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Abstract

We provide an overview of public support for the European car industry during the past decade. First, we identify the most relevant instruments of public support, and review their economic assessment. The European Commission increasingly recognizes the role of economic analysis in controlling public aid to the car industry, although the degree of economic assessment varies across different instruments of public support and individual state aid cases. Moreover, the state aid legislative framework is open to derogations and interpretations. In particular, the Temporary Framework, approved by the Commission to tackle the last financial and economic crisis *de facto* implied a relaxation of the state aid rules and foresaw no formal control of individual state aids.

Second, we aim to estimate the amount of public support for European car manufacturers. Three factors complicate the overall quantification of public support for each instrument: (i) the Commission does not scrutinize, and hence does not quantify all public support measures; (ii) the available information depends on whether the state aid is granted to individual companies or in the form of general schemes; and (iii) the available information depends on whether the aid is granted in the form of a grant, soft loan or guarantee. Our lower bound estimate of state aid suggests that the aid

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declined over the pre-crisis period, but peaked at €1.2 billion as a response to the last financial and economic crisis in 2009. Perhaps even more strikingly, this state aid was combined with an unprecedented amount of public support granted through scrapping schemes of at least €4.0 billion, and loans from the European Investment Bank of €2.8 billion, or an equivalent of €400 million of “aid element”.

In conclusion, the existence of multiple public support instruments at different levels may create coordination problems and a lack of transparency, in spite of the Commission’s efforts. The lack of transparency in turn poses a challenge for the quantification of state aid and non-state aid support to any industry or sector. This paper provides a first step towards informing the policy debate on the effects of public support to the car sector, and also stimulates the academic interest in the subject of state aid, and - more generally - public transfers to companies.

1 Introduction

Public intervention in the automotive industry has a long and worldwide history. In Europe, this has translated into the transfer of public resources to the car industry, both from individual member states and from the European Union itself, through a wide variety of instruments and institutions. The willingness to support the automotive industry has become even more apparent during the last financial and economic crisis, which severely hit this sector. On the one hand, member states have heavily made use of the Temporary Framework, an emergency regulation enabling rapid additional state aid measures to address the exceptional difficulties companies have in obtaining and securing financing, especially for green investments. And they combined this with scrapping schemes to boost the local demand for cars. On the other, at European level, public support for the automobile sector mainly translated into large investments to develop cleaner cars through the European Investment Bank. Despite the severity of the crisis, no major car manufacturer exited, and no major restructuring through mergers and acquisitions took place, a fact which may be attributed to these interventions.¹

The effect of public intervention in the automotive industry, especially during the crisis, is subject to public debate and poses some difficult questions. Does it have a “distractive” effect, whereby a radical and necessary restructuring of the industry is held back? Or does it effectively facilitate structural adjustments, addressing the multiplicity of market failures to which this sector is subjected? Moreover, even if specific market failures are correctly identified, are they addressed using the most adequate instruments? Or do governments privilege some forms of interventions that can give more immediate and visible effects, such as state aid?

Against this background, it is particularly timely to present a global outline of public support to the European car industry.² We distinguish between two main tasks. The first is to identify the most relevant instruments of public support to the European car industry, and

¹In particular, following the last financial and economic crisis, only four assembly plants have been closed in Europe: GM Antwerp (Belgium, 2010), Fiat Termini Imerese (Italy, 2011), Saab Trollhaettan (Sweden, 2011), and Mitsubishi Born (Netherlands, 2012).

²We focus on public support directly granted to the car manufacturers, and exclude support to the upstream suppliers, the downstream distribution sector, the connected financial sector and other ancillary services. This choice is motivated by two considerations. First, the definition of how those firms are linked to the car producers is not obvious, so it becomes more difficult to provide a comprehensive overview of indirect support for car manufacturers. Second, there is an inverted pyramidal structure of the car industry, with a few large car manufacturers at the bottom, several first-tier suppliers, a number of second-tier suppliers, and, at the top, thousands of upstream third-tier suppliers. This has induced governments to grant the largest part of public resources to the lead car manufacturers, with the intention of ensuring the survival of the entire supply chain (Sturgeon and Van Biesebroeck, 2009).

provide an economic assessment of these instruments. We identify nine major instruments, and for each of them we discuss the main motivation, the effects (incentives and distortions of competition and trade) and the role of the economic assessment by the European Commission.³ For that purpose, we study the state aid legislation and reports of the European Commission in general, as well as official public support documents and state aid decisions of the Commission as related to the European car industry specifically.

The second task is to quantify the amount of public support given to car manufacturers through these different instruments. For that purpose, we collected a unique dataset on public transfers to the car sector for the period 2000-2011 in Western European countries with a sizeable automotive industry, namely Belgium, France, Germany, Italy, the Netherlands, Portugal, Spain, Sweden and the United Kingdom. On the supply side, these countries account for around 20% of the worldwide production and 80% of the European Union's production. On the demand side, sales in these nine European countries account for around 25% of worldwide automobile sales and 90% of the European Union's sales. Between 1998 and 2007, annual car sales in these European countries fluctuated within a relatively narrow margin, between 11.2 and 12.6 million. However, in 2008 new passenger car registrations fell to 8.7 million units.

Both tasks serve the ultimate aim of this paper, which is to inform the debate on the effects of public support to the car sector, and also stimulate the academic interest in the subject of state aid, and, more generally, public transfers to companies.

We can summarize our main findings as related to both tasks as follows.

Economic assessment of different instruments to support the car industry First, our overview of the different channels of public support suggests that the European Commission clearly recognizes the role of economic analysis in controlling public aid to the car industry. On the one hand, market failures affecting the car industry are well identified and constitute a justification of aid alongside with equity considerations. On the other, the Commission has increasingly become aware of the distortionary effects of aid on competition and trade, especially with regard to regional and training aid granted to the car industry. However, there is still considerable variation in the depth of the economic analysis across different instruments of public support and individual state aid cases.

Second, the state aid legislative framework is open to derogations and interpretations. The most evident derogation is the one established by the Temporary Framework. While this

³We do not consider any general economy public support measures (e.g. nation-wide fiscal measures), industry-specific demand-side measures (apart from scrapping schemes due to their large scale and easier quantification), public support for short-term work or any other employment support schemes during the last financial and economic crisis.

was used to tackle the last financial and economic crisis, it *de facto* implied a relaxation of the state aid rules, in particular of rescue and restructuring (R&R) aid and aid for research, development and innovation (R&D&I). The Framework has lacked clearly-defined objectives and rules. In particular, there has been no formal control of individual state aids.

Third, at European level, loans granted by the European Investment Bank (EIB) for R&D&I projects constitute a significant source of finance for the car industry and are subject to the opinion of the Commission. The substantial assessment of those projects is not published, and the Commission does not have the same power to request additional information from the granting authority, as in regular state aid cases. For these reasons, it is not clear to what extent the Commission has the possibility to apply the same principles of economic analysis expressed in its state aid decisions. Increasing the transparency of the process would be recommendable, due to the large amounts at stake and the importance and particular value of innovation in this industry.

Fourth, many European countries have introduced large-scale scrapping programs as an economic stimulus to increase market demand within the automotive sector during the crisis. The programs are not subject to notification requirements of the Commission with regard to state aid. However, since they are based on technical specifications, the Commission has to be notified at the draft stage. The Commission has the right to issue comments on the technical specifications where the fiscal and financial incentives can potentially hinder trade in the internal market. However, there is no formal compatibility assessment of the scrapping schemes. The Commission also does not carry out any *ex-post* evaluation of the schemes regarding their potential distortionary effects on competition and trade. Such *ex-post* evaluation could be advisable, given the large amounts of public money spent in the form of scrapping subsidies that bring large financial benefits to the car producers, and from which particularly domestic producers could benefit if the incentives are linked to environmental eligibility criteria.

In conclusion, the existence of multiple public support instruments at different levels may create coordination problems and a lack of transparency, in spite of the efforts of the Commission in this respect. In general, worldwide international coordination across countries to reduce overcapacity in the world clearly failed during the crisis. It is an open question as to whether the Commission managed to coordinate these instruments at least within the European Union. The cases of France and Germany, where national car manufacturers were largely favored during the crisis, seem to suggest a negative answer, although we recognize the role of the Commission in limiting subsidy races between countries.

Quantification of public support to the car industry The quantification of the state aid element for each channel of public support is a challenging task due to three major factors. First, only if the European Commission scrutinizes a public support measure, will it also clearly quantify the state aid element. Second, regarding the public support that is scrutinized by the Commission, the availability of information on the state aid element depends on whether this is an aid granted to individual companies (*ad hoc* aid), or an aid granted in the form of schemes to multiple companies. Accordingly, there are different sources of information that need to be analyzed and put together. Third, the quantification of the aid element depends to a considerable extent on whether the aid is granted in the form of a direct grant, soft loan or guarantee.

