Central Banking in the Time of Covid

by

Alan S. Blinder, Princeton University

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Alan S. Blinder
Princeton University

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"When the facts change, I change my mind – what do you do, sir?"
— John Maynard Keynes

Introduction

The Merriam-Webster dictionary (online version) defines a *crisis* as "an unstable or crucial time or state of affairs in which a decisive change is impending, *especially* one with the distinct possibility of a highly undesirable outcome." By that definition, central banks around the world may never have faced a more acute financial crisis than the one that confronted them in the early months of 2020.

The pandemic was, of course, in the first place a *public health crisis*: Massive numbers of people were contracting a previously-unknown and frighteningly-contagious disease; many were dying from it. It also created a momentous *macroeconomic crisis*: National economies were crumbling, and unemployment was soaring. But most to the point of this lecture, it also presented central banks with an actual or incipient *financial crisis*: Markets around the world were either shuddering, cratering, or shutting down—depending on the country and the market you were looking at. Naturally, people and governments in most countries turned to their central banks for help.

By and large, the central bankers delivered—both in quantity and quality. Their responses were not perfect, of course. How could they have been when Covid-19 presented sudden and

novel challenges for which there was no pre-existing playbook. But central banks generally rose to the occasion and performed well. There is simply no doubt that national economies are in far better shape today than they would be if central bankers had sat idly by and watched the public health and fiscal authorities fight the pandemic alone.

But what have we learned from this episode (and from the many financial crises that preceded it) about best central banking practice in a crisis? This lecture seeks to enunciate and discuss a few key principles that either did, or should have, guided central bank reactions to the pandemic. Where I use concrete examples, they are mainly from the United States; but the principles, I believe, are quite general—at least for advanced economies.

A short and only slightly inaccurate summary of what follows is this: Take everything you thought you knew about best central banking practice, and multiply it by minus one! For openers,…

Speed Kills

A crisis caused by some highly unusual—perhaps even unique—emergency, such as a pandemic, has several special features. Perhaps the most dramatic is that it hits the economy suddenly, probably with little or no warning, and most likely hits it hard, else we would not deem it a "crisis." These two characteristics—speed and severity—carry at least three clear implications for monetary policy.

First, the central bank will have little or no time to prepare for the crisis in advance—to "foam the runway," as they say. Under normal circumstances, a capable central bank should and would try to act somewhat *preemptively*, looking ahead and taking—or at least initiating—

appropriate mitigating policies.[1] But when a crisis hits suddenly, such preemptive actions are out of the question. One clear implication is that monetary policy will almost certainly find itself "behind the curve" and therefore playing catch-up. The obvious advice here is: Catch up as fast as you can. Proceeding in baby steps, which is the norm in central banking, won't do.

Second, the well-known lags between monetary policy *decisions* and the *effects* of those decisions on the economy pose a severe handicap to the use of monetary policy to limit the damage. In a dire emergency, standard policy actions (such as cutting interest rates) that will boost aggregate demand in, say, a year or two are plainly not up to the task—even if the central bank is not at the effective lower bound. This unfortunate fact holds (at least) three implications for monetary policy, two of them obvious.

The first obvious implication is that monetary policy may have to take a back seat to fiscal policy, which can, at least in principle, boost aggregate demand expeditiously by, for example, granting large transfer payments to households—as the US government did in 2020 and 2021.

The second obvious implication is that monetary policy must do whatever it can—such as cutting interest rates to the floor—*immediately*, thereby, in what may now be ancient parlance, reducing the "inside lag" in monetary policy to zero even as it must live with the "outside lag." So, for example, the Federal Reserve reduced its policy rate (the federal funds rate) to its definition of "zero" in a matter of days.[2]

[1] In this respect, many central banks, certainly including the Federal Reserve, performed poorly *before* the global financial crisis of 2007-2009.

[2] The Fed's definition of "zero" is the range between zero and 25 basis points. It insists that terrible things will happen if the funds rate goes negative, despite experience to the contrary in other countries.

