

# THE CREATIVE STATE

*Innovation driven by the state could be the catalyst that takes our economy in the right direction*

*by Mariana Mazzucato*

Countries around the world are seeking smart innovation-led growth. At the same time, there is rising concern that this growth needs to be both more inclusive and sustainable than in the past. Achieving these outcomes requires rethinking the role of both government and public policy in relation to the economy funding not just the rate of innovation but also envisioning its direction. Such an approach challenges our very notion of economic progress and the need for this to speak to wider social considerations than simply growth itself.

It requires a new justification of government intervention that goes beyond the usual one of fixing market failures. It means ensuring that our policymakers and their institutions have the ability and confidence to shape and create markets and for a more ‘inclusive’ notion of growth to more fairly distribute both risks and rewards.

Modern capitalism faces a number of great societal challenges, including climate change, youth unemployment, obesity, ageing and rising inequality. As the European Commission’s 2020 strategy demonstrates, these challenges have created a new agenda for innovation and growth policy that requires policymakers to ‘think big’ about what kinds of technologies and policies can fulfil visionary ambitions to make growth smarter, more inclusive and sustainable.

Although such challenges are not strictly technological – they also

require behavioural and systemic changes – they have much to learn from those mission-oriented feats that led human beings to put a man on the moon, or those that led to the emergence of new general-purpose technologies, ranging from the internet to bio- and nanotechnology.

Achieving such missions required companies that were willing and able to invest in long-run areas and a confident entrepreneurial state willing and able to take on the early, capital-intensive, high-risk areas, which the private sector tends to fear. The entrepreneurial state is one that is able and willing to invest in areas of extreme uncertainty, courageously envisioning the direction of change across public agencies and departments. Such a state must welcome, rather than fear, the high risk and uncertainty across the entire innovation chain, from basic research to commercialisation, and the experimentation processes required for organisational learning along the way. Most importantly, an entrepreneurial state must ‘think big’ in terms of the scale of the challenges it seeks to address, the innovations needed and the shift in direction aspired to.

Finding ways for governments to do this is not just about throwing public money at different activities. It requires a new economic framework that can justify the role of the public sector in directing change forming the right institutional structures that can foster and adapt to change in a dynamic way. This framework needs to be based on an understanding and justification of the potential catalytic role of government: its ability to transform landscapes, create and shape markets and not just fix them. Such an approach >>

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## “EVERY TECHNOLOGY THAT MAKES THE IPHONE SMART – INTERNET, GPS, TOUCHSCREEN – WAS PUBLICLY FUNDED”

requires new indicators through which to evaluate public investments. It implies a very different approach to the organisation of government, and to the distribution of risks and rewards that emerge from the collective effort towards smart, innovation-led growth.

### BEYOND MARKET FAILURES

Market failure theory (MFT) justifies public intervention in the economy only if it is geared towards fixing situations in which markets fail to efficiently allocate resources. This approach suggests that governments intervene to fix or compensate for markets by investing in areas with ‘public goods’ characteristics, such as basic research or drugs with little market potential, and by devising market mechanisms to internalise external costs like pollution or external benefits, like herd immunity.

While MFT provides interesting insights, it is at best useful for describing a steady-state scenario in which public policy aims to put patches on existing trajectories provided by markets. It is less useful when policy is needed to dynamically create and shape new markets. This means it is problematic for addressing innovation and societal challenges, because it cannot explain the kinds of transformative, catalytic, mission-oriented public investments that in the past created technologies and sectors that did not exist before (the internet, nanotech, biotech, cleantech and so on) and that the private sector feared. It was such mission-oriented investments that coordinated public and private initiatives, built new networks and drove the entire techno-economic process, resulting in the creation of new markets.

There are broadly four opportunities for changing innovation policy discourse, currently hampered by the limitations in MFT, which continues to guide policymaking today. These relate to directionality (‘picking’ broadly defined directions); evaluation (of public sector investments in terms of market making, not fixing); organisation (building the public organisations of the future that can welcome risks) and risks and rewards (making sure the rewards of public sector risk-taking are shared collectively).