Because of these challenges, we first quantify the state aid element by the instrument of public support whenever this is possible. We then sum up those aid elements that we can estimate consistently to quantify the overall amount of state aid granted to the European car industry. We pursue this strategy for state aid support instruments, i.e. aid under General Block Exemption Regulation (GBER), regional aid, training aid, Research and Development and Investment (R&D&I) aid, Rescue and Restructuring (R&R) aid and aid to remedy a serious disturbance in the economy as approved under the Temporary Framework.

Non-state aid support instruments, such as loans of the European Investment Bank, social public support and scrapping programs, do not fall under the formal scrutiny of the European Commission. Hence, there is no economic compatibility assessment of those instruments as in the case of state aid support, and the aid element is not quantified. We therefore report the amounts of public support granted under each instrument of the non-state aid support separately.

As related to the state aid support, we find that regional aid was granted extensively to the European car industry over the decade prior to the crisis, followed by training aid. R&D&I aid and R&R aid were rarely granted to the car sector. None of those aid instruments were used extensively during the last financial and economic crisis: At that time the aid was primarily granted under the Temporary Framework. The table below summarizes our quantification of public support granted to the European car industry over the last decade. Our lower bound estimate of state aid shows that the state aid to the European car industry declined over the last decade, but peaked in response to the crisis under the Temporary Framework in 2009. The total state aid declined in 2010 and 2011 to an even lower level than the average pre-crisis level.

As related to the non-state aid support, we find the following: First, the loans of the European Investment Bank were granted in large amounts to the European car industry before the crisis and increased substantially during the crisis. Second, the amounts of social

Summary of quantification of public support for the European car industry

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Tot.
	€mil.	€mil.	€mil.	€mil.	€mil.	€mil.	€mil.	€mil.	€mil.	€mil.	€mil.	€mil.	€mil.
State aid support instrument													
GBER										3.80			3.80
Regional aid	46.04	302.92	590.12	78.52	26.54	106.37	7.40			89.27	15.82	51.37	1,314.36
Training aid		19.72	2.65	54.57	4.57	14.22	5.55	23.19	14.68			17.09	156.24
R&R aid						6.50							6.50
Temporary Framework										1,125.00	96.80		1,221.80
Tot. by year	46.04	322.64	592.77	133.08	31.11	127.09	12.95	23.19	14.68	1,214.27	112.62	68.46	2,698.90
Per unit of production (€)	2.86	19.89	37.00	8.37	1.96	8.18	0.85	1.48	1.04	104.16	8.67	5.27	15.13
Non-state aid support instrument													
EIB loans	525.00	845.00	400.00	580.00	550.00	245.00	697.00	750.00	650.00	2,800.00	2,822.00	1195.00	12,059.00
“aid element”	78.75	126.75	60.00	87.00	82.50	36.75	104.55	112.50	97.50	420.00	423.30	179.25	1,808.85
EGF support								4.80		15.10	4.30	52.50	76.70
Scrapping schemes									19.19	4,057.17	1,334.90	12.00	5,423.26

Source: own estimations. This table reports the quantification of the public support for the European car sector for the period 2000-2011 in Belgium, France, Germany, Italy, the Netherlands, Portugal, Spain, Sweden and the United Kingdom. State aid support is expressed as gross grant equivalent in present value and relative to the units of production. Non-state aid support is expressed in nominal value. Empty cells mean no relevant public support was awarded in those years.

Our estimates are based on the following major assumptions:

(i) State aid support: Estimates reflect planned aid amounts collected from the Commission’s decisions published in the state aid register. They do not generally include the aid granted in the form of schemes unless (i) the aid is notified individually under the approved scheme to the Commission and the respective decision is published in the register, or (ii) we can infer the information on the granted aid amounts from the Commission’s reports published *ex post* as in the Temporary Framework case. We also do not include the aid amounts published under the “Transparency system” of the Commission for regional aid and R&D&I aid that reflect the actual aid amounts.

(ii) Non-state aid support: An “aid element” in case of the EIB loans is quantified as 15% of the nominal value of the loans granted. Scrapping schemes cover France, Germany and the United Kingdom, and the amounts reflect government budgets.

For detailed explanation of the assumptions behind our estimates, see paragraph 4.12.

public support, in particular through the European Globalisation Adjustment Fund, went up during the crisis to ease the consequences of the restructuring process in the European car industry. Third, many European countries have introduced large-scale scrapping programs as an economic stimulus to increase market demand within the automotive sector during the crisis.

The state aid granted to the European car sector in the crisis peak of 2009 (€1.2 billion) is consequently much lower than the financial benefits received by the European car producers through the scrapping programs (at least €4.0 billion) and through the loans of the European Investment Bank (€2.8 billion of loans in each year of 2009 and 2010, which corresponds to an estimated €400 million of “aid element” in each year). Quantifying and analyzing only the state aid would considerably underestimate the extent of public intervention in the European car industry during the last financial and economic crisis.

In conclusion, the overall amount of state aid to the car industry at the national level or eventually at the European level is difficult to quantify. This poses a great dilemma particularly if one aims to understand how much state aid the European carmakers receive in each country or in total across Europe, and how that aid has evolved over time, or if one wishes to infer whether some industries are favored over others and how a decade’s orientation towards horizontal aid is implemented in practice. We recognize that it is not the aim of the Commission to monitor every single aid granted to any company (which would pose a huge administrative burden). However, we recommend more transparency and clarity on the side of the Commission in the process of notifying (*ex-ante*) and reporting/monitoring (*ex-post*) the state aid and the existence of various sources of information on state aid support. Furthermore, it is necessary to consider non-state aid support to obtain a more complete picture of public interventions in any industry or sector of the economy, and to evaluate the extent of protectionism during economic recessions (which may be especially distortive as the necessary restructuring of the industry could potentially be held back).

Contribution to the policy debate Our overview of public support to the European car industry and subsequent attempt to quantify it is timely for two related reasons. First, during the crisis every government and the European Union as a whole has intervened in the car market in some way. Subsequently, it is important to understand to what extent these clearly sectoral interventions have reversed a decade’s orientation towards horizontal aid, i.e. to benefit all sectors of the economy. While state aid schemes under the Temporary Framework were formally compliant with the requirement of horizontal application, some member states have in practice used it to target solely the automotive sector (European Commission, 2011).

Second, there is a handful of studies analyzing and quantifying the different instruments of public support available to the car industry, but these studies only focus on a selected number of instruments and cover a limited period without giving a complete overview. A few studies focus on the 2008 crisis and provide an overview of the different channels and levels of public support to the automotive sector, namely Eurofound (2009), Eurofound (2010), European Commission (2011) and Copenhagen Economics (2011). Sturgeon and Van Biesebroeck (2009) also discuss governmental measures in the U.S. and Europe during the last financial and economic crisis, with a focus on the impact of these interventions on the evolution of the global structure of the automotive industry. Nicolini et al. (2010) focus on state aid between 1990 and 2008, before the crisis. They find large and persistent disparities in expenditure levels across countries, which they conjecture could lead to possible subsidy races in recession periods, when public help is most needed.

The core of the paper is organized as follows. Section 2 provides a framework for the analysis of state aid and other instruments of public support. We first provide the legal definition of state aid and discuss its compatibility with the internal market. Then we illustrate the principles of the balancing test used in the economic compatibility assessment of state aid and other instruments of public support. Section 3 provides an overview of the instruments of public support relevant to the car sector. Section 4 presents a detailed quantification of public transfers in the last decade for the relevant countries. Conclusions are then given in section 5.

2 Framework for the analysis of state aid and other instruments of public support

2.1 Definition and compatibility of state aid

Definition Public support to companies is subject to legislative control. The European Union has established a set of rules to prevent public support to certain sectors and activities distorting competition and trade in the common market. According to article 107(1) of the Treaty on the Functioning of the European Union (TFEU)⁴, public support should meet four conditions to be classified as state aid and be subject to state aid control by the Commission:

1. *transfer of state resources to companies*: aid must be granted by national, regional, or local authorities, or by a private or public intermediary delegated by the state;

⁴Consolidated Version of the Treaty on the Functioning of the European Union art. 107, 2010 O.J. C 83/91.

2. *granting of an economic advantage*: aid must favor certain economic sectors or companies;
3. *selectivity in eligibility criteria*: the aid must be available only to a particular firm or to firms that satisfy certain criteria regarding turnover, employment, ownership, etc.;
4. *impact on competition and trade*: the aid must be liable to potentially distort competition and affect trade.

If public support measures do not meet all four of the above conditions, they do not constitute state aid and article 107(1) does not prohibit them. For example, general measures that are open to all companies, such as scrapping schemes to stimulate car purchases, do not constitute state aid. In contrast, if public support measures meet all four of the above conditions, they constitute state aid and are, in principle, illegal and prohibited under article 107(1).

Compatibility Article 107(3) identifies a number of derogations under which state aid measures can be declared compatible at the discretion of the Commission. As related to the car sector, these derogations cover aid for economic development of areas with low standards/serious unemployment (article 107(3)(a)), projects of common European interest or to remedy a serious disturbance in the economy (article 107(3)(b)) and development of certain economic activities/areas (article 107(3)(c)). Generally article 107(3) constitutes the basis for soft law provisions that give a practical application to these general principles.⁵ This secondary legislation is composed of the Notices, Communications, Guidelines and Frameworks regulating aid for regional, training, R&D&I, environmental and other purposes.