The less obvious implication of these long outside lags is that the central bank should take every possible step to reduce them—which won't be easy. One possibility is to make it crystal clear to the financial markets that extremely low short rates will prevail for a long while, thereby (hopefully) pulling down intermediate and long rates quickly. The Fed and many other central banks did that, of course, as the pandemic took hold. Notably, having built up high *credibility* in advance may be crucial when it comes to influencing expectations. For forward guidance to have serious impacts, the central bank must be believed. Of course, every monetary authority strives for credibility, even under normal circumstances. My simple point here is that credibility becomes even more critical in crisis times.

The third "normal" function that central banks may have to speed up is identifying instances of poor liquidity or weak spots in credit markets—and then moving quickly to shore them up. This role, which was well-articulated by Bagehot in 1873, was painfully obvious in the Great Financial Crisis, but perhaps less so in the pandemic crisis. The latter, however, may have been because the Fed and other central banks stood up emergency lending and liquidity facilities so quickly in 2020 that the "cure" preceded the "cold." At least in that limited sense, central banks did manage to foam the runway.

That said, it may be devilishly difficult to distinguish between illiquidity and insolvency in time of crisis. Fears of insolvency quickly lead to huge demands for liquidity, in the modern, market-based version of old-fashioned bank runs. Conversely, shortages of liquidity may necessitate fire sales which imperil banks' solvency by inflicting capital losses. Both of these problems arose on huge scales during the Great Financial Crisis of 2007-2009, but less so, it appears, during the pandemic crisis—perhaps because of prompt central bank actions.

The identification problem(s)

Possessing both high credibility and the freedom to act swiftly are essential. But they won't produce sound, *stabilizing* policy responses unless the central bank understands what kinds of shocks it is dealing with. The first basic question is: Are we dealing primarily with an *aggregate demand* shock or an *aggregate supply* shock?

The adverb "primarily" is crucial here, for the pandemic obviously had—and still has—elements of both. Supply chains were disrupted. Fear of contagion induced businesses to shut down or reduce hours or employment. People fell ill and couldn't go to work. Governments ordered a wide variety of "shutdowns," or reduced hours, or less density in stores and workplaces, etc... The pandemic impaired aggregate supply by doing all of these things and more. Some of the supply disruptions were very large.

But those same fears of contagion, and those same illnesses, also weighed heavily on aggregate demand. People didn't want to shop (except online), to visit malls and entertainment venues like movie theaters, to go to restaurants and bars, to get their hair cut—and even, in the first months of the crisis, to visit dentists and doctors for normal healthcare services. For the first time ever, the recession was deeper and longer-lasting in personally-delivered *services* than in *goods*.

But which was the bigger problem, the damage to aggregate supply or the damage to aggregate demand? Central banks around the world had to decide (or estimate, or guess) the answer quickly because the appropriate policy responses are so different. When aggregate demand falls, a central bank will want to shore up its economy with rate cuts and other expansionary policy measures. When aggregate supply falls, central banks face the classic

supply-shock conundrum: Should they cut rates to boost real output or raise rates to fight inflation?

At first, many central bankers, government officials, and economists outside China saw Covid-19 as primarily a supply shock. For example, supply chains from China were cut or severely disrupted, and manufacturing activities that required workers to be in close proximity to one another became too dangerous to continue. But I think this initial attitude quickly gave way to the view that the demand-side effects were far larger than the supply-side effects. Why?

One obvious, and obviously germane, piece of evidence was the behavior of inflation. Both negative supply shocks and negative demand shocks reduce real output; but negative supply shocks *raise* inflation while negative demand shocks *reduce* it. In the event, inflation dropped precipitously as economies cratered in the early months of the pandemic. For example, the U.S. CPI actually registered month-to-month *declines* in March, April, and May of 2020. By May, the 12-month trailing inflation rate was down to 0.2%, versus 2.5% in January. Such numbers point strongly toward the demand shock being the dominant force.

