IIPP Policy Brief (August 2018)

The economics of change: Policy appraisal for missions, market shaping and public purpose

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Policy makers are increasingly embracing the idea of using industrial and innovation policy to tackle the 'grand challenges' facing modern societies. But for challenge-led policies – like the UN Sustainable Development goals or the UK's Industrial Strategy – to be successful they also require robust and appropriate forms of policy appraisal and evaluation. Currently, however, the analytical frameworks used by governments to evaluate policy assume that government interventions are mainly concerned with correcting 'market failures'. This encourages a view of policy as involving marginal interventions and a focus on improvements to the allocation of limited resources in a particular sector to achieve 'value for money'.

This approach needs rethinking. Challenge-led policies will be most effective when they are concerned with co-creating and shaping markets to achieve societally agreed missions driven by public purpose, rather than limited to 'market fixing' (Mazzucato 2016). This may well involve structural economic change across multiple sectors as well as difficult-to-predict spillover effects outside the immediate policy area. This policy brief examines some of the key elements of a new analytical framework for evaluating and appraising market-shaping policy (summarised in Table 1).

The market failure theory for government intervention argues that, under certain conditions, individuals pursuing their own self-interest in competitive markets gives rise to the most efficient and welfare-maximising outcomes. Efficiency is understood in an allocative and utilitarian and sense, whereby an activity is efficient if it enhances someone's welfare without making anyone else worse off (so-called 'Pareto efficiency'). Market failures arise when there are impediments to efficient market exchange and competition which prevent pareto-efficient outcomes. Policy interventions are justified to remove such impediments. The typical examples are 'externalities' – such as pollution – that impair an agent's welfare who is not involved in the market transaction or providing public goods (like defence) that cannot be provided effectively by the market because they are non-excludable.

Table 1: Market-fixing vs Market-shaping analytical frameworks

	Market fixing	**Market shaping**
Justification for the role of government	Market or coordination failures: • Public goods • Negative externalities • Imperfect competition/information	All markets and institutions are co-created by public, private and third sectors. Role of government is to ensure markets support public purpose, also by involving users in co-creation of policy
Business case appraisal	Ex-ante cost benefit analyis (CBA) – allocative efficiency assuming static general relationships, prices etc.	Focused on systemic change to achieve mission-dynamic efficiency (including innovation, spillover effects and systemic change)
Underlying assumptions	Possible to estimate reliable future value using discounting. System is characterised by equilibrium behaviour	Future is uncertain because of potential for novelty and structural change; system is characterised by complex behaviour
Evaluation	Focus on whether specific policy solves market failure and whether government failure avoided (Pareto-efficient)	Ongoing and reflexive evaluation of whether system is moving in direction of mission via achievement of intermediate milestones and user engagement. Focus on portfolio of policies and interventions, and their interaction
Approach to risk	Highly risk averse; optimism bias assumed	Failure is accepted and encouraged as a learning device

Influenced by the market-failure framework, modern appraisal and evaluation approaches are usually based upon a static form of ex-ante cost-benefit analysis (CBA) with costs and benefits measured using existing market prices. The underlying assumption of this approach is that it is possible to estimate reliable future values with the aid of discounting techniques (Net Present Value calculations) because the rest of the economic system itself is characterised by equilibrium behaviour. Evaluation, after the policy intervention, then seeks to verify whether the estimates were correct and whether the market failure was addressed. This approach also tends to be highly risk averse. Influenced by public choice theory, there is typically a strong emphasis on the potential for 'government failure', whereby government intervention may reduce welfare, even where there is clear evidence of market failure.

In contrast, a market-shaping, mission-oriented approach to policy views markets themselves as embedded in society and hence as outcomes of the interactions between the public, private and civil society sectors. In addition, market-shaping policy is not only concerned with the effectiveness of public spending, but also includes the wider institutional features of markets, from the regulatory framework (e.g. environmental standards) to the supply of skills, to the creation of demand for new products and services (e.g. through procurement and fiscal policy). However, in order to coordinate such varied activities and policies effectively, public policy appraisal and evaluation need to be based on a wider understanding of the public value policies can create.

A user-centric approach to the evaluation of market-shaping policies will be important because missions will be more aligned with public purpose where they have been co-created by civil society and users as well public and private sectors. This might involve intensive use of user research, for example ethnographic research in urban areas before undertaking regeneration projects in order to avoid increasing inequality and loss of urban density and diversity. It might also involve the use

Case study
Decarbonisation and dynamic efficiency

Decarbonising the economy is a good example of a dynamic efficiency approach can be beneficial in relation to the assessment of tax, subsidy and regulatory policy options:

Taxation

In his Cost of Energy Review, Dieter Helm (2017) recommends a 'common carbon price across the economy', stating that this is required for achieving least-cost decarbonisation. If the objective were to maximise allocative efficiency, this would be correct. But least-cost decarbonisation is a dynamic efficiency problem. The level of carbon pricing that can significantly influence investment decisions, rates of innovation and the behaviour of market systems varies greatly between sectors: whereas in the power sector a carbon floor price of £18/tonne has been instrumental in accelerating the demise of coal (Howard 2016), in the auto sector an effective carbon price of £300/tonne has had a much more limited effect on the transition away from petrol and diesel vehicles (Watson 2012). Dynamic efficiency can be increased by setting carbon prices in each sector that are somewhere close to a threshold that is likely to act as a tipping point in system behaviour, such as the cost differential between clean and fossil alternatives. Applying a carbon price indiscriminately would prevent any such focus, so this recommendation is actively unhelpful.