To assess the compatibility of state aid, the Commission carries out an economic assessment in which the beneficial effects of state aid are weighted against its adverse effects on competition and trade. This exercise has been formulated as a “balancing test”. The test involves three steps (European Commission, 2008):

1. Does the state aid measure address a market failure or other objective of common interest (e.g. regional and social cohesion, employment, etc.)?
2. Is the aid measure well designed? In particular, is there an incentive effect, i.e. does the aid change the behavior of the recipient?
3. Are distortions of competition and trade limited so that the overall balance is positive?

⁵Soft law provisions are rules of conduct that are not legally binding, but which may have practical effects, for example in the court decisions (Cini, 2000).

The balancing test was first formalized as a conceptual framework to implement state aid control using a refined economic approach in the State Aid Action Plan of 2005.⁶ Later, the balancing test has been incorporated in the set of Community’s soft law provisions to assess the compatibility of state aid. These provisions detail a set of conditions, for example in terms of eligible costs, aid intensity, or nature of the beneficiaries under which member states can grant state aid to companies. Consequently, in most cases the balancing test is not carried out explicitly, but in terms of the predefined criteria and the soft law provisions are applied in a rather strict formal way (Friederiszick et al., 2008, Neven and Verouden, 2008).

In particular, a complete analysis of competitive distortions of aid is rarely done in practice. Distortions of competition and trade are assumed to be present when the public support measure is selective in terms of granting an economic advantage. However, this formal approach to the assessment of the effects of state aid on competition and trade appears to be changing, and the Commission is increasingly required to carry out a complete economic analysis to prove the existence of distortion of competition or affectation of trade (OECD, 2011). For instance, in the Wam ruling⁷, the Court of First Instance concluded that it was not enough to show that a company is involved in intra-European trade to argue that aid to that company would affect trade between member states: *“The mere observation that Wam participates in intra-community trade is insufficient to conclude on trade affectation or distortion of competition, and an in-depth analysis of the effect of aids is necessary”*.

We now elaborate on the three steps of the balancing test - objectives, incentive effects and distortions of competition and trade following Friederiszick et al. (2008) - in our application to the car industry.⁸

2.2 The balancing test

2.2.1 Objectives

State aid may be justified by efficiency and/or equity considerations. Increasing efficiency has the target of enlarging total welfare, while equity considerations are related to how available resources can be redistributed along the welfare frontier.

⁶State Aid Action Plan Less and better targeted state aid: a roadmap for state aid reform 2005–2009 Consultation document, 2005 COM (2005)107.

⁷Court of First Instance, 6 September 2006, Italy and Wam SpA v Commission, case T 304/04.

⁸For the general discussion of those effects, see also for instance Nitsche and Heidhues (2007), Neven and Verouden (2008).

Efficiency From the point of view of economic efficiency, public support is justified if it corrects or removes market failures. We identify the following types of market failures as relevant to the car sector:

1. Externalities. Externalities are costs (negative externalities) or benefits (positive externalities) not transmitted through the transaction prices that are incurred by the parties who did not agree to the action causing the cost or benefit. Positive externalities result in the under-provision of a public good from a social perspective, while negative externalities result in over-provision. We distinguish the following externalities:

Knowledge spillovers: Knowledge spillovers occur due to the fact that firms can acquire information created by others without paying the transaction price. Such spillovers can arise, for example, in presence of R&D&I activities as a consequence of the impossibility to completely protect new knowledge generated by these activities, or training activities, as a consequence of employees moving across companies. Given the difficulties in appropriating the benefits of these activities, individual companies may undertake too few of these activities from the point of view of social optimum. State aid can establish a more efficient outcome by financing research and training investments.

Regional spillovers or agglomeration externalities: Agglomeration externalities are positive externalities due to the concentration of firms active in the same sector in a given region. Following OECD (2010), we distinguish three types of effects that can arise from such concentration: (i) input sharing, i.e. attraction of input suppliers that lowers all firms' costs; (ii) labor market pooling, i.e. attraction of workers with sector-specific skills that reduces search costs for both workers and firms; (iii) knowledge spillovers, i.e. a company's efforts in R&D&I may benefit other companies as knowledge diffuses more rapidly outside the company through business interactions or labor mobility across companies. Automotive producers and suppliers often tend to cluster where all three of the above mechanisms are at work. State aid can be used to support these agglomeration externalities.

Coordination failures and network externalities: Coordination problems between market actors impede the efficient functioning of markets. R&D&I aid, especially for advisory services and innovation clusters, may help to solve coordination and network failures when companies find it difficult to coordinate with each other or find appropriate partners. In the car industry the collaboration between universities or science institutions, car producers and suppliers (including lower-tier suppliers) is very important for developing innovation.

Pollution: Pollution is a negative externality that arises when producers or consumers do not take into account the deterioration of the environment induced by their activities and products. State aid, together with taxation and regulation, can be a policy tool to address this market failure by developing incentives for producers and consumers to invest in environmentally friendly cars.

2. Asymmetric or imperfect information. Asymmetric or imperfect information - notably in capital markets - affects the ability of firms to obtain finance. Interest rates could be higher in the capital market from an efficiency point of view because lenders do not have full information on the degree of risk associated with a particular investment.

The incompleteness of the financial market is relevant to the car market both from the production and the demand side. From the production side, car producers may have difficulties in obtaining financing for innovative products. From the demand side, the incompleteness of the financial market can affect the availability of loans to consumers buying expensive durable goods such as cars. According to IHS Global Insight (2009), between 60% and 80% of new European private vehicles are bought using some form of credit. This problem is particularly relevant during periods of demand uncertainty due to economic crisis. State aid can alleviate market failures in capital markets, for example, support to the bank branches of car manufacturers, or scrapping schemes, can address the incompleteness of the capital market for consumers.

3. Market power. Market power is a failure of competition which leads to prices that are too high from the point of view of a social optimum. The car industry is a clear example of an oligopoly, in which firms are the price makers and sell a differentiated good. There are a variety of reasons for competition failure in this industry, first of all due to the presence of increasing returns to scale in production. In this industry entry costs are high, where the level of output is determinant to sustain profitability. Car manufacturers should price above marginal cost, because as marginal cost is lower than average cost, marginal cost pricing would therefore lead to losses. State aid measures can reduce market power through fostering entry in a market and creating competition. An example is the Boeing case, analyzed by Neven and Seabright (1995). State aid measures can also prevent exit of ailing firms. The event of exit can cause tightening of an existing oligopolistic situation, with a direct effect on prices and loss in product variety whenever bankruptcy results in loss of business assets.
4. Frictions and other market failures. Frictional problems of adjustment to changes in markets and, more generally, imperfect factor mobility are relevant to the problems of

unemployment and regional disparity. These problems are important in an industry which is highly unionized, geographically concentrated, capital intensive and characterized by production rigidities.

Equity The outcome of the market process is efficient, but may not be socially acceptable. State intervention may therefore be appropriate for redistributive purposes. Regional, social and R&R aid are examples of state aid motivated by equity considerations.

Equity considerations can have negative side effects upon efficiency – in other words, there can be a trade-off between equity and efficiency objectives, or - vice versa - equity objectives can promote efficiency objectives or simply be consistent with efficiency considerations. In the first case, redistributive policies may introduce market failures. For example, regional subsidies can concentrate market power in the hands of the recipient firms, or create incentive problems for regions that are “rewarded” for not performing well.

In the second case, a redistributive policy can be an instrument for partially solving market failures. Friederiszick et al. (2008) cite two examples. The first is related to redistribution policies between countries equally endowed with the same input factor, but with different distributions, and imperfect capital markets. In this situation, a government redistribution policy may maximize welfare by replicating, at least partially, the market equilibrium with perfect capital market. The second example comes from Besley and Seabright (1999), where regional aid is shown to provide a correction for a bidding contest between rich and poor regions to facilitate the attraction of regional investments in the presence of resource constraints which would not allow a poor country to compete with a rich one.

2.2.2 Incentive effects/crowding out

The existence of incentive effects for state aid measures implies that public support is effective in changing the behavior of a recipient firm and does not result in mere windfall profits. In other words, public aid should only be granted when it is necessary to achieve the objective. The presence of the incentive effect can only be identified by an analysis of the counterfactual scenario in which no aid would be granted by the member state to the beneficiary. In the absence of incentive effects, public funds may generate both negative efficiency issues, due to the social cost of subsidies, and equity issues, due to the transfer of taxpayer money to firms that do not need aid. Specifically, public support may result in the crowding out of private investment, meaning the presence of public funds discourages private investors.

2.2.3 Distortions of competition and trade

We analyze four distinct, but interrelated, types of competition and trade distortions that are relevant to the car sector.

