

# Economic analyses of state aid - English abstract

State aid and competition - economic analyses

---

## 1. Introduction

In the last 10-15 years, there has been an increasing emphasis on the economic consequences of state aid. However, although the overall EU level of state aid has fallen from 1.7 percent at the beginning of the 1990's to around 1 percent at the end of the 90's, the total use of resources spent in the EU countries is still of a considerable size.

Governments' expenses on state aid are equally motivated by economic and political concerns. Fundamentally, three types of state aid exist: Sector aid, regional aid and horizontal aid. The formal motives for giving state aid are often very noble. Thus, sector aid is aimed at relieving the burdens for sectors in recession by e.g. supporting restructuring of the sector, reeducating the sector's labour force etc. Regional aid is targeted against developing the poorest regions in Europe, creating the foundation for expansion and modernisation of the regions and thereby contributing to the overall EU goal of economic and social cohesion in Europe. And horizontal aid is aimed at reducing market failures by subsidizing e.g. environmental action or R&D activities in private firms.

However, state aid also has some detrimental effects which can lead to potentially large economic costs. State aid can distort competition and lead to inoptimal use of society's resources by e.g. supporting an outdated industrial structure and delaying a necessary restructuring process in firms.

The need for emphasizing both positive and negative sides of state aid is the background for the Danish government's decision to perform thorough economic analyses of both existing and potential new state aid schemes. The ambition is to valueate – if possible in monetary terms - both positive and negative effects of state aid. The long term ambition behind this work is that an increasing focus on both positive and negative sides of state aid will lead to better state aid schemes. Thus, state aid should in the future secure the largest possible effect for taxpayers' money and with the smallest possible distortionary effects on competition.

The ambition to increase the use of economic analyses of state aid is in accordance with the work in the EU Commission. During the Danish EU chairmanship in the autumn 2002, the Danish Minister of Economic and Business Affairs will be dedicated to implementing the Danish ideas in the EU system. A coordinated EU effort will minimize the distortionary effects on competition due to state aid.

One important step towards increasing openness and transparency concerning state aid is the establishment of a public EU state aid register. A state aid register will enable firms to acquire knowledge of potentially distortionary state aid paid to competitors. The Danish government will actively support the implementation of a common EU state aid register.

## 2. Economic analyses of state aid

The Danish Ministry of Economic and Business Affairs has commenced the work on improving policymakers' foundation for making decisions by undertaking a number of case studies on existing or earlier state aid schemes. Consequently, the analyses undertaken so far are ex post analyses. However, experience from ex post analyses leads to some general conclusions as well as a general methodology that will be useful in future ex ante analyses. In the long term, it is the ambition that all new state aid schemes should be carefully analysed at an early stage in the decision process. Such analyses should point at possible detrimental effects of a given state aid scheme as well as an assessment of the scheme's suitability for solving the problem in question. This should lead to better aid schemes and force policy makers and planners to consider alternative regulatory steps other than state aid. In short, "less aid but better aid".

The negative effects of state aid are:

- Distorted competition
- Excessive profits
- Excessive wages
- Low productivity
- Outdated industrial structure
- Direct costs, administrative costs and distortionary taxes

Distorted competition

State aid often distorts competition by giving some firms a competitive advantage over others. This enables less efficient but subsidized firms to win market shares from more efficient firms. The effect of this is that total production is less than what would be possible with a more efficient use of society's resources.

Excessive profits

There is a risk that state aid ends as higher profits in the subsidized firms and sectors without solving the structural problems originally intended. Excessive profits due to state aid leads to excessive investments in subsidized sectors thereby distorting investment patterns. The consequence is that too much capital and labour is tied up in sectors compared to what would be optimal in an unsubsidized market equilibrium.

#### Excessive wages

State aid bears the risk of leading to higher wages in subsidized firms and sectors than in other, unsubsidized, firms and sectors. This means that wages are potentially higher than the level corresponding to workers' productivity. At the overall society level, this implicates distorted labour markets where firms operating on market conditions experience difficulties attracting workers paid at market wages. The consequence is that labour is fixed in less efficient firms at the expense of more efficient firms. This has overall social costs.

#### Low productivity

State aid can lead to a general "slack" in production, lack of cost control etc. There is a risk that state aid can delay necessary renewal, innovation, product development and lead to lower productivity growth. In the long run, state aid can tie resources in unproductive firms and sectors.

