

Local Needs, Global Challenges: The Meaning of Demand-Side Policies for Innovation and Development

JAKOB EDLER, Manchester Institute of Innovation Research, Alliance Manchester Business School, University of Manchester

In very generic terms, ‘innovation policy’ is traditionally conceived as a way to support the capability of countries or regions and their innovation systems in producing novelties and putting them to use. The academic and political debate about innovation policy has focused for decades on supporting the generation of innovations. This is best illustrated by the concepts and indicators used to assess and compare the innovativeness and competitiveness of countries, which concentrate primarily on supply-side conditions, activities, capabilities, and interactions. Moreover, innovation policy rationales and policy instruments have been developed mainly in the context of developed countries.

This chapter argues that this traditional take on innovation policy severely limits its potential to deliver innovations across the globe, in particular in developing and emerging countries. It suggests that attention should be paid to demand and the demand conditions for innovation, and that the conditions of developing and emerging countries should be taken firmly into account to make a difference at national and international levels. In doing so, the chapter introduces the concept and rationale of demand-side innovation policy and links it to the debate on innovation policy for development.

Demand-side policies: Justifications

The function of innovation is three-fold, and it is an important starting point to stress that for all three of these functions the understanding and support of *demand* is essential.

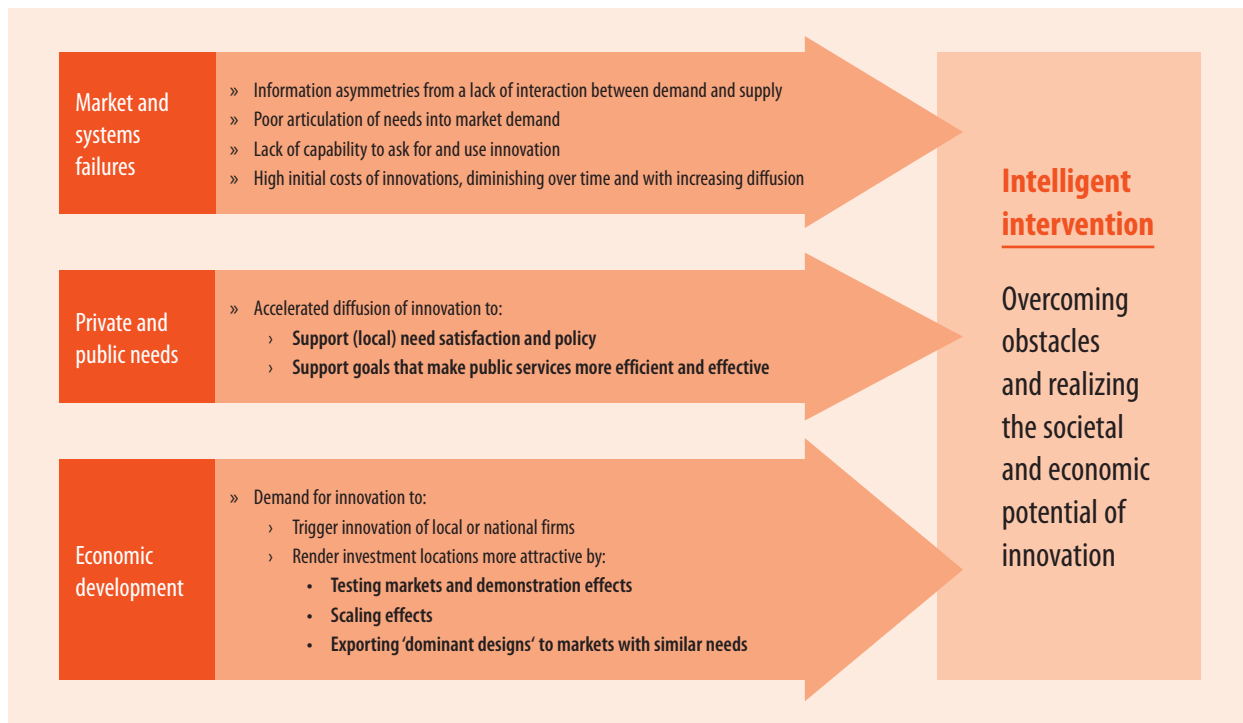
The first function of innovation is to *drive economic development*, which in terms of policy and analysis—despite many regional and even city-wide approaches—is still largely associated with the nation state. It is critical to note that the economic dynamics of countries depend as much on *demand*—that is, on the speed of adopting and absorbing innovations—as they do on the generation of innovation itself.¹ In fact, for considerable time economists have regarded favourable conditions for innovation diffusion as the most important driver for economic development.² The constructive role of lead users in testing, further improving, or even co-generating innovations is an essential element of these favourable demand conditions.³ Thus systems with an advanced demand for innovation offer better context conditions for firms to invest in innovation, often leading to export advantages as international demand catches up.⁴ This can be seen in a broad innovation survey, where European companies indicated that uncertainty in the demand for their innovations is the major obstacle for innovation and demanded support on the demand side—rather than for

their own research and development activities.⁵

Second, innovation systems need to help *satisfy national and local needs*. In market economies, needs are fulfilled only if they are articulated as *demand*—that is, as signals to potential suppliers to buy for a certain price. Innovation systems are of limited legitimacy if the innovation they offer cannot respond to the needs of their own populations—that is, if they are not orientated towards local demand.