Supporting inefficient production (productive inefficiency) State aid may cause productive and allocative inefficiencies which can be harmful for total welfare. Lyons et al. (2008) argue that in mature sectors such as the car industry, in which growth in annual productivity surpasses growth in demand, only a small number of firms can be supported. Relative efficiencies and scale will determine the speed and order of exit. For example, an inefficient firm will exit first, or if two firms have the same costs, the larger will decrease its size first. State aid may distort this natural order and allow an inefficient business to survive (or at least stay longer in the market) at the expense of those which are more efficient, or a large firm can maintain its scale at the expense of a smaller competitor. This problem is exacerbated by the presence of overcapacities. State aid can give rise to market structures that operate below their efficient scale. The European car sector is characterized by significant overcapacities of between 20% and 30% (Eurofound, 2010).

Distorting dynamic incentives Distortions in dynamic incentives can be relevant both to the recipient firm and to the competitors. In the first case, state aid can introduce “soft budget constraints” which reduce the beneficiary’s incentive to adapt to market conditions or, at the limit, to behave efficiently. In the second case, competitors may revise their future investment plans because of the advantage that has been granted to the aid recipient. For example, if a company receives aid to develop its products, this company can increase its future presence in the product market. As a consequence, competitors can reduce the scope of their original investments (this is another form of crowding out effects presented in paragraph 2.2.2). Distortions of dynamic incentives are particularly relevant in the car industry, given the importance of strategic interactions between the limited number of players in the market.

Increasing market power Although reduction of market power can be an objective of state aid, as explained in paragraph 2.2.1, state aid can also create market power in the hands of a group of firms, for example when non-recipients are forced to decrease their market presence, or when aid is used to erect entry barriers. Governments are often criticized when they support firms in their “home” market, especially those firms that often already have a high degree of market power. Domestic firms can use these subsidies to avoid the entrance of non-domestic producers, while resulting oligopoly rents can be employed to expand into

foreign markets. The presence of market power is one of the two legs of the strategic trade argument, which is elaborated upon in the next paragraph.

Distorting production and location decisions across member states State aid can affect the production side of firms, by influencing both the location choice of firms and the level of production/investment in different locations. In the car industry, state aid has often been offered to overcome the costs of operating in one location with respect to competing locations, or to support a higher level of domestic production and attract foreign investors. Therefore, government aid can result in distortions of trade flows and allocative inefficiencies across countries.

The strategic trade policy literature initiated by Brander and Spencer (1985), points out that if firms operate in markets that are both imperfectly competitive and international – both conditions verified in the car industry - then a government in one country can subsidize its own economic activity at the expense of lost activity in another country. In other words, state aid can result in negative international spillovers (which are distinct from the positive regional spillovers described in paragraph 2.2.1), and cause “subsidy wars”. These wars are caused by prisoners’ dilemma situations, in which every country competes with one another in a game of individually rational but collectively wasteful industry subsidies, stimulated by the prospect of poaching each other’s profits generated in the imperfectly competitive markets. For instance, Röller and von Hirschhausen (1996) discuss the effects of possible rent-shifting between European countries due to state aids to East German shipyards and synthetic fibers industry, which could be inefficient from a broader European perspective. Strategic trade policy arguments are the crux for a supranational control system of state aid in Europe, which can avoid those uncoordinated actions of member states.

These arguments could be valid not only at member level within the EU, but also at European level with respect to the rest of the world. In other words, European governments could coordinate to support the position of the European car industry to maintain such economic rents within European boundaries. For example, the R&D&I Framework contains a matching clause, which allows granting higher R&D aid when it is proven that firms outside of Europe have benefited from more aid than they would normally be allowed under the European state aid rules for similar projects or programs.⁹

International spillover effects are complex to estimate, and it is indeed possible that European governments try to collectively shift rents in favor of domestic firms, thus having a negative impact on the world welfare, but a positive impact on the European one. Neven

⁹Community Framework for State aid for Research and Development and Innovation at art. 5.1.7, 2006 O.J. C 323/15.

and Seabright (1995) find econometric evidence of these effects in their analysis of state aid granted to Airbus.

Implementation of the analysis of competitive distortions We examine three criteria, which are strongly interdependent, to assess the impact of competitive distortions of aid.

1. Procedural aspects. Aid can be granted in the form of schemes, which are open to all firms of one or multiple sectors that meet certain requirements, or can be granted to individual companies (*ad hoc* aid). Schemes can also serve as a basis for granting *ad hoc* aid, which does not require individual notification unless the amount of aid exceeds certain thresholds. Since aid measures granted through schemes are open to multiple firms, they are assumed to be less distortive with respect to *ad hoc* aid. Accordingly, compatibility analysis of schemes by the Commission is relatively standard: When the scheme meets the conditions set in the applicable Communications, Guidelines or Frameworks, they are compatible. There are two caveats on the approval of schemes (de Cervin and Siaterli, 2008). First, the Commission carries out a substantial check on discriminatory conditions which are not justified by the state aid nature of the scheme. For example, the Commission does not allow the imposition of requirements such that aided activities should be carried out exclusively in a certain member state. Second, schemes should exclude granting of aid to firms in difficulty. This is the reason R&R aid is always individual aid (with the exception of small and medium enterprises). In the car sector, aid measures are granted both in the form of schemes and individual aid.
2. Market characteristics. The characteristics of the car market are important to take into account in order to assess the economic effects of aid measures. Distortions are more likely when aid increases asymmetry between competitors or reinforces a strong national incumbent, but it can also help to avoid a tightening of an already concentrated sector. Aid to incumbents can have significant negative effects when entry barriers (with respect to both production and R&D) are high, since it can alter the incentives for potential entrants. Aid can be especially distortive in the case of mature industries and the presence of structural overcapacities. All those conditions are met in the case of the car industry.
3. Amount. As a general principle, the larger the aid – in absolute amount or in terms of aid intensity, i.e. the aid amount expressed as a percentage of the eligible costs – the

higher the possibility of distortions and the more likely the Commission is to oppose the aid. We elaborate on this issue in paragraph 3.1.

3 Instruments of public support for the European car industry

3.1 Instruments of public support and classification

We identify nine major instruments of public support that are relevant to the European automotive sector:^{10,11}

1. Aid granted under the General Block Exemption Regulation (GBER)
2. Aid granted under the Regional aid Guidelines
3. Aid granted under the Training aid Communication
4. Aid granted under the Research and Development and Innovation (R&D&I) Framework
5. Aid granted under the Rescue and Restructuring (R&R) Guidelines
6. Aid granted under the Temporary Framework
7. Support granted by the European Investment Bank (EIB)
8. Social public support granted by the European Social Fund (ESF) and the European Globalisation Adjustment Fund (EGF)
9. Support granted through scrapping schemes

¹⁰We use the following three terms throughout the paper: (i) public support (or support) to denote all possible instruments of public support (which entails and does not entail state aid), (ii) state aid support (or state aid) to denote the public support that entails state aid and is subject to the formal scrutiny by the European Commission, and (iii) non-state aid support to denote the public support that does not entail state aid and is not subject to the formal scrutiny by the European Commission.

¹¹We do not consider environmental aid granted under the Community Guidelines on State Aid for Environmental Protection (2008 O.J. C 82/1) as an instrument of public support explicitly in our analysis since we have not found any individual aid case in the state aid register of the European Commission related to the car sector. We identified one scheme directly related to the car industry (Commission Decision State aid No. NN 56/2005 - United Kingdom Low Carbon Research and Development Programme, 2006 O.J. C 002) that the Commission had assessed based on the R&D&I Framework. We discuss R&D&I projects aimed at environmental protection and sustainable development in length in paragraph 3.5, in light of their relevance to the car industry.

Table 1 classifies these instruments according to several criteria. The second column distinguishes between public support measures that are granted at national (instruments 1 to 6 and 9) or European (instruments 7 and 8) level. The EGF funds are granted by the EU in co-financing with member states.

The third column reports whether those instruments constitute state aid according to article 107(1) of the TFEU. Instruments 1 to 6 constitute, strictly speaking, state aid since they fulfill all four definition requirements described in paragraph 2.1. EIB loans and social public support granted by the ESF and the EGF do not, strictly speaking, constitute state aid since they are granted at European level and they do not fulfill the requirement of state aid being a transfer of state resources to companies.¹² Scrapping schemes do not constitute state aid since ex-ante this measure is assumed not to be selective, i.e. it is granted without discrimination, for example, with regard to the origin of the product.

The fourth and the fifth columns summarize when the Commission carries out a substantial assessment, and which type of assessment is applicable for each instrument. Note that even instruments that do not constitute state aid according to article 107(1) of the TFEU can be subject to the assessment of the Commission. The depth of this assessment varies and we classify it by degree: no assessment, standard assessment, or detailed assessment. We present the degree of assessment in Figure 1. The figure does not report the EIB loans and scrapping schemes which are not subject to a formal assessment by the Commission as in the case of state aid. We distinguish three cases. First, when aid amount and/or intensity is very low, namely in cases falling under the GBER, the Commission does not carry out a substantial assessment according to the principle that distortions should be limited and the balancing test should implicitly be satisfied. Second, when the aid intensity is higher and the measure falls under the relevant Notices, Communications, Guidelines and Frameworks, state aid is to be notified, and can be subject to two types of substantial assessment: standard or detailed. If aid is granted through schemes and the aid amount or intensity is below a set of ceilings, the Commission carries out a standard assessment, which is a check on whether the aid measure meets the formal criteria set out in the relevant legislative text. Third, if aid is granted to individual firms and/or the amount or intensity is above a set of ceilings, the Commission carries out a detailed assessment, which generally follows the balancing test illustrated in paragraph 2.2.