First, MFT assumes that the state only fixes problems, with the ‘market’ setting the actual direction. In actuality, periods of transformative change have been deeply steered on both the supply and the demand side by visionary policy making. As I show in my book, *The Entrepreneurial State: Debunking public vs. private sector myths*, every technology that makes

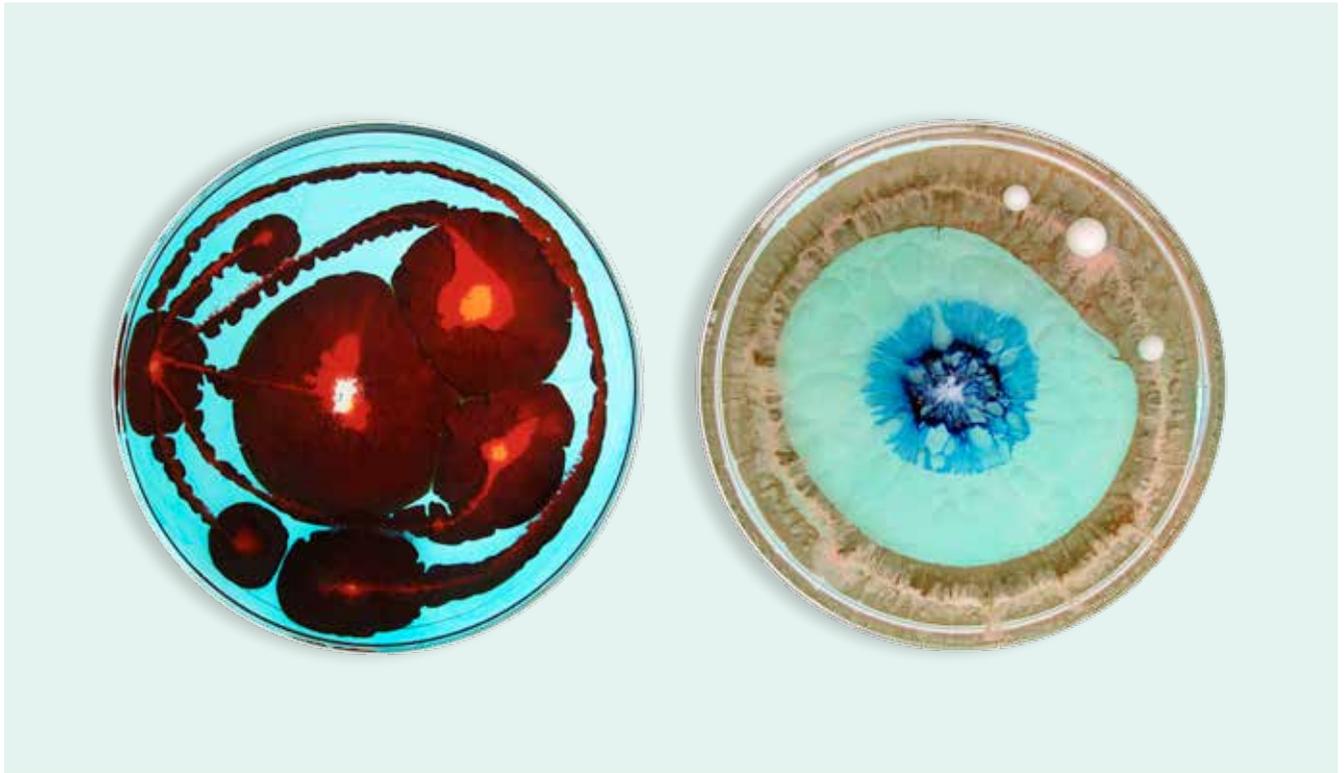
the iPhone ‘smart’ (internet, GPS, touch-screen display and Siri) was directly publicly funded. Public money has not only funded the actual technologies, such as mainframes, the internet, wind and solar power, and fuel cells, it has also created a network of decentralised public and private actors, provided early-stage funding to companies that risk-averse private finance would not, and devised special tax credits that favoured some activities more than others. These facts seem to point to a different analytical problem facing policymakers: not whether the right role is to intervene or to stand back, but understanding how particular directions and routes can be chosen and determining how to mobilise.

By ignoring this fact, we allow directions to be set without much debate. Shale gas, which was fully funded by the US government, is a case in point, considering the negative impact that the technology required to produce it (fracking) has on natural environments.

The importance of such a debate is absent in traditional economic policies, which aim to correct markets and assume that once the sources of the failure have been addressed, market forces will efficiently direct the economy to a path of growth and development. Yet, markets are ‘blind’ and the direction of change they provide often represents suboptimal outcomes from a societal point of view. This is why, in addressing societal challenges, states have had to lead the process and provide the direction towards new ‘techno-economic paradigms’, which do not emerge spontaneously from market forces. In the mass production revolution and the IT revolution, governments made direct mission-oriented investments in the technologies that enabled these revolutions to emerge and formulated bold policies that allowed them to be fully deployed throughout the economy.

