

# Rethinking the social contract between the state and business: A new approach to industrial strategy with conditionalities

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**Mariana Mazzucato**

Professor in the Economics of Innovation and Public Value

Founding Director | UCL Institute for Innovation and Public Purpose (IIPP)



UCL Institute for  
Innovation and  
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## Abstract

Governments around the world are embracing industrial strategy to foster innovation and economic growth. To ensure this growth is inclusive and sustainable, investments must be directed towards clear goals and made conditional on recipients meeting requirements aligned with these goals - such as a just green transition. This working paper explores the opportunity for the governments to leverage conditionalities to shape and direct public funding, with a view to maximising the public value of this funding. This means redesigning the very contracts that define the relationship between the public and private sectors.

This working paper considers six international cases from various countries - Germany, France, UK, South Korea, Scotland and Israel - to analyse how conditionalities have been designed, implemented, and governed to stimulate innovation and investment that contributes to inclusive and sustainable growth. Specifically, these cases outline four ways in which conditionalities can be leveraged: namely, to (1) increase access to goods and services, (2) direct investment towards climate-friendly goals, (3) profit-share with a wider range of stakeholders, and (4) reinvest in productive business activities, such as R&D and worker training.

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## 1. Revival of industrial policy: an opportunity not to waste

Industrial policy is back all over the world. In Europe, the Green Deal is being positioned through an industrial strategy framework to create green services and manufacturing. In the US, the CHIPS and Science Act (CHIPS) announced in August 2022, alongside its legislative companions, the Inflation Reduction Act and the Bipartisan Infrastructure Law, are conduits for pumping over 2 trillion dollars<sup>1</sup> into the economy. There is no time like now to ensure that this revival helps to shape economies to be greener, more inclusive and more resilient.

In his landmark speech in October 2022, Brian Deese, Director of President Biden's National Economic Council (NEC), described the 'strong animating vision that unifies these laws: a modern American industrial strategy'. Deese issued a clarion call to action for government, industry and labour to collaborate in realising this vision, comparing the scale of the investment and ambition behind it to the Apollo programme. The White House, Department of Commerce (DoC), Department of Energy (DoE) and National Science Foundation (NSF) stand at the threshold: their choices today will shape American infrastructure and markets for decades to come.

Similarly, in Europe, there is talk about directing growth so that it is innovation led, sustainable and inclusive. The €2 trillion Next Gen EU programme includes conditions related to member states having climate and digitalisation strategies (to green their economies and reduce the digital divide, among other goals).

But ensuring that public investment in innovation is good for people and planet requires something more. It requires conditions to be attached to the contracts and funding criteria governing the terms under which funding can be received. In other words, industrial strategy must contain a 'deal' to ensure that the public benefits of public investments are maximised. Innovation in the past has not always led to socially beneficial or environmentally friendly outcomes. If the only remit of government policy is to fix market failures, then public investment 'fills a gap' without shaping markets to deliver on ambitious outcomes. To ensure investment and innovation lead to more inclusive and sustainable growth, a 'market shaping' approach is needed.

It is increasingly clear that all are not benefitting from the traditional approach to economic policy. Indeed, labour's share of global income is almost at an all-time low. In the US, for instance, the share of gross value added in the non-farm business sector paid out to workers as wage (or self-employment) income remained stable, between 63% and 65%, for more than a century, but then, around 2000, it began to drop, to hit a low of 56% in 2013, before recovering slightly to about 58% by 2020 (Gene Grossman and Ezra Oberfield 2022). At the same time, and consequently, the capital share of global income has risen. Is this because capital has become smarter and more efficient, while labour has become less so? No. Even in periods when productivity has risen, labour has not reaped the rewards. Indeed, the growth of real wages has lagged productivity growth

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<sup>1</sup> Bipartisan Infrastructure Law: approximately \$1.2 trillion in spending. CHIPS and Science Act: \$280 billion package, of which \$52.7 billion is authorised for semiconductor manufacturing, R&D and workforce development, with another \$24 billion worth of tax credits for chip production. Inflation Reduction Act of 2022: the law will raise \$737 billion and authorise \$369 billion in spending on energy and climate change, three years of Affordable Care Act subsidies, prescription drug reform to lower prices, tax reform and \$300 billion in deficit reduction. Source: Fact sheet: CHIPS and Science Act will lower costs, create jobs, strengthen supply chains and counter China, 2022.

(Michael Jacobs and Mariana Mazzucato 2016; David Autor, David A. Mindell and Elisabeth Reynolds 2022). And the increasing financialisation of the economy has meant that profits are not being reinvested into the economy, but to a large extent are going to shareholders — increasing the divide between those who own capital and those who do not.