Expanding this understanding of innovation as serving needs on the global scale leads us to the third function of innovation: Innovations are essential for *tackling the big global challenges*. However, simply producing ever-more sophisticated technologies that are not rolled out broadly and globally will not be sufficient to tackle global challenges such as the reduction of carbon emission. For that to happen, broad diffusion and application of innovative energy-efficient products and processes are required. This means that *demand* must be articulated and must connect with supply, and potential buyers and users must be able to understand and use innovations that address the challenges defined.

Although demand capabilities and conditions are important for all three innovation functions, for a very long time they have not received due attention in innovation policy discourse and practice.

Figure 1: Justifications for innovation policy intervention on the demand side

Despite acknowledging the importance of demand, neoclassical economists are in general still very sceptical about policy that supports demand for innovation, claiming this to be a counterproductive intervention into market forces. However, three sets of justifications for policy interventions that tackle the demand side exist (see Figure 1).⁶ First, numerous market and system failures occur on the demand side and between demand and supply. Often innovations are not bought and used because of a lack of information about their added value or because of a lack of capabilities to use them. Furthermore, needs are sometimes poorly articulated, and thus suppliers are not aware of a potential demand for solutions they could provide. Moreover, innovations are initially often too costly for potential users. All of those failures

turn into a policy problem if the diffusion of that innovation would greatly add societal benefit.

A second set of justifications is genuinely political and refers to the orientation towards needs and grand challenges: it is a prime task of the state to provide solutions to societal problems and to support the satisfaction of societal needs, at local and global levels. Measures to increase the deployment and diffusion of innovative solutions can significantly contribute to that purpose. Finally, there is an immediate economic argument. The academic literature has shown the positive effects of forefront demand for innovation on the attractiveness of locations as places to generate innovation.⁷ Local and national firms thrive when they are co-located with consumers or firms willing and able to buy and adopt their innovations, and those

firms in countries with leading-edge demand tend subsequently to export their innovations to foreign markets. Support on the demand side can thus be a means of intelligent industrial policy that is, at the same time, linked to societal needs.

Demand-side policies: Instrumentation

The demand-side instruments available for the state are numerous, but they can be classified into five groups where strategic demand-side approaches can combine those measures and ensure that corresponding supply-side measures are in place.⁸

- The state can act as *buyer*. The most direct leverage for the state is public procurement of innovation, whereby the state *strategically* decides to invest in innovations that help to satisfy societal

demands or make public services more effective and efficient.

- The state action can apply so-called *price-based measures*. Subsidies or tax allowances reduce the price for innovations in their early stage in order to set in motion a virtuous cycle of diffusion and cost reduction through economies of scale.
- There are numerous non-financial measures by which the state can *improve the capabilities and readiness* of potential customers to buy and use an innovation. Those instruments include awareness measures, labels and demonstration projects to build up trust in innovations, and education programmes designed to enable consumers and firms to use innovations effectively.
- The state can support the *articulation of needs* (e.g., through needs-based foresight activities);⁹ translating those needs into signals of demands for innovation is important to direct innovation activities towards demands.
- The state can support the *user of innovation in generating or co-generating innovation*, including so-called social innovation initiatives.

Existing evidence has shown that the design and deployment of demand-side measures to stimulate innovation is challenging, but it can have a considerable impact on innovation generation and especially on innovation diffusion.¹⁰ In many countries in the Organisation for Economic Co-operation and Development (OECD), a re-orientation towards demand-side rationales and instruments has begun.¹¹ It is not yet clear whether this signals the beginning of much more directionality and societal orientation

in innovation policy in the OECD world, which would necessitate a more radical shift in the governance of innovation policy.¹² What is clear, however, is that just as in the OECD world, developing and emerging countries would equally benefit from such a shift in their innovation policy. A shift towards the demand side could link the local and national development agenda much better to the innovation agenda. In fact, such a shift towards recognizing and supporting the demand for innovation is urgently needed on a global scale for innovations to make a speedy and recognizable impact on local needs, global challenges, and economic development.

