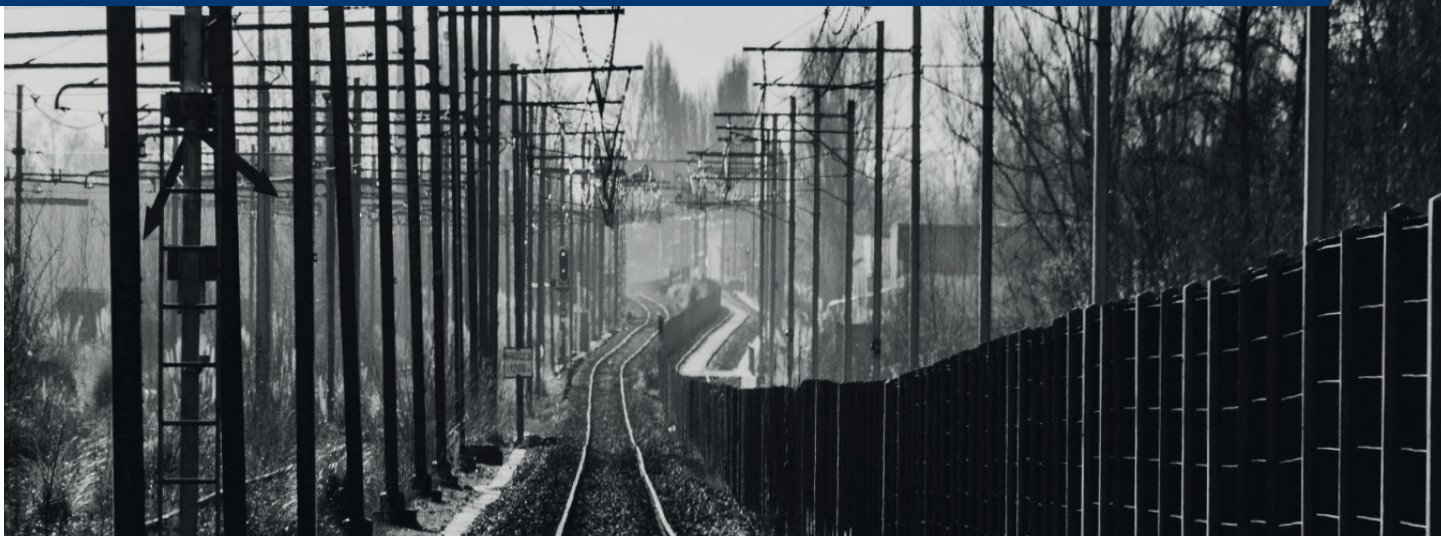


April 2023

EU publication on State aid:

E.CA supports DG Competition with revision of Railway Guidelines



E.CA study on Railway Guidelines

- E.CA and partners provided study for European Commission, DG Competition
- The study covers four main areas: i) rail infrastructure; ii) passenger and freight rolling stock; iii) cost, revenues and profitability of rail freight services; iv) and design of State support measures.
- For more information, visit www.e-ca.com or scan the QR code.



Key take-aways

- According to European Green Deal, rail freight traffic is supposed to double by 2050. However, the share of rail freight in total freight transport is low and stagnating
- The European rail infrastructure is inadequate to meet the challenges of the future, e.g. rail networks are congested and there are not enough private sidings
- More and more modern rolling stock is required to increase the rail modal share
- In many cases, in particular on short distances, for low volumes and time-critical transports, rail freight is not competitive with road transport via trucks
- State aid for rail freight can help address these challenges, but needs to take into account the complexity of the sector

The Revision of the Railway Guidelines: A Big Bang for a Substantial Modal Shift?

Getting the rail freight sector back on track

Rail freight used to be one of the leading modes for freight transport, but its modal share declined significantly in the second half of the 20th century. Over the last two decades, the rail modal share in freight transport has stagnated at a low level across Europe. In the last pre-pandemic year 2019, the share of rail in the total freight transport was at 8.8% on average in Europe with some degree of regional variation: Rail freight is less important in Southern Europe and more important in Eastern Europe.

