

# Freight transport, policy instruments and the climate

Svante Mandell, Jan-Eric Nilsson and Inge Vierth

## **Extended abstract**

Freight transport is increasing, both on a local and a global level. As a result, greenhouse gas emissions from freight services increase. Focusing at the EU and Sweden in particular, this is somewhat puzzling as policies towards greenhouse gas emissions have gradually become stricter. Two complementary explanations are plausible; (i) the policy instruments do not work and/or (ii) without policy instruments the transport increase would have been even larger. This paper addresses the first of these by analyzing potential reasons that may hinder the policy instruments' impact. These include market power, public goods, and in particular asymmetric information, and split incentives. We discuss how each of these operates in the framework of freight transportation. The general conclusion is that, even though some of these market failures certainly exist, there is little reason to believe that they will provide major limitations for the operation of economic instruments geared toward greenhouse gas emissions other than in the short run.

We show that market power may have implications for how the freight transport market responds to economic incentives, e.g., from fuel taxes. It may even be the case that transport volumes would be even less than what is socially optimal due to such a tax. However, it is difficult to characterize competition in the transport market in general terms as it varies greatly between submarkets.

The main focus of the paper is on asymmetric information. Using a simple hidden action model we show how asymmetric information influences the market's response to (changes in) economic instruments. This crucially depends on the design of the contracts on the market, at least, in the short run. The contract may work as a 'filter' such that agents who have the ability to change behavior in order to reduce emissions are shielded to (parts of) prices and taxes. Reasonably, over time, as contracts are renegotiated, changes in policy will influence the design of the new contracts. A plausible conclusion is thus that information asymmetries in connection with long-term contracts create rigidities in the system, but they do not constitute any absolute obstacles.

Special interest is devoted to fuel clauses, which are common in practice. We show that minor alterations of the design of these clauses may have substantial impact on the market's behavior.

The hidden action model is calibrated to handle consequences of, so called, split incentives on how the market adapts to economic policy instruments. Economic instruments enable companies to save money by reducing their energy consumption and / or emissions, or otherwise limit the externalities of traffic. When there are split incentives problem, multiple parties may affect the volume of the emissions, but it is difficult to provide efficient incentives for all parties to do this. The consequence is that the overall reduction in emissions will be less than what would be efficient.

The rapid development of information technology may directly or indirectly influence the situation by facilitating access to information that formerly was unavailable. By this, it becomes possible to contract on measures that formerly were unobservable and/or unverifiable. This relaxes the problem of asymmetric information and thus reduces – but will probably never entirely eliminate – the negative consequences following from it.

Related to transferring information, we noted that the market will underinvest in trying to find new ways to reduce emissions and energy consumption due to the public goods characteristics of knowledge. This problem is difficult to solve using policy instruments as fuel taxes. Rather, they call for patents and/or publicly funded research. Information campaigns will not solve the underinvestment problem, but is a remedy to the related problem of there being little incentives for individual agents spreading the knowledge they have.

To sum up: We have identified a series of market failures that may hinder otherwise correctly set economic policy instruments from leading to an efficient outcome. These market failures certainly exist on the freight transport market. Some are more general, as problems with asymmetric information, and some probably only occurs in segments of the market, as problems related to market power. However, it is arguably the case that neither problem is large enough to have any major disturbing effect on the operation of the economic policy instruments, at least not in the longer run.

Finally, let us return to the initial question stated in this paper; why are the sector's emissions increasing at the same time as the policy instruments geared towards these emissions have gradually become stricter? This study provides three important insights. First, there is little

reason to believe there being any major inherent problems with regulating the freight transport market's greenhouse gas emissions through economic policy instruments. Second, this suggests that without the instruments being in place we would have seen a, potentially much, larger increase in the sector's emissions. Third, the levels of the existing instruments as a whole, i.e., not only those targeting CO<sub>2</sub>-emissions, seems to be currently set below – and in cases far below – what would be efficient. Thus, even if the climate motivated policies work and are set at reasonable levels, the policy package as a whole is not strict enough to keep transportation at an efficient level. Consequently, energy consumption and CO<sub>2</sub> emissions will also be inefficiently high.