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Book Review of Mariana Mazzucato's (2014): The entrepreneurial state - debunking the myth of the public sector vs. the private sector

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Book Review of Mariana Mazzucato (2014) *The entrepreneurial state: debunking the myth of the public sector vs. the private sector.* São Paulo (Portuguese Edition): Portfolio-Penguin.

The Italian economist Mariana Mazzucato aims to dispel the commonly associated image of the state in theoretical and political discourse, which tends to portray it as a bureaucratic, inefficient entity, expensive for society. Her book is a necessary contribution to the debate on the role of the state and the limitations of the market as an agent capable of solving socioeconomic problems and challenges on its own. The last four decades have marked the rise of neoliberalism as the obligatory economic framework worldwide, leading to an increasing questioning of the state's role in the economy and perception of it as unnecessary. Mazzucato's meticulous argumentation contributes to retrieving evidence to clarify this debate and to understand the fundamental role that the state and public funding have been playing in the innovation process of major corporations.

In the **Introduction** to the book — comprising nine other chapters and a conclusion — the author aims to demonstrate that, although innovation is not the state's main task, it does play an active role in this regard. Opposite to what many economists and the mainstream media proclaim, its actions go beyond correcting "market failures" or mitigating business risk. The state can and should act as the true entrepreneur, not only by promoting startups, granting venture capital, and betting on "backyard geniuses", but also because it is the agent that effectively assumes the risk in uncertain conditions.

To convince the reader of this idea, Mazzucato argues that a substantial part of the investments in Research and Development (R&D) activities are less related to the problems of "public goods" and more to society's great challenges, which require vision, a sense of mission, and, mainly, confidence in the state's ability to lead major changes. Mazzucato argues that, contrary to the common perception, it is the state that embodies the true "animal spirits", a la Keynes, symbolized by the lion. On the other hand, private investors would be better illustrated by a small kitten (as opposed to the lion) since they are less tolerant to risk and act meekly when it is necessary to "undertake" actually new paths for the business sector.

The author dedicates the **First Chapter** ("From crisis ideology to the division of innovative labour") to present and refute the widely entrenched narrative that it is necessary to impose limits on the state, with the defense of economic austerity being the current representation of such rhetoric. This narrative holds the power to "fabricate its own history": by defending austerity, the state becomes less capable of fulfilling its functions. Mazzucato highlights that a second narrative comes to follow the first: the argument declaring the state's inability to "pick winners", which justifies the defense, by many critics, of the idea that the state should have its role limited and act only to correct market failures.

However, history itself shows that on several occasions it was up to the state to have an "animal spirit", capable of assuming risks that the private sector would not assume, even if it had monetary resources to do so. Such as in the development of the Internet and the algorithms behind the technologies used by companies such as Google and Apple, which also indicate the need for the state to better communicate its role in entrepreneurship and

in what types of activities it is willing to invest, innovate, and give support, for the markets that will be created.

Subsequent to this contextualization, the **Second Chapter** ("Technology, innovation and growth") begins with a historical review of the economic thought of important economists who, from different perspectives, emphasized the importance of the state. Based on this framework, Mazzucato draws attention to the need for greater agreement between the lessons left by John M. Keynes and Joseph A. Schumpeter. On the one hand, she emphasizes the importance of the notion of an interventionist state that acts to prevent instability, as pointed out by Keynes; on the other hand, she highlights the need to understand the role of technology and innovation in stimulating economic growth, as studied by Schumpeter. Thus, the author resorts to a synthesis of economic growth theories, from Robert Solow — who considers technological change as a residual in his growth model — to the developments of endogenous growth theories that analyze human capital and technology as engines of growth.

According to Mazzucato, it was with these theoretical assumptions that policymakers began to pay attention to the importance of investments in technology and human capital as drivers of growth. Therefore, the key point would not necessarily be the investment in R&D *per se*, but how knowledge diffuses throughout the entire economy. Concluding the argument, the author highlights some false premises that lead to the notion of effective innovation policies, which she labels as "myths" to be addressed in subsequent chapters: 1) that innovation is synonymous with R&D; 2) that small companies are important for growth and innovation; 3) that venture capital loves risk; 4) that there is a direct relationship between the number of patents, innovation, and economic growth; 5) that Europe's issues lie in commercialization rather than the creation of innovation, and 6) that corporate investment requires fewer taxes.