#### Outdated industrial structure

State aid can support an industrial structure with many small firms. Such a structure might be preferable from an e.g. regional perspective, but at the same time could collide with the potential for economies of scale by concentrating production on fewer plants. Economies of scale might lead to lower production costs and in the longer run make resources available for other sectors.

#### Direct costs, administrative costs and distortionary taxes

State aid means both direct and administrative costs for the public finances. On top of this, state aid also leads to administrative costs in the private sector. Financing public expenses leads to higher taxes with potential distortions on e.g. labour supply and investment. The Danish Ministry of Finance estimates the social cost of taxation to be 20 percent of the total tax revenue. These extra costs should be taken into account when deciding whether to implement a state aid scheme.

#### Economic analyses address several problems

Ideally, economic analyses of state aid should address all these problems. The toolbox for such analyses builds on the methods developed for analysing competition problems and economic analysis methods in general. Evidently, the data used for such analyses will be limited by the data available.

### 3. Three case studies

The Danish Ministry of Economic and Business Affairs has performed careful analyses of three state aid schemes representing respectively sector aid, regional aid and horizontal aid. The three schemes are 1) shipbuilding subsidies, 2) transport aid to firms producing on the island Samsø, and 3) subsidies to firms' investment in energy saving technology.

#### Danish aid to shipbuilding – an example of sector aid

Almost all Danish sector aid has been channelled to the shipbuilding industry. However, as most of the world's shipbuilding countries support their national shipbuilding industries, shipbuilding aid is often considered a "defensive" step by national authorities. In the EU this area is regulated by the Commission's common state aid rules. The analyses of Danish shipbuilding aid have been performed in the light of this situation.

The conclusion of the analysis is that - in spite of massive aid - turnover, employment and the number of shipyards for building new ships has been declining through the latest decades. Parallel with this, public subsidies' share of wages has been increasing to a level of more than 70 percent in 2001.

The international shipbuilding industry has a large overcapacity compared to the need for newbuilt ships. Thus, shipyard closures have been expected. In Denmark, the shipbuilding aid has prolonged the process of closing down shipyards.

The question whether Danish shipbuilding aid has had distortionary effects on competition remains unsolved. The main part of the world's shipbuilding is still subsidized in some way.

However, the analyses point to some unfortunate effects on productivity and wages in the shipbuilding industry in Denmark. Over a period of 35 years, productivity at Danish shipyards has increased with 20 percent less than the rest of the manufacturing industry. Thus, shipbuilding aid has delayed the industry's needs for rationalisation and innovation.

Moreover, wages for workers at shipyards have been 8-20 percent higher than for other workers in the metal- and iron industry in the same regions. The higher wage level can apparently not be attributed to a higher productivity in shipbuilding – on the contrary. But higher wages in shipbuilding has distorted the labour market for metal- and iron workers by deterring other firms' and sectors' chances of hiring metal- and iron workers.

Profits in Danish shipbuilding have been low for many years. This has been reflected in the numerous shipyard closures. Thus, state aid hasn't been channelled into excessive profits. But there is no doubt that the owners of the Danish shipyards have been better off with than without state aid.

In the debate, it has often been stated that shipbuilding aid has large indirect effects on e.g. employment in other industries. However, input-output analyses show that one extra person employed at a shipyard does not lead to higher indirect effects than one extra person employed in other sectors – on the contrary.

An important aspect when considering whether or not to give state aid is the consequences if the state aid had not existed. By using Danish official registers for employment, it is shown that most of the workers dismissed from shipyards in the past 5-10 years found new jobs after a relatively short period of time (1-2 years). Of course, this result should be seen in the light of the Danish economy being in a favourable stage in the business cycle in the same period. However, this development also illustrates that it makes sense to phase out state aid schemes when the economy is going through periods of economic boom.

Transport aid to firms producing on the island Samsøe – an example of regional aid

In the last half of the 1990'es, the Danish government ran a scheme targeted at compensating for extra transport costs for firms operating on the island Samsøe. Thus, subsidies were paid when goods were ferried *to* the island for manufacturing in Samsøe firms, and subsidies were paid when goods were ferried *away* from the island again.

The subsidy scheme was constructed to compensate only for extra transport costs for Samsøe firms, but there is no doubt that the overall aim of the scheme was to secure firms and jobs staying on the island. The lack of explicitness in formulating the precise goals for this scheme makes it difficult to evaluate whether the scheme has been successful. The scheme has indeed compensated for extra transport costs due to ferry fares and time spent on waiting for and on the ferry. However, there are other extra costs connected to producing on a small island like Samsøe. It is difficult to benefit from economies of scale as both the production capacity in physical terms and the labour supply is limited.