This working paper considers a particular lens on how to bring equity and sustainability considerations into modern industrial and innovation policy: conditionalities. In Section 1 we make the case for conditionalities, followed by Section 2 where we consider how they have been used in various countries — Germany, France, UK, South Korea, Scotland and Israel — to direct public finance, and shape economic activity and innovation, to achieve desired public policy objectives.

There are clear lessons for public agencies engaged in promoting innovation and growth — including for the Department of Commerce, Department of Energy, National Science Foundation and others in the US, as they consider how to structure and direct the funding made available through CHIPS and related vehicles. There is a clear opportunity to direct this finance to decarbonise US manufacturing and supply chains, as well as steer it towards other societal and environmental objectives.

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## **2. The importance of conditionality: building a new social contract**

### **2.1 The importance of building a new social contract**

Innovation is a key driver of economic growth. It is the fruit of collective investment, by both public and private entities. For the public sector, innovation policies are often framed via industrial strategy. Industrial policies are not novel in the US, from Hamilton's advocacy for supporting the US manufacturing sector through tariffs and subsidies, through to Roosevelt's New Deal programmes of the 1930s and the inception of DARPA in the technological race with the Soviet Union. Substantial innovations happen when there exists a complex network of actors, institutions and interactions, which influence the rate and pattern of knowledge creation and diffusion across the economy.

While the industrial policies of the past picked sectors, modern challenge-oriented industrial strategies pick objectives — or missions — and help coordinate inter-sectoral responses (Mazzucato 2021). Indeed, the Apollo programme itself was mission-oriented in the way it galvanised many different sectors, from aerospace to electronics, materials, nutrition and software. Picking challenges exposes government less to the 'picking winners' problem, where choices are made about particular technologies or sectors. It requires a 'picking the willing' strategy aimed at working with firms willing and able to work with government to achieve its objectives. Indeed, one of the first things NASA's head of procurement, Ernest Brackett, did to foster public-private partnerships was to change how procurement was done, moving away from a cost-plus to a fixed-price model with incentives for innovation and quality improvement. He also inserted a 'no excess profits clause' into the contracts with business: in other words, the benefits of a process that requires collective investment should also be shared collectively.

While traditional policies are framed in terms of fixing market failures, mission-oriented policies are more clearly about shaping markets, and mobilising dynamic public and private sector investments driven and coordinated by shared goals (Mazzucato 2016). This is about maximising public benefit, prioritising stakeholder value on the part of willing businesses, and co-investing in technology, skills and infrastructure (Laplaine and Mazzucato 2020). One of the central relationships any government must get right in order to achieve its missions is with the private sector.<sup>2</sup> However, too often the state socialises the risks and privatises the rewards when partnering with the private sector. This has led to an unbalanced and parasitic relationship. To create a more symbiotic relationship, mission-oriented industrial strategies need conditionality to ensure that the value created from these partnerships benefits people and the planet (Mazzucato 2021). A market-shaping, mission-oriented approach can thus inform an alternative framework to allow public and private entities to collaborate, and share both risks and rewards. Socially desirable conditions can function as the strings attached to the use of public funds to ensure a more concrete social return on investment.

Conditionalities are one powerful tool that governments can use to co-shape investment and co-create markets with the private sector. When companies benefit from public investments in the form of subsidies, guarantees, loans, bailouts or procurement contracts, conditions can be attached to help shape innovation and direct growth so that it achieves the greatest public benefit. For example, procurement can be made conditional on greener supply chains, reinvestment of profits and better working conditions.

Importantly, there are different types of conditionalities governments can leverage and this working paper addresses four of them: (1) conditionalities related to **access**, where equitable and affordable access to the resulting products and services is ensured; (2) conditionalities related to **directionality**, notably related to the **green transition**, where firms' activities are directed towards climate-friendly goals, and they intentionally use green options and reduce negative environmental impacts, and to the improvement of **labour conditions**, where productive employment opportunities are created by firms, measured not just in quantity but also in quality, and diversity and equity are embraced; (3) **profit-sharing** conditionalities, where profitable firms share royalties or equity with government and may be incentivised to leverage their profits through acquisition of government shares; and (4) conditionalities related to **reinvestment**, where profits gained are reinvested into productive activities and R&D for longer term benefit, avoiding financialisation; (Laplaine and Mazzucato 2020). In the context of the revival of industrial policy across nations, it is critical to reflect on how best to build accountability and alignment with key policy goals into government support.

## 2.2 The CHIPS Act: an opportunity to form a new partnership

In the US, policymakers face a choice about whether to advance relatively conventional industrial policies that emphasise national and economic security or to realise the full potential of these policies by designing them to maximise benefits related to labour, climate and other key policy

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<sup>2</sup> <https://voxeu.org/article/trying-account-decline-labour-share>

goals. US policymakers have a compelling opportunity to pick up the Hamiltonian mantle of great American programmes (Roosevelt's New Deal) and institutions (DARPA and Bell Labs) that have come before them. CHIPS, in particular, offers a powerful opportunity to inject Hamiltonian confidence into industrial policy through the use of a suite of stronger conditions — attached to grants, loans, procurement contracts and tax credits — designed to match its ambition.

