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Innovation policy in times of change

The new relationship between state and market

AT A GLANCE

The way of doing business is currently changing on a global scale and at a rapid pace. It is necessary to meet the challenges posed by digitalisation, climate change and globalisation. This can only be achieved by producing new public goods through massive state intervention. This requires a new innovation policy based on cooperation between the state and the market. To be successful, the state must be willing to take higher risks.

The way of doing business is changing on a global scale and at a rapid pace. Three mutually influencing challenges are shaping the picture. The first is the increasingly pervasive digitalisation of the economy and society. Although this process has been underway for a long time, it is only now that digitisation, in combination with other challenges, is gaining an almost revolutionary force that is deeply affecting the everyday lives of consumers and producers alike.

In this environment, companies must face a second major challenge in addition to digitalisation: the switch to ecologically sustainable production, i.e. production that is largely free of harmful emissions. The relevance of the climate crisis is evident (Deutsche Bundesbank 2022). This leads to the necessity of fundamental changes within existing companies. It also enables new companies to enter the market, while others will leave. Both lead to a noticeable structural change and a changed global division of labour (Pisani-Ferry 2021).

This marks the third challenge: under the pressure of technological and ecological change, trade flows are shifting. The change and the uncertainties associated with this create a dynamic towards a renationalization of economic policy in many states. This makes globalisation more fragile. The war in Ukraine has made this even more evident.

The mutual intertwining of these challenges can be illustrated by two examples. An obvious one at this time is the disposability and use of video conferencing. The technology for this had been available for some time. But it is only with the Covid19 pandemic that its benefits have become fully apparent, leading to its use in wide circles of business and society. As a result, the structure of the sector is changing massively. All providers around this technology will profit. New jobs are created there. On the other hand, all those businesses, such as airlines and conference providers, which have derived their profits from the behaviour practised up to now, suffer. Jobs will be lost there in the course of this structural change.

Another example is the new concept of mobility necessitated by the climate crisis. The automotive industry is focusing on e-mobility, but this will only be climate-neutral if the electricity used is generated and distributed with renewable energy. This not only entails the much-discussed structural change in energy production, but will also bring about a change in global trade flows for energy. In the long run, the suppliers of oil and gas will lose their global market power. They will be replaced by those who are able to satisfy the huge electricity demand of the industrialised countries with renewable energies through efficient transport routes. The foreseeable loss of Russia as an energy supplier reinforces this trend.

These two examples alone make it clear that the upheavals cannot be explained by just one set of factors (ICSE 2021). Rather, the entire economic system is undergoing fundamental change. The world is in a state of "meta-crisis" (Azmanova 2019) with various manifestations.

NEW PUBLIC GOODS FOR NEW CHALLENGES

Economic change is mostly understood as a change in private economic and profit-oriented structures, i.e. as a changed supply of private goods. This is far too narrow an understanding. We must not lose sight of the public goods that are associated with this new economic order. On the one hand, these are goods whose production is not lucrative in the private sector because one cannot exclude neither competitors nor customers from using them.

In addition, there is a large number of goods that are produced by the private sector, but possibly to an insufficient extent. A prime example is the infrastructure of digitalisation. Without a doubt, this can be offered by the relevant providers. But this happens only where it is profitable, as in metropolitan regions. In more sparsely populated regions, these services are not continuously provided. Moreover, many people will not be able to afford such a connection. Therefore, if the development of a digital infrastructure is left to the market alone, there will be a deep division between those who can afford it or live in metropolitan areas and those who do not. Some will be able to achieve professional success with it, others will be left behind. A universally accessible digital infrastructure is therefore the conscious political decision to avoid such a division.

It is obvious that these types of public goods are an enormously important part of economic life, especially for broad strata with rather low incomes. After all, without state provision, these goods would be far beyond their financial means. This part of economic life is also referred to as fundamental economics or collective goods (Ökonomie des Alltagslebens 2019). With the ongoing transformation of the economy, this fundamental economy or the necessary supply of collective goods is now changing. Four areas stand out here.

The first has been apparent for some time and has already been described above. In the digital age, access to a broadband connection is as much a necessary infrastructure for every household as an electric power connection. Without this access, not only are the professional and educational opportunities of a household with children limited, but also more generally the communicative participation in society. In future, this should therefore be part of the fundamental economy that can be used by everyone at all times. Therefore, this good must be offered collectively through proactive intervention by the state. The gaps that still exist must be closed as quickly as possible through appropriate, publicly financed investments. This is also necessary because a sophisticated digital infrastructure is a prerequisite for the creation of further elements of a sustainable infrastructure in general.

