

IIPP Policy Brief (updated April 2019)

Patient Finance for Innovation-Driven Growth

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The challenge of smart, inclusive and sustainable growth

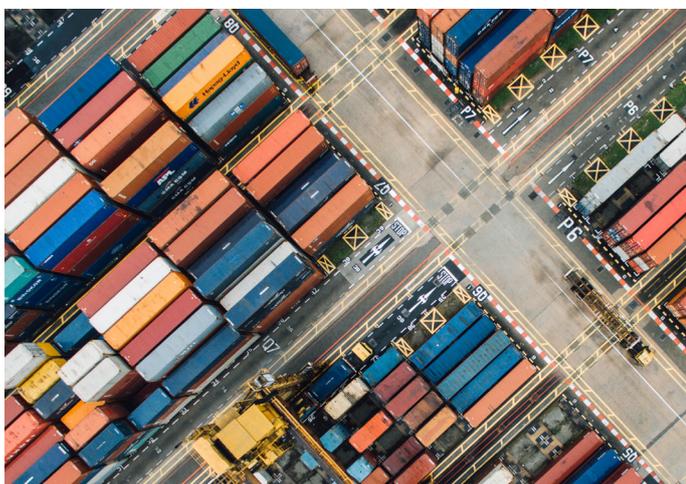
Tackling societal challenges, from climate change to improving public health and adjusting to demographic changes, require steering investments and innovation towards achieving concrete targets, such as those outlined in the Sustainable Development Goals. Technological, organisational and institutional innovations are key in this process. And because innovation has not only a rate but also a direction, this ‘directionality’ helps determine the degree to which innovation outcomes lead to more inclusive and sustainable growth.

The research of the Institute for Innovation and Public Purpose (IIPP) on “mission-driven” innovation has provided thought leadership on how both innovation and industrial policy can help achieve concrete challenge led goals. Missions require cross-sectoral and cross-actor investments, and bottom up experimentation. In the UK, IIPP has set up a Commission for Mission-Oriented Industrial Strategy (MOIIS) to help transform challenges set out by the government (clean growth, mobility, data economy, and ageing society) into missions, and our European Commission report, Mission-Oriented Research and Innovation in the European Union, focuses on how to use the Commission’s FP9 budget for research, science and innovation to tackle targets like plastic free oceans, carbon neutral cities, and decreasing the burden of dementia (Mazzucato, 2018).

Missions must be bold and inspirational, addressing societal priorities that are set through political leadership but determined more horizontally through multiple stakeholder engagement. They must inspire and reward investments across different types of actors (public, private, and third sector) and especially across different sectors in both manufacturing and services. They must also nurture different forms of bottom up experimentation that lead to different types of solutions.

A mission-oriented approach is not easy. It requires rethinking the policy tool kit which is often wed to just fixing market failures and ‘levelling the playing field’. Rather than just ‘fixing’ what is required in a mission-oriented approach is a more active co-creation of markets framework, and rather than levelling what is required is actively tilting the playing field in dynamic ways that reward and assist those organisations willing to engage in new forms of collaborations to tackle difficult missions. Not picking winners but picking the willing. Not just de-risking but sharing risks and rewards.

Missions thus raise as many questions as they answer. Who chooses the missions and how can diverse stakeholders be engaged throughout? What sort of administrative structures and capabilities are required for governing missions? How can a delicate balance be struck between directing innovation policy towards societal goals, while also fostering bottom up exploration and experimentation which keep open multiple



biotechnology and nanotechnology, many major technological breakthroughs – in both basic research and downstream commercialisation – were only made possible by direct public investment willing and able to take risks before the private sector was willing to (Mazzucato, 2013).

A key lesson is that financial instruments can provide an ‘investor of first resort’ role that implies moving beyond fixing market failures towards one of actively co-shaping and co-creating new landscapes (Mazzucato, 2016). Understanding how this was done – what works, what does not – requires learning from international experiences with financial institutions willing to provide strategic long-term finance. This has taken different institutional forms, from public venture capital funds, such as Yozma in Israel, to public banks like the KfW in Germany or the multilateral banks including the European Investment Bank. It has also required new forms of financial regulations (Kattel et al, 2016; Campiglio et al, 2018).

