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| **Institution:** University College London | | |
| **Unit of Assessment:** 13 – Architecture, Built Environment and Planning | | |
| **Title of case study:** Pioneering mission-oriented innovation with policymakers in Europe, the UK and Scotland to create public value | | |
| **Period when the underpinning research was undertaken:** 2017-2020 | | |
| **Details of staff conducting the underpinning research from the submitting unit:** | | |
| **Name(s):** | **Role(s) (e.g. job title):** | **Period(s) employed by submitting HEI:** |
| Mariana Mazzucato | Professor in the Economics of Innovation & Public Value | 2017-present |
| Rainer Kattel | Professor of Innovation and Public Governance | 2017-present |
| **Period when the claimed impact occurred:** 2017-2020 | | |
| **Is this case study continued from a case study submitted in 2014?** N | | |

**1. Summary of the impact** (indicative maximum 100 words)

UCL's Institute for Innovation and Public Purpose (IIPP) researchers' work on 'mission-oriented' approaches to solving complex societal challenges has helped rethink the role of the state as an active participant in innovation. The research has encouraged governments to organise innovation policy around specific, inspirational goals or 'missions' and had a significant impact by:

i) Influencing the European Union to create a new EUR100,000,000,000 mission-oriented research and innovation programme
ii) Influencing the UK Government to adopt a mission-oriented approach to industrial policy worth more than GBP4,000,000,000 to the British economy
iii) Shaping the design of the Scottish Government's new GBP2,000,000,000 Scottish National Investment Bank

**2. Underpinning research** (indicative maximum 500 words)

Since 2017, Mariana Mazzucato and colleagues at the UCL Institute for Innovation and Public Purpose (IIPP), have championed 'mission-oriented' approaches to solving complex societal challenges, such as climate change, poverty and inequality. This research encourages policymakers to set specific, bold and inspirational targets or 'missions' and then focus efforts across multiple policy spheres on achieving these. It rethinks the role of the state as an active participant in catalysing innovation and collaboration across public, private and civil society sectors to create and co-shape markets to achieve ambitious aims.

'The Value of Everything' (Mazzucato, 2018) challenged the dominant narrative that businesses create value and governments merely facilitate this process and fix market failures. The book argues that governments should pursue policies, such as those which govern the human-made surroundings of the built environment, by driving interactions between public, private, civil and third sector actors in a way which rewards value creation, not extraction **[a]**.

In a special issue of the journal *Industrial and Corporate Change*, Mazzucato and Kattel contextualised the re-emergence of mission-oriented innovation policies against the broader search for a new type of policy to tackle grand societal challenges, and the organisational structures necessary to facilitate them **[b]**. They identified a lack of dynamic capability in the public sector as a critical barrier to innovation. In an article in the same issue, Mazzucato drew on lessons from successful mission-oriented policies during the 20th and 21st centuries to advocate an alternative approach to policymaking. This new approach should be based on setting concrete directions, building decentralised networks of public organisations that can form dynamic partnerships with private and third sector partners and developing new methods to assess missions' success **[c]**. This approach also examined how to structure new types of 'deals' between public and private sector actors to ensure rewards are shared as much as

risks. This contrasts with traditional sector-based strategies whereby government typically funds early-stage high risk R&D and the private sector then joins later once the technology is proven and is able to capture a disproportionate share of the profits via patents.

In a subsequent article, data on global asset finance flows between 2004 and 2014 were analysed to evaluate the relationship between different types of finance and their willingness to invest in renewable energy innovation and these green technologies' success **[d]**. The study demonstrated how different types of financial investors, such as institutional investors, state banks and utility providers, with different incentives and risk appetites, had determined the direction of renewable energy development. This research found that state banks and utility providers had greater risk appetite than private sector finance and were playing a market-shaping role in supporting renewable energy innovation and deployment, beyond merely addressing market failure.

