

Review of Policy Measures to Stimulate Private Demand for Innovation. Concepts and Effects

This report introduces the logic of demand-based innovation policy and it reviews in more detail instruments that are primarily geared towards supporting private demand. The report defines demand side innovation policy as all public action to induce innovation and/or speed up the diffusion of innovation through increasing the demand for innovation, defining new functional requirements for products and services and/or improving user involvement in innovation production (user-driven innovation). A typology of demand-side instruments is introduced, distinguishing between public procurement Uyarra (2013), tax incentives and subsidies to support private demand (so called price based measures), a range of information and training measures, regulations, combinations of demand side measures and measures at the interface of supply and demand approaches (such as pre-commercial procurement, Rigby (2013), or Lead Market approaches). Numerous policies in many fields have influenced demand, however, in the last decade the attention of policy makers in the OECD countries and beyond has turned towards supporting demand more systematically, and demand-side instruments have attained new prominence as explicit measures amongst other innovation policy tools. The policy rationale for demand-based policy is threefold: (1) to react to market and system failures on the demand side (such as information asymmetries, adoption externalities, high entry costs, path dependencies, etc.), (2) to respond to societal needs and (3) to support the economy on the supply side. In order to design and analyse demand policies, it is important to distinguish the different ways in which demand contributes to innovation. Demand may trigger an innovation (asking for new products / services), and demand can be responsive by absorbing, adopting and using an innovation offered by suppliers. Further, users may co-produce an innovation with suppliers or develop an innovative solution themselves (user-produced innovation). There is strong theoretical reasoning and empirical evidence that demand is crucial for innovation activities. A number of econometric analyses demonstrate that sophisticated and novel demand, along with rapid diffusion can stimulate R&D and innovation investment. It has also been shown that demand is more important for innovation than R&D subsidies. Consequently, European-wide surveys indicate that firms see policies to improve demand for innovation as highly relevant, more important than R&D support, while uncertain demand has been rated as one of the most important obstacles to innovation. The empirical evidence for this report draws largely on analyses from the area of energy and environmental policy. Here, in contrast to the innovation policy area, supporting the uptake and diffusion of innovations has been a core policy element for many years. However, many of these analyses focus on the effectiveness of measures in terms of diffusion of innovation and the subsequent societal impact, rather than on the actual direct effect as a result of innovation. As regards price based support measures (tax incentives and subsidies), the empirical literature contains mixed messages: there is not a clear "best" approach. By and large, demand subsidies have been shown to have a positive impact on the uptake of eco-innovation. However, this impact is rarely statistically significant, and other factors are often more important for the purchasing decision. For example, comparative studies found that between 8% and 11% of purchases of a specific innovation (innovative insulation) were critically influenced by a subsidy of 15%. A range of studies compare R&D subsidies to demand side instruments. Mostly, this is done with patents (R&D output) as innovation indicator - which clearly limits the scope of the evidence, as patents contain a time lag and mirror only a fraction of innovation activities. This shows that R&D subsidies are more important for patents than demand subsidies. However, one study found that diffusion supported by demand measures is more important for process innovation, while some older studies claim that (public) demand has been more important than R&D subsidies for the generation and diffusion of innovation. Importantly, econometric analysis has shown that, in contrast to supply side measures, the innovation effect of demand measures spills over to foreign markets. This is especially true for innovations which do not necessitate close proximity between user and producer. Finally, the literature is not conclusive when comparing price-based measures to command and control regulations. There are weak signs that command/control regulations are more likely to trigger more radical innovation. The review defines a range of design principles for price-based measures: instruments which reduce purchasing price upfront appear to be more important than those that lead to savings over time (or raising the costs of old technology over time). Further, timing and choice are of key importance. Demand measures risk creating technological lock-in by supporting

state of the art rather than demanding continuous improvements or radical innovation. In addition, while the leverage effect on diffusion is higher in the early phases, to support the demand for an innovation too early can slow down further improvements that would, with delay, be more competitive in the long run. Finally, price-based measures face the further challenge of setting the incentive right; if it is too high, windfall profits will surge, if it is too low, it will not lead to self-sustained diffusion. No decisive rule on the right level of incentives has been found in the literature. The limited evidence for the innovation and diffusion effects of labelling and information campaigns is ambivalent. Increasing awareness for an innovation and security of its use accelerate diffusion, thus feeding back to innovation effects, while transparency through labelling increases competition and innovation. Labelling has a more positive effect on innovations for those firms that are highly innovation active, while for firms that are less active innovative regulation is more effective in triggering innovation. It appears that in order to trigger radical innovation or to make firms change their behaviour dramatically, price-based measures and labels are not enough; regulation and command and control are more effective. However, labelling and information campaigns can be counter-productive. They are in general status quo oriented, built on pre-existing standards and do not reward further innovation. Further, private schemes are less effective than public schemes, and labelling is more effective the clearer and simpler it is (especially when related to cost savings). The diffusion and subsequent innovation effect of labelling can be increased when they are combined with financial means such as cheaper loans. The report finally shows that it has been possible to transfer markets in the energy sector by combining a range of different demand-side measures, tailored towards the specific failures and needs for certain innovations. These approaches clearly pick winners, need intensive preparation to understand specific needs and leverages and risk reducing variety and the competition among solutions in the longer run. Overall, this study highlights two evidence and intelligence gaps. First, there is no meaningful analysis of innovation effects for any scheme that supports private demand in triggering innovation or supports the interaction of users and producers. Second, only a limited number of evaluations are available which actually look at the innovation effect of measures that support private demand. The report also demonstrates that innovation policy has still to learn from other policy domains with regard to the design and effects of demand based measures, and, conversely, domain policies have to improve their appreciation of the potential of demand based measures to support innovation. Finally, the difficulty in containing the innovation effects of demand measures within national borders requires international coordination or, in Europe, the expansion of demand measures to the EU level. Otherwise opportunities to support the introduction and diffusion of products and services that are societally desirable will be lost to national political considerations.

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