The US Department of Commerce will benefit from new economic thinking, which is less focused on fixing market failures and more on shaping markets, to realise the full potential of CHIPS. Markets are not static or deterministic, they are outcomes of individual and collective decisions made by consumers, producers, governments and many other actors throughout the economy. In the mid-20th century, the US Government understood this and used dynamic public sector institutions and strategic public sector investment to define clear objectives and invest with purpose, resulting in ground-breaking innovations. Today, we face even bigger challenges, including the climate crisis, social inequalities and geopolitical threats, and require even bolder public policy objectives or 'missions'.

CHIPS has been intentionally designed to have 'guardrails' or conditions, for example associated with prohibiting the use of funds for stock buybacks and shareholder dividends, ensuring funded activity aligns with economic and national security interests (notably by restricting transactions involving certain foreign countries), and establishing certain minimum standards for job quality. It also sets out broad societal goals, for example related to equity and diversity. But without further work to define and strengthen accountability around these and other conditions, including in notices soliciting applications for funding and in the negotiation of the individual contracts used to distribute CHIPS funding, it will fall short of getting the best deal for the American people and of reinforcing critical policy priorities. Importantly, the Department of Commerce has a unique opportunity with CHIPS to support a just green transition — channelling funds to shape green innovations and markets with a view to achieving its net-zero targets by 2050 — and to foster new employment pathways to quality jobs, while bolstering productivity and stimulating growth. This is not about government constraining business to make its work harder, but about designing contracts that generate mutually beneficial partnerships, oriented around shared goals that increase public benefit.

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### **3. Case studies of conditionality in practice**

In this section we present a range of case studies demonstrating how governments have attached conditions to contracts with businesses benefiting from public investment to achieve priority policy goals and yield long-term benefits. These examples may not be entirely replicable, or without challenges, and the outcomes of some are yet to be seen. However, they illustrate the range of tools at the disposal of governments aiming to strengthen the public value created through public investments and willing to take a confident, ambitious approach to shape the nature of public-private partnerships, and the direction of economic growth.



### 3.1 Germany: KfW Bank and financing for sustainability

This is a case study of conditionality attached to low-interest loans, designed to shape investment and reinvestment behaviours in borrowers.

With total assets of EUR 546.4 billion in 2020, KfW has long stood strong as the world's second biggest national development bank and Germany's third largest bank (Top German banks by total assets, Germany 2020, no date), and is even more exemplary as an effective, state-owned<sup>3</sup> vehicle for promoting energy efficiency and green energy transition since the 1990s. Here, we present two initiatives where KfW has successfully supported domestic businesses using its toolkit of favourable loans with conditionalities attached.

First is the Energy-efficient Refurbishment and New Construction programme. In 2007, the German Government advanced an Integrated Energy and Climate Programme to deliver on ambitious targets for energy savings and renewable generation, aiming at reducing greenhouse gas emissions. Over 80% of energy use goes to heating rooms and water in Germany (study from 2000-2009). From 2002 to 2020, the EU Directive on Energy Performance in Buildings (EPBD) was adopted, requiring that all new buildings need to be nearly zero energy. The public sector was expected to take the lead.

As part of the Federal Government's energy policy, KfW<sup>4</sup> introduced the Loans and Grants Programme, supporting SMEs in need of finance for refurbishment and construction of non-residential buildings with up to EUR 10 million per project, conditional on meeting KfW standards based on the EPBD. These loans offer favourable interest rates and up to a 25% repayment bonus based on the loan amount and energy efficiency class of the buildings (Energy efficiency, corporate environmental protection and renewable energies | KfW, no date). The conditions are designed to promote buildings with higher energy efficiency. The higher the standards met, the higher the repayment. For example, the more energy-efficient KfW 40 Plus house receives a 15% grant on the total KfW loan amount in comparison to a KfW 40 building, which receives a 10% repayment (The Standards of the KfW Efficiency House 2022).

The programme is famously known as Build a KfW Efficiency House and Receive a KfW Subsidy. More buildings, as a result, have been constructed using the highest possible standards to benefit from the higher repayment rates. The loans are taken up mainly by private companies, which invest around three-quarters of the lending amount in new builds of administration and office buildings. In 2018 alone, more than 2000 projects received funding, triggering additional investments of EUR 220 million among the private companies. It is estimated that the programme reduces borrowers' investment costs by about 5.1%, while saving energy costs of around EUR 943 million over 20 years. Almost 80% of borrowers participating in the programme are satisfied with this deal (Heinrich 2020).