This low modal share of rail endangers important goals in environmental and transport policy. The European Green Deal, to which the European Union committed in 2020, aims to make Europe the first climate-neutral continent by 2050. Compared to highly polluting road transport by truck, rail freight is a safe and low-emission type of transport. Therefore, one of the policy goals is to double rail freight until 2050.

At the moment, the transport sector is not on track to achieve this objective. This policy brief discusses options in the domain of State aid to foster the modal share of rail freight. It is based on an impact assessment support study which the European Commission, DG Competition, commissioned to a consortium led by **E.CA Economics**.

RAIL FREIGHT BASICS: WHICH TYPES OF FREIGHT ARE TRANSPORTED BY WHICH KINDS OF TRAINS?

The single largest category of goods currently transported by rail are containerised goods, i.e. mixed goods in containers, semitrailers and other multimodal loading units. Apart from such containers, the main types of rail freight are heavy bulk goods such as coal, steel and chemicals. These types of goods will become less important in the future due to structural economic change, the substitution of fossil fuels like coal and oil and the declining relevance of heavy industry. In addition, current and future freight transport demand will require fast, scalable and flexible solutions. This will also affect the type of freight trains in demand.

In the past, a large share of rail freight volume was transported by block trains and single-wagon load. Block trains carry a large volume of mostly bulk goods in a point-to-point connection, e.g. a full train of coal from a coal mine to a coal-fired power plant. While block trains tend to be efficient in terms of costs per tonne-kilometre, demand for such trains carrying bulk goods will likely decrease.

Single-wagon transport is a classical system of rail freight: One or a low number of wagons are collected from a factory or other facility with a private siding and combined with wagons from other senders to form a full train. This full train travels to a large freight yard in the destination area and the individual wagons are disassembled and distributed to their different end-destination, for example other factories or freight terminals.

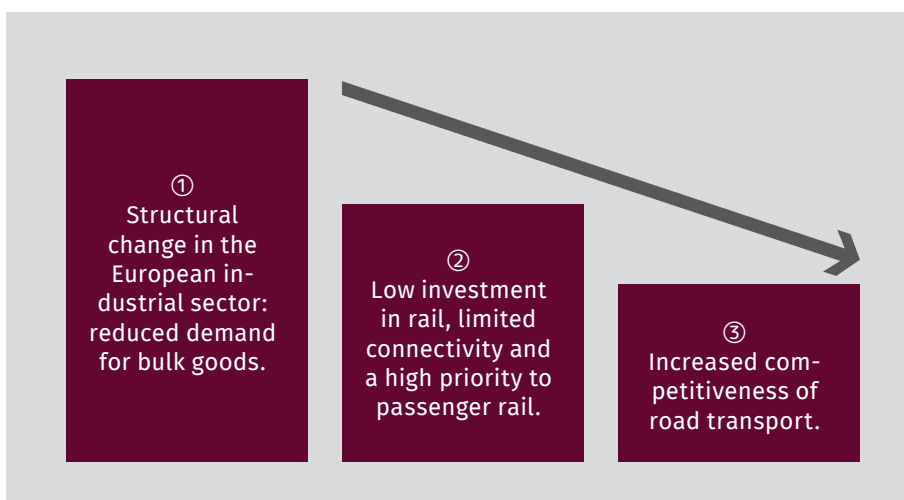
Single-wagon transport is mostly unprofitable and faces strong competition from road transport, which tends to be cheaper, faster and more flexible. Therefore, freight volumes in single-wagon transport are declining and many incumbent operators in Europe stopped such operations completely, e.g. in Spain. The third type of train, combined transport or multimodal transport, i.e. trains carrying containers and other multimodal loading units is thriving.