In **Chapter Three** ("Risk-taking state: from 'de-risking' to 'bring it on!'"), the author discusses the role played by the state as both an entrepreneur and a market maker. To this end, Mazzucato highlights the importance of state investment in basic research. Public investments are not limited to correcting market failures, as they also contribute to the creation of new products and markets. In this context, the state would assume certain risks that the private sector usually does not. An analysis of emblematic cases shows that the state not only financed investments in basic and applied research, but was oftentimes responsible for the initial funding needed to create technology. Such investments have been directed to the field of nanotechnology and the Internet itself. In other cases, state action has a significant impact on maintaining and stimulating innovative dynamics. Some highlights are the pharmaceutical field, in which the state invests in public laboratories and universities, consequently enabling the emergence of innovative medicines, and the biotechnology sector, in which biopharmaceutical development is a result of public investments rather than private initiative. Thus, the state took the lead when private capital fled sectors with greater risks.

Next, **Chapter Four** ("The US entrepreneurial state") discusses innovation in the United States, which is strongly driven by public spending in the area. Emblematic cases of this are the US government's Defense Advanced Research Projects Agency (DARPA), SBIR (Small Business Innovation Research Program), ODA (Orphan Drug Act), and the National Nanotechnology Initiative. They are all examples of the state's proactivity in shaping an innovation-focused market, with investments in "new" areas, as opposed to the private sector, which usually focuses on short-term investments. This dynamic illustrates the contradiction between the defense of a liberal state in the face of significant public investment in certain sectors.

In **Chapter Five** ("The state behind the iPhone"), Mazzucato deconstructs the idea that the private sector alone promotes radical innovations in the capitalist economy by

analyzing how Apple was able to become a dynamic company, as well as emblematic of a permanently innovative company. According to the Italian economist, Apple's innovative success can be traced back to a deliberate "erasure" of the role of the state. Public funding for research requested by the US armed forces played a crucial role in the development of various technologies that would later be used by Apple. The manufacture of products such as the iPod, iPhone, and iPad heavily relied on revolutionary technologies such as the Internet, GPS, touch screens, and other communication technologies, whose research were financed with public funds from DARPA. Thus, Mazzucato demonstrates that Apple's secret was to not direct its efforts and resources towards developing new high-cost technologies. Instead, the company has focused on integrating twelve of these technologies, which are the fruit of public-private partnerships. Based on "innovative architectures", this strategy shapes and differentiates its products from competitors in the telecommunications and electronic devices market.

In the same vein, **Chapter Six** ("Pushing vs. nudging the green industrial revolution") discusses support mechanisms for the promotion of renewable energy technologies, from the perspective of suppliers or producers of these technologies. Mazzucato highlights the key role of public policies and of the state in contexts avoided by private capital, as a result of the private sector's risk aversion. As it was still a "marginal" technology in the 1970s, the acceleration of the green energy transition, for example, required coordinated action by the state. Financing a "green revolution" would therefore require the transformation of the current industrial system into an environmentally sustainable one, linking the Information Technology (IT) revolution to all sectors of the economy (as is the case with smart electricity grids, for example).

According to the author, the state will have to finance, directly or indirectly, the growth of the long-term renewable energy market in order to accelerate the formation of innovative companies that can help bring about the green revolution. The text presents China and Germany as examples of progress in the areas of clean technology, due to more coherent policies on both the demand and supply sides. In contrast, the US, the UK, and other European countries have presented unstable "start-stop" strategies. The United States has adopted a "fund it all" approach, with the hope that a disruptive energy innovation will emerge sooner or later in the laboratories and that venture capital will decide to finance startups to make these new technologies commercially viable and widespread. However, this has not happened automatically because the development of clean technologies generally requires long-term financial commitments that private venture capital is not willing to take on. Since capitalists are "impatient" and these types of investments involve technological and market uncertainties, this riskier position is taken on solely by the state.