A second initiative is KfW's Green Loans Programme (KfW IPEX-Bank 2021), implemented by one of the three wings of the bank — KfW IPEX-Bank — which provides financing for climate-

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<sup>3</sup> 80% federal republic, 20% federal states – source: Dominik Bach, 'Finance for Energy Efficiency: Adopting a Holistic Approach – the Case of KfW in Germany' (Brussels and Prague, 21 October 2020).

<sup>4</sup> Promotional programmes are financed by federal budget funds and implemented by KfW, launched in July 2015.

friendly investments in Germany and Europe. Green Loans imposes a set of conditions that are remarkably detailed and tailored to each sector. KfW IPEX also uses a hands-on approach in each stage of each project in this programme. To qualify for its low-interest loans, borrowers must provide proof of compliance with the programme's criteria in the initiation phase. Loan proceeds are exclusively used for the predefined purpose. A three-stage verification process by independent experts is employed to ensure fairness in the loan assessment process.

The steel industry's transformation is an example of these tools at work. The transition of the steel industry in Germany to a climate-friendly, circular economy model is the result of a comprehensive web of industrial policy instruments and funding programmes that not only incentivise national steel manufacturers to adopt low-carbon or zero-carbon processes, but also effectively establish markets for CO<sub>2</sub>-efficient steel and materials, and for green hydrogen. The Carbon2Chem research project of EUR 140 million and KlimPro-Industrie research funding of EUR 80 million provided momentum for applicable innovation in the steel industry. Carbon contracts set incentives for companies to operate green technology. The National Hydrogen Strategy, adopted since 2010 (The Federal Government 2020b), established a new market for hydrogen technologies, responding to the energy efficiency and demand issues for the industry.

The German Resources Efficiency Programme (ProgRess)<sup>5</sup> lays out a plan, and assesses research and innovation progress in building a resource-efficient circular economy in Germany. As steel is entirely recyclable, these instruments aim to boost the industry's reuse, remaking and recycling rates (The Federal Government 2020a). The government affirms that they want to send a strong signal for climate-friendly steel 'made in Germany' (KfW IPEX-Bank, no date). KfW IPEX-Bank is a leading lending arm of the government, which promotes a strong export-oriented industrial base with their medium and long-term loans for investments in steel plants and machinery. Borrowers need to show how they meet resource efficiency and sustainability criteria, appraised by the bank's Department of Resources and Recycling, alongside other environmental and social experts. Notably, in 2014, the bank authorised a 10-year tenor EUR 794 million loan to Arkansas-based Big River Steel LLC to finance a scrap-based sheet steel production facility. The technology and core components are supplied by German SMS Siemag, with the German Federal Government providing export credit insurance (KfW IPEX-Bank 2014).

These reflect only some of a range of environment-focused programmes that KfW has been running to support the policy priorities of the German Government. Notably, they do not do it alone. For example, KfW incorporates and collaborates with municipalities in their programmes. The EPBD programme prioritises municipal companies and social organisations. About 45% of such companies received funding for education and training buildings in 2018, and spill-over effects can be witnessed in real estate, energy and water supply, and manufacturing construction. It is estimated that 1 Euro in funding can trigger 10 to 20 Euros of investment in construction (Schröder et al. 2011).

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<sup>5</sup> The German Government submits an update report on the programme and developments in resource efficiency every four years. The first update report, ProgRess II, was adopted in 2016; the second, ProgRess III, in June 2020 (BMUV 2020).

### 3.2 France: Air France–KLM and a short-term bailout for long-term cleaner air

This is a case study of conditionality attached to bailouts that stipulate directionality.

To rescue the aviation industry, EUR 4 billion was approved to recapitalise Air France through the Air France–KLM holding company<sup>6</sup> (European Commission 2021). This bailout saved Air France from insolvency due to travel restrictions during the pandemic. The French state will receive remuneration for their investment, while Air France and its holding company are incentivised to meet certain conditions and can buy back equity from the state when financially viable.

The government introduced several climate conditions to make Air France ‘the most environmentally friendly airline. There are three key areas of conditions: efficiency (improve efficiency by 50% by 2030 compared to 2005, measured in CO<sub>2</sub> per passenger km), emission reduction (reduce 50% of emissions from domestic flights by 2024) and fuel mandate (minimum 2% alternative fuels in 2025, starting from 0% as in 2021). Initially, a number of domestic routes were to be withdrawn in favour of rail trips of under 2.5 hours where possible, cutting 0.8% of aviation emissions. These conditionalities are coupled with further aviation taxes proposed in 2021, including a progressive Solidarity Tax (with a lower rate for lower income people) and Eco Tax (based on the distance of the flights).

These environmental conditionalities are the first for such a major polluting industry. While they are not legally binding and lack clear financial penalties for failed compliance, they have incentivised Air France to make decarbonisation efforts with no commercial advantage in the short term, which they would not otherwise have made.