In many countries patient strategic finance is increasingly coming from state investment banks. We focus on this particular type of institution, and consider its role within a mission oriented setting.

State investment banks as a source of patient strategic finance

State investment banks have their historical roots in the reconstruction plans for Europe following the Second World War. While the traditional functions of state investment banks were in infrastructure investment and counter-cyclical lending, some have more recently become key domestic and global actors driving economic growth and innovation, often focusing on tackling modern societal challenges (Mazzucato and Penna, 2015; 2016).

In two new IIPP working papers, IIPP Director Professor Mariana Mazzucato and Research Associate Laurie Macfarlane compare the activities of eight state investment banks from different countries and regions and analyse the role they play in their respective economies. Different design features are examined, and lessons are used to reflect on how state investment banks can be designed to address the challenges and opportunities of mission-oriented policy (Mazzucato and Macfarlane, 2017, 2018). A summary of the lessons from the research and are summarised in the next section.

This research, along with IIPP’s work on patient finance and mission-oriented innovation, has been used to inform the design of the new Scottish National Investment Bank, which is due to

pathways? How can missions be evaluated using new public value metrics that go beyond static cost-benefit framework? What sort of financing requirements does mission-oriented innovation-led growth require?

In this policy brief we focus on the issue of financing missions, while also touching on some of the other questions above. We will be addressing more directly the issue of stakeholder engagement, public value, and policy capacity in two forthcoming IIPP policy briefs.

Strategic mission-oriented finance

Access to finance is essential for firms looking to grow and innovate. But simply increasing the availability of finance will not on its own improve economic performance. What matters is not just the quantity of available finance, but the quality of finance. This is because finance is not neutral; the type of finance available can affect both the investments made and the type of activity that occurs (Mazzucato and Semieniuk, 2017). Because innovation is highly uncertain, has long lead times, is collective and cumulative, innovation requires not just any type of finance but patient strategic committed finance (Lazonick and Mazzucato, 2013). Short-termism and risk-aversion means that the private sector will often not invest in higher-risk areas until future returns become more certain. And if financial institutions, like venture capital, are too short-termist and exit-driven, they can lead to problems in sectors, as those faced by the biotechnology industry (Pisano, 2006; Lazonick and Tulum, 2011).

Early-stage public investment helps to create and shape new markets and nurture new landscapes which the private sector can develop further. In other words, it can – if structured well – lead to a dynamic ‘crowding in’ effect. Indeed, from advances such as the internet and microchips to

Case study

Scottish National Investment Bank

In September 2017 the First Minister of Scotland Nicola Sturgeon announced plans to establish a new Scottish National Investment Bank to support the Scottish Government's vision for delivering smart and inclusive growth. The announcement was informed in part by advice from IIPP Director Professor Mariana Mazzucato, who has been part of the Scottish Government's Council of Economic Advisors since 2016.

Following the announcement, IIPP was appointed to a small Advisory Group that was convened to lead the work developing an evidence-based implementation plan. The implementation plan was published in February 2018, and draws on IIPP's research to outline a roadmap for creating a new mission-oriented Scottish National Investment Bank. The proposed vision for the bank outlined in the plan is:

"The Scottish National Investment Bank will provide finance and act to catalyse private investment to achieve a step change in growth for the Scottish economy by powering innovation and accelerating the move to a low carbon, high-tech, connected, globally competitive and inclusive economy."

In March 2019, IIPP published a new report outlining a mission-oriented framework for the Bank which, if implemented successfully, will maximise its potential for promoting transformational change across Scotland's economy (Mazzucato and Macfarlane, 2019). Drawing on international evidence, as well as IIPP's own path-breaking research, we set out clear criteria for designing missions, as well as how a mission-based approach should be implemented in practice.

The bank is expected to become operational in 2020, and will aim to maximise additionality by providing access to the long-term patient finance necessary for ambitious firms to invest in innovation, and for large-scale projects that will help transform Scotland's economy in line with the bank's missions.

become operational in 2020. As Brexit creates new economic challenges, including the potential loss of access to the European Investment Bank, what key lessons can be drawn for policymakers across the rest of the UK?