Subsidy

Subsidies for the deployment of clean technologies such as renewable power generation and electric vehicles have been effective in reducing the costs of these technologies, growing the markets for them and accelerating innovation, strengthening the comparative advantage of countries that have led the way. Allocative efficiency frameworks such as CBA can justify the use of these measures based on the value of avoided carbon emissions, but they exclude from consideration any benefits relating to innovation, cost-reduction and future competitiveness. Consequently, the value of these measures is underestimated and, in situations where industrial competitiveness is the primary aim, the allocative efficiency analysis becomes largely irrelevant to the policy decision.

Regulation

In allocative efficiency frameworks, regulation is generally seen as a negative unless it corrects a market failure. In contrast, from a dynamic efficiency perspective, well-designed regulation can be an important positive. Its potential to drive innovation and investment is widely recognised by participants in the construction sector (UK Green Building Council 2018). Agent-based modelling and evolutionary economics have provided empirical and theoretical explanations for this effect: when placed under constraints, agents devote more of their effort to exploration and less to exploitation (Holland 2000).

of big data analytics to consider hard to identify behaviour patterns and social experiments. Such approaches can also be seen as 'participatory evaluation' processes where citizens are actively engaged and where evaluation itself is part of service design (through prototyping and other agile tools of development).

CBA-type analyses derived from market-failure theory are concerned with allocative or distributive efficiency, which involves making the best use of (fixed) resources at a fixed point in time. But market-shaping policy and mission-oriented innovation (Mazzucato 2017) is focused upon making the best use of resources to achieve changes over time including, perhaps most importantly, the creation of new technologies and/or the shifting of technology frontiers. Such change will likely impact multiple sectors and prices, so the assumption of 'all else being equal' becomes inappropriate.

Some useful examples come from the decarbonisation challenge (see Case study). It is well understood that taxation and subsidies for renewable energy sectors and environmental regulation have had major impacts on innovation and investment in clean energy. An allocative efficiency framework can justify these approaches on the basis of carbon emissions reduced or the amelioration of a market failure (under-pricing of carbon). But they tell us nothing about the impact such policies might have on shaping whole now markets in clean energy by helping to crowd in private investment and stimulating innovation. The same applies to more direct public investment in renewable energy (Semieniuk and Mazzucato 2018). In contrast, a dynamic efficiency approach to evaluation, with a longer-time frame and an understanding of complex systems will better capture these impacts.

Underlying a market-shaping approach is the Keynesian concept of uncertainty about the future and the idea that economic and social systems are complex and prone to disequilibrium states rather than self-correcting equilibrium (Arthur 2014). Dynamics-oriented analytical frameworks view equilibrium behaviour as one special case in a wide range of possible behaviours of complex systems. Such frameworks are increasingly being used, including by governments and economists to examine complex policy challenges such as obesity, house-price movements and financial crises. Both the OECD (2015) and the European Commission (2016) have considered dynamics-focused analytical frameworks, noted their distinct differences from more traditional allocative efficiency frameworks, and highlighted their applicability to mission-oriented policy making.

We can summarise the following key principles for policy appraisal and evaluation of market-shaping policies focused on dynamic efficiency, in contrast to allocative efficiency models:

Table 2: Principles of evaluation

	Allocative efficiency	**Dynamic efficiency**
Principles for evaluation	Value ability to predict quantified future outcomes	Value alignment with desired direction of travel
	Minimise/eliminate uncertainty	Work constructively with irreducible uncertainty
	Focus on equilibrium; avoid distortion	Focus on change; identify points of greatest leverage
	Assess deterministic effect of each action individually (micro level)	Assess emergent effects of all actions collectively (meso level)
	Value evidence of optimality	Value evidence of adaptability and resilience to shocks

Given fundamental uncertainty over the future, the evaluation of market-shaping policies should focus on intermediate milestones and encourage risk-taking and experimentation, since it is impossible to know, ex-ante, what the correct intervention might be. Relatedly, broader measures of the cross-sectoral and cross-science impact of market-shaping policies are needed. So even if a milestone or the overall mission objective is not reached, the mission might still be considered to be successful (at least to an extent) if the process produces positive, economy-wide spillovers.

For example, the internet was not discovered because of an ex-ante objective, but rather as a solution to a problem that scientists had in the late 1960s around allowing multiple computers to communicate on a single network. Indeed, creating cross-sectoral spillovers can be an objective itself, best achieved when the process of innovation remains open and cross-disciplinary. Research suggests directed public sector investment in Research and Development (R&D) can have very strong economic multiplier effects by crowding in private sector R&D and accelerating the pace of technological innovation (Deleidi and Mazzucato 2018; Deleidi et al. 2018).

In summary, current market-fixing analytical frameworks for policy, which assume market equilibrium and focus on allocative efficiency, are only suitable for situations of marginal change. Challenge-led policies, focused on shaping markets and structural economic change, should focus on dynamic efficiency which involves managing complex systems under conditions of uncertainty. Such policies should be evaluated on three levels: their ability to enhance user experience and engagement; expand technology frontiers; and increase macroeconomic multiplier effects.

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Further information

This brief is a summary of IIPP Policy Report of the same name available at https://www.ucl.ac.uk/bartlett/public-purpose/wp2018-06

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