Chapter Seven ("Wind and solar power: government success stories and technology in crisis") demonstrates the active role of the state in promoting radical technological innovations, with the examples of wind and solar energy. The author begins by discussing how the energy crisis in the 1970s conditioned the state's change in stance to favor "greener" solutions to energy production, and then describes the evolution of the wind power industry. Mazzucato subsequently presents a brief history of the pioneering companies in the solar energy sector, as well as the role of the state behind the rise of these corporations. The economist then exposes certain challenges for industrial policy: (a) investment in direct and indirect R&D is a necessary, but not sufficient, condition for promoting innovation; (b) patient investment is needed to promote long-term industrial development, something the financial market is unwilling to do due to its short-termist logic; (c) the market for new technologies must be created, which implies a demand-side policy, and (d) a nascent industry must be protected from competition in its early stages in order to guarantee its long-term growth and economic support.

In **Chapter Eight** ("Risks and rewards: from rotten apples to symbiotic ecosystems"), the author resumes the discussion about the enrichment of renowned companies — disproportionate to their contributions to innovation — and points out the flow of rewards directed towards the state, its biggest investor. The entrepreneurial state takes the biggest risks, but reaps the smallest rewards; as a result, two expected impacts do not materialize. The first would be the potential increase in tax revenue, which does not take place since the companies benefiting from state support choose tax havens to establish themselves. This reinforces "the fact that the tax system is unreliable for recovering investments in risky innovation". The second expected impact is a qualitative increase in the level of employment, which also fails to materialize as a result of the companies' strategy: in the search to reduce production costs, companies employ increasingly intensive outsourced labor in countries with low labor costs, such as China. Through this discussion, the author argues the unsustainability of this model: "ignoring how much all this innovation has been achieved thanks to radical components financed with state money and denying the state its reward (...) will not help the emergence of future shiny apples".

After discussing the impacts of innovation and the central role of the state in it, the economist presents what she calls a "distorted reality of risk and reward" in **Chapter Nine** ("Socialization of risk and privatization of rewards: can the entrepreneurial state eat its cake too?"). Namely, this distorted reality is the pernicious behavior of privatizing profits and socializing losses, as observed during the last international financial crisis, a fact that has also been occurring in the area of innovation. Furthermore, those favored by the gains in this field end up hijacking a disproportionate share of these fruits.

The discourse adopted to legitimize this unequal arrangement is usually based on the so-called "shareholder value theory", anchored in neoclassical principles. This construct gives greater importance to the financial investment of the innovation process, to the detriment of workers' and taxpayers' contributions. The argument is that shareholders would be the biggest risk takers without any guarantee of a return because they are "residual claimants". That is, they would only get paid when the other economic agents have been remunerated.

However, this narrative very skillfully conceals the fact that the state is an actor that repeatedly invests heavily in updating and expanding physical and technological structures, as well as in the training of human resources in universities and public laboratories. The state does this because there is a greater risk for investments when they are made in science and technology. This type of investment is only eventually taken on by individual companies since the inability to control this risk can negatively affect their profitability. Innovation is, by its nature, a collective and cumulative process, so this unequal division not only generates more inequality, but ultimately harms the innovation process itself. Therefore, there must be a working risk-reward dynamic that replaces the dysfunctional "socialized risk" and "privatized reward". In this regard, Mazzucato proposes some solutions so that growth is not only sustained and sustainable, but also inclusive.

The first would be the creation of a golden share over intellectual property involving technological innovations financed directly by the government, thus ensuring that the patent owner does not adopt a predatory stance. Consequently, the owner would be pressured to license the patent "widely and fairly" after an initial period of protection, sufficient enough for them to recoup the investments made, but without preventing the dissemination of this knowledge among other agents who could benefit from the invention.

The second solution would be to set up a "national innovation fund": if the state has proved to be this important in financing high-risk innovation, then it should have a direct return on its investments, a kind of royalty on its application, creating resources for the government to continue financing innovation and making the investment of taxpayers'

money more sustainable. The remuneration earned by various technologies in different sectors should be funneled into a common fund, with the aim of financially maintaining the system of innovation and covering the inevitable losses associated with the high-risk investments that are characteristic of the field.