Evaluating whether the aid scheme was a success also depends on the time perspective. The analyses show that firms kept producing while subsidies were paid. When the aid stopped in 1999, the largest plants on Samsøe stopped operating. Thus, the aid scheme only maintained industry and employment on the island for a short period, but it didn't contribute to a more future oriented development on the island. The natural question to ask is whether the 5½ million Euro given over five years could have been spent on better and more long-term initiatives. Future regional aid schemes should aim at supporting local industries with the potential of operating on market conditions after a certain period of time.

Subsidies to energy saving investments and voluntary agreements – an example of horizontal aid

In 1993, Denmark implemented a CO<sub>2</sub> tax on energy use in industries and households. At the same time, the Danish government introduced some complementary initiatives. These initiatives aim at promoting firms' incentives to undertake energy savings. The most important initiatives were *subsidies to energy saving investments in industries* and *subsidies to cover CO<sub>2</sub> taxes in certain firms (voluntary agreements)*. The two subsidy schemes both had two main goals. The *first* main goal was to reduce total energy use through subsidisation towards less energy intensive fuels. The *second* main goal was to partly compensate Danish firms for the CO<sub>2</sub> tax's detrimental effects on Danish industries' international competitiveness. The analyses focus mainly on the investment subsidy scheme as this scheme has been the most costly.

Several analyses indicate that both subsidy schemes have contributed to the first goal - reducing industrial energy use and CO<sub>2</sub> emissions. For the investment subsidies, this question has been analysed in several different ways. One analysis, which builds on information given by the firms on the amount of energy saved, concludes that the reduction in firms' energy use is 0.5 kg per subsidy Dkr. Another analysis performed on micro data for firms' actual energy use estimates an energy reduction of 0.2 kg per subsidy Dkr.

Thus, most analyses estimate that investment subsidies have lived up to their overall goals. But they also point at some rather high shadow prices for energy reductions financed by investment subsidies compared to other instruments as e.g. a uniform CO<sub>2</sub> tax or a CO<sub>2</sub> quota system. Investment subsidies are a relatively expensive way to undertake energy savings. However, the subsidy scheme was in fact built to mitigate the negative consequences of a uniform CO<sub>2</sub> tax on firms' international

competitiveness. Consequently, the investment subsidy scheme's lack of cost effectiveness was most likely anticipated and politically accepted and wanted. The analyses also suggest that cost effectiveness of the voluntary agreement scheme has been comparable with e.g. a uniform CO<sub>2</sub> tax or a CO<sub>2</sub> quota system.

Overall, the two subsidy schemes have achieved their two goals. However, the state aid elements of the CO<sub>2</sub> package do not all live up to achieving the Danish CO<sub>2</sub> goal at the lowest possible social cost.

Survey based analyses estimate the amount of free riding, i.e. subsidising investments which the firm would have undertaken with or without the subsidy, to around 20 percent. This figure is based on a recent survey of investment behaviour among subsidized firms. It is likely that firms tend to answer such questions in a strategic manner in order to avoid being blamed for having received subsidies for investments that they might have undertaken the investments after all. But the firms also emphasize that the subsidized investments have had other positive effects apart from energy reductions, i.e. improved production and working environment. These other effects might enhance the risk of free riding.

The combination of an investment subsidy scheme, voluntary agreements and subsidies to paying CO<sub>2</sub> taxes for certain firms and industries have contributed to the small net effects on Danish firms' competitiveness of the total CO<sub>2</sub> package. The net effect of the CO<sub>2</sub> package on Danish industries is only small.

Bearing in mind that the two subsidy schemes have been part of a large CO<sub>2</sub> package, there is no indication of the subsidy schemes leading to negative effects on competition. Compared to international producers who have not been subjected to a CO<sub>2</sub> tax, the subsidies have not distorted international competition. Competition on Danish markets for comparable goods has not been distorted by the subsidy schemes either. In principle, all Danish firms have been able to benefit from the subsidy schemes.

The cost of the investment subsidy scheme amounted to 1.8 billion Dkr. for the period 1996-2000. This is a large sum which calls for considering the overall social costs of the Danish CO<sub>2</sub> policy and the need for finding the most cost effective solution to meeting the Danish CO<sub>2</sub> target.