A year after the bailout, in April 2022, Air France launched Air France ACT, a programme that sets out the airline’s new CO<sub>2</sub> emissions reduction strategy. More specifically, ‘offsetting actions’ include measures such as new-generation aircraft, eco-piloting and sustainable aviation fuel, with the goal of reducing 30% emissions per passenger by 2030 compared to 2019, reaching net-zero emissions by 2050 (Air France — Corporate 2022). In May, new eco-responsible initiatives were implemented for two flights, to Montreal and Lisbon, reducing their CO<sub>2</sub> emissions by half (Air France 2022). Being financially more stable, Air France–KLM is already raising money to repay state aid.

### 3.3 UK: Oxford/AstraZeneca Partnership — knowledge-sharing and an accessible, affordable vaccine

This is a case study on conditionality aimed at ensuring public accessibility, attached to government R&D funding and procurement. Costs and prices were kept low, knowledge-sharing for public health purposes was practised, and vaccines were produced efficiently and delivered domestically in a timely manner.

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<sup>6</sup> KLM, the other subsidiary of the Air France–KLM group, did not benefit from the aid.

On 8 December 2020 the UK became the first country in the world to deploy an approved COVID-19 vaccine. Over 2.5 billion AstraZeneca vaccines have now been administered in over 170 countries, at a much lower cost in comparison to the alternatives of Pfizer and Moderna (Dyer 2021). The UK has not only showcased how quickly it rolled out a 'phenomenal' nation-wide vaccination programme, but also strengthened its image as a world leader in innovative medical research (UKRI 2021). The UK Government, more than its pharmaceutical industry, can boast about the success of the Oxford/AstraZeneca vaccine, because of its long-term, intensive and timely involvement throughout the whole process.

The 'Oxford vaccine' (so-called by UKRI (UKRI 2021)) employs the ChAdOx1 vaccine technology that stems from continual research grants made by UK Research and Innovation (UKRI) and the National Institute for Health and Care Research (NIHR) for development of the influenza vaccine (UKRI, no date) from 2010 to 2018. £20 million in further research funding (NIHR-UKRI COVID-19 rapid response initiative (NIHR 2020)) came in early 2020 at the height of the pandemic, for clinical trials. Three months later, with £65.5 million for manufacturing (University of Oxford 2020), the consortium formed of the University of Oxford and AstraZeneca made a commitment to the UK Government to deliver 30 million doses in September 2020 (six months later) and 100 million in total. Contrary to the claim by former Prime Minister Boris Johnson that the vaccine was a product of 'greed' pursued by private pharma, it is in fact the fruit of the UK Government's long-term investment, estimated at 95.5% of total funding up to autumn 2020 (Cross et al. 2021).

The funding came in a timely manner, not only as pre-emptive to a series of recurring coronavirus diseases in the last decades, but also as an instant response, including at critical stages of the COVID-19 pandemic. Clinical trials were fully funded at Oxford, supplemented by human trials fully funded at Imperial College. In February 2020, not a single dose had been produced. In March 2020, the UK Government Vaccines Taskforce succeeded in getting vaccine manufacturers on board (Dr Sandy Douglas 2021). Coordination between the consortium and the government was watertight, with the UK prioritised to receive AstraZeneca vaccines. The agreement reflected the entire supply chain, for example when the government 'filled seats on Oxford-AstraZeneca joint liaison committees' (Isaac and Deutsch 2021).

The government de-risked the whole vaccine development process, using tools from long-term investment funding to financial insurance, and made it happen within a year instead of a conventional 15-year process. The Vaccine Task Force made an advance order of 100 million doses of the vaccine in May 2020 at a pre-arranged price on non-refundable terms even in the event of failure. In exchange, the manufacturers could not profit from the vaccine during the pandemic. The rights to the vaccine, held by the Oxford spin-out company, Vaccitech, are also donated to any drugmaker. During the pandemic, actions taken by the government and the company were clearly conditioned to benefit public health. The lessons (Health and Social Care and Science and Technology Committees 2021) from this pandemic inspired the government to increase its pledge to worldwide vaccine research and development efforts, making it the biggest contributor of any country (Department for Business Energy and Industrial Strategy 2020). This example shows the potential of mission-oriented innovation and mission-oriented public-private partnership.

### 3.4 South Korea: Chaebols and export-led industrial development

To achieve its current economic status, South Korea invested in extensive industrial strategies, starting in the 1960s, and reshaped its economy, which, in the 1950s, had been one of the world's poorest. The Korean Government supported domestic companies financially, directing them to higher-value, export-led technological production. With the government's directives, loan guarantees and other 'rescue packages' throughout the decades, globally successful family conglomerates (chaebols) emerged, flourished and contributed to remarkable economic growth (Akarsu 2021).