International lessons for mission-oriented state investment banks

Mandate and mission

The overarching mandate is critical to the role that state investment banks play in their economies. Mandates are often set out in law or in Articles of Association, and often change and evolve over time. There is a notable contrast between banks that are 'mission driven', with activities being driven by a desire to solve big societal problems, and those which are focused on more static outcomes such as 'competitiveness' or serving particular sectors. By focusing finance on missions that need cross sectoral collaborations, the role of the banks is less open to 'capture' by specific business interests, and less susceptible to the related 'picking winners' problem. An exciting area for future work relates to how the definition of missions can be opened up to a wider group of stakeholders across civil society.

Different economic roles

Most state investment banks play a capital development and countercyclical role, however in recent years some have gone further and are now playing key venture capitalist and mission-oriented roles. By placing state investment banks at the centre of the investment process, countries like Germany and China as well as the European Union have taken centre stage in confronting the key social and environmental challenges of the 21st century. By steering the path of innovation towards overcoming key challenges, these banks are not just fixing 'market failures'; they are actively creating and shaping markets and enabling activity that otherwise would not take place. How state investment banks can optimally interact with other public agencies to drive innovation and contribute to the kind of 'networked entrepreneurial state' that has been responsible for many great technological breakthroughs, is a rich area for further study.

Investment activity

The investment activities of state investment banks vary between countries according to the bank's mandate, socio-economic circumstances and the stage of development. In the UK, a mission-led state investment bank could provide additionality by catalysing activity that otherwise would not



happen. Investment activities would be guided by specific challenges, rather than an ex-ante desire to serve any specific sector. This could most effectively be achieved by placing a state investment bank at the centre of the investment process, nurturing knowledge and expertise and coordinating other stakeholders in the investment ecosystem. Some state investment banks have been criticised on the basis of ‘picking winners’, ‘crowding out’ or funding large incumbent companies. Indeed, crowding out can occur precisely when state investment banks are not causing additionality: making things happen that would not have happened anyway. And focussing loans on firms of a specific size (e.g. SMEs) or in a specific sector can lead to handouts that do not result in higher business investment. By focusing on providing patient strategic finance to organisations willing to engage with challenging problems (missions), a ‘picking the willing’ framework can replace the problematic picking winners one.

But it is also true that capturing the crowding in process requires monitoring and evaluation frameworks which adequately capture the dynamic spillovers created by mission-oriented investments and the additionality generated by these institutions. As a result, new monitoring and evaluation frameworks may be required in order to assess their performance.

Governance

Governance arrangements are vital to the success and legitimacy of state investment banks. Achieving the right balance between political representation and independent decision making is a key challenge. It is important that management teams are free of day to day political interference to make independent, long-term decisions; such capacity for autonomous decision-making has historically been key for successful ‘innovation bureaucracies’ (Karo and Kattel 2018). While political representation can help to maintain alignment with government policy

and maintain a path of democratic accountability, steps should be taken to prevent undue political interference or capture by interest groups. The experience of some state investment banks such as the German KfW indicates that including a wider range of stakeholders can be beneficial.

Sources of finance

There are many different ways that state investment banks finance their operations, including taking savings and deposits from the public, raising funds in the domestic or international capital markets, borrowing from other financial institutions, using return on investments, receiving budget allocations from the national treasury, managing public pension or social security funds, or receiving financing from the central bank. There is evidence that sources of finance can have an impact on the ability of state investment banks to successfully meet their mandates. If a source of finance proves to be volatile or unstable, then it can impair the ability of the bank to fulfil its mandate. An important consideration is whether different sources of finance affect a bank’s appetite for risk.

Funding instruments – direct versus indirect

State investment banks with a mission-oriented mandate should have a range of financing instruments, covering both debt and equity, suited to different areas of the risk landscape. In this regard lessons can be learned from the banks that have become key players in the innovation system. Indirect instruments such as guarantees can also be used, but care should be taken to avoid creating dependency relationships – direct investments that help to create new technological and industrial landscapes tend to be more effective at crowding-in private investment than indirect mechanisms (i.e. at providing additionality). Subsidies and guarantees may fail to foster catalytic effects.

