Leviathan as a Partial Cure?
Opportunities and Pitfalls of Using the State-Owned Apparatus to Respond to the Covid-19 Crisis

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Abstract

The unprecedented Covid-19 pandemic has sparked a new debate on the merits of markets vs. states for addressing acute societal crises. While some argue that market forces are imperative to stimulate increased supply of critical products and services, others contend that dealing with the pandemic requires rapid adjustments in supply that may be constrained by a host of factors. Even if usual discussions have centered on policies to promote financial liquidity and industry survival, we examine whether the state apparatus—not only state-owned enterprises but also development agencies and investment funds—can promote rapid experimentation and adjustment in production processes to increase prevention and treatment infrastructure and capabilities. Potential actions include complementary public-private effort addressing both discovery and coordination problems—such as collaborative effort to develop prevention and treatment technologies, as well as injections of state capital to stimulate retooling and expansion of strategic infrastructure. The state apparatus, especially the existing public bureaucracy, can help access remote and critical areas with higher marginal costs, with relatively lower private returns. In contrast, selective support to industries must be implemented with caution, especially in the case of sectors whose demand may suffer permanent shifts due to changes in lifestyle. To avoid the risk of perpetuating unjustified and ineffective state support, exit strategies must be carefully crafted, with milestones and termination clauses based on clear performance indicators. We argue that while using the state apparatus as a countermeasure entails its own set of risks, perhaps paradoxically *not* using it also increases the risk of extending the crisis and ending up with a bloated state sector (e.g. due to massive bailouts), making it more difficult to implement subsequent adjustments.

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Introduction

The unprecedented Covid-19 pandemic has sparked a new debate of the merits of markets versus states in addressing acute societal crises. Some argue that market forces are imperative to stimulate increased supply of products and services necessary to prevent the spread of the virus (such as face masks, respirators, sanitary products, and vaccines) and treat those in critical conditions (such as hospital capacity and drugs). Others contend that dealing with the pandemic requires *rapid* adjustments in supply that may be constrained by a host of factors. First, companies may face critical resource constraints—such as the lack of financial liquidity and capabilities to quickly adjust production processes (e.g. retooling to produce health products).

Second, even in the case of unconstrained firms, they may be reluctant to revamp production due to sheer uncertainty about the extent and duration of the crisis. Third, these responses may require coordinated effort—for instance, the value of investing in hospital infrastructure depends on actions that affect prevention.

In this context, as in other severe and unpredictable crises, a natural question is whether and in which conditions the state-owned apparatus can help promote these necessary adjustments. State participation in the economy is much more complex and nuanced than decades ago (Bruton, Peng, Ahlstrom, Stan, & Xu, 2015; Musacchio & Lazzarini, 2014). By "state-owned apparatus," we mean not only state-owned organizations (such as companies with majority or minority state control, as well as corporatized public service units), but also development banks and agencies, as well as public or quasi-public investment vehicles such as public and pension funds. Can these diverse instruments help address resource constraints and promote coordinate responses to the crisis?

In this short article, we review the pros and cons of state involvement and describe a host of policy tools involving the state-owned apparatus, which can be effective depending on the extent and severity of the crisis. We also propose a set of "exit strategies" to guarantee that these policies do not lead to unproductive and unjustified state support even after the crisis—a problem that is often neglected by those proposing higher state engagement in moment requiring additional investment and coordinated effort.

Leviathan: Cure or Disease?

There are opposing views of the role of state organizations in the economy (Musacchio, Lazzarini, & Aguilera, 2015; Yeyati, Micco, & Panizza, 2004). A more negative (*political*) view argues that they may be used for political purposes and cater to the demands of well-connected industrialists and public bureaucrats (Ades & Di Tella, 1997; Megginson & Netter, 2001; Shleifer & Vishny, 1994). Using the state apparatus, including its capacity to provide subsidized credit and/or bailouts, has a big downside. During a crisis of this magnitude industrialists and, especially, service providers will want to use the conjuncture to ask for financial support. In addition, increased state involvement may have the downstream implications of bloated public bureaucracies and unjustified support to industries even after the crisis has been mitigated—in those circumstances state organizations may end up supplying "public bads" (Klein, Mahoney, McGahan, & Pitelis, 2013).