The second opportunity is to address the limitations that MFT has in its ability to measure its transformational impact by developing more dynamic and less static evaluation metrics. MFT has developed concrete indicators and methods to evaluate government investments. These stem from the framework itself, usually through a cost-benefit analysis that estimates whether the benefits of public intervention compensate for the costs associated both with the market failure and the implementation of the policy, including ‘government failures’.

There is a mismatch, however, between the intrinsically dynamic character of economic development and the static tools used to evaluate policy; the diagnostic tools and



evaluation approach based on MFT involves identifying the sources of market failure and targeting policy interventions on their correction. This entails *ex-ante* considerations about administrative and fiscal requirements and the political-economic consequences of intervention.

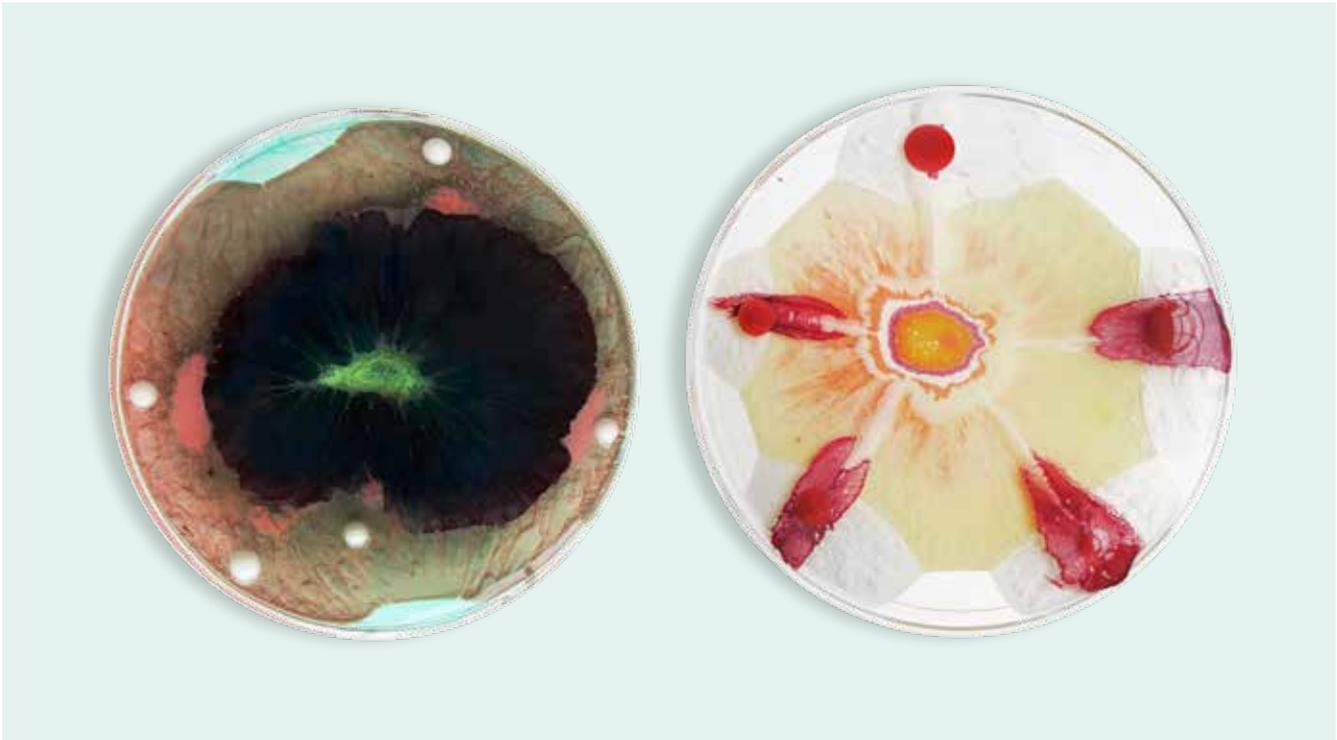
Such an exercise usually consists of a number of steps. Prior to any action taken, there will be a cost-benefit analysis that weighs up the costs of the failure, the (private and social) benefits that flow from addressing it, the costs and risks of government failure and an identification of the sources of market failures and of second-best policy tools to address them. This process then informs a diagnosis of the best “principal-agent” structure that avoids governmental capture by private interests (insulation/autonomy) and that forces private agents to do what the principal (government) wants. And, after changes have been implemented, there will be an evaluation of the outcomes of the intervention set against any quantifiable predictions made in relation to the likely outcomes of the intervention.