Similarly, while many state investment banks use the ‘on-lending’ model whereby they provide funding to private financial sector intermediaries such as commercial banks who in turn on-lend money to customers, we recommend that it is better to develop the capacity to lend directly. This is because in practice it is difficult to demonstrate that intermediaries have used the money in the intended manner, and may end up using the funding to promote undesirable activities (e.g. supporting property lending, or increasing shareholder dividends)

Some state investment banks have also created specific funding programmes that target particular issues, whether related to health or the climate. In addition to lending operations, advisory services

can help to create viable projects and encourage businesses to make investments that otherwise would not happen.

Risks, rewards and conditionality

State investment banks must be able to strike the right balance between risks and rewards, ensuring that investments are structured across a risk-return spectrum so that lower risk investments help to cover higher risk ones. Where success occurs, a bank should be able to reap some of the financial rewards in order to offset the inevitable failures. To help balance risk and reward, state investment banks can use a number of return-generating mechanisms, including retaining equity or royalties, retaining a share of the intellectual property or using income-contingent loans. Conditions can also be attached to loans and investments (e.g. including conditions regarding private profits being reinvested, employment pay and conditions, or carbon footprint). Mechanisms should be designed to encourage a symbiotic and mutualistic type of public-private partnership.

Capacity and expertise

Talent is key – staff must have clear understanding of the nature of the investments being made, and a willingness to engage in ‘big thinking’. In many cases this includes not only financial expertise but significant in-house engineering and scientific knowledge about the sectors the bank is active in. This enables state investment banks to base investment decisions on a wider set of criteria than relying on market signals alone and create a hub of expertise that can be drawn on to provide expert advice on government policy design and implementation. It also enhances their ability to crowd-in private investment by giving private sector actors the confidence they need to invest.

Relationship with government policy

Close alignment between state investment banks and government policy, including central bank and other regulatory bodies, can create a powerful synergy between policy, regulation and financing, which can be coordinated for maximum impact. For example, new government policies can be complemented with new financing instruments or financial regulations in order to transmit policy objectives more efficiently. Although potentially powerful, this relationship is highly dependent on effective governance arrangements to ensure that sound banking principles are maintained and undue political interference is avoided. Industrial policy and new forms of patient finance must go hand in hand. The work of the Commission on Mission-Oriented Innovation and Industrial Strategy (MOIIS)

Case study **European Investment Bank (EIB)**

The European Investment Bank (EIB) is the financing institution of the European Union (EU) and works closely with other institutions to implement EU policy. In 2016 the EIB committed a total of €76.4 billion – including £7 billion in the UK. However, following the UK’s vote to leave the European Union, the future of the EIB’s activity in the UK is uncertain.

Guided by the objectives of the Europe 2020 strategy of smart, sustainable, and inclusive growth, the EIB’s current activities are aligned to four priority areas: innovation and skills, SMEs, infrastructure, and climate and environment. The EIB Group is also the majority shareholder in the European Investment Fund (EIF), which facilitates access to equity for high-growth and innovative SMEs.

Despite evidence of economic growth returning to Europe over the last year, there remain major challenges for EU countries with regards to investment and innovation. Public investment across the EU remains at a 20 year low, and investment in research and development (R&D) remains well below that in the US, China, Japan and South Korea. Financing also remains a constraint for smaller, younger and innovative firms or those with high investment in intangibles who typically lack a credit history or collateral (Mazzucato et al, 2018).

There is therefore an opportunity for the EIB to play a more significant mission-oriented role, steering investments towards missions that tackle key societal challenges. The EU’s unique multilevel governance system is well suited to mission-oriented policies: member states and regions can experiment within larger EU-wide missions and the lessons can then be shared across member states. By embracing a mission-oriented approach, the EU has the opportunity to lead the world in confronting the key challenges of the 21st century.

is a live experiment in how the concept of missions can help to steer industrial policy in ways that are less sector focused and more problem focussed, reducing the risk of capture by particular business interests, and achieving greater additionality (MOIIS, 2018).

References

Campiglio, E., Dafermos, Y., Monnin, P., Ryan-Collins, J., Schotten, G. and Tanaka, M. (2018). 'Climate change challenges for central banks and financial regulators'. *Nature Climate Change* volume 8, 462–468.