A more positive view emphasizes that state organizations may supplant and, in some cases, even complement private responses. The *industrial policy* view argues that the state apparatus can play an important role in solving market failure. In its most refined version, this view posits that state involvement can address discovery and coordination problems (Hausmann & Rodrik, 2003; Rodrik, 2004). In terms of discovery, think of experimentation to see if it is profitable to invest in a new industry or project, the first company to do it would incur all the discovery costs, but new entrants would not have to pay the initial costs to know if the industry or project is profitable. In addition, prevention and treatment R&D efforts generate large social gains but are particularly prone to private expropriation; think for instance of companies not willing to do R&D to develop vaccines and alternative drug treatments for fear that the returns will be limited as the

government would probably control its price and distribution. Essentially, discovery entails externalities, and externalities may not be adequately priced.

In terms of coordination, think of how, for instance, everyone in a country would be better off if some companies dedicate their facilities to produce face masks and breathing ventilators, but no one wants to have to pay for the retooling to do it. Complicating matters, the return on these investments may depend on complementary actions that will affect the severity and duration of the crisis (e.g. the availability of vaccines and hospital infrastructure). Addressing the pandemic may also require quick and coordinated expansion in capacity and reorganized processes—e.g. assign the tasks necessary to treat patients with Covid-19 in one location and other patients in a completely different location.

Note that deregulation of production is desirable to increase speed but that these coordination problems would persist even if there was total deregulation—companies, for instance, could be free from impediments and bureaucratic hurdles to produce health products and equipment, but the return of their investment will depend on complementary efforts in the economy and social returns may largely surpass private gains. However, the implementation of industrial policies is not straightforward and also requires strong public capacity to identify areas of potential improvement and continuous monitoring of results (Lazzarini, 2015; Pack & Saggi, 2006). In other words, as we discuss in the next sections, it is crucially important to identify particular types of state actors and policies, to guarantee that the required public capabilities are in place.

Apart from changes in the supply structure of the economy, another view of state organizations emphasize that they follow *social* objectives that are not typically the focus of profit maximizing private companies (Bai & Xu, 2005; Shirley & Nellis, 1991). For instance, state companies may be more willing to preserve employment even in light of negative demand shocks and avoid sharp increases in the prices of products in high demand. They can also be more willing to invest in distant regions and continue undertaking riskier projects necessary to tackle the crisis—think for instance of state-owned banks that are willing to reduce interest rates and lend to more credit constrained organizations. To be sure, some of these problems can be solved by broader employment promotion policies and targeted monetary transfers to vulnerable populations. Furthermore, requiring state-owned organizations to absorb the cost of social policies can generate a host of additional complications—including societal conflict when these organizations are also partially owned by other (private) shareholders (Pargendler, Musacchio, & Lazzarini, 2013).

Finally, there is evidence that state-owned banks can be more resilient and act as catalysts for more expedient responses during crisis, such as injecting liquidity to the economy by rapidly during a crisis (Coleman & Feler, 2015). That is, even if there is evidence on the inefficiency of the state-owned apparatus (Caprio, Fiechter, Litan, & Pomerlano, 2004), there is a tradeoff of speed recovery and efficiency when facing large, sudden economic or health shocks.

In what follows, building on this discussion, we describe potential policies to address the Covid-19 crises and potential policy instruments using the state-owned apparatus. We consider the objectives and mechanisms emphasized by the industrial policy and social views, while at the same time acknowledging the constraints imposed by the political view.

Policy Tools Using the State-Owned Apparatus

The different view of state-owned organizations have multiple policy recommendations, which may at times be conflicting. Thus, in this section, we provide a series of policy tools that we believe can help some of the most urgent problems, with an assessment of their potential effectiveness.

Accelerated investment in strategic infrastructure and production capacity

Policies to minimize the death toll caused by Covid-19 involve containing the spread of the virus to avoid a spike in the number of people that need to be admitted in hospitals and treatment centers. As the Italian case has shown, lack of sufficient hospital and treatment capacity can severely affect the ability of the system to avoid deaths. Also, prevention requires an increase in the production of face masks, hygiene and sanitary products, and other key inputs. Importantly, there is a time value attached to these supply increases; the earlier, the better to avoid deaths.