A third alternative would be to make the granting of repayable loans conditional on the retention of earnings: if the company's profits surpass an established threshold, a fraction of the subsidized amount would be returned.

Finally, in the **Conclusion,** the author highlights that, considering the central role of innovation in discussions on economic growth, it is crucial to precisely identify the roles and contributions of the public and private sectors. History is full of examples that clearly show that the main entrepreneurial force came from the state and not from the private sector, which should be enough to disqualify the assumption that the state's role should be restricted to incentivizing (especially financially) innovations carried out by the private sector. Even so, this narrative is predominant, with significant impacts on public-private arrangements for innovation, which become increasingly parasitic rather than symbiotic. Even if the state takes on more risk, it should not do so alone since companies will benefit from the positive results achieved in the future. The actions of the state, in this sense, must focus on the niches where the private sector is not willing to invest, which means that the state must not only assume the risks, but also enjoy the returns.

When it comes to innovation, the fundamental difference between the state and the market is not their mission, but rather the instruments that each has at their disposal to fulfill it. Therefore, the focus should be on the state's willingness to create markets, facilitating situations favorable to innovation that would not occur without its intervention. Many historical cases of radical technological breakthroughs demonstrate that private capital repeatedly avoids the most costly and risky stages of investments in science, technology, and innovation, expecting the state to bear the largest part of the risk and uncertainty in the creation of potential new markets. Additionally, the return on these investments tends to be almost completely privatized.

For Mazzucato, three fundamental implications emerge from this analysis:

1. It is not enough to recognize the importance of the "entrepreneurial state;" it must be built, including government organizations and institutions dedicated to long-term growth strategies.
2. Since the state has been actively involved in the intrinsically high-risk creation of new markets through innovation, it stands to reason that in the case of success, there should be a return to cover the inevitable failures. As the rate of failure is very high, these investments should provide for the possibility of a direct return on investment for the state in successful cases, which would serve to cover losses and finance future investments.
3. The centrality of recognizing the different roles played in the “ecosystem” of innovation. Otherwise, the role of the state will continue to be underestimated, while, at the same time, by overestimating the role of other actors, such as small and medium-sized companies, shareholders of large corporations, and venture capital, the vicious cycle of nationalizing losses and privatizing benefits will remain unbroken.

Almost a decade after its publication, it is easy to understand why this book had such a strong impact. The text makes a significant contribution to demystifying the dominant narrative about the role of the state in the economy, especially in creating innovations and shaping markets. However, it is also important to note that the reality characterized by the author is completely different from the scenario observed in the peripheral countries of capitalism, especially in the countries of the Global South. In Latin American countries, for

example, this would mean adding new elements to this analysis. In addition to the role of the state in the economy and its centrality in the processes of technological development and innovation, there are several important variables: a) the volatility of local governments; b) the high concentration of income, which significantly reduces the consumer market for high value-added goods; c) the low propensity of local companies to innovate, and d) the mimetic consumption model and the importance of transnational companies in local economies. All this takes place against a backdrop of deindustrialization and a loss of economic complexity in the activities carried out locally in these Latin American countries.

This reality further politicizes the author's discussion on the socialization of costs and privatization of profits. In our opinion, this behavior is typical of the capitalist system. In other words, it would be naïve to expect companies to choose, of their own free will, to reward the state either by paying their taxes in the place where the economic activities originally take place or to think that it is enough just to create local jobs. Beyond this, it is necessary to question why companies do not choose to pay their employees better instead of just redistributing dividends among their shareholders. This occurs undoubtedly because it goes against the rules of economic rationality within a capitalist system. Possible explanatory factors for the maintenance of this parasitic relationship in central countries, such as the search for soft power, seem to be less representative of peripheral countries, whose scenarios are marked by highly opportunistic business behavior and rentierism.

This scenario seems even more discouraging in view of the proposals put forward by the author as a way of reacting to the problems discussed throughout the book. There is no doubt that Mazzucato's text deserves careful reading because it is thought-provoking and enjoyable, despite the various challenges she highlights, which make the reader feel a certain dismay at the current format of relations between the funding state and the parasitic private sector. It is a great starting point for reflections that could offer changes in this *modus operandi* and in the way public opinion views acclaimed innovative companies.

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