Karo, E. and Kattel, R. (2018). 'The Bit and the Rainforest: Towards an Evolutionary Theory of Policy Capacity'. UCL Institute for Innovation and Public Purpose WP (IIPP WP 2018-03). Available at: https://www.ucl.ac.uk/bartlett/public-purpose/sites/public-purpose/files/iipp_wp_2018-03.pdf.

Kattel, R., Kregel, J. and Tonveronachi, M., eds. (2016). 'Financial Regulation in the European Union'. Routledge.

Lazonick, W. and Mazzucato, M. (2013) 'The risk-reward nexus in the innovation-inequality relationship: who takes the risks? Who gets the rewards?', *Industrial and Corporate Change*, 22(4), pp. 1093-1128.

Lazonick, W. and Tulum, O. (2011). 'US biopharmaceutical Finance and the sustainability of the biotech business Model'. *Research Policy* 40, no. 9: 1170–87.

Macfarlane, L. and Mazzucato, M. (2018). 'State investment banks and patient finance: An international comparison'. UCL Institute for Innovation and Public Purpose WP (IIPP WP 2018-01). <https://www.ucl.ac.uk/bartlett/public-purpose/wp2018-01>

Mazzucato, M. (2013). 'The Entrepreneurial State'. Anthem Press, London.

Mazzucato, M. (2017). 'Mission-Oriented Innovation Policy: Challenges and Opportunities'. UCL Institute for Innovation and Public Purpose WP (IIPP WP 2017-01). Available at: <https://www.ucl.ac.uk/bartlett/public-purpose/sites/public-purpose/files/moip-challenges-and-opportunities-working-paper-2017-1.pdf>

Mazzucato, M. (2018). "Mission-Oriented Research & Innovation in the EU: a problem-solving approach to fuel innovation-led growth" <https://publications.europa.eu/en/publication-detail/-/publication/5b2811d1-16be-11e8-9253-01aa75ed71a1/language-en>

Mazzucato, M. and Macfarlane, L. (2017). 'Patient strategic finance: opportunities for state investment banks in the UK'. UCL Institute for Innovation and Public

Purpose WP (IIPP WP 2017-05). Available at: <https://www.ucl.ac.uk/bartlett/public-purpose/wp2017-05>

Mazzucato, M., Macfarlane, L. (2019). 'A mission-oriented framework for the Scottish National Investment Bank'. UCL Institute for Innovation and Public Purpose WP (IIPP WP 2019-02). Available at: <https://www.ucl.ac.uk/bartlett/public-purpose/publications/2019/mar/mission-oriented-framework-scottish-national-investment-bank>

Mazzucato, M., Macfarlane, L., Penna, C., and Ryan-Collins, J. (2018) 'The role of patient finance in mission-oriented innovation: the market shaping role of state investment banks'. ISIGrowth report, Deliverable DD4.3, WP4. Available at: http://www.isigrowth.eu/wp-content/uploads/2018/05/working_paper_2018_21.pdf

Mazzucato, M. and Penna, C. C. R. (2015) 'The Rise of Mission-Oriented State Investment Banks: The Cases of Germany's KfW and Brazil's BNDES', SPRU WP, 2015-26. Available at: http://www.isigrowth.eu/wp-content/uploads/2015/11/working_paper_2015_1.pdf

Mazzucato, M. and Penna, C. (2016) "Beyond market failures: the market creating and shaping roles of state investment banks", *Journal of Economic Policy Reform*, 19(4): 305-326.

Mazzucato, M. and Semieniuk, G. (2017). 'Public financing of innovation: new questions'. *Oxford Review of Economic Policy*. Volume 33, Issue 1, <https://academic.oup.com/oxrep/article/33/1/24/2972707>

MOIIS (2018) Commission for Mission Oriented Innovation and Industrial Policy, is chaired by Professor Mariana Mazzucato and Lord David Willetts, and hosted by the UCL Institute for Innovation and Public Purpose, <https://www.ucl.ac.uk/bartlett/public-purpose/partnerships/ucl-commission-mission-oriented-innovation-and-industrial-strategy-moiis>

Pisano, G. (2006). 'Can science be a business? lessons from biotech'. *Harvard Business Review* 84, no. 10: 114–25.

Scottish Government (2018) "Scottish National Investment Bank Implementation Plan." <http://www.gov.scot/Resource/0053/00532119.pdf>

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