One prominent chaebol is Samsung, the biggest South Korean company, accounting for 13% of the nation's GDP, and the world's biggest TV vendor with market share of 31.9% (Amy Gunia 2021). Back in its early years, Samsung was a producer of fish, groceries and noodle products. Samsung entered electronics in the 1960s to receive loans from the government that were conditional on making a switch to production of exportable technological devices (Zhou 2020). The government pushed banks to grant credit to chaebols to promote strategic sectors (including heavy, chemical and export-driven industries), creating safety nets (Doh and Ryu 2004) to shelter chaebols from the risk of failure — an implicit bailout policy used in the 1970s and 1980s.<sup>7</sup>

Industrial policy prioritised industries with increasing knowledge content, trade policies selectively managed import restrictions and export incentives, and exchange rates were managed to favour exports of national products. Policies for human capital prioritised first literacy and later excellence in training and research, accompanying the rising demand for skilled labour by the domestic industry (Development Centre Studies, no date). In the 1970s, the government promoted best-practice learning from other countries. In the 1980s, the government incentivised the private sector to invest in R&D, and by the 1990s they were highly committed to R&D and had expanded into new industrial sectors which then ventured into lucrative foreign markets. These powerful conglomerates, dubbed 'champions of the South Korean economy' (Foreign Brief 2022), have become global household names, including Samsung, LG and Hyundai, and by 2010 almost 90% of manufacturing value came from heavy and chemical industries.

Korean industrial policy achieved a major economic transformation over the course of three decades. However, the dominance of chaebols is not without controversy. Insufficient checks and balances within their corporate structures (Murillo and Sung 2013) and little state control have raised concerns. Chaebols gained influence over the policy-shaping process and political scenes in South Korea, which resulted in significant economic risk. Institutional reforms and antitrust laws (Eleanor Albert 2018) are being proposed to tighten the grip on these conglomerates. This case study highlights the potential of conditionality to redirect economic activity to build areas of industrial strength, while also pointing to the importance of careful timing and regulation to avoid unintended consequences.

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<sup>7</sup> Large chaebol firms in distress received subsidised loans and capital injections through domestic banks during the 1972 debt crisis (August 1972 Emergency Decree), the 1979–81 restructuring of heavy and chemical industries triggered by the second oil shock and the 1984–88 wave of business insolvencies.

### 3.5 Scotland: ScotWind and national supply chain development commitment

This is a case study about conditionality focused on directing private investment towards sustainable and local development goals.

Offshore wind is becoming one of the lowest cost renewable energy sources in the UK. In Scotland, the macroeconomic benefits of floating offshore wind are immense, potentially creating 17,000 jobs and £33.6 billion of gross value added — or more in the context of export opportunities (Catapult Offshore Renewable Energy 2018). Offshore wind plays a vital role in Scotland's plan for reaching net zero emissions by 2045. While energy policy for the most part falls within the remit of the UK government, Scottish ministers, for the first time, managed to use devolved rights to support national development in the area of offshore wind. ScotWind — leasing out the Scottish seabed — is advancing the biggest offshore wind development effort ever in Scotland, with the potential to power every home in Scotland.

ScotWind is plan-led and conditionality-based. Projects are selected based on a set of published criteria, related to concept, budget, delivery and developer profile. The assessment of bids is not based solely on the highest option fee, but also on the obligatory Supply Chain Development Statement (SCDS) (Crown Estate Scotland, no date). The SCDS outlines the nature, location and expenditure associated with supply chain activities across the four stages of the proposed project: development, manufacturing and fabrication, installation and operations. While selection does not depend on the level of the commitments promised, SCDS information serves two key purposes.

First, committed figures and related activities are entered in the agreement with Crown Estate Scotland (CES) and failure to meet the predetermined commitment results in a remedy based on a percentage of the contract value. Final SCDSs are submitted just before developers secure a full seabed lease. In the worst case, if less than 25% of the commitment is spent, no lease will be requested, meaning no actual construction of the wind farms can proceed.

Second, for international developers, Scottish Development International (SDI) (Hallan, no date) — the international arm of the Scottish Government and its enterprise agencies, with 30 country offices — provides assistance by channelling their database of contractors, suppliers and labour in Scotland, and by using their access to energy-specialised companies to suggest to developers how best to use their capital to build their supply chains. There are 15 areas of seabed available, covering the entire Scottish coastline, and 25 ports will be used for wind farm development.

The ScotWind bidding process attracted 74 applications from multinationals, consortia and investment funds from around the world. As of August 2022, 20 applications have been selected for Options Agreements. The Option Agreements allow the tenant (companies) to carry out tests, surveys and site investigations without permanently installing any works or structures on the seabed (Crown Estate Scotland, 2021). Option fees of over £750 million<sup>8</sup> will be paid to the Scottish government for public spending.

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<sup>8</sup> The first 17 projects collect £699,200,000 and three NE1 projects collect £56,00,000 (Crown Estate Scotland 2022; 2022).