The need for quick and complementary investments magnify the challenge of promoting coordinated responses, both on the side of the government and of the private sector. In other words, during crises there is an increased "speed premium" (Cowen, 2020). The United States case provide some useful examples to understand the coordination problem. First, the United States government has been very slow to present a united, coordinated front on the purchase of supplies. That is, state governments and the federal government have been competing in the bidding for key supplies, such as masks, and equipment, such as respirators. This has led to unnecessary scarcity and price increases. A unified procurement policy with coordinated allocation of the supplies to the places that need it the most would lead to more efficient outcomes.

The second coordination problem is associated with the lack of capacity of the private sector to internalize all the externalities generated from switching production to key necessities or key medical supplies. The market mechanisms may not be enough—for instance, price spikes in respirator market may be insufficient to get a manufacturer of alternative products to pay the cost of retooling and training to produce respirators. These investments are idiosyncratic and will lose value after the crisis.

The state-owned apparatus can help address these coordination problems in several ways. In cases where *existing* state organizations are in place and master the required execution capabilities, they can be asked to increase or switch production, possibly with additional government transfers to support their adjustment costs. Perhaps the most striking example of coordinated effort is the construction of the Huoshenshan Hospital in Whuan, the epicenter of the Covid-19 outbreak in China. The hospital was built in 10 days and was staffed with medical human resources provided by the People's Liberation Army.

State-owned and development banks loans can also help induce firms to do the transition and provide a unified government policy to guarantee those investments will have the returns necessary to induce the change may be necessary to create the rapid response. Yet the speed of

these adjustments may not be as high as in the case of direct action by state organizations, depending on the time to design these credit programs and implement expedited approval processes. Another possibility that may provide faster coordinated response is to promote collaborations between state and private organizations. Singapore, for instance, has engaged private hospitals to accommodate patients from capacity constrained public units. Private organizations, in turn, can help transfer operational practices and procedures to increase the productivity of state organizations. This type of collaboration can be particularly relevant for services in high demand, such as in the case of intensive care units.

Execution capabilities for massive collective action programs

While the former policies help promote investments in capacity, addressing the Covid-19 crisis also require mobilizing specialized personnel to implement massive collective action programs—such as large scale laboratory tests, clinical care, family orientation programs (as in the case of social distancing measures and hygiene practices), and so forth. Hiring new personnel to perform these tasks may prove less appealing to private firms especially when there are costs and restrictions to adjust the labor force after the crisis. In addition, certain communities are located in remote areas or regions of difficult access (e.g. slums). Reaching an additional person at "the last lime" will likely entail increasing and often prohibitive marginal costs (Wong & Skead, 2019).

In this context, again, faster responses will likely come from existing state-owned organizations, which may mobilize specialized personnel and, if possible, even reallocate technical and managerial staff across regional units. Yet these human resources and input to implement collective action programs will likely be in short supply. A possibility is to develop collaborations with the private sector, whereby public organizations can focus on areas with more difficult access and higher marginal costs, while private organizations can be engaged to cater to less constrained individuals and relieve public personnel to focus on more vulnerable populations. Regulatory changes can be particularly helpful here. For instance, the FDA authorized Covid-19 testing by states and territories in the United States, with ongoing calls that other regulatory restrictions need to be lifted to facilitate the production and transportation of critical equipment and inputs. Nonprofit and community organizations can also be helpful to identify vulnerable areas and help with localized effort.

New technological capabilities

Being largely unanticipated, crises like the Covid-19 pandemic should benefit from existing capabilities but at the same time stimulate new exploration and technological development. The most obvious need is accelerated R&D and clinical trials to generate new vaccines and drugs. Discovery costs are particularly critical here, as R&D investments will tend to be risky and generate high social returns—much larger than the returns that private developers may reap. Although public or private customers may place a high value on a newly developed vaccine, "fairness" considerations may prevent private developers to charge prices sufficiently high to compensate for their initial investment. As noted before, they can also be subject to expropriation whenever their developed technology is considered "of public interest."