Mazzucato developed this theme in a 2020 article which challenged theoretical arguments that public direct investment in renewable energy would either 'crowd in' private investors by leading to unsustainably high private sector investment, or 'crowd out' businesses from the sector **[e]**. The research offered the first quantitative estimate of the effect of public direct investment on private investment into renewable electricity technologies for 17 countries, between 2004 and 2014. It found that public investment has the most significant consistent impact on private investment flows, relative to other government incentives, such as feed-in tariffs, tax subsidies, and requirements on utility companies to produce a proportion of their energy through renewable sources.

In a subsequent article **[f]**, Mazzucato presented a new framework for analysing the role of the state as a risk taker and co-investor in innovation, more in tune with a market co-creation than a market failure perspective. The article highlighted that policies that explicitly take into consideration the risk-taking entrepreneurial role of the state, can positively affect reward distributions and favour more equitable public–private partnerships. Sharing rewards enables a 'portfolio' mindset, where the upside is used to cover the downside, and more stable funding better serves citizens' needs. This is a key element of the mission-oriented approach, enabling the state to take risks by supporting multiple different projects, knowing that some may fail but that successes will also earn a return for the taxpayer.

**3. References to the research** (indicative maximum of six references)


a) Mazzucato, M. (2018) The Value of Everything, Allen Lane: London
b) Kattel, R. and Mazzucato, M. (2018) 'Mission-oriented innovation policy and dynamic capabilities in the public sector', *Industrial and Corporate Change*, 27 (5), pp. 787-801. https://doi.org/10.1093/icc/dty032
c) Mazzucato, M. (2018) 'Mission Oriented Innovation Policy: Challenges and Opportunities', *Industrial and Corporate Change*, 27 (5), pp. 803–815. https://doi.org/10.1093/icc/dty034
d) Mazzucato, M. and Semieniuk, G (2018) 'Financing renewable energy: who is financing what and why it matters', *Technological Forecasting and Social Change*, 127, pp. 8-22. https://doi.org/10.1016/j.techfore.2017.05.021
e) Deleidi, M., Mazzucato, M. and G. Semieniuk (2020) 'Neither crowding in nor out: Public direct investment mobilising private investment into renewable electricity projects', *Energy Policy*. https://doi.org/10.1016/j.enpol.2019.111195
f) Laplane, A. and Mazzucato, M. (2020) 'Socialising the risks and rewards of public investments: Economic, policy, and legal issues', *Research Policy*. https://doi.org/10.1016/j.repolx.2020.100008

**4. Details of the impact** (indicative maximum 750 words)

IIPP has used its research to build strong relationships with policymakers, which have led to collaborations to develop and implement new mission-oriented policies at a European, UK and Scottish governmental level.

**4.1 Inspiring the European Union to create a new mission-oriented research and innovation programme**

In January 2018, the then European Commissioner for Research, Science and Innovation, appointed Mazzucato as Special Advisor for Mission-Driven Science and Innovation, with a remit to shape the EU's new Research and Innovation programme. During her time as a special advisor, Mazzucato drew on her research **[a, b, c]** on mission-oriented innovation to author two EU-funded reports.

Mazzucato's February 2018 report *Mission-Oriented Research & Innovation in the European Union* argued missions should be a critical component of EU research and innovation policy. It also set out a detailed policy framework to harness innovation policy to solve societal challenges, such as the decarbonisation of cities, and guide the union's selection of mission-oriented projects **[1]**. In June 2018, the Commissioner for Research, Science and Innovation formally announced the ambitious EUR100,000,000,000 Horizon Europe research innovation project for the next EU budget between 2021 and 2027. He described this investment as "the biggest increase [in budget] in absolute terms, ever' from €80bn to €100bn" **[2]**. The proposals incorporated and referenced, in detail, Mazzucato's recommendations on mission-oriented innovation policy. Discussing her influence on its design, the Commissioner stated, "The idea of the missions, which comes from the work of the economist Mariana Mazzucato, is exactly to create ways of communicating better to the people what we do (in European science and research). Instead of saying that we will map the brain, we can say that our mission is to cure some diseases like Alzheimer's or dementia, or that we'll do something for people not to die of cancer, and people will understand better what we do" **[2]**. The European Parliament endorsed the proposals on 17th April 2019 **[3]**.