It is a long process before turbines become visible, but initial successes have been recorded. ScotWind was expected to bring in an extra 10 GW of generating capacity, but the first 17 selected projects (as of April 2022) are already committed to just under 25 GW (ScotWind Leasing Round, no date) and the total 20 selected projects (as of August 2022) to 27.6 GW. Committed spending laid out in the SCDS is estimated at £1.4bn per 1 GW of capacity. Once operating, these projects are expected to add £4m per GW per year to public funds. ScotWind also builds on Scotland's reputation in leading offshore engineering and technology. Publicly viewed proposals highlight commitments to, for example, develop new skilled workers, adopt and develop innovations associated with floating wind farms, and develop EV charging networks (TGS 2022).

### 3.6 Israel: funding for domestic R&D to build a 'Start-up Nation'<sup>9</sup>

This is a case study of conditionality attached to public funding that directed companies to invest and keep reinvesting in R&D locally, to share profits and to keep access to IP strictly local.

Israel's innovation achievements are impressive (Israel Innovation Authority 2022): 54% of Israeli exports in 2021 were high-tech; Israel had the highest R&D expenditure among OECD countries as a percentage of GDP in 2020; Israel is second in the world in number of start-ups per capita; and high-tech employees make up nearly 10% of its workforce.<sup>10</sup> The high-tech sector is the driving engine of the economy, according to the CEO of the Israel Innovation Authority (Meir Orbach 2022).

These successes are the product of intensive government efforts in stimulating R&D and de-risking innovation since the 1990s. The country's industrial development can be attributed to<sup>11</sup> stringent R&D legislation and funding for domestic companies, frameworks for international collaboration on R&D and industry-academia cooperation.

The Israel Innovation Authority (IIA) in the Ministry of Economy and Industry (before 2016 known as the Office of the Chief Scientist) manages R&D grants with the key objective of encouraging domestic R&D projects (Cohen, Gabbay and Schiffman 2012). Notably, these grants are strictly conditionality-based. Applicants for grants must specify the portion of manufacturing of products under the grants to be performed domestically. Depending on this portion, grants could be awarded from 20-50% of the approved budget. The higher the portion of manufacturing occurring outside the country, the lower the grants.

Other factors that affect the grant amount include collaboration with academia through the Magnet and Magneton programmes<sup>12</sup> and the location of activities within National Priority Areas (NPAs) (Foreign Investments and Industrial Cooperation Authority, 2018). Companies with sales

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<sup>9</sup> This term is used by the Israel Innovation Authority.

<sup>10</sup> To put the number in perspective, Israel is 9.5%, UK is 5.5%, France is 4.6% in 2020 for high-tech. For the US, the percentage of the workforce in tech is 5.7%, expectedly lower in high-tech. (Data from TheMarker 2018, U.S. Bureau of Labor Statistics, EMSI Burning Glass and CompTIA; estimates for 2021).

<sup>11</sup> The government runs a great number of other supporting programmes, including technological incubators, seed fund, support for research institutes, etc.

<sup>12</sup> Magnet and Magneton programmes support generic R&D; Tnufa and Nofar programmes support companies at the pre-seed stage. Other government programmes exist to support companies along the innovation chain.

over \$100 million p.a. with R&D inside the country can receive two to three years of support equal to 65-75% of approved R&D expenses. These eligibility conditions are part of a risk-and-reward sharing framework. Periodic reports must be submitted by recipients. If the assisted R&D project becomes profitable, royalties must be paid on sales of developed products and associated technology-based products. Royalties start at 3% and are payable until 100% of the grant has been repaid with interest. In the case of overseas manufacturing, the royalty ceiling can go up to 300% of the grant amount (applicable to 90-100% of the portion of overseas manufacturing). Intellectual property rights are therefore limited to ensure that firms scale up and operate locally. Tax benefits are also dependent on the ratio of R&D expenditure each year.

Government support needs to be timely. The Yozma programme (1993–1998) quickly captured the momentum of the rising Nasdaq index and expanding ICT market to fundraise for a spurt of Israeli start-ups in the 1990s. Yozma was a state venture capital (VC) company created as a foundation for the country's VC industry and a catalyst for a network of international investors and partners. Upon fulfilment of its criteria, Yozma could invest 40% (up to \$8 million) of the funds raised for start-ups, meaning that the dedicated \$100 million pot drew at least \$150 million in private sector funds (Avnimelech 2019). Between 1996 and 1998, the VC industry strongly emerged with exponential growth of new start-ups. Firms were required to share profits with the state, proportionate to the share of funds received, and state capital could be bought out at the same value with interest within seven years.

