

<b>Institution:</b> University of Sussex		
<b>Unit of Assessment:</b> 17 – Business and Management Studies		
<b>Title of case study:</b> Shaping the UK's Industrial Strategy, the Scottish National Investment Bank and the European Commission's Horizon Europe programme		
<b>Period when the underpinning research was undertaken:</b> 2011 – Mar 2017		
<b>Details of staff conducting the underpinning research from the submitting unit:</b>		
<b>Name(s):</b>	<b>Role(s) (e.g. job title):</b>	<b>Period(s) employed by submitting HEI:</b>
Mariana Mazzucato	Professor; RM Phillips Chair in the Economics of Innovation	2011 – Mar 2017
Caetano Penna	Research Fellow	2012 – 2014
Gregor Semieniuk	Research Fellow	2015 – 2016
<b>Period when the claimed impact occurred:</b> 2014 – 2020		
<b>Is this case study continued from a case study submitted in 2014?</b> N		
<b>1. Summary of the impact</b> <p>Research led by Professor Mariana Mazzucato has had a major influence on the UK Government's Industrial Strategy, underpinning core policy and funding decisions. Through close engagement with UK parliamentary and government actors and processes, the researchers' 'mission-oriented' concepts for stimulating and financing innovation have dramatically shaped the UK Government's change in approach to public funding, which included a funding commitment of £1 billion, announced in 2017. By structuring its Industrial Strategy around 'grand challenges' and 'missions', the Government is putting this research into action, with the aim of improving productivity and economic growth to solve some of society's biggest problems. Mazzucato's work has also influenced the Scottish Government's development of its National Investment Bank, and has defined the European Commission's €95.5billion research and innovation programme Horizon Europe.</p>		
<b>2. Underpinning research</b> <p>After the financial crisis of 2008, the coalition government pursued a fiscal policy of austerity that forced major cuts in public services. The prevailing narrative was that cuts were necessary to boost competitiveness and innovation. Research by Mazzucato and colleagues at Sussex investigated the economics of innovation and the high-tech industry, and found links between the most innovative companies and state investment. It challenged perceptions of 'the State' as a bureaucratic machine, too inertial to drive innovation. Instead, it presented comprehensive analyses of instances where the state has played a pivotal role in fostering sustainable, innovation-led economic growth.</p> <p>Two grants from the Ford Foundation [G2] funded the research that underpinned Mazzucato's book <i>The Entrepreneurial State</i> [R1]. The book used case studies – covering the aviation, IT, biotech and nanotech industries – to demonstrate that the private sector finds the courage to invest only after an 'entrepreneurial state' has made the initial, high-risk investments. It also illustrated how, in order for a 'green revolution' to transform our society, it must be fuelled by the kind of patient, public-sector financing that enabled the internet to succeed. In the book's revised edition [R1], Mazzucato outlined how government investment often has the effect of 'crowding in', or stimulating, private investment. For example, America's moon mission led to breakthroughs crucial to today's ICT sector. Such 'spillovers' – the ensuing creation of technologies and capabilities – demonstrate the societal benefits to be reaped from a transformed public-private innovation ecosystem.</p> <p>Turning to Europe in the aftermath of the financial crisis [R2], Mazzucato and Perez (Honorary Professor) put the case that – rather than aiming to return to 'business as usual' – 'mission-oriented' state investment is required. That is, driven by innovation; specifically, by the perception of where new technological opportunities lie and thus directed towards creating those</p>		

opportunities across all policy spaces and affecting the entire economy. Mazzucato and Perez proposed eight criteria for designing innovation policy, including 'public investments as mission/challenge-oriented', as well as recommendations to invest patient, long-term capital, for example via public development banks, and to accept the high failure rates that this might entail. In **R3**, Mazzucato and Penna further explored 'mission-oriented state investment banks' (SIBs) and their role in market creating and shaping. In a 2016 report, '[The Brazilian Innovation System: a Mission-Oriented Policy Proposal](#)' commissioned by the Brazilian Government, Mazzucato and Penna set out the ten principles of mission-oriented policy and the six key institutional capacities needed for its success. These ideas reappear in Mazzucato's later publications at UCL.