The Temporary Framework constitutes a derogation to the ceiling system illustrated in Figure 1. Aid granted under the Temporary Framework is always subject to a standard assessment independent of the amount of aid and whether it is granted in the form of

¹²In particular, the EGF funds go directly to the employees and do not entail state aid since they do not provide an advantage to undertakings.

schemes or as *ad hoc* aid. In the case of scheme, aid recipients are not known ex-ante, so a balancing test is not carried out. In cases of *ad hoc* aid notified to the Commission under the Temporary Framework, the Commission carries out only a standard assessment. During the crisis, the Commission often resorted to *ex-officio* investigations, thus reversing a decade of claims with regard to the need for transparency in the state aid control system.

In the fifth column of Table 1, note that social public support granted by the ESF can be subject to no assessment, a standard or a detailed assessment depending on the aid amount and intensity. Support granted by the European Investment Bank in the form of a loan is subject to the opinion of the Commission. The information on EIB projects before and after their approval is absent or limited. The substantial assessment of those projects is not published, and the Commission does not have the same power to request additional information from the granting authority, as in regular state aid cases. For these reasons, it is not clear to what extent the Commission has the possibility to apply the same principles of economic analysis expressed in its state aid decisions.

With regard to scrapping schemes, the Commission issues comments on their technical specifications where the fiscal and financial incentives can potentially hinder trade in the internal market.

The above instruments of state aid (i.e. GBER, regional, training, R&D&I and R&R) are granted under different soft law provisions. Since 1989, the car industry has been subject to the Community Framework for State aid to the motor vehicle industry¹³, revised in 1997.¹⁴ The 1997 Framework expired at the end of 2002. From 2002, the rules in the car sector were included into the Multisectoral framework on regional aid for large investment projects¹⁵, replaced by the current Guidelines on national regional aid for 2007-2013.¹⁶ Some sectors receive separate treatment under the guidelines, although the car industry now falls under the general horizontal legislation of state aid.

Support can be granted with a main specific objective. For example, aid granted under the R&D&I Framework is logically aimed at supporting R&D&I projects. However, support can also be granted with multiple objectives that can overlap with other instruments of aid. For example, aid can be granted for one project both with regional and training objectives. Then it is assessed by the Commission under the Regional aid Guidelines and the Training aid Communication.

We now elaborate on each instrument of public support. First, for each instrument we highlight the relevant legislation. Second, we evaluate the relevance of each instrument for

¹³Community Framework for State aid to the motor vehicle industry, 1989 O.J. C 123.

¹⁴Community Framework for State aid to the motor vehicle industry, 1997 O.J. C 279.

¹⁵Multisectoral framework on regional aid for large investment projects, 2002 O.J. C 70/8.

¹⁶Guidelines on national regional aid for 2007-2013, 2007 O.J. C 54/08.

Table 1: Summary and categorization of public support instruments for the European car industry

Public support instrument	Level	State aid	Commission assessment	Assessment type
1. GBER	National	Yes	No	No
2. Regional aid	National	Yes	Yes	Standard/ Detailed
3. Training aid	National	Yes	Yes	Standard/ Detailed
4. R&D&I aid	National	Yes	Yes	Standard/ Detailed
5. R&R aid	National	Yes	Yes	Standard/ Detailed
6. Temporary Framework	National	Yes	Yes	Standard
7. EIB support	European	No	Yes	Opinion
8. Social public support	European/ National	No	Yes	No/Standard/ Detailed
9. Scrapping schemes	National	No	Yes	Technical

The table reports the nine instruments of public support for the European car industry, classified according to authority level, state aid element, applicability of Commission’s assessment and assessment type.

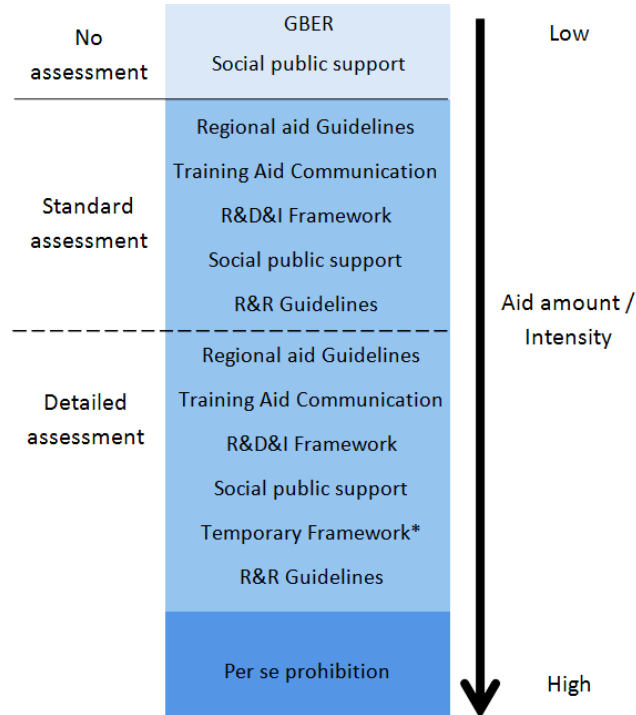
the car sector. Third, we analyze the objectives of public support. Fourth, we look at the incentive effects. Fifth, we study the distortions of competition and trade. The third, fourth and fifth points clearly follow the structural framework for the economic assessment of state aid and other public support embodied in the balancing test described in paragraph 2.2.

3.2 Aid granted under the General Block Exemption Regulation

Legislation The General Block Exemption Regulation (GBER) applies to cases of low intensity aid, where the intensity is regulated by a system of aid ceilings.¹⁷ It covers numerous types of aid, including regional aid, training aid and R&D&I aid. In this sense, the GBER

¹⁷Commission Regulation (EC) No 800/2008 of 6 August 2008 declaring certain categories of aid compatible with the common market in application of Article 107 and 108 (ex Article 87 and 88) of the TFEU (General block exemption Regulation), 2008 O.J. L 214/3.

Figure 1: Details on state aid control architecture and Commission’s assessment



This figure represents the structure of the assessment carried out by the Commission for each instrument of support granted to the European car industry (except EIB loans and scrapping schemes). At the top are aid measures that are automatically allowed because of their low amount/intensity, as represented by the allowable ceilings (indicated by the continuous line). When the amount/intensity grows, the Commission has a set of allowable ceilings (indicated by the dashed line), below which the Commission normally carries out only a standard assessment. Above those ceilings, the Commission usually carries out a detailed assessment (balancing test) except for the Temporary Framework* (*= always standard assessment).

overlaps with the other state aid instruments listed in paragraph 3.1, but the difference lies in the amounts rather than in the purpose. Aid fulfilling the conditions set out in the GBER is automatically considered compatible with article 107(3) of the TFEU and is exempted from the obligation of notification.

Relevance to the car sector Given the conditions and criteria that aid measures should comply with to be granted under the GBER, these are small-sized companies, namely automotive suppliers rather than car manufacturers, which are more likely to benefit from these aids. We find several aid schemes in the Spanish car sector that are open to both car manufacturers and suppliers (e.g. “Plan de Competitividad Sector Automoción”¹⁸).

Objectives The aids granted under the GBER pursue various efficiency and/or equity objectives depending upon the type of aid. We discuss the issues related to regional, training or R&D&I aids below.

Incentive effects/crowding out Incentive effects are relevant for aid granted under the GBER. The Regulation does not apply to aid for projects that the beneficiary would carry out under market conditions alone. For a large company, an incentive effect is assumed to be present if the project size or scope or total money spent increases significantly, or the project completion is speeded up considerably. Nitsche and Heidhues (2007) argue that the amounts should be adapted to the type of market failure that is being addressed. Limited amounts of aid can be insufficient to effectively address relevant market failures, and may encourage the wasteful use of public funds.

Distortions of competition and trade Distortions of competition and trade are assumed to be limited, given the small amounts at stake.

3.3 Aid granted under the Regional aid Guidelines

Legislation Regional aid allows the creation of new establishments in the most disadvantaged regions. Paragraphs (a) and (c) of article 107(3) of the TFEU constitute the legal basis for assessment of compatibility of regional aid. These paragraphs form the basis for the Guidelines on national regional aid for 2007-2013 (hereinafter *Regional aid Guidelines*),

¹⁸Commission Decision State aid No. X 59/2009 - Plan de Competitividad Sector Automoción, 2009 O.J. C 279/21.

which stipulate under which conditions and allowable ceilings, for each disadvantaged region, member states can finance investments of companies setting up in such regions.¹⁹

Relevance to the car sector Regional aid is the most common instrument of state aid used in the car industry, especially in the form of investment aid to establish new car plants or to extend the existing ones. One of the most notable examples is the large investment aid granted to BMW for the construction of a new car plant in Leipzig in 2002.²⁰

Objectives Efficiency objectives are relevant when granting regional aid. Specifically, regional aid can address market failures such as insufficient provision of positive externalities, namely regional spillovers (agglomeration externalities) and network externalities connected to coordination problems, as well as presence of imperfect information (discussed in paragraph 2.2.1). Regional aid can also tackle market failures created by imperfect factor mobility.

