitalisation aid other than small and medium-sized businesses from acquiring "a stake of more than 10% in competitors or other operators in the same line of business, including upstream and downstream operators."[18] This rule takes away a potentially efficient and effective option for the exit of a firm – or a part of it – that failed in its investments. If the rule stays in place over a prolonged period, it could impede investments.

To the extent that the objective of the Temporary Framework's ban on acquisitions is to prevent firms from using State Aid to enhance their market power, this would be consistent with the implications of the theory describing the relationship between uncertainty, market power and irreversibility of investments. However, given the potential role of mergers in facilitating the recovery of failed investments – thereby relaxing the irreversibility constraint on investment – and because the ban also applies in conditions where there are no competition concerns, it may be counterproductive.

A rigorous merger review – possibly more so than in normal times – would likely achieve the same objective of preserving competition, without adding much in terms of hurdles to the exit of firms and to divestment and thus potentially reinforcing the negative relationship between uncertainty and investment.

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It would be an impossible task, especially in current circumstances, to account for every possible consideration in the design of fiscal interventions and aid policy. The reaction of the European Commission and Member States has had to be swift and the quantum of measures larger, to prevent a massive shock to the economy and to mitigate harm to households. Nevertheless, we think the next rounds of interventions will have to be designed – and communicated – more carefully, taking into account the important role – and the interaction between – uncertainty, irreversibility of investments and market power, alongside other factors.

[17] Indeed, from the perspective of shareholders of the target company, an acquisition can be a way of recovering a failed investment in human and physical capital. This may also be the case from the perspective of the target firm's management, when the acquisition takes the form of a sale of a part of the company's assets.

[18] See https://ec.europa.eu/commission/presscorner/detail/en/ip_20_838. Note that recipients of loans and loan guarantees are not included in the ban. Moreover, if the beneficiary of recapitalisation can establish that acquisition is necessary to ensure its viability, it may be allowed.

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