Why is R&D in Israel also attractive to multinationals? Back in the 1960s through to the 1980s, the number of multinational R&D centres was minimal. IBM was the first multinational to open an R&D centre in 1972. This number exponentially picked up in the 1990s with an average of 3.4 centres opening per year, increasing to 19.5 per year during the 2000s and to 23.4 per year during the 2010s (TheMarker 2018). Most multinationals are based in the US and their R&D investments in Israel are concentrated in software and programming, semiconductors and telecommunications equipment. Over 320 R&D centres opened in Israel. Collaboration with local grant recipients, where royalties do not need to be paid in exchange for their consulting services and resources,<sup>13</sup> is attractive. Microsoft and IBM alone are responsible for half of the research collaborations, as of 2022. Other bilateral and multilateral funds, and collaboration frameworks, also focus on encouraging know-how sharing, enabling Israeli companies and researchers to learn the latest technological advances from the best in the industry.

The growth of Israel's high-tech industry was indisputably spurred by the government's industrial policies (Breznitz 2006, 2007). Now, the IIA is embarking on a new mission to promote R&D investment in key areas, including health and medicine, energy, water, and environment and sustainability, signalling the potential for these sectors to make their mark in global supply chains. These sectors receive more funding from the government than from the private sector. As of 2018, 22% of new start-ups requested grants from the government; 48% for life sciences and 38% for clean tech and food tech.

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<sup>13</sup> For example, technological guidance, loan of equipment, use of laboratories, discounted software licenses, regulatory advice, etc.



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## 4. Conclusion

As governments are rediscovering industrial strategy, now is the time to be bold. It is not enough to steer investments in desired directions; it is also necessary to ensure the benefits are as widely shared as possible. Leveraging conditionalities in a challenge-driven and outcomes-oriented way can help direct innovation, shape markets and bolster this ambition. To do so, we need new economic thinking to underpin policy decisions — economic thinking that sees the public and private sectors as partners in co-shaping investment and co-creating markets (Mazzucato 2020).

In the US, there is a huge potential for the Department of Commerce, Department of Energy and National Science Foundation to build conditions into their grants, loans, procurement contracts, tax credits and other policy instruments to: (1) ensure that more citizens and businesses have **access** to specific goods, services or technologies; (2) **direct investments** towards social or environmental objectives; (3) include **profit-sharing** provisions between contributing parties; and (4) promote the **reinvestment** of business profits into productive activities.

The Bell Labs model, from the 1940s to 1970s, is a testimony to the success of combining state funding with conditionality. In order to maintain its monopoly status, AT&T was required by the government to invest in innovation. That was the public sector's share of the deal and Bell Labs was the answer. AT&T consistently reinvested in R&D in exchange for the stream of government funding and the enviable position of a government-guaranteed telephone monopoly. The US Government would benefit from an approach that builds on this long-term, public-value-oriented thinking, using tools and institutions that operate in more mission-oriented ways. Importantly, there is a real opportunity to reimagine public contracting. Redesigning the contract means redesigning the direction of the economy from the ground up.

The cases discussed in this working paper demonstrate the potential to embed conditions in the contractual relationships between the public and private sectors; to deliver on policy objectives that increase public benefit. These cases demonstrate how conditionalities can leverage publicly funded R&D to expand **access** to products and services at reasonable prices, as well as access to patent rights, as in the Oxford/AstraZeneca case. Conditionalities can influence the **direction** of innovation and economic activity, leading to socially and environmentally desirable technologies, as in the case of KfW. Government funding can also come with **profit-sharing** conditionalities, as seen in the case of Air France. And conditionalities can require funding recipients to **reinvest** their profits, in terms of magnitude, geographic localisation or type of investment, as in the cases of KfW's Green Loans and South Korea's territorial development strategies. Getting conditionality right is no simple task, but it is a vital one if governments are to realise the full potential of modern industrial and innovation strategy.

Governments are being pushed to rethink market fundamentalist approaches that are woefully under-equipped to respond to present challenges and to adopt well-crafted industrial policies. To succeed, these policies must be intentionally sustainable, welfare-oriented and innovation-led; coordinated as a holistic package; and implemented cooperatively across government agencies and with the private and third sectors. The conditionalities written into contracts are a key site for realising these aims. Conditionalities are explicit and enforceable, and provide detailed standards and clear goals that offer the guidance companies need to innovate with purpose — and to walk

the talk of stakeholder value (Mazzucato 2022). This is not about mandating compliance with a bureaucratic checklist of conditions; rather, it is about offering a direction that companies can invest in with confidence. If the US is serious about its vision for a 21st century industrial strategy, then it must think carefully about how best to align the contracts associated with CHIPS and other major investments with this vision.

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UCL Institute for Innovation and Public Purpose  
11 Montague Street, London, WC1B 5BP

**General enquiries:**

[iipp-research@ucl.ac.uk](mailto:iipp-research@ucl.ac.uk)

Tel: +44 (0)20 3108 6961