Equity objectives are the most used justifications in the Commission’s decisions to declare the compatibility of regional aid measures. Granting of regional aid is aimed at encouraging investments and job creation in regions whose socio-economic situation is below the EC average (article 107(3)(a)) or below the national average of the concerned member state (article 107(3)(c)).²¹

Incentive effects/crowding out The analysis of the incentive effects of regional aid is one of the most important elements in the detailed assessment of regional aid awarded to large investment projects.²² Member states have to provide a comprehensive description of the counterfactual scenario. There are two scenarios in which the incentive effect can be proven: (i) a company decides to make an investment in the assisted region that would not be profitable at any location (i.e. investment choice), and (ii) a company decides to invest in the relevant region rather than elsewhere since the aid “compensates for the net handicaps and costs linked to a location in the assisted region”, i.e. the comparison of costs and benefits of locating in the assisted region and in an alternative region is made (i.e. location choice). Location choices are usually analyzed while granting regional aid to car companies.

¹⁹Guidelines on national regional aid for 2007-2013, 2007 O.J. C 54/08. For the period 2000-2006 the applicable guidelines are the Guidelines on national regional aid, 1998 O.J. C 74/06. Competition and trade concerns related to regional aid are discussed in the Communication from the Commission concerning the criteria for an in-depth assessment of regional aid to large investment projects, 2009 O.J. C 223/02.

²⁰Commission Decision State aid No. C 26/2002 - on the State aid which Germany is planning to implement for BMW AG in Leipzig, 2003 O.J. L 128/12.

²¹The Commission has qualified this distinction in the Regional aid Guidelines in paragraph 3.2 and 3.4.

²²Communication from the Commission concerning the criteria for an in-depth assessment of regional aid to large investment projects, 2009 O.J. C 223/02.

Distortions of competition and trade Since regional aid may influence competition between individual plants of a car company and competition among car companies that operate in global markets as well as location choices of the car industry throughout Europe, it can cause all of the types of distortions of competition and trade listed in paragraph 2.2.3.

First, regional aid can lead to a creation or preservation of inefficient production structures, since it mainly serves to fund productive capacity expansions. Particularly aid granted in markets characterized by overcapacity is likely to be problematic, as it may distort the natural order of exit or consolidation in an industry, and strengthen the market position of the aid beneficiary.

Second, regional aid can distort the dynamic incentives of rivals. It may lead to capacity reductions of competitors in response to the expansions of the recipient. Smaller competitors may eventually be forced to exit the market. Moreover, regional aid may prevent foreign competitors from entering the market.

Third, regional aid can strengthen market power of the aid beneficiary. Regional subsidies in the home market may foreclose actual or potential competitors.

Fourth, whilst regional aid explicitly serves to influence the decision on where to locate an assembly plant, it can generate an inefficient location outcome when the aid is offered solely to overcome the higher cost of operating in one location with respect to a competing location.²³ Inefficient location choices can especially be harmful whenever regional aid is not combined with other instruments of public intervention to improve the business environment in the disadvantaged region through developing infrastructure, improving education and security and in general establishing a more efficient public administration. Distorting the decision on where to locate and adding production capacity in one market may create a risk that production and investment in other markets may be adversely affected. This may cause market failures, such as a loss of positive regional spillovers and network externalities in those regions that would have been chosen for investment in the absence of aid.

3.4 Aid granted under the Training aid Communication

Legislation Aid to finance training for workers, to the benefit of both employers and employees is granted under the Communication from the Commission - Criteria for the analysis of the compatibility of State aid for training subject to individual notification (hereinafter *Training aid Communication*).²⁴ Articles 107(3)(a) and 107(3)(c) form the legal basis for

²³This objection was raised by France against the aid measures offered to BMW in Leipzig in 2002.

²⁴Communication from the Commission - Criteria for the analysis of the compatibility of State aid for training subject to individual notification, 2009 O.J. C 188/01. For the period 2001-2008, Commission Regulation 68/2001/EC on the application of Articles 87 and 88 of the EC Treaty to training aid, 2001 O.J.

this Communication.

Relevance to the car sector Training aid is frequently used to support the car industry. The European Commission has generally taken a favorable stance towards training aid in the past. Recently, training aid has been subject to a more careful assessment, especially in relation to the assessment of the presence of market failures such as underinvestment in the training of workers and generation of positive spillover effects due to training, incentive effects, as well as effects on competition and trade (see for instance decisions on training aid concerning Ford Genk, General Motors in Antwerp and Fiat Auto).²⁵

Objectives Training aid addresses the market failure arising from under-provision of a positive externality such as knowledge spillovers. In particular, we refer to underinvestment in training which can occur for two reasons. First, enterprises cannot fully internalize the benefits of the training they offer to their employees, especially when training is targeted at skills that are transferable between firms (i.e. general training). Second, employees may be unwilling to invest in training if they are risk-averse, face financial constraints or are unable to signal the level of their knowledge to potential employers. The Training aid Communication explicitly recognizes that training aid has positive external effects (knowledge spillovers) for society as a whole because it increases the pool of skilled workers and the competitiveness of the whole economy.

Training aid can also help to solve market failures connected to imperfect factor mobility, for example if workers acquire skills that allow them to become more mobile.

Incentive effects/crowding out The main concern expressed by the Commission in its decisions concerning training aid to the car sector is that it wishes to avoid the allowance of aid measures for an activity which the company would undertake in any case, even without the aid, to the same extent (crowding out). This verification is particularly compelling because car manufacturers put their production plants in competition with one another for the production of new models. Competition between plants derives from two specific features of the car industry: structural overcapacity, and improved flexibility on the production side, where production technologies have evolved such that a plant can more flexibly accommodate

L 10/20, the so called “Training Block Exemption Regulation (BER)” is applicable. This “Training BER” has been included into 2008 GBER.

²⁵Commission Decision State aid No. C 40/2005 - Ford Genk, 2006 O.J. L 366/32; Commission Decision State aid No. C 14/2006 - General Motors Antwerp, 2007 O.J. 2007 L 243/71; Commission Decision State aid No. N 322/2003, Fiat Auto, 2003 O.J. C 284/02.

Bermudez and Galand (2007) provide a discussion of several training aid cases in the car industry in the light of a more economic approach of the European Commission.

the production of an additional model. Training aid measures could therefore distort this competition by reducing operating costs for the plant located in the concerned member state.

The Commission has established the principle that the incentive effect is present only for training aid related to qualifications which are not immediately required for the production of cars (Pesaresi and Hoof, 2008). When training aid is associated with the production of a new model in the plant it is not justified, because the production of a model is a normal feature in the car market, indispensable to maintain market shares and profitability. In practice, incentive effects are very difficult to evaluate since they require a specific knowledge of the different types of training activities.

Distortions of competition and trade Training aid is a type of operational aid, and is often related to the production of new models or the establishment of a new plant, which requires new skills and qualifications for the workers. As such, it has a direct impact on the level of variable cost.

First, with regard to the issue of supporting inefficient production, given the operational nature of training aid, this instrument of support is likely to directly result in severe productive inefficiency.

Second, training aid can distort the dynamic incentives of rivals in their timing plans of new model introduction, since they may take into account the advantage given to the aid recipient. Competitors may also reduce their own investment in training as a consequence of training aid to a rival.

Third, training aid can result in increased market power, since it can influence firm's ability to compete and capture market shares by financing training for the production of new models, which is a vital condition to maintaining competitiveness in the car market.

Fourth, training aid can effectively distort location decision by influencing the decision upon which plant a new model should be produced, with a direct consequence for the output level of each plant. The Commission, however, recognizes that, as opposed to regional investment aid, which is explicitly influencing location, training aid should not be intended to influence the choice of the location of the production, but only to remedy underinvestment in training when the market incentive is not adequate.

3.5 Aid granted under the Research and Development and Innovation Framework

Legislation State aid granted to finance R&D&I projects is assessed on the basis of the Community Framework for State aid for Research and Development and Innovation (here-

inafter *the R&D&I Framework*).²⁶ This aid is primarily justified on the basis of articles 107(3)(b) and 107(3)(c).

Relevance to the car sector While R&D&I is very important for the car sector, there are no cases of large individual R&D&I aid grants to car producers in the last decade. These individual projects are rather financed by the European Investment Bank, which we will discuss in paragraph 3.8. There are several cases of R&D&I aid granted in the form of schemes targeting car companies (e.g. “R&D&I aid to the car manufacturing sector in the Community de Madrid”²⁷). The lack of big R&D&I cases in the car industry may be attributed to the fact that the Commission favors approving aid for projects to fund fundamental research directed towards increasing scientific knowledge in a particular area while it disfavors granting aid for developing new products, when R&D gets closer to the market and may thus become particularly distortive for competition.