The subsequent report, *Governing Missions,* was launched on 4th July 2019 in Helsinki, Finland at a ministerial meeting of 28 innovation ministers from EU member states. It details three areas that have a large effect on mission implementation: financing, public sector capabilities and civic engagement **[4]**. In a November 2019 letter, the Commissioner for Research, Science and Innovation explained how the "combination of economic theory with policy practice demonstrated both the ability of public servants in directing innovation and the potential for market shaping policies", noting that IIPP's input had inspired the EU to "fundamentally redesign" the Horizon Europe framework to "incorporate a funding stream based upon the missions" **[5]**.

**4.2 Influencing UK Government to adopt a mission-oriented approach to industrial policy**

In November 2017, following formal and informal consultations with Mazzucato, the UK Government's Department for Business, Energy & Industrial Strategy (BEIS) published a new industrial strategy entitled *Building a Britain Fit for the Future.* The publication included a specific reference to her work and stated, "Where appropriate, teams will develop 'missions' to tackle the Grand Challenges. They involve tackling specific problems, such as reducing carbon emissions by a given percentage over a specific year period, using well defined and concrete goals" **[6]**. The influence of the work was also evident in the industrial strategy's mission-orientation around four 'Grand Challenges'; Future of Mobility, Clean Growth, Ageing Society, and AI and Data Economy **[6]**.

In March 2018, IIPP established the UCL Commission on Mission-Oriented Innovation and Industrial Strategy (MOIIS) to develop policy solutions to address each of these challenges.

Co-chaired by Mazzucato and Lord Willetts, former government minister for science and innovation, the commission included academics and industry experts**.** BEIS civil servants closely involved in Industrial Strategy policy development also attended monthly meetings and participated in working groups. In a May 2018 speech at Jodrell Bank Observatory, then Prime Minister Theresa May cited the MOIIS Commission's work when launching the first set of missions in each Grand Challenge, supported by a GBP6,000,000,000 Industrial Strategy Challenge Fund. She stated, "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" **[7i]**. The move represented a significant shift in focus from traditional, sector-based strategies, to societal challenges with local and national resonance **[7ii]**.

The MOIIS Commission launched its first major report, *A Mission-Oriented UK Industrial Strategy*, on 22nd May 2019 at an event attended by the then BEIS Secretary of State, Greg Clark **[7iii]**. The report identified several key implementation challenges and policy recommendations for the UK Government to drive the Grand Challenges agenda forward, such as policy evaluation, leadership and regulations. Media outlets such as the *Financial Times*, *City AM* and the *Times Red Box* reported on its recommendations **[7v]**. On September 13th 2019, the government officially announced the Grand Challenge Missions pertaining to four areas: Artificial Intelligence and Data, Ageing Society, Clean Growth, and the Future of Mobility, all drawing heavily on the MOIIS report **[7ii]**.

MOIIS Commission co-chair, Lord Willets wrote that without Mazzucato and IIPP colleagues' work, he doubted "that the Industrial Strategy white paper would have included the four 'Grand Challenges". Moreover, he acknowledged Mazzucato's "important role in reshaping a key plank of the UK economic policy" **[7iii]**. Greg Clark MP confirmed that the research "was a significant contributor to the increase in public R&D spending of over £4 billion that was achieved in 2018" and that the challenge-based thinking she advanced "has been, and still is, highly influential on both public policy and practice in the UK" **[7iv]**.