Such trains often run shuttle services between two freight terminals, e.g. a harbour and a road-rail terminal close to a city or large industrial sites. Combined transport has the disadvantage of transshipment costs that arise when a container is transferred from a truck to the train or vice versa. On the positive side, it does not require a direct connection to the rail network and it can combine the flexibility of truck transport with the cost advantage of rail in transporting large quantities at long distances. This gives rail a competitive position vis-à-vis road transport.

Three reasons for the decline of rail freight stand out:

- 1 structural change in the European industrial sector, which reduced the demand for the transport of bulk goods and required more flexible transport solutions
- 2 relatively low investment into rail infrastructure and modern, digitalised solutions, its limited interconnectedness across countries and priority for highspeed passenger transport.
- 3 increased competitiveness of road transport due to large-scale investments into road infrastructure, innovations in road logistics, lower costs and better, more flexible service quality

As a result of these developments, rail freight is mostly not competitive against road transport.



The liberalisation of rail markets in the last two decades could not reverse the trend of a declining rail modal share in total freight transport. Still, the opening of rail markets affected the market structure significantly in many European countries. The share of national rail freight volume accounted for by the incumbent, i.e. the former stateowned monopolists, varies considerably from country to country. In some countries, e.g. Germany and Poland, there is a considerable level of competition between rail freight operators.

A look at the bigger picture shows that other world regions are more successful in achieving a higher rail modal share. For example, Canada and the USA have a significantly higher modal share of rail freight and make use of the strengths of rail transport: rail freight transport is most efficient when high volumes are carried on long trains over large distances.

Where to start?

For a successful transition to a green economy and to achieve the climate and transport policy targets, a substantial modal shift from road transport to rail freight is necessary. A substantial rise in the rail modal share will require improvements at three levels:

More, better and more modern infrastructure: Modern and high-capacity infrastructure can improve the competitive situation of rail freight: Bottlenecks in the rail network often lead to congestion and slow and unreliable delivery times; modern infrastructure can foster cross-border transport which suffers from technological and regulatory disruptions; modern facilities like digitalised intermodal terminals can speed up transport times and decrease costs; more private sidings are required to connect factories and other facilities to the rail network; better interconnectedness across countries would facilitate longer distances for freight trains, i.e. leveraging the competitive strengths of rail and make it more costefficient.

More and modern rolling stock: The existing fleet of rolling stock will not suffice for a substantial increase of the rail modal share. Furthermore, a significant share of the rolling stock is outdated and not fit for future requirements, such as automated coupling and digital safety systems etc.

Rail freight must become competitive with road transport: Rail freight is often in close competition with road transport. This holds especially true for combined transport and single-wagon load. Shippers will choose rail transport instead of road transport only if rail freight is overall cheaper, after taking service quality into account. At the moment, rail freight is not competitive in many cases - as the low modal share proves.

**Better
infrastructure**

**Increased capacity
of rolling stock**

**Competitiveness
with trucks**

How can State aid help?

An increase of the rail modal share will require more and more efficient rail infrastructure, more and more modern rolling stock, and rail freight operators that can effectively compete with road transport by truck. Public policies can contribute to an improvement at all three levels of the rail freight system. One way - among others (Other options could be better regulation, e.g. regarding cross-border trains, higher taxes for road transport, etc.) - is a modern State aid framework that fosters the rail modal share.

What types of investments into infrastructure could be supported by State aid support?

- ➔ A **denser rail network** with more capacity is needed. Doubling rail freight by 2050 will only work if network capacity is increased, because currently networks are congested and passenger trains have priority. Dedicated rail freight tracks/corridors could help.
- ➔ The **modernisation of the track network**, including the introduction of digital technologies and EU-wide standardised safety systems.
- ➔ **More and more modern terminals**, including intermodal terminals which connect the railway network to road transport, inland waterways and deep-sea harbours; this would make rail freight more flexible, cheaper and faster.
- ➔ **More private sidings** would lower the costs for industry clients to use rail transport and increase the overall efficiency of rail transport, e.g. by higher capacity utilisation of single-wagon systems.
- ➔ An **improved cross-border compatibility** of national rail networks and rolling stock would allow leveraging the benefits of long-distance routes, which are crucial for efficiency in rail transport.