The mainly-demand view was buttressed by observing the sorts of disequilibria we witnessed (but did not capture in standard data sources) in markets around the world. Stories of would-be sellers scrambling around in search of buyers were common. But apart from a few commodities that were subject to panic buying and hoarding (e.g., hand sanitizers), relatively few would-be buyers found themselves unable to locate willing sellers. The whole picture resembled pervasive excess supply, not excess demand.

To be clear, I am *not* claiming that the pandemic was *only* a demand shock. It certainly had supply-shock elements, too. It was critical, however, that monetary policymakers quickly

recognize that Covid was more of a demand shock than a supply shock, and therefore called for easier, not tighter, monetary policy. This they did.

Things look different today. Demand is roaring back, partly because of expansionary fiscal and monetary policies, but also because of pent-up demand after months of what amounted to forced saving. In some segments of the economy, such as automobile manufacturing, supply bottlenecks are ruling the roost. There is little doubt today that automakers could sell more cars if they could produce them. In other segments, including restaurants and hotels, labor shortages are still constraining the ability of suppliers to meet demand. All these bottlenecks will dissipate over time, but while they last, central bankers are dealing with supply shocks once again.

The second identification problem is different—and in this case was easier to solve. When a crisis strikes, every central bank must ask itself: Are we dealing mainly with a *financial crisis* that might spill over into the real economy, causing damage there? Or are we dealing mainly with a *crisis in the real economy* that might infect the financial system, thereby exacerbating the real shock? The Great Financial Crisis was clearly of the first kind, implying that the central bank's first and primary duty was to protect the real economy from the raging financial disease. The pandemic-induced recession of 2020 was clearly of the second kind, implying that the central bank's first duty was to prevent the disaster in the real economy from spilling over (much) into the financial sector, from where it would reverberate back onto the real sector. The world's central banks seemed to understand that point well, and they acted accordingly.

The third identification problem was mentioned earlier: Are we dealing mainly with an illiquidity problem or mainly with an insolvency problem? Central banks are well-equipped to

deal with the former, but not so well-equipped for the latter. And as mentioned, it is sometimes difficult to tell one from the other.

Losses are asymmetric, so go big

Once the diagnosis has been made—presumably correctly, a central bank dealing with a crisis must not be timid in using whatever weapons it has. Applying precisely the right amount of force is a fine goal, but it will likely be unachievable amidst pervasive Knightian uncertainty. Central bankers will, after all, be peering through the dense fog of war. Crucially, society's loss function in a crisis is likely to be highly asymmetric—in stark contrast to the symmetric, quadratic loss functions that are ubiquitous in academic models of monetary policymaking.

The social costs of doing too little to mitigate a crisis will include prolonged, and perhaps massive, unemployment and underemployment; bankruptcies of otherwise-viable businesses; underinvestment in both physical and intellectual capital; and much more. Some of these phenomena may lead to quasi-permanent effects, perhaps even to *hysteresis*. (More on this below.) In stark contrast, the main social costs of doing too much—of, say, overstimulating the economy—are likely to be a bout of inflation, some bad investments induced by super-low interest rates, and some overleveraging as firms borrow to excess.

Are those costs either equally likely or equally severe? I think not. For example, a durable rise in inflation during and after a slump seems a remote possibility. It also seems highly likely that firms coming through near-death experiences will be cautious. Furthermore, a few bad investments seem a small price to pay for shortening an economic calamity. So I conclude that the costs of doing too little in a crisis are probably far higher than the costs of doing too much.

The main implication of this asymmetry is straightforward: The central bank (and the fiscal authorities) should go big. I realize this advice cuts against the grain of normal central bank practice. By both inclination and training, central bankers are a cautious lot, accustomed to moving deliberately and incrementally. That is often sound practice in normal times. But a crisis is a time to throw caution to the wind.

Take down that wall

Best practice in monetary policy also ordinarily calls for the central bank to be staunchly *independent*, which mainly means independent from the political side of government. The doctrine of central bank independence applies, most prominently, to independence from the president or prime minister and from the congress or parliament. Operationally, however, it probably focuses most on the traditional wall between the central bank and the nation's Treasury or Finance Ministry. (From here on, I will use the American parlance: president, Congress, and Treasury. But the ideas are generic.)