A demand-side rationale for innovation-based development

The vast majority of scholars working in science, technology, and innovation (STI) policy in developing countries agree that traditional supply-side STI policy has failed to deliver economic development, and in particular has failed to include the poor.¹³ One major problem identified is governance failure and a lack of policy and governance models appropriate for innovation policy in emerging (and developing) countries.¹⁴ The argument put forward in this chapter is that the concept of innovation has to be broadened, and that the rationales and instruments of demand-side policies need to be further developed and deployed broadly across the developing world to support and increase the generation and diffusion of innovation for the benefit of local *and* global needs. This broader approach will open up new opportunities for South–South trade between countries with similar needs and capabilities. This could contribute to an uplift of innovation capabilities in the developing world

that could turn a vicious cycle of innovation dependency into a virtuous cycle of contributions to global innovation. At the same time, the development and rollout of demand-side innovation policy for developing countries would be an opportunity to experiment with policy support measures and to expand the toolbox of demand-side innovation policy itself.

As mentioned above, traditional STI policy for developed as well as developing countries is built on the paradigm according to which innovation is mainly a result of scientific knowledge and technologies employed; in this paradigm, actors and entire innovation systems learn through the spread of scientific and technological knowledge. However, countries with poor scientific and technological capacities rely largely on alternative forms of learning and innovating. As Lundvall, among many, has stressed, there are other forms of learning: ‘learning by doing, using and interacting’.¹⁵ In fact, even in developed countries, the bulk of innovation generated and diffused is not based on scientific knowledge. Therefore the ability to learn by using and doing is important. Support for this ability is a major pre-requisite for the absorption and diffusion of innovation in the economy and in society more broadly. Zanello et al. (2015), in a broad review of evidence on innovation diffusion, claim that the transfer, adoption, and adaptation of knowledge to low-income countries ‘... constitute an important issue to understand and promote economic growth and global development ...’.¹⁶ However, a range of specific obstacles exists for developing countries—in particular, the lack of absorptive capacity for products that are often not originally designed for those countries’ specific local needs.¹⁷

All this calls for capability building on the side of the users to improve the ability to use innovations;¹⁸ for more awareness and communication about innovation supply and need; and, finally, for more emphasis on the generation of innovation by those who need it themselves.

Consequently, a demand-side innovation policy approach for developing countries would start with their specific need for innovation and the particular ways in which they would use it. This would link to and build on existing approaches of ‘inclusive innovation’,¹⁹ ‘inclusive development’,²⁰ and ‘innovation for inclusive growth’.²¹ Those approaches should *not* be seen merely as ‘innovations for the poor’,²² but rather should be understood as an opportunity for major change in innovation policy development, based on a ‘radical shift in how we think about innovation’.²³ All those approaches start from the premise that local needs often cannot be satisfied through existing, mostly international, supply. Instead, initiatives are needed that are seen as directly contributing to local and national ‘problem solving’;²⁴ such initiatives involve those who have the need, include them in the development of innovation, and—ideally—support the scaling up of those inclusive innovations for diffusion within and between countries for a global spread.²⁵

Mobilizing demand-side instruments for innovation-based development

To trigger those innovation-oriented approaches, demand-side innovation policy approaches as outlined above can be mobilized. Three examples can illustrate this approach. First, in line with the demand- and need-driven paradigm of innovation policy, the starting point should be to

foster the *articulation* of needs. This articulation can take advantage of foresight techniques. Existing foresight processes all too often focus on the development trajectories of new technologies and how they could be deployed in developed and developing countries. But foresight can be need- and challenge-oriented, can include users at all levels of society, and can focus on (future) needs and jointly explore creative ways in which those needs can be satisfied.²⁶ On that basis, needs can be translated into research and development activities.²⁷ Those exercises could be performed jointly by countries with similar conditions in terms of economic development, socioeconomic context, geographical conditions, and so on. International need-driven foresight can unearth commonalities between different regions in a country or between different countries, allowing for synergies in innovation generation and developing markets for innovation that are attractive to providers. Thus groups of countries or global or regional international organizations could employ joint ‘need-and-solution’ foresight activities.

A second way to start innovation development and deployment with local needs is illustrated by the impressive Massachusetts Institute of Technology (MIT) D-Lab. This initiative supports concrete, need-driven innovation activities of users and, in order to ensure rollout, assists in the capacity building for the actual use of bottom-up innovations as well as the build-up of global networks. Since 2011 the MIT D-Lab has been rolling out a programme intended to scale up and transfer proven solutions, cooperating with a range of national and international organizations with a wide reach in similar contexts.²⁸ Again, there is no reason why scaling up and good practice

should be confined to specific localities or nations.