STATE AID CONTROL IN THE EUROPEAN UNION

State aid is generally not permitted in the European Single Market due to its distortive effect on competition and trade. However, State aid can be exempted from the general prohibition if it fulfils six criteria:

1. **Incentive effect:** State aid must provide incentives for firms to change their behaviour in the way desired by the State aid objectives;
2. **Need for State aid:** It must be used only when the market cannot deliver itself, for example in a situation of a market failure or an equity/cohesion concern. The following are typical market failures relevant for rail freight:
 - Negative externalities of road transport exceeding those of rail transport (e.g. carbon emissions, noise, congestion).
 - Public good nature of rail infrastructure means that the value created by one undertaking is appropriated by other undertakings. This typically implies weak incentives to invest in infrastructure, resulting in underinvestment.
 - Asymmetry of information between infrastructure manager and railway undertakings regarding what infrastructure is needed may result in misdirected, suboptimal investment.
 - Coordination failure: complex coordination is required between infrastructure manager providing paths, infrastructure available at the origin and destination, rolling stock available on time and at a certain place, technical compatibility of infrastructure and rolling stock. When this coordination is failing, rail freight services will be undersupplied.
 - Natural monopoly/high investment cost of infrastructure and rolling stock implies that profitable rail freight service is possible only with a large scale of operations.
 - Market power of incumbents may restrict contestability of the market, distort incentives to innovate and enter.

How to support investment into rolling stock?

- ➔ The available evidence suggests that the **existing rolling stock fleet is aging and in need of renewal**. This is due to the significant cost of access to rolling stock, its maintenance and modernisation. State aid can address this by supporting the purchase or retrofitting of rolling stock when the old one approaches its expected useful life. State support could foster migration to new technologies such as the Future Railways Mobile Communication System (FRMCS), Digital Automated Coupling (DAC), Virtual Coupling (VC), Automatic Train Operation (ATO), Predictive Maintenance (PdM) and Fuel Cell and Hydrogen (FCH).
- ➔ **Support for leasing companies** would improve access to rolling stock, which currently represents a significant barrier to entry and/or expansion for existing or potential railway undertakings. This is particularly important for small rail freight firms and future market entrants.
- ➔ **Support for technical standardisation** of rolling stock across the EU would be an important step to facilitate access to rolling stock and ultimately reduce its costs. State aid could foster the introduction of the European Rail Traffic Management System, which will facilitate interoperability of rolling stock across countries.
- ➔ State aid to first-movers into **innovative and clean technologies** in rolling stock could help fostering the adoption of these technologies. It could have a form of a subsidy to reduce investment cost or to reduce track access charges when the rolling stock is equipped with these technologies

STATE AID CONTROL IN THE EUROPEAN UNION (continued)

3. **Appropriate instrument** to achieve a significant effect on the modal share. For example, State aid needs to be efficient in terms of the outcome, e.g. when comparing the modal shift (out-come) achieved to the subsidy amount spent (input);
4. **Limited to the minimum** necessary to achieve the goals (this criterion is also called proportionality);
5. **Avoid undue negative distortions** on competition and trade between Member States and balance any negative effects by positive effects: The very aim of State aid for rail freight is to make rail transport more competitive vis-à-vis fossil fuel-based road transport. This distortion of competition in freight transport services is aligned with the common interest of the European Union pursuing ambitious environmental and transport policy goals and is therefore desired. However, other potential distortions of competition should be avoided:
 - Distortion within the rail freight sector can be expected when State aid benefits only selected undertakings. This is likely for individual aid for rolling stock or operations, but unlikely in case of aid for infrastructure, since (open-access) infrastructure benefits everyone.
 - Distortion with respect to other environmentally friendly modes of transport such as inland waterways or clean/electrified trucks can be of concern when such modes of transport are a substitute to the subsidised service.
 - Distortion of dynamic incentives to enter or innovate is likely an issue when a company with a strong position in the market is supported to become even stronger, leaving less space for its current or potential competitors to grow or enter.
 - Distortion of trade between countries may play a role when undertakings redirect rail freight traffic to the country granting State aid. For example, trains might be driving via the

Which types of rail freight services should be supported?