There is an irony here in terms of institutional design. I have emphasized the importance of acting swiftly and decisively in time of crisis. Doing so is obviously easier when the central bank is independent and thus needs not seek permission to act from anywhere else in the government. In that sense, central bank independence is even more important in time of crisis.

But speed is not the only criterion; strength matters, too. A major crisis is likely to be too big for either the central bank or the Treasury to handle by itself. Monetary and fiscal policy must therefore *cooperate* to a degree that clearly violates the letter—and probably even the spirit—of central bank independence. Specifically, maintaining the traditional wall that

separates (and insulates) the central bank from the Treasury may be neither *feasible* nor *desirable* in a crisis. Start with feasibility.

A nation's financial markets are all interconnected, and those connections are likely to get tighter—not to mention more worrisome—in a crisis. Remember the old market adage: "In a crisis, all correlations go to 1.0." In normal times, some markets and financial institutions are probably supervised and regulated by the central bank (examples: banks, the payments system, …) while others are supervised and regulated by other agencies (examples: the stock market, futures markets, …), and it is probably not disastrous if each regulator makes its own decisions.

But the interconnections across markets tighten in a crisis, perhaps alarmingly, and someone needs to take overall charge—at least enough to ensure that what's being done in Market A is consistent with what's being done in Market B. Who will play that coordinating (or commanding) role?

The central bank is one obvious candidate. It seems unlikely, however, that the Treasury and other government agencies will willingly cede their authority to the central bank. One reason may be the central bank's lack of political legitimacy; the decisionmakers there are, after all, unelected technocrats. In addition, the central bank may lack the relevant expertise in areas that are beyond its normal purview. The Fed's failed Main Street Lending Program in the U.S. is a prime example.

Should the Treasury sit in first chair, then? Probably. But it will almost certainly have to lean heavily on the central bank for expertise, personnel, and—above all—for funds. Only the central bank can be the lender of last resort, a role that is almost certain to be critical in a crisis. In addition, some—perhaps many—of the emergency loans made in a crisis may carry some risk

of loss, making them quasi-fiscal actions, and thus the proper province of the political side of government.

That last point brings up the issue of *desirability*. Do we really want the central bank and the Treasury to act *independently* during a crisis? Surely not, and several nations have "squared the circle" on quasi-fiscal lending by having the Treasury backstop any losses the central bank may incur. More broadly, however, and much more important, allowing nervous markets to see any daylight showing between the Treasury and the central bank is a potential recipe for disaster. The two agencies must present a united front. Metaphorically, and probably actually, the heads of the central bank and the Treasury should be on the phone every day. That's the antithesis of acting independently.

In sum, the doctrine of central bank independence probably needs to be placed into suspended animation during a crisis. And that, by the way, adds yet another element to the central bank's eventual exit strategy: Once the crisis passes, it must get its independence back.

The new abnormal

When a crisis like the Covid-19 pandemic strikes, the central bank's principal expansionary policy instrument—reducing short-term interest rates—is likely to be (and should be) exhausted rather quickly, especially if pre-crisis rates were already low. That was, of course, the case in many countries in early 2020. The ECB, for example, already had a negative policy rate before Covid struck; there was not much more interest rate cutting it could do. But even in the U.S., where the Fed began the pandemic with a 2.25-2.5% target range for the federal funds rate, the central bank did all of its rate cutting in the first half of March 2020.

Besides, the pandemic posed a special problem for the use of interest rate reductions to spur spending. No one ever thought that consumer spending on nondurables and services was sensitive to interest rates, and therefore to monetary policy. When central bankers around the world cut interest rates to boost aggregate demand, they expect to see their fingerprints mainly on increased spending on automobiles and houses, perhaps also on business investment. They *never* expect rate cuts to boost consumer spending in restaurants, theaters, barber shops, and dentists' offices. Yet the Covid recession hit precisely these sorts of service businesses hardest.

In short, central banks' traditional interest rate canons both had little ammunition left when the pandemic struck and were pointed in the wrong directions.[3] What else could monetary policymakers do—quickly?