Indeed, states have been traditionally involved in exploratory technological development (Mazzucato, 2011; Mowery, 1984) and the laxed short-term economic incentives of state organizations have been shown to promote novel (and often riskier) inventions, despite their lower operational efficiency (Lazzarini, Mesquita, Monteiro, & Musacchio, Forthcoming; Zhou, Gao, & Zhao, 2017). Such inventive effort can come from either state-controlled research agencies or companies (including entrepreneurial ventures) with partial state equity—such as equity from development banks or state funds. Because R&D investments are risky, with outcomes that are difficult to contract for ex ante, equity or hybrid financing mechanisms are generally preferred to loans (Inoue, Lazzarini, & Musacchio, 2013; Williamson, 1988).

Of course, this does not mean that private companies (without state equity) cannot be involved in new, exploratory R&D. We again expect the emergence of collaborations between public organizations and private companies receiving grants or participating in consortia. Indeed, by the time we wrote this article, two clinical trials were in progress, both involving state participation in tandem with private firms: one led by the National Institute of Allergy and Infectious Diseases (part of the United States Department of Health and Human Services) in partnership with biotech firm Moderna, and another by Chinese Academy of Military Medical Sciences (a research institute of the People's Liberation Army) in collaboration with CanSino Biologics.

There are also multiple avenues to perform complementary R&D in other critical areas. For instance, Embrapii (a Brazilian research agency managing public-private collaborations) signed a contract with Instituto Eldorado (a nonprofit) to develop new respiratory equipment. Similar collaborations can be promoted in myriad critical areas such as quick laboratory testing, process technologies to foster accelerated production of health inputs, and even information technology to improve remote connectivity and big data analysis.

Financial/liquidity support to specific industries

Lockdowns, social distancing measures and travel restrictions triggered by the Covid-19 pandemic are expected to inflict substantial losses to several industries such as transportation, retailing of nonessential products, cultural events, and many others. Companies and associations in these industries are already requesting support to compensate for their revenue loss and avoid bankruptcy. Apart from more general government policies such as tax postponement and relief, companies also usually request subsidized loans and even bailouts, with may eventually lead to governments taking part of their equity (as it happened with General Motors during the 2008 financial crisis).

Although these actions may help preserve employment and industrial capacity, they also have important negative implications. First, there are cases where the Covid-19 may generate long lasting changes in lifestyle and social interactions. For instance, increased use of videoconferencing may reduce the need of business travel, whereas the streaming of cultural content may reduce demand for film screening in theaters. These industries may suffer permanent downward changes in demand, thereby reducing the social value of government support for the whole sector. Second, there is always the issue of which sector will benefit from subsidized lending and bailouts. Examples abound where politically connected industrialists are able to reap preferential treatment, regardless of their potential to generate productivity gains

(Claessens, Feijen, & Laeven, 2008; Lazzarini, Musacchio, Bandeira-de-Mello, & Marcon, 2015; Rajan & Zingales, 2004).

For these reasons, "vertical" support to selected industries is likely less effective than "horizontal" support to a broad range of industries and firms that are relatively more affected by the crisis. This seems to be an approach chosen by Germany, using its large state-owned development bank, KfW. The new measures approved by the European Commission include subsidized loans and credit guarantees in partnership with private banks, applicable to multiple sectors and firms.

Support to constrained companies (e.g. SMEs)

Although governments can promote liquidity programs to support a broad range of firms, the more effective policies should involve SMEs, which tend to be more credit and resource constrained (Cavalcanti & Vaz, 2017). That is, increased uncertainty due to Covid-19 crisis should make private banks highly reluctant to lend to SMEs with scarce track record. Because not all countries have existing state-owned and development banks providing direct lending, a common response is to substantially increase credit guarantee programs, whereby governments or their state-owned financial organizations cover part of the credit risk of SMEs borrowing from private banks (OECD, 2009). Increasing credit guarantees, however, creates moral hazard, as private banks may have less incentive to find and screen SMEs with potential to survive and prosper after the crisis. For this reason, more effective credit guarantee programs tend to involve *partial* state guarantees, possibly increasing with the severity of the shock (Yoshino & Hesary, 2016).