This is a limited toolbox. The nature of policy intervention and investment involved in addressing societal challenges are intrinsically dynamic, and this approach represents a static exercise of evaluation. By not allowing for the possibility that government can transform and create new landscapes, the ability to measure such impact has been affected, with economists often resorting to an analysis of the public sector as an inefficient private one.

This is evident not only in the area of innovation, but also for public services. This then leads to accusations of government ‘crowding out’ businesses, which implies that

those areas that government moves into could have been areas for business investment. Such accusations are at best defended through a ‘crowding in’ argument, which rests on showing how government investments create a larger pie of national output that can be shared between private and public investors, including savings to both. However, this defence does not capture the fact that the goal of public investments should be to not only ‘kickstart’ the economy but to choose directions that, as Keynes wrote, “do those things which at present are not done at all”. By not having indicators for such transformative action, the market failure toolbox affects governments’ ability to know when it is simply operating in existing spaces or making new things happen that would not have happened otherwise. This often leads to investments that are too narrow or directed within the confines of the boundaries set by business practices of the prevailing technological paradigm.

The third opportunity presented by the weakness of MFT relates to the organisation of the state. Currently, the theory neglects the role that fear of failure has in limiting the capacity of public sector institutions to innovate through a process of learning, experimentation and self-discovery. At its most extreme, MFT calls for the state to intervene in the economy as little as possible, in a way that minimises the risk of ‘government failure’ (for example, crowding out, cronyism and corruption). This view requires a structure that insulates the public sector from the private sector (to avoid issues such as agency capture) and has resulted in a trend of ‘outsourcing’ that often rids government of the knowledge capacities and capabilities, such as around IT, that are necessary >>



for managing change. Studies have examined the influence of outsourcing on the ability of public institutions to attract top-level talent with the relevant knowledge and skills to manage transformative mission-oriented policies. Without such expertise, it will be difficult for the state to coordinate and provide direction to private actors when formulating and implementing policies that address societal challenges.

Indeed, there seems to be a self-fulfilling prophecy whereby the less ‘big thinking’ occurs in government, the less talent/expertise the public sector is able to attract, the less well it performs and the less ‘big thinking’ it is allowed to do. In order to promote transformation of the economy by shaping and creating technologies, sectors and markets, the state must organise itself so that it has the intelligence (policy capacity) to think, to be ambitious and to formulate bold policies. This does not mean it will always succeed. Indeed, the underlying uncertainty in the innovation process means the state will often fail. But if the emphasis is on the process of policymaking that can allow the public sector to envision and manage transformational change, then it is essential to understand the appropriate structures of public organisations, to allow them to become ‘learning’ organisations that welcome rather than fear the trial-and-error process underlying innovation.

The final opportunity a new framework should address is how to ensure a fairer distribution of both risks and rewards from the innovation process, developing more symbiotic private-public partnerships. MFT has little to say about cases where the state is the lead investor and risk taker in capitalist economies through ‘mission-oriented’ investments and policies. Having a vision of which way to drive an economy requires direct and indirect investment in particular areas,

not just creating the conditions for change. This requires crucial choices to be made, the fruits of which will create some winners but also many losers. Indeed, precisely because venture capital has become increasingly short-termist, with emphasis on an exit in three years (while innovation takes 15 to 20 years), publicly funded early-stage seed finance, such as SBIR funds in the US, has become increasingly important, as have guaranteed loans for innovative high-risk projects. For example, the Obama administration recently provided large guaranteed loans to two green-tech companies, Solyndra (\$500m) and Tesla Motors (\$465m). While the latter is often glorified as a success story, the former failed miserably and became the latest example, used widely by both economists and the more popular treatment in the media, of government being unable to ‘pick winners’. Indeed, the taxpayer picked up the bill and complained.