Serving as the *lender of last resort* (LOLR) is a classic function of central banks, long predating monetary policy. If there ever was a pressing need for an emergency lender of last resort, the pandemic recession presented it. Every central banker in the world was well-schooled in the classic Bagehot principles: In a crisis, lend freely, at a penalty rate, against good collateral. But was Bagehot's dictum appropriate in the time of Covid? The "lend freely" part surely was. The needs for liquidity and credit were massive, and no other entity could do the job at scale. But the other two Bagehot principles seem more appropriate for, say, a short squeeze in a speculative market than for relieving economy-wide financial strains during a pandemic.

[3] Remarkably, however, lower interest rates seem to have given big boosts to auto and home sales in the U.S. even while the pandemic raged.

Start with the idea of charging a penalty rate to limit moral hazard, that is, to ensure that "cheap money" does not encourage reckless, profligate lending. The penalty rate also facilitates the central bank's eventual exit from emergency lending because banks and other borrowers that are paying penalty rates for LOLR credit will be anxious to depart from the shelter of the central bank as soon as normal borrowing channels open up.

For the sorts of "Lombard Street" liquidity crises that Bagehot was thinking about, he had it right. But Bagehot's dictum may need modification in a serious crisis. The government may want banks to become part of the solution, rather than part of the problem, especially in extending credit—perhaps even to borrowers experiencing financial strain.[4] Charging penalty rates for LOLR loans to banks could weaken them precisely when society needs them most to help shore up the shaky *nonfinancial* edifice. Besides, banks that are forced to pay more to borrow from the central bank will in turn charge higher rates to their loan customers. In time of crisis, we want credit to be abundant and cheap, not scarce and dear.

The last part of Bagehot's dictum calls for demanding "good collateral," which is typically interpreted as *superb* collateral. The idea, of course, is that the central bank should never suffer a loss on its lending. But is that principle sacrosanct in a deep, lasting crisis? Even if you believe that the central bank should never put taxpayer money at risk, clearly *someone* should—most likely the Treasury or Finance Ministry, with authorization from the congress or parliament. After all, when a government goes "all in" to avert or mitigate an actual or potential catastrophe—in this case a deep recession—it must surely take *some* risks with taxpayer

[4] One prime example of this in the U.S. is the Payroll Protection Plan that Congress enacted in March 2020.

money, and probably also *spend* a great deal of it.[5] Such risks are presumably worth taking in order to avoid the likely consequences of inaction.

In sum, even though doing so may make Walter Bagehot turn in his grave, a central bank in a time of pandemic should perhaps lend freely *and cheaply* and not be so fussy about the collateral it takes. If so, the bank might incur some loan losses. As mentioned earlier, one good way to "solve" this problem is to have the Treasury underwrite the central bank's risk.

Discussing possible loan losses brings to mind one of the perils inherent in a big balance sheet, which is something many central banks acquired in 2008-2009 and then grew further in 2020-2021. Unless all the assets on a central bank's balance sheet are T-bills, there is always some risk of loss—whether from credit risk or mere market risk from rising interest rates.[6] This vulnerability worries many central bankers, probably more than it should. After all, a central bank is a public institution that should care about the economic well-being of its country, not about its P&L statement or its returns to shareholders, if it has any.[7] If a conflict between the two ever arises, the bank's mandate must take precedence.

In extreme cases, a central bank's losses might grow so large that its *net worth* is imperiled or even turns *negative*. After all, most central banks are, in the literal meaning of the term, highly leveraged.[8] Since its assets are a large multiple of its capital, even a small *percentage* loss on assets can wipe out a central bank's capital. Negative net worth is a frightening prospect for a private company, and justifiably so; it puts bankruptcy court in sight. But a central bank can't

[5] The US government, for example, has already spent nearly *five trillion* dollars on Covid relief.
[6] The Fed does not mark its portfolio to market, but some central banks do and outside observers can do it for the Fed's balance sheet.
[7] The Federal Reserve Banks do have shareholders—their member banks. They receive a fixed annual dividend, not contingent on the Fed's profits. For large banks, the dividend rate is the 10-year Treasury bond rate.
[8] At this writing, the Federal Reserve's leverage ratio (assets/capital) is about 207-to-1 and rising.