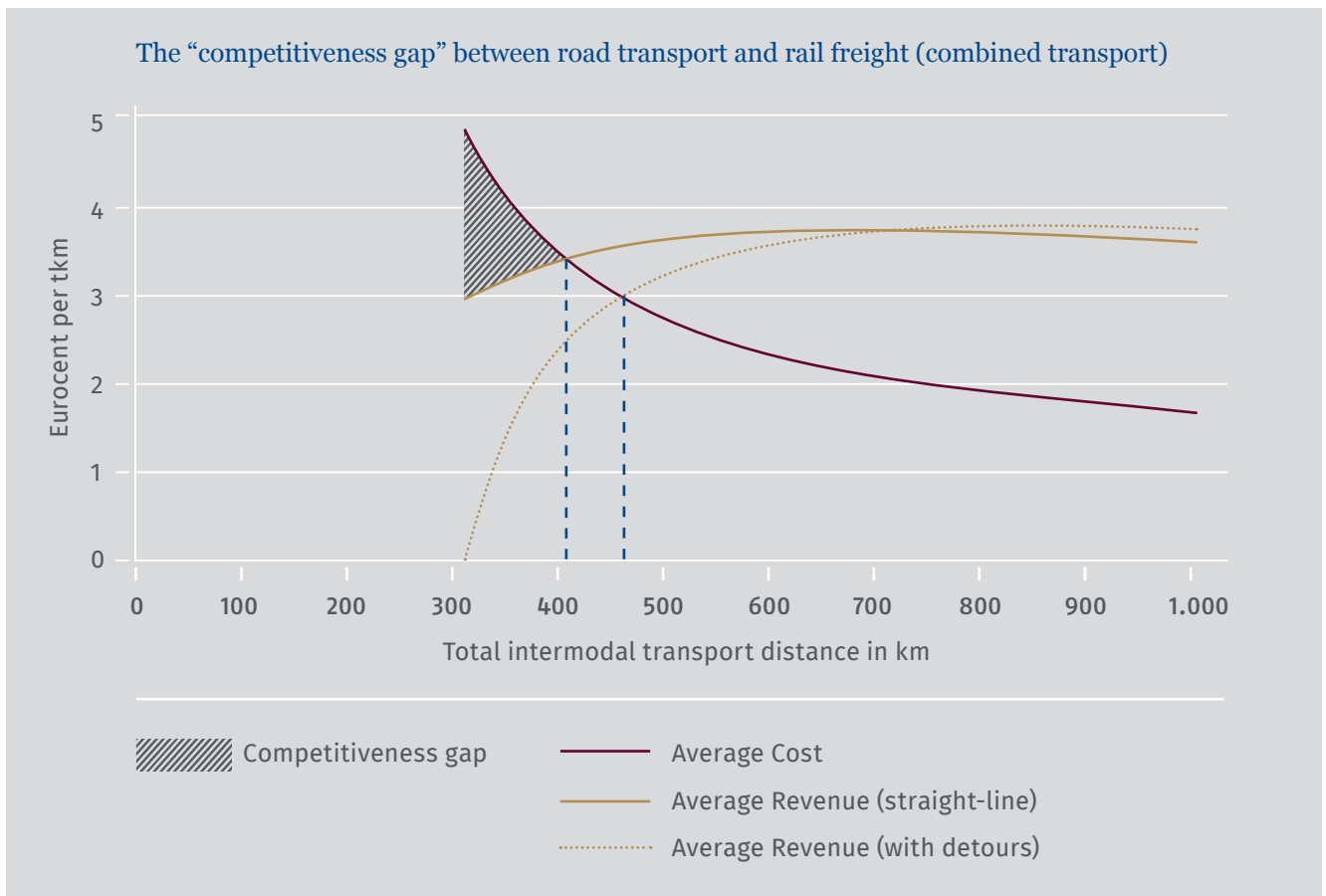
- Operating aid for rail freight operators could increase the price competitiveness of rail freight vis-à-vis road transport. Such kind of State aid should be directed towards rail freight services with a high price-elasticity of demand. This way, the efficiency of the State aid in terms of public money spent and modal shift achieved can be maximised.
- In terms of **types of goods**, the available evidence suggests that rail freight of high-value goods such as food or vehicles and related equipment has a high price-elasticity of demand, meaning that a small decrease of the price can increase demand significantly. In contrast, heavy bulk goods – often transported by block trains – tend to feature lower price-elasticities and State aid might be less efficient in these cases.
- **Block train** services tend to have low price-elasticities of demand, as they compete less with road transport than combined transport and single-wagon load. Hence, supporting **combined transport** and **single-wagon load** with State aid will be more efficient than supporting block trains.
- Rail freight can be competitive on long distances due its low variable costs. This means that supporting rail freight over **short distances** can have a greater effect than supporting long-distance services. (see figure on the next page)