In **R4** (further developing the insights in her report for Innovate UK [**S1**]), Mazzucato argued that the state can 'create and shape' markets, rather than simply fix failing markets. She asserted that it is key for government to not just pick different technologies or sectors but ask what it wants from these sectors. Using examples such as NASA's Apollo mission, she proposed that it is today's societal challenges – which combine social, political, economic and technological ambitions – that should guide new policy missions. The paper outlined four questions that need to be addressed to enable public and private actors to work together in more symbiotic and dynamic ways: Directions, Evaluation, Organisational change, Risks and Rewards.

The same 'big questions' are asked in **R5**. Mazzucato revisited the 'mission-oriented' strategies implemented by public agencies and investment banks, and showed that – for real societal transformations to occur – public policy needs to provide and organise patient finance in a way that aligns with its 'missions'. The research found that innovation also needs well-funded public research and development institutes, and strong industrial policies. By setting societal missions, and using their own resources to co-invest with long-term capital, governments can do far more than 'level the playing field' – they can help 'tilt' the playing field towards the achievement of publicly-chosen goals.

Analysis of how public financing could support a green revolution is the focus of **R6**, which examined the emerging clean technology sector; it concluded that – and outlined how – 'mission-oriented' public investment along the entire innovation chain could bring about the major transformative innovation needed to confront contemporary societal challenges.

### 3. References to the research

- R1.** Mazzucato, M. (2013) *The entrepreneurial state: debunking public vs. private sector myths*. Anthem Press, London, UK. ISBN 9780857282521; also Revised edition (2015), Anthem Press. ISBN 9781783085200. Both available on request.
- R2.** Mazzucato, M., and Perez, C. (2015) 'Innovation as growth policy: the challenge for Europe' in Fagerberg, J., Laestadius, S. and Martin, B. (eds.), *The triple challenge for Europe: economy, climate change and governance*. Oxon: Oxford University Press, pp. 229-253. ISBN 9780198747413. <http://dx.doi.org/10.1093/acprof:oso/9780198747413.003.0009>. Also available as SPRU Working Paper Series, SWPS 2014-13: <https://www.sussex.ac.uk/webteam/gateway/file.php?name=2014-13-swps-mazzucato-perez.pdf&site=25>
- R3.** Mazzucato, M., & Penna, C. C. R. (2016), Beyond market failures: the market creating and shaping roles of state investment banks. *Journal of Economic Policy Reform*, 19(4), pp. 305-326. <https://doi.org/10.1080/17487870.2016.1216416>
- R4.** Mazzucato, M., (2016) From market fixing to market-creating: a new framework for innovation policy, *Industry and Innovation*, 23(2), pp. 140-156. <http://dx.doi.org/10.1080/13662716.2016.1146124>
- R5.** Jacobs, M. and Mazzucato, M., eds. (2016) *Rethinking capitalism - economics and policy for sustainable and inclusive growth*. Chichester: Wiley Blackwell. ISBN 9781119120957. Including chapter by Mazzucato: 'Innovation, the State and Patient Capital' pp. 98-118. <https://sro.sussex.ac.uk/id/eprint/61952/> Available on request.
- R6.** Mazzucato, M., & Semieniuk, G. (2017), Public financing of innovation: new questions, *Oxford Review of Economic Policy*, 33(1), pp. 24-48. <https://doi.org/10.1093/oxrep/grw036>

**Related grants**

- G1.** Institute for New Economic Thinking (INET), Financing Innovation: an application of a Keynes-Schumpeter-Minsky Synthesis, PI: Mazzucato (with Randy Wray), 2012-2014 (total \$200,000; £71,249 to Sussex)
- G2.** Ford Foundation, Finance and the Entrepreneurial State. PI: Mazzucato, 2012-2014, renewed 2014-2016 (combined total £266,243 to Sussex).
- G3.** European Commission, Horizon 2020, ISIGrowth: Innovation-fuelled, Sustainable, Inclusive Growth, Sussex PI: Mazzucato (Coordinating Institution: Univ. Sant'Anna, Pisa), 2015-2018 (€2,498,610 from EU, €380,238 to Sussex)