go bankrupt. Moreover, it can continue performing *all* of its normal duties even with negative net worth. The one grain of truth in the worry over negative net worth and operating losses is that maintaining independence may be harder if the central bank is forced to go to the legislature each year for its operating budget, rather than covering its expenses out of seigniorage revenue (or dipping into net worth). That's a *small* grain of truth if the government is friendly, but much more than a *large* grain if the government is hostile.

Last on this list of abnormal policies, I come to the f-word: *forbearance*. If the central bank is also a bank supervisor, and if it sees its economy in danger of crumbling, it might want to ease up on enforcing some safety and soundness regulations. That could mean, for example, reducing (or ignoring) capital or liquidity requirements,[9] not demanding that commercial banks classify (or book losses on) as many loans as usual, and so on. I hasten to add that a prudential supervisor should not engage in such measures in normal times. But in a time of Covid, nothing is normal. As long as the central bank (or some other government agency) is prepared to stand behind the banks, a touch of micro-imprudence might actually be macro-prudent.

Looking ahead: The legacy of the Covid responses

Justifiable concerns are frequently voiced about central banks' "exit strategies." After all, we do not want them to continue doing all the abnormal things they have done in the time of Covid. From what policies must central banks eventually exit?

[9] Example: On April 1, 2020, the Federal Reserve announced that it would exempt Treasury bond holdings and reserves at the Fed from the Supplementary Leverage Ratio (SLR) calculation for one year in order "to ease strains in the Treasury market resulting from the coronavirus." On March 31, 2021, that exemption expired.

Paying more attention to *moral hazard* in, e.g., lending programs ranks high on the list, even though it can be safely ignored during the crisis. To be sure, the usual source of moral hazard is absent in the case of the Covid emergency: No one will ever deliberately fall victim to a pandemic in order to obtain cheap credit from the central bank. But the more modest form of moral hazard, the one Bagehot understood and warned against, remains. Banks and businesses must not grow accustomed to living on subsidized credit, not to mention getting loans they need never repay.[10]

Classic Bagehot-style lending has an effective, built-in safeguard against this form of moral hazard: the penalty rate. Borrowers forced to pay high rates for LOLR loans will be eager to repay them. The Federal Reserve's numerous lending facilities during the financial crisis were self-liquidating in this sense. Covid-style lending at low rates will not be self-liquidating, however. It will have to be stopped by policy decisions—though not prematurely. A tricky business for sure.

A second worry is inflation—a possible legacy of massive money and credit creation, often coupled with sizable fiscal expansions and huge pent-up demand. After several decades (in Japan's case nearly 30 years) of trying to push inflation *up* (mostly in vain), central banks were not worried about high inflation in 2020. Nor should they have been. After all, none of the alleged "danger signs" pointing to higher inflation—ranging from tight labor markets to mountains of excess reserves—have been successful inflation forecasters in recent decades. Will they ever be?

[10] PPP loans in the United States are forgivable.

Well, “ever” is a long time. Central banks would be wise to keep at least one eye on inflation, just in case. Here’s one concrete example of what this might mean: As part of its new policy framework, announced in August 2020, the Federal Reserve abandoned its former policy of moving *preemptively* to nip inflation in the bud, in favor of a new wait-and-see policy. Under its current policy regime, the Fed will reverse its forward guidance, end its QE program, and/or raise interest rates only when *actual* (not forecasted) inflation goes above its 2% long-run target for some (unspecified) period of time. With a reliable Phillips curve, a permissive policy stance like that might be viewed as irresponsible since it is guaranteed to put the Fed “behind the curve” when inflation finally rises. But in the absence of a usable Phillips curve, or of any other reliable tool for forecasting inflation, I believe it makes sense.