There are also opportunities to create partnership programs with SMEs and move beyond liquidity enhancing programs. Indeed, some development banks have provided SMEs with technical consulting, in cases where these banks have specialized personnel with industry knowledge (Armendáriz de Aghion, 1999). For instance, the Business Development Bank of Canada (BDC) has allocated dedicated account managers to follow the performance of clients and implement a host of management practices (such as cost-saving measures and turnaround operations) in cases of uncertain repayment (Musacchio, Lazzarini, Makhoul, & Simmons, 2017). More generally, improved management practices are generally lacking in SMEs and their implementation can potentially promote firm survival in moments of crises (Aghion, Bloom, Sadun, & van Reenen, 2014). Engaging SMEs in public procurement programs is also an option, even though these mechanisms require public capabilities to reduce bureaucratic constraints to their effective participation and monitor their performance over time (Cabral, 2017).

Table 1. Policies and policy instruments involving state-owned organizations, according to their likely effectiveness (+ low, ++ moderate, +++ potentially high)

Policy focus	Policy instrument involving state-owned organizations				
	Loans (e.g. loans directly provided by state-owned or development banks)	**Credit guarantees** (e.g. public guarantees for firms to borrow from private banks)	**Equity** (e.g. minority stakes in entrepreneurial firms or temporary stakes in failing large firms)	**Partnership programs** (e.g. state-owned organizations purchase from or collaborate with private firms)	**Direct operation** (e.g. existing state-owned organizations directly running hospitals, R&D institutes, etc.)
Accelerated investment in strategic infrastructure and production capacity	++			++	+++
Execution capabilities for massive collective action programs				++	+++
New technological capabilities			++	+++	+++
Financial/liquidity support to specific industries	+	+	+		
Support to constrained companies (e.g. SMEs)	++	++		+++	

Policy Tools in Distinct Crises Scenarios

We want to emphasize the importance of acting expeditiously and decisively, rather than waiting for the economic and health crises to worsen, as the latter will increase the size of the state intervention needed to actually tackle the crisis and will also increase the size of the state apparatus because of the need for massive bailout programs. Thus, we start by outlining three scenarios of crisis, from a short-term severe shock to a prolonged depression, and we outline how the solutions outlined above can turn into more permanent fixtures of the economy, increasing not only the costs of acting, but also the level of statization and the exit costs for those state interventions. It is important to note that we are thinking of countries that already had a significant presence of state-owned organizations to begin with, otherwise the recommendations we outline in the previous section would be harder to execute and even unfeasible (that is, we are *not* recommending the creation of *new* state-owned organizations).

Our three crisis scenarios are as follows (see Table 2). First, we describe a short-term crisis with a somewhat fast V-shaped recovery. This is a crisis in which the health shock is acute but has short duration, to a large extent because the state mobilizes the right resources to fight the immediate crisis and prevent a long economic collapse. In this scenario we picture state-owned organizations mobilizing to coordinate a response, to accelerate investments in key sectors and provide support especially to SMEs (which suffer a large blow in the short run). Additionally, we envision credit guarantees aiding SMEs and providing further liquidity—with the caveat that, as

discussed before, these guarantees should be partial to avoid rampant moral hazard. In this relatively short-lived crisis, we see governments using both equity purchases and partnerships with the private sector as mechanisms to both help, but also to mobilize industries to produce what is necessary for prevention and treatment. If these tools are used wisely, the post-crisis exit strategy should be relatively simple and should come with moderate costs. Winding down these kinds of state interventions should not be that easy, as most of them did not imply permanent shifts in ownership of large parts of the economy and the tools prescribed are mostly to crowd in the private sector. They should also promote capabilities to prevent and respond to subsequent health crises.

The second scenario, in contrast, implies a more permanent change in lifestyle and in the role of the government as owner and financier of the economy. This second scenario incorporates the idea that the economic and health shock will affect economies for over 18 months, generating significant changes in work and social life patterns that can have a long-lasting effect on the service sector. In this scenario, state-owned organizations may have to step in and replace operators of key raw materials and inputs and may need to provide some of those services at a loss to help the recovery (e.g., electricity, internet services, telecommunications, etc.). Fiscal losses would compound. Additionally, procurement and public-private collaborations would become necessary to undertake large, risky investments in infrastructure. Credit guarantees would turn into extended support mechanisms. Meanwhile, state investment funds, sovereign wealth funds and pension funds would see significant increases in minority equity shares in private companies and majority investments as part of bailouts of failing industries. The costs of state action in this scenario would be a lot higher—say between 30-60 percent of GDP, or the equivalent of a large bailout program (Laeven & Valencia, 2013).