STATE AID CONTROL IN THE EUROPEAN UNION (continued)

country with subsidised track access charges, even when it prolongs the driven distance.

6. Transparent: Information on the legal provisions and aid awarded must be easily available for the Member States, the Commission, firms and the public. The Commission maintains a State Aid Transparency database collecting such information from all Member States except Poland, Romania and Spain, which have their own national databases.

These criteria ensure that State aid can achieve its objectives, while its intervention in market forces and competition is as small as possible.



Source: Publicly available sources and stakeholder consultation. The figure displays two lines to approximate revenues with truck prices. The solid line emerges from the assumption of a straight-line connection of an intermodal transport chain, i.e. the rail leg as well as first and last mile are on the same optimal path as is a road-only transport. The dashed line, on the other hand, reflects an assumption that first and last mile are “detours” to access the rail infrastructure. For both lines, the adjusted price for road transport excludes costs of and an assumed 11%-mark-up on transshipment, first/last mile and overhead costs. We assume an average of the transshipment technologies gantry crane and hydraulic material handling crane. The x-axis represents total transport distance, i.e. it includes two road legs of 75km each.

How to design State aid for rail freight?

Complex, interconnected rail freight system: When designing a State aid framework for the rail freight market, it is important to consider that all three levels of the entire system are interconnected and the same effect can be achieved by State aid at different levels of the overall rail freight system. For example, a subsidy for an investment into a private siding could have the same effect as a subsidy for modern rolling stock with automated coupling or operating aid. Consequently, a State aid framework should define clear objectives and employ the most efficient mix of State aid measures – together with other policies like regulation – to reach these objectives. As an illustration, an effective support for combined transport could combine State aid for infrastructure investment into modern terminals, also in hitherto unserved areas, support for investment into retro-fitting outdated rolling stock which can achieve the synergies with the new terminals as well as operating aid for short- and medium-distance combined transport services to make these services competitive vis-à-vis road transport. In a similar way, effective support for single-wagon load could combine investment aid into private sidings with investment aid into modern rolling stock featuring digital automated coupling and operating aid to allow single-wagon service operators to compete successfully with road transport.

Trade-offs to consider: There are important trade-offs in terms of the time needed to achieve the objectives and the expected distortions of competition for different types of State aid. State aid for rail operations can be expected to reduce operating costs in the short term and thus it can more effectively facilitate a modal shift to rail in the short term. However, compared to investment State aid, operational aid has greater potential to distort competition within the rail freight segment. Investment State aid for infrastructure and rolling stock can be expected to reduce operating costs in the long-term by supporting the use of modern and efficient technical solutions. Compared to operating State aid, such aid has less potential to distort competition within the rail freight segment, but it would likely take longer to facilitate a modal shift to rail.