Third, public bodies can think creatively about the way they procure. The idea of procurement of innovation as a policy means to foster innovation has been discussed in the OECD world for a number of years now.²⁹ The organizational and institutional obstacles to asking for and buying innovation in the public sector are high in any country, because public purchasing is often averse to risk taking, learning, and engaging with suppliers.³⁰ In addition, many emerging and developing countries also endure a high level of corruption and low level of trust in public procurement. However, as a current study for the Inter-American Development Bank has shown, there are opportunities in emerging and developing countries to define local needs and engage with suppliers in ways that increase the likelihood of producing meaningful innovations for the public sector. As that report notes, a trend of considering the use of public purchasing for locally meaningful innovation is emerging,³¹ whereby the initial purchase of an innovation can serve as a trigger for broader diffusion and adoption in the private market. In some cases, initial supply may come from foreign firms, but the practical application and modification of innovation in a local context leads to innovative processes and products in local supply chains, to learning, and eventually to added value activities across the economy. Furthermore, if public bodies define needs locally in consultation with public and private users as well as potential suppliers, the local production of innovation and/or the co-generation of innovative solutions is more likely to follow.

Conclusions

This chapter argues that the debate on development, frugal innovation, and innovation for developing and emerging countries should be linked with a broader discourse on innovation policy that focuses on needs and the demand conditions for innovation. There is a good social and economic justification for innovation policy for the demand side, and this justification is even more compelling for developing countries. Innovation policy is not only about the immediate economic effect of who supplies the innovation in the first instance, but also about contributing to development and need satisfaction through diffusion. Innovation generated on the basis of demand measures is much more likely to satisfy local needs and enable learning across societies.

Besides, the adoption and use of innovation in a country is economically beneficial not only through the use of the innovation. Because policy starts with needs and demands articulated in the developing country, the likelihood that the generation of innovation happens in the country is higher because users have to be involved or mobilized. Furthermore, the supply of innovative solutions through international firms also tends to trigger innovative adaptation on the local supply side, and local suppliers and service providers upgrade and adjust their skills. A whole range of policy instruments is available to support the articulation of demands and the co-generation of innovation between suppliers and users, as well as the uptake and diffusion of innovative solutions that work in a given context. Policy activities should thus focus much more on the combination of satisfying local needs and generating innovative solutions.

Those measures are not confined to local or national contexts only;

rather, they can be deployed also at the international level. Markets for innovative niche solutions can be scaled up if a cross-national awareness about similar needs and corresponding solutions is actively created. International policy can focus on joint foresight activities, on exchange of good practice, on supporting the scaling-up activities, and on supporting South-South trade opportunities for locally produced solutions that satisfy similar needs in other locations.

In the end, the support measures outlined above would enhance the ability of populations and systems in developing and emerging countries to develop innovation themselves, for their own needs and for the needs of others. In doing so they would also help the diffusion of innovation across developing countries and make it more attractive for international suppliers to modify their products to better fit the local needs. Only the combination of international supply and local production of innovation as well as active demand-side policies will lead to the scaling up of diffusion and use of appropriate innovations needed to make a real global difference.

Notes

- 1 Di Stefano et al., 2012.
- 2 See, for example, Freeman, 1994.
- 3 Flowers et al., 2010; Herstatt and Von Hippel, 1992; Von Hippel, 1976, 1986.
- 4 Beise, 2004; Beise-Zee and Rammer, 2006; Meyer-Krahmer, 2004.
- 5 Gallup, 2011.
- 6 See also Edler, 2010; OECD, 2010.
- 7 Beise, 2004; Quitzow et al., 2014.
- 8 This typology builds on and expands the typology put forward in Edler, 2010.
- 9 'Foresight' can be defined as 'a systematic, participatory, future-intelligence-gathering and medium-to-long-term vision-building process aimed at enabling present-day decisions and mobilising joint actions' (FOREN, 2001, p. v).

- 10 Edler, 2016.
- 11 Izsak and Edler, 2011; Izsak and Griniece, 2012; OECD, 2011.
- 12 Edler and Nowotny, 2015.
- 13 Arocena and Sutz, 2012; Cozzens, 2014; George et al., 2012; Padilla-Pérez and Gaudin, 2014; Zanello et al., 2015.
- 14 Kuhlmann and Ordonez-Matamoros 2016, forthcoming.
- 15 Lundvall, 2010.
- 16 Zanello et al., 2015, p. 2.
- 17 Chataway et al., 2014.
- 18 Chaminade et al., 2009.
- 19 Arocena and Sutz, 2012; Chataway et al., 2014; Heeks et al., 2014; World Bank, 2010.
- 20 Cozzens, 2014; George et al., 2012; Johnson and Andersen, 2012.
- 21 Bresson et al., 2015; George et al., 2012.
- 22 World Bank, 2010.
- 23 STEPS Centre, 2010, p. 2.
- 24 Cozzens, 2014.
- 25 OECD, 2015.
- 26 George et al., 2012.
- 27 Cozzens, 2014.
- 28 See <https://d-lab.mit.edu/scale-ups/overview>.
- 29 OECD, 2011.
- 30 Uyarra et al., 2014.
- 31 Munoz et al. 2016.

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