Finally, we include a scenario that has medium- to long-term doomsday characteristics. That is, this is a scenario in which there is a health crisis that translates into a 2-3 year economic crisis, very much like the Great Depression (with 2-3 years of negative GDP growth), except that the initial shock is more acute and therefore the recovery is also longer. We envision that under such a scenario, most of the programs that we recommended in the previous section would have a large scale and would become permanent or semi-permanent fixtures of the economy. For instance, due to bailouts and nationalizations, the size of the state-owned apparatus would increase dramatically. Similarly, private investment in major infrastructure projects would have to be supported by massive public capital. Most of the liquidity facilities provided by state-owned banks and investment funds would turn into extended support mechanisms. Credit guarantees would become necessary to support affected sectors, with large fiscal costs to the state. State investment funds, sovereign wealth funds and pension funds would turn into dominant asset managers as there would be a significant increase in majority and minority ownership of formerly private corporations. These actors would essentially turn into market makers. The cost of such a scenario would be the highest and could be in the 60-100% of GDP (the equivalent of a massive bailout program) and the exit strategy for state intervention would become complex and costly. Reversing many of those policies would also have extremely high political costs. Think of how costly it was for the United Kingdom to reverse some of their nationalizations such as coal and railways or how hard it has been for most oil exporting countries to partly privatize the oil companies they nationalized in the twentieth century.

Table 2. Crises scenarios, types and consequences of state involvement

	Crisis scenarios		
	Short-term liquidity and supply shock (1 year crisis; V-shaped recovery)	**Medium term (18+ months; with significant changes in work patterns and social life)**	**Medium- to long-term doomsday scenario (2-3 years of severe recession)**
Economic and industry-level implications			
Main economic impact	-Short term liquidity issues - Transient uncertainty - Rapid spike in unemployment	- Relative shift to activities requiring remote connection. -High unemployment in the medium term - Asymmetric labor shocks (low-skilled labor may suffer more) - Severe recession (negative growth) is extended to 1-2 years	-Significant changes in lifestyle, affecting industries intensive in social interactions - Great Depression scenario (2-3 years of negative growth) + slow recovery - Major bankruptcies
Effect on bank and financial market liquidity	-Short-term liquidity problems -Short-term stock sell-off that recovers over time -Risk aversion of banks (thanks to Basell III) reduces loan growth in short-term, but recovers after a few months	- Bank risk aversion continues (contraction in loans follows) - Loan defaults lead to some bank bankruptcies -Trading is disrupted, uncertainty in all asset prices	- Bankruptcies disrupt holdings of major asset holders (some major bankruptcies) - Stocks collapse on a sustained fashion (2-years of decline) -Bank bankruptcies due to defaults is high
Effect on the supply chain	- Temporary disruptions in domestic supply chains - Short-term disruptions to international supply chains due to stopped factories and transport impediments	- More frequent disruptions in supply chains - Production facilities have reduced output - Scarcity of basic products	-Major disruptions in supply chain as bankruptcies of production facilities follow - International trade patterns change significantly
Effect on manufacturing and services	- Short-term decline due to factory closings - Negative but temporary shock on services that involve social interactions or transport - Rapid recovery after quarantining measures are eased	- Factory closings continue - Accelerated mechanization of existing factories -Layoffs continue for over a year, perhaps concentrated on services that involve social interactions or transport	- Bankruptcies disrupt manufacturing - Mechanized producers forge ahead - Massive layoffs turn into long recovery with high unemployment - Permanent disruption of services that involve social interactions or transport
Role of state-owned actors and policies (see Table 1)			
	Lower state expansion *Lower exit costs*		*Higher state expansion* *Higher exit costs*
State-owned organizations	- State companies holding line on layoffs and accelerating investments and used to help coordinate responses. - Some subsidies and price controls to support health care and healthcare suppliers	- State companies replacing key suppliers and raw material producers - Key state-owned infrastructure turned into national utility (e.g., fiberoptic network)	- Bailouts and nationalizations to maintain key input providers going - Price controls in key raw materials and inputs to sustain manufacturing and service activity