**4. Details of the impact****4.1 Shaping the UK's Industrial Strategy**

Following political and media interest in **R1**, Mazzucato and Penna organised a three-day conference on 'Mission-Oriented Finance for Innovation' (London, 22-24 July 2014), which resulted in the Policy Network publication '[Mission Oriented Finance for Innovation: New ideas for investment-led growth](#)'. The event introduced the pair's ideas to UK and international policymakers, business executives and academics, challenging conventional thinking about the public sector's role in financing innovation, and promoting long-term 'mission-oriented' policies to stimulate economic growth *and* solve societal challenges.

When the UK Government's Technology Strategy Board rebranded as Innovate UK in 2014, it commissioned Mazzucato to produce a report to "inform our strategic development of innovation support" [**S1**]. The report drew on **R1**, stating "innovation-led growth is a major battle that requires public policy to fundamentally change," to start "actively creating and shaping markets" through "'mission-oriented' investment."

In 2016, the Business, Energy and Industrial Strategy Select Committee launched an inquiry around the development of a UK Industrial Strategy [**S2**]. Mazzucato provided evidence [with reference to **R1-5**] to the inquiry, and was invited to a roundtable led by Rt Hon Greg Clark (then Secretary of State for the Department for Business, Energy & Industrial Strategy (BEIS)) to discuss how an Industrial Strategy could incorporate the mission-oriented approach. The Committee criticised the BEIS Industrial Strategy Green Paper (Jan 2017), drawing extensively on Mazzucato's evidence. It recommended that "the Government reconsider giving sectoral strategies priority and instead focus on horizontal policies and specific 'missions' to meet UK-wide and local public policy challenges. This will make clear that the function of the Government's industrial strategy – and of industry itself – is to solve societal problems and it will provide a clear focus for activity across Government and industry." [**S2**, p3]

In March 2017, the Government launched the Industrial Strategy Challenge Fund, committing more than £1 billion over four years to fund UK business and research, with the aim of placing research and innovation at the heart of the Industrial Strategy. Mazzucato continued to engage in the strategy's development, responding to the Green Paper consultation [**S4**] and presenting her work to BEIS officials (July 2017). When the Government launched its Industrial Strategy White Paper in November 2017 [**S4**], the influence of the 'mission-oriented' research was immediately evident. The policy was now built around "ambitious missions – global and national challenges that need to be tackled by breaking down traditional barriers and finding new ways of doing things." [**S4**, p22]. The Strategy is infused with references to the Sussex researchers' concepts, including:

- "Governments can make long-term investment that no single commercial or academic player can take alone. The modern nation state is the most powerful means we have of pooling risk. We are willing to take these risks... An industrial strategy that avoids risk is no industrial strategy at all" [p22]
- "A truly strategic government must do more than just fix the foundations: it must... look to shape new markets and industries" [p32]
- The announcement of four Grand Challenges, towards which "business, academia, civil society and the government must work together, bringing their expertise and entrepreneurial spirit, to drive us all towards success" [pp 34-5]

- Plans to “develop ‘missions’ to tackle the Grand Challenges... tackling specific problems, such as reducing carbon emissions... using well defined and concrete goals to allow progress to be monitored and assessed.” [p35]

In March 2018, Mazzucato, now at UCL, gathered a network of influential academic, policy, public- and private-sector proponents of her research (many of whom, including Lord David Willetts, attended the conference she organised in 2014) to assemble the ‘Commission for Mission-Oriented Innovation and Industrial Strategy’ (MOIIS). In a speech on 21 May 2018, PM Theresa May explicitly acknowledged the influence of this Commission, stating:

“...setting ambitious and clearly-defined missions motivates human endeavour. There is huge potential in a missions-based approach to drive faster solutions and it is an approach being pioneered here in the UK, by University College London’s Commission on Mission-Oriented Industrial Strategy. So today I am setting the first four missions of our Industrial Strategy – one in each Grand Challenge.” [S5]

Mrs May subsequently announced four ‘missions’, each with time-bound, measurable targets. These were described in a BEIS policy paper ‘Forging our future: Industrial Strategy’ [S6, p9]: (i) to transform chronic disease prevention, diagnosis and treatment by 2030; (ii) to ensure everyone can enjoy five extra healthy, independent years by 2035; (iii) for all new small vehicles to be zero-emission by 2040; and (iv) to halve energy use of new buildings by 2030.

In May 2019, BEIS published their policy paper ‘The Grand Challenge missions’ [S7a], which details the £2billion spent or committed to supporting the four missions. Inspired by Mazzucato’s work, it also announced additional ‘missions’ to “focus on a specific problem, bringing government, businesses and organisations across the country together to make a real difference”. The paper’s introduction links to the MOIIS Commission’s report [S7b], which draws on Mazzucato and Perez’s work (referencing R1, R2, R5) to outline the research behind ‘mission-oriented innovation’ (pp22-3), its application to industrial strategy (pp24-5), and how the Industrial Strategy ‘should evolve to deliver innovation-led growth that solves key societal challenges’ (p13).

#### **4.2 Inspiring the development of the Scottish National Investment Bank**

In 2015, Mazzucato was appointed to the Scottish Government’s Council of Economic Advisers, enabling her to “highlight the important role that national investment banks play in providing long-term investment to support economic growth in many European countries” [S8a, p7]. In December 2017, First Minister Nicola Sturgeon announced plans for a Scottish Investment Bank (SIB) “with the aim of boosting Scotland’s economic performance ...by providing patient capital to finance growth” [S8a, p7]. The Bill states: “Much of the Scottish Government’s inspiration for a national investment bank draws on the academic work of Professor Mariana Mazzucato” [S8a, p4] and cites R3 [S8a, pp9, 10, 14, 26]. The SIB launched in November 2020, backed by £2billion government funding to support projects and businesses that meet goals such as cutting carbon emissions and reducing inequality. Sturgeon said: “The launch of the bank is one of the most significant developments in the lifetime of this parliament, with the potential for it to transform, grow and decarbonise Scotland’s economy.” [S8b]

#### **4.3 Defining Horizon Europe: a €95.5bn mission-oriented programme**

As a result of work funded by the European Commission grant [G3], Mazzucato’s research became noticed by the Commission. Carlos Moedas, European Commissioner for Research, Science and Innovation, demonstrated his support for Mazzucato’s work in a series of engagements and speeches in 2016-17 [S9]. He subsequently invited her to become his Special Adviser on Mission Driven Science and Innovation, and commissioned her to develop strategic recommendations about how to maximise the impact of the EU Framework Programme for Research and Innovation through mission-oriented policy. Her report, ‘[Mission-Oriented Research & Innovation in the European Union](#)’, published in February 2018, builds on Mazzucato and Perez’s previous work on Europe [R2] and cites R1 and R4. In June 2018, the Commission announced their proposal for Horizon Europe – a €100billion programme to succeed Horizon 2020 that “will incorporate research and innovation missions to increase the effectiveness of funding by pursuing clearly defined targets.” [S10a]. Outlining how Horizon



Europe was designed, the Commission lists three key documents on mission-oriented policy “that shaped the proposal”: two are outputs from Mazzucato’s research (the above report, and in presentation format), and the third is an analysis of the stakeholder consultation response to this report [S10b].