**Combination
of State aid
measures**

**Trade-offs
between
measures**

Future State aid schemes should require mandatory evaluation based on statistical evidence: Evidence on the effect of different State aid schemes for rail freight is surprisingly scarce, for example, there are only very few ex-post evaluations for State aid schemes under the Railway Guidelines. However, for the design of an efficient State aid framework, robust evidence is required to learn about the effectiveness and efficiency of various scheme designs. The introduction of the requirement to evaluate schemes could facilitate the generation of such evidence, and allow for better-informed choices of scheme design in the future.

Should State aid be granted to customers or to providers of rail freight services? State aid can be given directly to shippers to compensate a part of the price for rail transport or it can be given to rail operators with the hope that the operators will use it to reduce their prices and compete more effectively with road transport. Both ways of providing State aid can be effective in shifting transport volumes from road to rail. The first way is a direct price reduction for the customer, the price effect of the second way depends on the pass-through applied by the rail operator. Anecdotal and descriptive evidence from the assessment of Swedish, British and Italian State aid schemes suggests that State aid to railway undertakings results in a partial reduction of the end-customer price. The advantage of aid granted to rail operators is, however, that non-price elements of the offer (like quality) can be adjusted, too. When designing State aid schemes, it is thus helpful to consider who is the best-placed beneficiary depending on the objective of the specific scheme.

Evidence-based policies

Types of beneficiaries

Good practice examples



Austria has awarded subsidies to rail freight transport since many years now. The State aid is granted per net tonne-kilometre and its level is differentiated by type of traffic (domestic transport or import/export). It may be further broken down by distance categories. The scheme foresees a fee if the beneficiary's service is not sufficiently punctual. Subsidy contracts are published on the Federal Ministry for Transport, Innovation and Technology's website so that business partners of beneficiaries can use this information in their business negotiations. Also, final customers are made aware of the aid via their invoices. These measures aim at increasing pass-through of aid from rail operators to customers.



Germany introduced an aid scheme for the promotion of rail freight transport in 2018, under which State aid covered 40-45% of track access charges for rail freight under-takings. With the onset of the COVID-19 pandemic this level was increased to 98% from March 2020 until May 2021. Rail freight operators benefiting from this scheme must inform customers of the aid and pass the subsidy on via lower prices to end users. Evidence suggests a pass-on rate between 50% and 100%, depending on the market segment. With this subsidy, the overall cost of rail freight in Germany became significantly lower and sometimes also lower than in neighbouring countries. For example, a Czech rail operator started rerouting freight trains to go via Germany rather than domestically and to save up to 10% of cost.



In **Italy**, two schemes Ferrobonus and Ecobonus provided State aid to the users of freight transport services (demand side). These schemes have achieved a modal shift from road to rail or short-sea transport. In Ferrobonus, the aid recipient was required to provide a discount to their customers equal to at least 40% of the aid received. Aid to the demand side can be more effective than rail-only incentives when rail is already a component of an intermodal service and the incentive can therefore operate at the margin, encouraging shippers to extend the length of the rail journey rather than switch mode for the entire journey.

Contact information



Dr. Elżbieta Głowicka
Director
glowicka@e-ca.com



Dr. Anselm Mattes
Director
mattes@e-ca.com

E.CA Economics is one of the leading European competition economics consultancies, advising law firms, companies and authorities in competition policy and regulation. Our work includes mergers, antitrust and state aid cases, economic analyses within regulatory procedures and studies on competition policy issues for international organisations. Our international team works in a wide variety of sectors and in numerous European jurisdictions.

Our offices are based in Berlin, Brussels, London and Munich.

E.CA Economics
info@e-ca.com
www.e-ca.com