This highlights the need to build a theoretical framework that can help the public sector understand its choices across a broad portfolio – offsetting the inherent risks of innovation by diversifying its investments to enable the rewards of the successes to cover the losses of the many inevitable failures – and how to therefore socialise not only the risks of those investments but also the rewards. In building a portfolio, it is crucial to make sure that the assumptions regarding the distribution of returns, as well as their measurement, are guided by a real understanding of the fundamental uncertainty that drives the innovation process and the broad nature of social returns. The risk-reward question comes down to whether, in an MFT framework, government deserves to retain a direct share of the profits generated from the growth that it fosters.

Is it right that US taxpayers shouldered the Solyndra loss, yet made nothing from the Tesla profits? Or, put another way, are taxes currently bringing back enough returns to government budgets to fund high-risk investments that will probably fail? It is well known that companies that benefit greatly from government investments have been successful in avoiding tax. Google, whose algorithm was funded by the National Science Foundation, has been criticised for such avoidance, as have Apple, Amazon and a host of ‘new economy’ companies. But even if they were not avoiding tax, tax rates, such as that on capital gains, have been falling due to the narrative that it is a narrow set of agents who are the real innovators, wealth creators and risk takers. It is indeed this same narrative that has justified the increasing financialisation of the private sector, with many large companies in IT, energy and pharmaceuticals spending more of their returns on share buybacks than on research and development, a dynamic that William Lazonick has shown to hurt sustainable and smart growth. Only when this limited and biased wealth creation narrative is debunked can we begin to build more symbiotic innovation eco-systems that can ensure future funding by both public and private actors.

### **NEW FRAMEWORK, NEW QUESTIONS**

The economy of 2030 and beyond requires an entrepreneurial state to boldly look ahead and set the direction of change rather than timidly creating the conditions and levelling the playing field, allowing markets to set directions for us.

The solutions derived from MFT, such as downsizing the state apparatus, promoting market-based mechanisms to counter market failures and insulating public agencies from the private sector, might hold for steady-state situations, but not for the situations in which public policy is required for transformation, such as those witnessed through the technological and socio-economic missions of the past. They are not fit for purpose.

This is not about prescribing specific technologies but providing directions of change that bottom-up solutions can then experiment with. My colleague in the Science Policy Research Unit at the University of Sussex, Professor Andy Stirling, puts it well: “The more demanding the challenges for innovation (like poverty, ill health or environmental damage), the greater becomes the importance of effective policy. These challenges of innovation policy go well beyond simplistic notions of governments trying to “pick winners”...This is about culturing the most fruitfully cross-fertilising conditions across society as a whole, for collectively seeding and selecting across many alternative possibilities and together nurturing the most potentially fruitful. This involves collaboratively deliberating, negotiating and constructing what ‘winning’ even means, not just how best to achieve it.”

## **“MARKETS ARE ‘BLIND’ AND THE DIRECTION OF CHANGE THEY PROVIDE OFTEN REPRESENTS SUBOPTIMAL OUTCOMES FROM A SOCIETAL POINT OF VIEW”**

It is, of course, important not to romanticise the state’s capacity. The state can leverage a massive national social network of knowledge and business acumen, but we must make sure its power is controlled and directed through a variety of accountability measures and diverse democratic processes. However, when organised effectively, the state’s visible hand is firm but not heavy, providing the vision and the dynamic push (as well as some ‘nudges’) to make things happen that otherwise would not have. Such actions are meant to increase the courage of private business. This requires understanding the state as neither a meddler nor a simple facilitator of economic growth. It is a key partner of the private sector – and often a more daring one, willing to take the risks that business won’t. The state cannot and should not bow down easily to interest groups that approach it for handouts, rents and unnecessary privileges like tax cuts. It should seek instead for those groups to work dynamically with it, doing things they would not have done otherwise and setting a direction of change. Today, such change could be driven by the mission for ‘green innovation-led growth’. In the same way that putting a man on the moon required many sectors to interact, the green direction being debated today requires all sectors to change. As Carlota Perez has emphasised, green is not only about wind, solar and biofuels, but also about new engines, new maintenance systems, new collaborative sharing economies and new ways of thinking about product obsolescence.

But this requires investment, and all the evidence shows that the kind of patient, long-term finance needed comes from state investment. In the UK, the next five years look set to be dominated by a continued focus on austerity and a politically inspired – and economically illiterate – drive to run a continual budget surplus. If we want to see real long-term growth in 2030, we need to understand the state’s critical role in creating and shaping the new markets of tomorrow. The successful economies of 2030 are already making that investment today. ■

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