In September 2020, the proposed EU missions – designed to address challenges including climate change and cancer – were announced. Mariya Gabriel, Commissioner for Innovation, Research, Culture, Education and Youth said: “The EU missions’ idea is to tackle these societal challenges in a new way: targeted, time-bound and with a measurable goal. They bring together policies and instruments as a coherent, joined-up approach to ensure a strong impact on society and drive long-term, systemic and disruptive change.” [S11]. On 11 December 2020, the EU institutions reached a political agreement on Horizon Europe (which will run from 2021 to 2027) and set its budget at €95.5 billion [S10a].

## 5. Sources to corroborate the impact

- S1. Innovate UK report ‘A mission-oriented approach to building the entrepreneurial state’ (Nov 2014) Report summary available at: [www.gov.uk/government/publications/a-mission-oriented-approach-to-building-the-entrepreneurial-state](http://www.gov.uk/government/publications/a-mission-oriented-approach-to-building-the-entrepreneurial-state) PDF of full report supplied.
- S2. BEIS Select Committee Inquiry. Industrial Strategy: First Review (21 February 2017): <https://publications.parliament.uk/pa/cm201617/cmselect/cmbeis/616/616.pdf>
- S3. Response to BEIS Green Paper. Building our Industrial Strategy (15 April 2017) PDF.
- S4. Industrial Strategy White Paper. Building a Britain fit for the future (27 November 2017) <https://www.gov.uk/government/publications/industrial-strategy-building-a-britain-fit-for-the-future>
- S5. Speech by Prime Minister Theresa May on science and modern Industrial Strategy at Jodrell Bank (21 May 2018): [www.gov.uk/government/speeches/pm-speech-on-science-and-modern-industrial-strategy-21-may-2018](http://www.gov.uk/government/speeches/pm-speech-on-science-and-modern-industrial-strategy-21-may-2018)
- S6. BEIS Policy Paper. Forging our future: Industrial Strategy - the story so far (6 December 2018) <https://www.gov.uk/government/publications/forging-our-future-industrial-strategy-the-story-so-far>
- S7. a) BEIS Policy Paper. The Grand Challenge missions (22 May 2019): <https://www.gov.uk/government/publications/industrial-strategy-the-grand-challenges/missions> b) MOIIS report ‘A Mission-Oriented UK Industrial Strategy’ (22 May 2019): <https://www.ucl.ac.uk/bartlett/public-purpose/partnerships/commission-mission-oriented-innovation-and-industrial-strategy-moiis/mission-oriented>
- S8. a) Scottish National Investment Bank Bill (26 April 2019): <https://digitalpublications.parliament.scot/ResearchBriefings/Report/2019/4/26/Scottish-National-Investment-Bank-Bill> b) First Minister launches Scottish National Investment Bank Press Release (23 Nov 2020): <https://www.gov.scot/news/investing-in-scotlands-future-3/>
- S9. Four key speeches in which Moedas expresses support of Mazzucato’s research (PDF): a) SET Plan 2016 – Central European Conference on Energy Union, 1 December 2016; b) European Commission 3rd EU Energy Summit - An EU Energy Policy Benefiting Citizens, Consumers and Businesses’, Brussels (28 March 2017); c) Presentation of Rise Group publication: “The best possible future is an Open one”, Centre for European Policy Studies, Brussels (15 May 2017); d) At Building Blocks for European Leadership in Renewables event, Brussels, Belgium (22 June 2017)
- S10. a) Horizon Europe [https://ec.europa.eu/info/horizon-europe\\_en](https://ec.europa.eu/info/horizon-europe_en) b) Reports and materials that shaped the proposal – see Mission-oriented policy: [https://ec.europa.eu/info/horizon-europe/commissions-proposal-horizon-europe\\_en](https://ec.europa.eu/info/horizon-europe/commissions-proposal-horizon-europe_en)
- S11. European Commission press release, 22 September 2020 [https://ec.europa.eu/info/news/top-experts-hand-over-their-proposals-eu-missions-commission-greener-healthier-and-more-resilient-europe-2020-sep-22\\_en](https://ec.europa.eu/info/news/top-experts-hand-over-their-proposals-eu-missions-commission-greener-healthier-and-more-resilient-europe-2020-sep-22_en)