		- State subsidies in key services become more of a permanent fixture (e.g., keeping electricity low for a long period of time to promote recovery)	- Critical infrastructure services become national utilities
Public units coordinating partnership programs	- Programs used as short-term incentive to coordinate actors to retool and manufacture necessary equipment/supplies - Publicly sponsored consortia to develop vaccines and drugs	- Public procurement and partnership programs to revive the private sector -Private-public collaborations to undertake large, risky investments in infrastructure	- Public procurement and partnership programs become key industrial policy tool - Direct public execution or public-private collaborations with heavy state sponsorship in major projects
State-owned commercial and development banks	- Provide short-term liquidity programs - Credit guarantees to support SMEs	- Liquidity programs turn into extended support mechanisms - Credit guarantees become necessary to support affected sectors, with relevant moral hazard problems - Corporate pressure to lend to targeted industries	- Major providers of liquidity in the economy - Credit guarantees become necessary to revive affected sectors, with high fiscal costs due to moral hazard - Targeted lending to rescue failing industries increase misallocation problems
State investment funds, sovereign wealth funds and pension funds of state-owned organizations	- Some minority equity investments are used to alleviate liquidity constraints in specific industries - Some equity investments used to build new capabilities	- Large minority equity investment programs - Significant increase in minority equity shares in private companies and some majority investments	- State funds become dominant asset managers - Significant increase in majority and minority ownership of formerly private corporations - State-owned pension funds as market makers
Consequences of state policies			
Cost	Moderate to high (e.g., 10-20% of GDP)	High (30-60% of GDP)	Highest (60-100% of GDP)
Downstream risk of permanent statization	Moderate to low - Temporary increase in minority equity positions - Bailouts in the form of financial support (so increases in gross debt) - Crowding out of private sector may increase state share in the short term	Moderate to high - Increase in role of the government, especially in investment on a permanent basis - Significant increase in the ownership and financing of corporations (harder to wind down) - Private sector risk aversion leads to a drastic reduction of private investment relative to public investment	High -Nationalizations and bailouts are pervasive. - State-owned organizations become key providers or inputs in the economy for a long period of time, with negative efficiency implications - High risk aversion of the private sector perpetuates state intervention

Exit Strategies: Limiting Post-Crisis Dependence on Leviathan

In the first part of this paper we have focused on positive aspects of state involvement, drawing from the industrial policy and social views of state ownership, but as the previous section makes clear, there are potential negative consequences of state involvement, especially the possibility of perpetuating costly support mechanisms and bloated public bureaucracies. Therefore, a critical issue in this case is to define optimal *exit* strategies to downsize the ballooning of the state apparatus after the crisis.

A direct implication from our previous discussion is that exit strategies will become harder the slower the response in the current Covid-19 pandemic (which is still close to the short-term crisis scenario described in Table 2). That is, a slow response in the use of the state apparatus in the current scenario, the more countries incur the risk of ending up in the worst case scenario, in which bailouts and nationalizations may exacerbate the overall presence of the state in the economy in the long run. This is because, while using the state apparatus as a countermeasure entails its own set of risks, perhaps paradoxically *not* using it also increases the risk of ending up with a bloated state sector. This, as most of the world experienced in the 1970s and especially in the 1980s, can thwart the process of private recovery and slow down subsequent privatization processes.

In an extreme scenario, the world could go back to what Europeans experienced in the 1920s and 1930s, when failing industries were taken over by the government to keep them operating as going concerns, rather than responding to market forces. This episode, which in previous work we referred to as "Leviathan as an accidental owner" (Musacchio & Lazzarini, 2014), would be an extreme response to the current crisis if all other tools mentioned above either failed or were not used on time. The problem of that approach is that it makes it hard to backtrack an economy to the initial status quo in which the balance between the private sector and the public sector is tilted towards the former, and where the latter plays a complementary role whenever necessary.

From the experiences we have of privatizations around the world, we know that executing the perfect divestment process is extremely difficult and requires giving new buyers concessions to induce new private entry. The kind of concessions privatizers had to offer new buyers included rents, like monopolies or oligopolies, protections from foreign competition, and other advantages (Haber, 2005; Ramamurti, 1996). The difficulty of doing an effective destatization program down the line (including not only privatizations but also adjustments in the state apparatus such as reducing subsidized loans) are hard to predict, as political capture could create new Russia-like scenarios, in which oligarchs control multiple sectors and prevent antitrust and other regulatory agencies to emerge and operate.