Given the lack of published individual aid decisions, it is not easy to evaluate the recent approach of the Commission towards R&D&I aid in the car industry. In the early 1990s, R&D&I aid was not permitted to support modernization. The European car industry was facing heavy competition from the Japanese car industry, with its innovative production system. Bhaskar (1990) reports that the Commission helped the car industry by adopting a particular definition of innovation applied to the car sector, according to which the operation of a new system or process representing a significant step forward for an industry could be subsidized. Over time, the Commission’s assessment of R&D&I aid has become more favorable thanks to the increasingly significant financial requirements and risks of R&D operations and the reduced likelihood that this aid will affect competition and trade given that aided projects are far away from the market.²⁸ Some insights into the current practice of the Commission can be derived from the description of approved R&D&I schemes.²⁹ In particular, the Commission evaluates whether the R&D&I programs have any distortionary effects on other European competitors or not, and ensures that such projects are aimed at improving European competitiveness. Furthermore, the Commission checks whether they finance investments that go beyond the normal business strategy of companies.

²⁶Community Framework for State aid for Research and Development and Innovation, 2006 O.J. C 323/01. For the period 2000-2006 the Community Framework for State Aid for Research and Development, 1996 O.J. C 45/06 is applicable.

²⁷Commission Decision State aid No. N 54/2008 - R&D&I aid to the car manufacturing sector in the Community de Madrid, 2008 O.J. C 264/2008.

²⁸Commission Decision State aid No. NN 56/2005 - United Kingdom Low Carbon Research and Development Programme, 2006 O.J. C 002.

²⁹Press release of the European Commission IP/06/1020, date: 19/07/2006. State aid: Commission authorises aid scheme by the French Agence de l’innovation industrielle for innovation-mobilising programmes.

Objectives R&D&I aid is mainly granted on the grounds of multiple efficiency objectives.

It tackles the problem of under-provision of positive externalities such as knowledge spillovers, regional spillovers (agglomeration externalities) and network externalities (discussed in paragraph 2.2.1). Those externalities are particularly relevant to R&D&I, especially with regard to knowledge spillovers. There is econometric evidence that, on average, the social rate of R&D&I exceeds the private rate of returns by 50% to 100% (Griliches, 1992). The existence of large spillover effects is therefore one of the most obvious justifications for the transfer of public resources to correct the differences between the social and the private returns on R&D&I activities. Economic studies suggest that subsidies for R&D&I may indeed be welfare increasing (Takalo et al., forthcoming). Positive agglomeration and network spillovers can also arise when R&D&I support funds are used to finance projects in cooperation with universities and suppliers.

R&D&I aid supporting projects related to the development of fuel-efficient technologies tackle the problem of over-provision of a negative externality such as pollution. With regard to environmental projects, a market failure could arise because lowering energy consumption would reduce the operating costs of a car, and these costs not being fully taken into account by consumers.³⁰ In this case, the cost of an innovation which reduces fuel consumption and emissions would not be fully incorporated into the price of the finished product, so a market failure in R&D&I for environmental projects could be deemed to exist.

Finally, R&D&I aid can help to tackle problems of imperfect functioning of capital markets which arise in financing innovation. This is connected to a reluctance of the firm and the financial market to invest in R&D&I, because of the difficulty in properly assessing the risk profile of these projects.

Incentive effects/crowding out Establishing the existence of incentive effects for R&D&I aid granted to the car industry is not an easy task. The automotive industry is the largest private investor in R&D&I in the European Union, with annual investments of over €26 billion.³¹

Following Zapata and Nieuwenhuis (2010), we can distinguish between incremental and radical innovations applied to the car sector. Incremental innovations improve the performance of established products. Alternative fuels constitute incremental innovation as long as they require minimal innovations to the existing engines. Radical innovation refers to innovative attributes and qualities that are significantly different. Alternative powertrains,

³⁰Greene (2010) finds that some studies show a complete undervaluation of fuel operating costs by consumers, whereas the overall evidence is mixed and there exists no study on the European market to understand how consumers value fuel efficiency.

³¹http://www.acea.be/news/news_detail/automotive_sector_tops_rd_investment_scoreboard/

such as electric engines and fuel cells, replace the existing internal combustion engine and therefore qualify as radical innovation. In the automobile industry the product has not fundamentally changed over time, which may be explained by the necessity of amortizing large capital investments in the existing technologies. Radical innovation is likely to encounter resistance as it requires the abandonment of existing systems, implying large sunk costs. Incremental innovation would use the existing capital investments, and would avoid the replacement of the old technology. This can arguably explain the industry's reluctance in embracing research in radically new products.

In conclusion, problems in relation to incentive effects can exist if R&D&I aid is aimed at incremental innovation, because these research activities are already carried out by several manufacturers and do not imply a complete abandonment of existing investments. Conversely, R&D&I aid could have strong incentive effects in situations of radical innovation, such as alternative powertrain technologies.

The Commission seems to consider these issues in its practice. For example, in the VHD case, the Commission expressed doubts about whether the aid from the French Industrial Innovation Agency to PSA for the development of a hybrid diesel car, which would classify as incremental innovation, could be justified. In particular, the Commission remarked upon the fact that similar projects had been announced by competitors. Therefore, the Commission considered the possibility of a lack of incentive effect since the project could have been implemented without aid.³²

Distortions of competition and trade R&D&I aid can lead to all four negative outcomes listed in paragraph 2.2.3.

First, R&D&I aid can support productive inefficiency when it is awarded to inefficient firms. Consequently, it might result in market structures where players operate below efficient scale.

Second, R&D&I aid can distort the dynamic incentives of competitors to compete. The car market is at the edge of a profound change, where the internal combustion powertrain has probably reached its maximum development potential, and completely different types of technologies could be developed. The support provided at this point to one competitor could give a temporal advantage and hinder the possibility for others to profitably enter future markets. R&D&I aid granted to manufacturers can also distort the dynamic incentives of suppliers, who are also actively involved in developing technologies to produce cleaner

³²Commission Decision State aid No. C 51/2007 - Support by the Industrial Innovation Agency in favor of the VHD program. The notification was withdrawn in 2008 after the formal investigation procedure by the European Commission (Commission notice pursuant to Article 88(2) of the EC Treaty, 2008, O.J. C 189/14).

vehicles. Manufacturers may exploit their financial strength to control new technological developments, with adverse effects on the innovation incentives of upstream suppliers, in a situation where the balance of power is already tilted towards manufacturers (Sturgeon and VanBiesebroeck, 2009).

Third, R&D&I aid can create or maintain positions of market power. It is of special concern if the aid beneficiaries can transfer their market power in the existing markets to the future product markets. The Commission identifies concerns related to market power when market share is above 25%. The definition of market is crucial and not always straightforward, especially with regard to R&D&I granted to new products. For example, in a case of announced aid to BMW for the development of electric vehicles, the Commission has expressed doubts (still unresolved) regarding whether the electric car market creates a separate product market or is part of the total passenger car market.³³

Fourth, R&D&I aid can distort location decisions. This is unlikely to happen at specific plant level, since these projects are normally executed at global level in research centers. However, the possibility should not be excluded for smaller-scale projects.

3.6 Aid granted under the Rescue and Restructuring Guidelines

Legislation Rescue aid is a temporary assistance provided to a firm at the verge of bankruptcy to keep it afloat for the time required to develop a restructuring plan. Rescue aid measures must comply with the “one time, last time” principle. Restructuring aid is an assistance granted to the firm on the basis of a restructuring plan to restore a firm’s long-term viability. In the assessment of R&R aid, the Commission applies the Community guidelines on state aid for rescuing and restructuring firms in difficulty (hereinafter *R&R Guidelines*).³⁴ Legally, the *R&R Guidelines* lay down the application of article 107(3)(c), in the instance of firms in difficulty.

Relevance to the car sector In the car industry, there is only one case of R&R aid being granted; that in favor of MG Rover by the United Kingdom in 2005, on the grounds of the limited duration of the measure, and the serious social difficulties that the immediate bankruptcy of the company would have caused. The aid was supposed to have no negative spillover effects on other member states, due to the low market share of the company and

³³We refer to a grant €46 million from the German government to BMW for the manufacturing of two models of electric passenger cars, which is under scrutiny by the Commission. Press release of the European Commission IP/11/875, date: 13/07/2011. State aid: decisions on regional investment aid for BMW, Volkswagen, Globalfoundries and CRS Reprocessing in Germany and AU Optronics in Slovakia.

³⁴Community guidelines on State aid for rescuing and restructuring firms in difficulty, 2004 O.J. 244/02.

the limited duration of the measure.

Objectives Efficiency considerations can play a role in justifying R&R aid.

First, R&R aid can have the objective of correcting problems of asymmetric or imperfect information affecting the capital market because those markets do not have all the information to gauge the viability of a firm.