This applies, for example, to a future mobility infrastructure. In the future, local public transport in particular will have to be strongly digitalised if it wants to compete with private transport, in order to relieve traffic congestion in conurbations or to make moving to rural regions attractive. Some things are already common practice, such as the digitalised

sale of tickets and timetable information on a network scale. But this can only be the beginning. In actual transport, major technological leaps are still necessary to achieve the goal of competitive and sustainable public transport. This will also require a corresponding infrastructure. Given the important future role of e-mobility, the development of a broad charging infrastructure is necessary. Here, too, considerable availability gaps still exist. Yet, the existence of a well-developed infrastructure is a prerequisite for the widespread use of e-mobility. Economic policy must therefore massively support its expansion, at least in the nearer future.

E-mobility as well as sustainable production as a whole not only require a changed mix in the generation of energy in general, but also a massive expansion of the electric power supply (Agora-Energiewende 2015). Against this background, in addition to the expansion of renewable energies, there must be additional technological leaps for greater efficiency in the production and distribution of this energy. Since the beginning of the war in Ukraine, the role of gas as a bridging technology has also been weakened, and its purchase is likely to become noticeably more expensive with the foreseeable loss of Russia as a supplier. For this, too, there is currently a lack of sufficiently developed infrastructure. All this has to be organised on a European as well as on a local scale. In the long run, however, this is the only way to achieve maximum independence from fossil fuels for energy production.

The crises of recent years have also raised the question of how resistant our economy is to crisis developments in general (resilience). In many areas, dangerous weaknesses have become apparent. In the financial market crisis, it was the inadequate security systems of banks. In the pandemic, it is the health system which, especially where public health is concerned, was hardly able to cope with the demands of a crisis situation. Likewise, it became apparent that the public administration is inadequate in many areas. Future crises will burden other areas, and it is to be feared that further weak points will open up.

What these phenomena have in common, despite all their differences, is the lack of a sufficient margin of safety. The banks had too little equity to absorb the shocks of the financial market crisis, whereas the health system had too few intensive care beds. And there was too inefficient technology in the public sector and, above all, too few staff to cope with the corona-related wave of illness. These shortcomings are no accident. The usual economic calculations are geared to the normal state of affairs and not to the rare case of a crisis. After all, maintaining safety reserves costs money. This reduces private-sector returns and strains tight public budgets. In this respect, security reserves that have not been used for a long time are always under pressure to justify themselves and, in case of doubt, are reduced or at least kept very tight. This, however, systemically increases the risk of insufficient protection in times of crisis. Systemic resilience in times of crisis is thus a public good that belongs to the fundamental economy, the supply of which should be guaranteed by the state directly or indirectly through appropriate regulations or subsidies. Such safety margins can be opened up, for example, by means of digital technologies.

THE STATE AS A DRIVER OF INNOVATION

The transformation of the fundamental economy towards a sustainable and digital economy is inevitably still piecemeal at present. In many cases, huge technological leaps are still needed to achieve the desired goals. It is more than doubtful whether these leaps can be made by the market alone. It is even more doubtful whether this can be the case in the relatively short time frames that mark the limit for tolerable climate change. Recent economic analyses show that the state has a decisive role to play in technological change (Mazzucato 2015). It can serve as an initiator, customer and accelerator of the technological change that seems necessary from the perspective of the common good. Therefore, future innovation policy should be designed in such a way that it can trigger these types of technological leaps.

The deeper reason for the high importance of state action lies in the high level of uncertainty associated with fundamental innovations. This makes private investors cautious - too cautious to bring about sufficiently rapid and fundamental changes such as those that are required by climate change. This is especially true for the goods of the fundamental economy, whose return on investment is low for individual companies, even if it is high for the economy as a whole. From a macroeconomic perspective, this leads in the end to underinvestment in these areas and thus reduces the prosperity of the entire national economy.

To avoid this, the state needs a targeted innovation policy. The approach of a mission-oriented policy according to the concept of Mariana Mazzucato offers itself here. However, its success is tied to a number of preconditions.

A decisive regulatory prerequisite concerns the distribution of tasks between the state and the market. The state sets the goals and gives impulses. The market takes up the impulses and contributes to the fulfilment of the goals through innovations. The impulses can consist of monetary grants for research projects or of regulatory requirements that must be fulfilled within a certain period of time. Both create incentives to behave in accordance with the targets on the market and thus contribute to their fulfilment.

The goals should be oriented exclusively to the common good or to macroeconomic needs. Only this justifies an independent state innovation policy - everything else can be regulated by the market alone. The return on the fulfilment of objectives should benefit the economy as a whole, not just individual companies. The latter arise from individual economic decisions in the market process and do not require any further support. The goals of government action, on the other hand, should yield returns for society as a whole. On the one hand, they should bring progress in overcoming the challenges described above and improve the future living conditions of people compared to a status quo without government action. On the other hand, they should result in an improved fundamental economy. This enables all, and not

just a few, to participate sufficiently in social life, even in times of change.