As central banks around the world move away from their hyper-expansionary monetary policies toward more neutral, or even contractionary, policies, their words (forward guidance), their asset purchases (QE), and their interest rates will all have to be adjusted. Issues of timing (when do you start?), pace (how fast do you move?), and sequencing (which policy instrument moves first?) will all be critical to getting exit “right.”

But that’s all for the future. The most important point about “exit” today may be: Don’t head for the exists prematurely.

Society’s loss function is far from symmetric. The damage from pulling the plug too soon is almost certainly greater than any harm that might come from keeping the emergency measures in place too long. It is certainly fine, even desirable, for central banks to start *planning* for exit *internally*. However, those plans should be kept under wraps as much as possible so as not to spook markets. I realize this would be a retreat from transparency, a cause I have championed

for decades. But as soon as an exit strategy is announced, or even leaked, markets will start reacting as if the central bank will begin tightening next Monday—and these reactions will effectively tighten financial conditions and impede the recovery. Central bankers need to understand that. The Fed does, which is one reason it has been so coy about when and how it will "taper" QE purchases.

Worries about hysteresis, or "scarring," provide another set of reasons not to pull the plug prematurely. Long periods of low economic activity may leave lasting scars on people who cannot find work and on actual or incipient businesses that either fail or never get started. Such channels of hysteresis can transform a lengthy-but-temporary shortage of aggregate *demand* into a long-lasting reduction in aggregate *supply*. Specifically in the case of Covid, scars are likely to be left, for example, on global supply chains, on international trade more generally, and on modern "just-in-time" inventory systems. All those adjustments and others are likely to reduce the world economy's long-run efficiency.

In conclusion

The many important ways in which a central bank's responses to a crisis should differ from its ordinary policy responses are easy to summarize. It is striking that, in most cases, the two are polar opposites.

Go fast: Central banks normally deliberate at length, weigh all the options and evidence, sometimes wait for more evidence, and then move at what is sometimes called "a central banking pace", to wit, a glacial pace. Such a stately pace clearly won't do in a crisis. To be effective, a central bank must act swiftly, perhaps even before all the i's are dotted and the t's

are crossed. Yes, speed can lead to errors of *commission*, which central bankers generally abhor. But in times of crisis, potential errors of *omission* are hugely important.

Go big: Part of central bankers' innate conservatism is caution, which may mean, among other things, moving policy instruments judiciously and incrementally—say, by 25 basis points at a time rather than by 100. But cautious policy responses are not what society needs in a crisis. With the risks of doing too little dwarfing the risks of doing too much, central banks facing a crisis like Covid-19 should go big.

Demand probably needs support: Every crisis is different, but I'm Keynesian enough to believe that the shock to aggregate demand will be greater than the shock to aggregate supply in most crises—certainly including this one. If that's right, monetary policy should move sharply and quickly in expansionary directions. There will be time to worry about inflation later.

Tear down that wall*:* In normal times, there are good reasons for the traditionally thick wall separating (and insulating) the central bank from the Treasury. But the wall must be taken down early in a crisis because overt *and visible* cooperation on multiple fronts will almost certainly be necessary. There must be no daylight showing between the Treasury and the central bank.

Forget (parts of) Bagehot: Part of "going big" will mean using the lender-of-last-resort function in volumes that are unthinkable in normal times. In performing its critical LOLR function, the central bank should not impose Bagehot-style penalty rates and should worry less about the quality of the collateral it accepts. A fiscal backstop for central bank loan losses is a good idea.

***Don't rush to the exits**:* In thinking about its eventual exit from the unusual panoply of crisis-era policies, the central bank should follow what I call the Scarlett O'Hara principle: Don't worry about exit today; worry about it *tomorrow*.[11] Yes, efforts to restore normality must eventually come, but timing the exit perfectly is probably beyond anyone's capabilities. In the aftermath of a crisis, a central bank can do far more harm by exiting too soon than by lingering too long. Combining this last point with the first point on this list leads to a simple maxim: Enter quickly but exit slowly.

[11] For those of you who have not seen *Gone with the Wind* lately, Scarlett regularly proclaimed, "I won't think about that now. I'll think about that tomorrow."