State expansion may also create perceptions that "states are necessary at all times." This happened in Brazil after the 2008 financial crisis. For instance, although there is some evidence that subsidized loans by the Brazilian Development Bank (BNDES) helped support investment during the crisis (Machado, Grimaldi, Albuquerque, & Santos, 2014), policy makers and industries advocated continuous state expansion, crowding out the private sector and leading to severe fiscal problems afterwards. Moreover, we know from the history of development banks that once these structures are in place and there is a technocratic elite operating it, it is politically

costly to wind it down, especially because the narrative or perception that *without* such structures no private institution would step in to fill in the role of provider of long-term credit (Musacchio et al., 2017).

Thus, we recommend that policies should have clear "sunset clauses" (Rodrik, 2004), meaning that support and state expansion will exist as long as certain metrics are met, and that the support would disappear when other milestones are achieved. An obvious performance indicator, in the case of the Covid-19 pandemic, is the evolution in the curve of infections and deaths. More specific indicators, at the sector- or firm-level, involve operational indicators in coordinated policy programs (e.g. retooling efforts in manufacturing industries and increases in the accommodation capacity of private health providers receiving subsidizing loans). Entrepreneurial ventures participating in R&D consortia or receiving minority state equity should also be subject to well defined exit strategies where governments terminate the association or sell equity stakes after phased, pre-specified targets are met (e.g. internal R&D milestones and indicators of how clinical trials evolve).

Governments should also provide detailed data to facilitate the work of independent evaluators (universities, research centers, and so forth) to quickly examine the effectiveness and progress of state policies. In this case, there will be a tradeoff between speed and rigor. For instance, while more rigorous evaluation studies will try to build counterfactual scenarios examining what would have happened without the proposed state interventions (Duflo, Glennerster, & Kremer, 2008), the urgency of addressing the crisis mandates more data-driven approaches with more operational indicators of implementation and progress (Liebman, 2018). Based on these indicators, governments can also craft outcome- and results-based contracts with private operators and ventures engaged in state-sponsored discovery and coordinated action (McIsaac, Kutzin, Dale, & Soucat, 2018).

Particular attention should be given to cases where states decide to bail out firms with large allocations of state capital. Whenever receiving large amounts of debt or equity, these firms should be required to implement substantial adjustment and cease share repurchases and dividend payments until the state exits. But perhaps the best remedy, as we noted above, may be for states to act quickly and pursue a coordinated effort to attenuate the systemic effects of the crisis. Delayed action will increase the odds that the size of Leviathan will balloon and become a fixture of the economy for a longer period of time, even after the effects of the crisis ameliorate.

Conclusion

The state apparatus is invariably called upon during severe crises that escalate uncertainty and reduce the ability of market forces to promote quick responses. Although usual discussions have centered on how policies can promote financial liquidity and industry survival, we examine whether the state apparatus—not only state-owned organizations but also development agencies and public funds—can promote rapid experimentation and adjustment in production processes to increase prevention and treatment infrastructure and capabilities.

In a nutshell, potential actions include complementary public-private effort addressing both discovery and coordination problems—such as collaborative effort to develop vaccines,

treatments and tests, as well as injections of state capital to stimulate retooling and expansion of strategic infrastructure (e.g. production of health products, hospital equipment, or hospitals themselves). The state apparatus, especially the existing public technocracy, can help access remote and critical areas with higher marginal costs. In contrast, selective support to industries must be implemented with caution, especially in the case of sectors whose demand may suffer permanent shifts in demand due to changes in lifestyle. In general, horizontal industry support focusing on financially strained firms (regardless of their sector) is preferred to vertical industry support picking particular sectors.

State expansion, of course, comes at a cost, especially the long-term cost of perpetuating unjustified and ineffective state support. Data sharing and clear targets must be implemented to monitor the performance of state initiatives, abort policies that have signals of poor impact, and revert the process of state expansion as the effects of the crisis ameliorate. In this process, speed and complementary public-private effort are critical. Slower and reluctant state responses may increase the need of more massive state support downstream, making subsequent adjustments in the state apparatus less likely.

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