This desired progress can be illustrated by examples. If, for example, emission-free energy supply on a global scale succeeds in limiting climate change and the rise in temperature, the everyday quality of life of everyone, not just some individuals, will be significantly better. There is therefore a positive social return that can be felt by all. Under these conditions, improved private returns can also be achieved as well.

A more limited example with regard to the fundamental economy is the general access to digital infrastructure described above, which would enable low-income households in particular to participate more intensively in society. This ranges from easier access to educational opportunities to political engagement at every level. This also creates a positive social return on investment that extends down to the local level, where the digitalisation of administrative and participation processes yields a kind of municipal or urban return on investment. The fact that positive private returns are also possible via e-commerce is now obvious. But it is also important to note that - as the pandemic has shown - this type of improvement of the fundamental economy can be a contribution to greater resilience in times of crisis. This makes it all the more important that everyone has equal access to it.

Another prerequisite for the success of such an approach is that the state's impulses must be given in a competitive economic environment. This is of particular importance when it comes to direct financial support for research that is intended to trigger technological leaps and is therefore of uncertain outcome. These grants must be awarded competitively to several providers or project participants. This in turn increases the incentive to achieve success and thus makes the use of funds more efficient. However, it also includes the failure of individual competitors. Under no circumstances should grants be designed to support individual companies or other institutions. This would weaken efforts and significantly reduce the chances of success.

REFORM OF THE PUBLIC SECTOR

The new distribution of tasks between the market and the state will not only change the way of doing business in the markets, but also the way the state acts. The concept of a mission-oriented innovation policy requires state agencies to behave like entrepreneurs in the service of the common good. They must therefore assume risks. This implies acting flexibly in order to take new insights into account during the processes. Moreover, it is by no means guaranteed that all projects intended to trigger technological leaps will be successful. The failure of individual participants is part of the process. This way of dealing with flexibility and uncertainty differs considerably from the usual behaviour in the public sector, which is rightly oriented towards traceability and reliability. This policy approach thus encounters both procedural and personnel

obstacles. For neither do the usual administrative procedures allow for risk-taking, nor is there the competent staff who can assess risks well. Risk taking is quickly criticised as a waste of taxpayers' money, risk assessing has not usually been one of the required competencies in the public sector.

Therefore, especially in the short term, it may be difficult or impossible to implement the new type of innovation policy within the usual structures of the public sector. At the same time, time is pressing to address the challenges. Therefore, it seems sensible to locate innovation policy outside the regular public service. The proposed structure makes it easier to recruit qualified personnel through appropriate remuneration. What matters here is not career thinking, but the willingness to take risks in the service of the common good. This should be rewarded by material incentives, as in the private sector.

The financing of staff and projects should therefore be done through funds outsourced from the normal budget. This makes it easier to deal with restrictive fiscal rules (Dullien/Rietzler 2021). The correct use of financial resources is monitored by an advisory board, which should include members of the government, parliaments and external experts.

Such an innovation agency should focus on financing projects that can be the foundations of the technological leaps that are necessary to overcome the challenges outlined above. These will therefore be basic projects in the field of digitalisation and sustainable production. The decisive factor is that the projects can be considered as innovative. The agency should focus on this objective. Regional or industrial policy considerations should not play a role in this context. Funding will be given to research institutions, but also to companies conducting research in the area in question. It is essential that the funds are awarded in competition. Thus, several competing teams should always work on the same questions. Competition increases the probability of success.

At the same time, it is not only about nationwide projects. Climate change and digitalisation also have their local dimensions. Therefore, there should be similar agencies at the sub-national level that are dedicated to regional and local issues. With regard to local transport this could be local energy production and distribution as well as local energy consumption. Likewise, the specific local opportunities through digitalisation should be explored here. The range goes from the simplification of administrative procedures to digital models of citizen participation. The appropriate way of implementing all these innovations locally, i.e. the interface between technological innovation and society, requires more in-depth research.

THE PUBLIC SECTOR ASSUMES RISKS

In this time of fundamental change, there is a need for a cultural change in the public administration in dealing with economic risks. The state must be prepared to take more risks in the service of the common good. This must happen quickly, because the problems are pressing. The proposed dedicated innovation agencies are a shortcut on this path. They do not have to exist permanently and in the long run, when the pressure for change subsides, they could be disbanded or integrated into the civil service. But until then, they appear to be a realistic means to quickly promote ideas that will help address the challenges ahead. In any case, a new relationship between state and market is emerging in this area. Cooperation replaces conflict. ←

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