### 4.3 Shaping the Scottish Government's new Scottish National Investment Bank

In her role as an economic advisor to the Scottish Government, Mazzucato has advocated for state investment as a critical component of mission-oriented innovation. In March 2019, she drew on specific research insights on the success of patient, long-term finance in driving innovation in areas such as renewable energy **[d, e, f]**, to publish a Scottish-Government-commissioned framework for its new Scottish National Investment Bank (SNIB) **[8]**. The publication laid the blueprint for the state-backed lender, which will invest GBP2,000,000,000 during its first ten years, to provide mission-oriented businesses with an alternative source of sustainable, long-term finance, with repayment terms between 10 and 15 years. It will fund projects that help Scotland meet its 2045 net zero target, tackle place-based inequality and foster innovation in the country's businesses **[9]**.

The Chief Economist at the Scottish Government described how "the design, structure and approach being taken forward in creating the SNIB has been influenced directly" by Mazzucato **[10]**. The Scottish Government's plans for the bank includes several references to Mazzucato's work **[11]**. The SNIB was launched in late 2020 when First Minister Nicola Sturgeon described the project as "one of the most significant developments in the lifetime of this parliament" **[12]**.

IIPP's impact continues to grow and in late 2020 it was awarded a grant of GBP470,000 from the Bittner Foundation for a project called 'Mission Oriented City Innovation: Tackling the Climate Crisis'. This will support IIPP to engage with cities on the decarbonisation 'mission' at an international scale, engaging with influential cities networks including C40, UN HABITAT and Bloomberg Cities.

**5. Sources to corroborate the impact** (indicative maximum of 10 references)

**1.** Mazzucato, M. (2018) Mission-Oriented Research & Innovation in the European Union: A problem-solving approach to fuel innovation-led growth, European Commission, DG Research and Innovation. Link: https://bit.ly/3lqDY8P

**2.** 7th June 2018 EU Horizon Magazine interview with EU Commissioner announcing the programme. Link: https://bit.ly/3r0B6AF

**3.** 'Text adopted - Programme implementing Horizon Europe' Link: https://bit.ly/30Ta83q

**4.** Mazzucato, M. (2019) Governing Missions in the European Union. European Commission. Link: https://bit.ly/2Nqa5sL

**5.** Testimonial: European Commissioner for Research, Science and Innovation.

**6.** Department for Business, Energy and Industrial Strategy, Industrial Strategy White paper, 'Building a Britain Fit for the Future', ref 19, page 35 (27th November 2017) Link: https://bit.ly/3vBU8Ba

**7.** Industrial Strategy evidence:
**i)** Prime Minister Theresa May's speech, 21st May 2018. Link: https://bit.ly/2QgdWtF;
**ii)** UK Government official announcement of missions in each Grand Challenge, 13th September 2019. https://bit.ly/3eX2n4C;
**iii)** Testimonial: Former Minister of State for Universities and Science, President of the Resolution Foundation;
**iv)** Testimonial: from former BEIS Secretary of State;
**v)** Media coverage of MOISS Commission report launch: 'Ministers must resist bailout of British steel' (City AM, 21st May 2019). Link: https://bit.ly/2NpLSmo; 'British industry needs its own version of the moon shot'(Financial Times, 22nd May 2019). Link: https://on.ft.com/3eOrlOd; 'Next PM cannot afford to drop the ball on our industrial strategy' (The Times Red Box, 3rd June 2019). Link: https://bit.ly/3lrljdd

**8.** Mazzucato, M., Macfarlane, L. (2019). A mission-oriented framework for the Scottish National Investment Bank. UCL Institute for Innovation and Public Purpose, Policy Report (IIPP WP 2019-02). https://bit.ly/3toHWSe

**9.** 'Scotland's national investment bank launches', BBC. https://www.bbc.co.uk/news/uk-scotland-scotland-business-55035520

**10.** Testimonial: Chief Economist at the Scottish Government

**11.** The Implementation Plan for the Scottish National Investment Bank https://bit.ly/2QgmuRe

**12.** 'Investing in Scotland's future' https://bit.ly/30QzxL0