Second, R&R aid can have the objective of reducing market power in instances where the disappearance of the firm in difficulty may result in a tight oligopolistic situation, causing an increase in prices, and/or in loss of product variety whenever the assets of the exiting firm are lost. Both higher prices and reduced product availability can have a negative effect on consumer welfare.

R&R aid is often granted on the basis of equity arguments. In practice, it is motivated by the fact that the bankruptcy of a large manufacturer has significant local impacts on employment given the geographical concentration in this sector. In addition, other local businesses may be affected through multiplier effects, given the forward and backward linkages of carmakers with upstream and downstream firms and, in general, with other sectors of the economy.

Incentive effects/crowding out We qualify incentive effects in terms of aid effectiveness, namely if R&R aid is successful in changing the behavior of the firm. Aid effectiveness is very problematic in R&R aid. In particular, R&R aid can just delay exit, as opposed to preventing it, a result presented by Glowicka (2008).

In response to the argument that R&R aid can correct an efficiency problem of imperfect information in the capital market, Lyons et al. (2008) note that it is very unlikely that a public body can have better information to make funding decisions, especially because capital markets have a strong incentive to acquire information that the funding entity does not have.

From an equity point of view, the effectiveness of this type of intervention is also questionable, because R&R aid does not provide structural solutions for the general business environment. In addition, Oxera (2009) finds that restructuring aid has a limited effect on jobs and activity, when compared to a counterfactual of no state intervention.

Distortions of competition and trade R&R aid is one of the most controversial types of aid from an economic point of view. It can generate all the forms of distortions of competition listed in paragraph 2.2.3.

First, it can support productive inefficiencies by maintaining the least efficient firm on the market and raising the costs of more efficient ones. In a declining industry forcing the gradual exits of certain producers, R&R aid can alter the order of exit, resulting in market power for the recipient and inefficient market structures.

Second, it can distort dynamic incentives of the recipient and the rivals. For the recipient, R&R aid can introduce a moral hazard problem when a firm correctly anticipates that public intervention will prevent bankruptcy. This evidently distorts the perception of risk for the recipient. For the rivals, R&R aid can provoke the revisions of their investment plans.

Third, R&R aid can increase market power of the recipient, especially when it is granted to a domestic national champion. Its dominance can thus be reinforced by further weakening the competitive constraint that competitors can exercise on the aid recipient.

Fourth, R&R aid can provoke distortions of location decisions. Negative international spillovers are likely to arise when a country grants aid to a domestic firm. As a consequence, R&R aid can cause collective wasteful subsidy competitions among member states.

3.7 Aid granted under the Temporary Framework

Legislation The Temporary Community framework for State aid measures to support access to finance in the current financial and economic crisis (hereinafter *Temporary Framework*) was adopted at the end of 2008 to address the consequences on the real economy of the global financial crisis that began in the summer of 2008 on the basis of paragraph (b) of article 107(3) of the TFEU. The Framework was preceded by the European Economic Recovery Plan in November 2008, which was already proposing a simplification package to allow state aid through horizontal schemes.³⁵ Given the exceptionality of the measures, the Framework was limited in time and was to expire at the end of 2010, but was prolonged until the end of 2011, subject to stricter conditions, in order to gradually phase-out the crisis support.³⁶

The Temporary Framework is open to all companies. The Commission acknowledges that even healthy companies may not be able to obtain the finance they need in the crisis circumstances. Thus, the temporary aid may ensure sufficient bank lending to those companies and also provide them with finance to continue their investment into a sustainable future, including the development of green products. Furthermore, the Framework can allow companies that face liquidity problems due to the crisis to benefit from the temporary relief

³⁵Communication from the Commission - Temporary Community framework for State aid measures to support access to finance in the current financial and economic crisis, 2009 O.J. C 16/01.

³⁶Communication of the Commission - Temporary Union framework for State aid measures to support access to finance in the current financial and economic crisis, 2011 O.J. C 6/05.

in the form of aid. The Framework is, however, not applicable to firms that were in difficulty before 1 July 2008. Such firms can apply for aid under R&R Guidelines.

In the case of aid granted under the Temporary Framework for the development of green products, it may be treated as aid for R&D&I projects, usually subject to the rules of the R&D&I Framework. Aid under the Temporary Framework to firms in temporary difficulty due to the crisis can be read as a sort of R&R aid granted through a fast track in derogation of the R&R Guidelines. Since the firms did not need to present a restructuring plan, this aid could better be qualified as rescue aid.³⁷

The Temporary Framework gave the possibility to use the following forms of measures:

- limited amounts of aid: a lump sum of up to €500,000 per company to cover investments or working capital over a period of two years to relieve them from current difficulties;
- subsidized loan guarantees: the guarantee could cover up to 90% of the loan and maximum loan could not exceed the total annual wage bill of the beneficiary for 2008;
- subsidized interest rates applicable to all types of loans;³⁸
- subsidized loans for the production of green products;
- a temporary derogation from the 2006 Guidelines on Risk Capital to allow €2.5 million of risk capital injection per SME and a reduction of the minimum investment cost from private investors;
- simplification of the requirements of the Communication on short-term export-credit insurance to use the exemption that allows non-marketable risks to be covered by the state.

From a procedural point of view, support is granted in the form of schemes, of which member states must notify the Commission. Only some schemes contained an overall budget limit. In terms of content, each scheme had to meet the conditions set in the Temporary Framework for each type of measure. Once a scheme (e.g. subsidized loans for the production of green products) had been authorized, *ad hoc* aid could be granted under the scheme

³⁷The Commission argues that “Despite that overcapacity, no major players exited the market during the crisis and no major restructuring case was notified to the Commission. That phenomenon may be due to the fact that the use of the Temporary Framework acted as a cushion in the most critical moments and the loans and guarantees granted under the Temporary Framework in fact allowed some restructuring to be initiated” (European Commission, 2011).

³⁸According to the R&R Guidelines, rescue loans should be given under market rates.

without further individual aid notifications. Horizontal schemes were chosen to speed up the procedural issues and tackle the urgency of the crisis.

Relevance to the car sector According to the European Commission (2011), member states committed €81 billion in schemes approved by the Commission, but only a quarter of that amount was effectively used. The most common measures were the limited amounts of aid, subsidized loan guarantees and subsidized loans. Germany and France have approved schemes covering all the measures under the Temporary Framework.

Although the Temporary Framework was implemented through horizontal schemes, some member states, namely France and Germany, have in practice used it to support their automotive sector. In particular, the Commission intervened on the implementation of the schemes in France for Peugeot and Renault and Germany for Opel. For the French case, the Commission requested the removal of the initial requirement that aided firms could not move their activities outside of France or prioritize France-based suppliers.³⁹ The aim of Commission’s intervention was to avoid a return to protectionism in member states.

For the German case, the Commission intervened *ex-officio* in the negotiations between the German government and the carmaker GM, which was requesting additional public aid for Opel restructuring, not only from the German government, but also from other member states such as Austria, Spain and the United Kingdom to subsidize further restructuring after the company had obtained a €1.5 billion bridging loan from the German government early in the summer of 2009. The aim of the Commission was to avoid a subsidy race between countries to save the company and to avoid the approval of any measures with conditions concerning “the location of investments and/or the geographic distribution of restructuring measures”.⁴⁰ GM eventually withdrew all requests for financial assistance following the refusal of the German government to subsidize further restructuring, and pursued its own restructuring plan.

The Commission did not approve any official decision for either of these two individual cases. The Commission’s intervention can only be followed through Commission’s press releases and reports released *ex post* (e.g. European Commission, 2011 and Copenhagen Economics, 2011).

There were two *ad hoc* cases in the car industry that were officially notified and scrutinized by the Commission under the Temporary Framework. Both were state guarantees at a

³⁹Press release of the European Commission MEMO/09/90, date: 02/28/2009. State aids: the Commission obtains guarantees from the French government on the absence of protectionist measures in the French plan for aid to the automotive sector.

⁴⁰Press release of the European Commission MEMO/09/411, date: 09/23/2009. State aid: Commission statement on aid for Opel Europe.

reduced premium covering 90% of loans granted by the EIB to Volvo and Saab in Sweden.⁴¹ The guarantees on the remaining 10% of the loans (that could not be covered by the favorable guarantee terms) were provided at a market premium by the Swedish government rather than the market itself. The individual notifications were submitted for two reasons. First, since Sweden did not notify any scheme under the Temporary Framework (apart from export-credit insurance scheme), the Commission discussed the compatibility of the 90% of the loans with the Framework's provisions. Second, the Commission carried out a check to find an appropriate market benchmark because of legal certainty issues as regards the remaining 10% of the loan, and established that the latter guarantee really did not contain state aid within the meaning of article 107(1) of the TFEU.

Objectives Since the Temporary Framework was essentially a fast-track to grant R&D&I aid and R&R aid during the period of crisis, the objectives discussed in paragraph 3.5 and 3.6 apply here.

First, aid granted under the Temporary Framework is explicitly aimed at correcting market failures connected to asymmetric or incomplete information, namely imperfect functioning of the capital markets by ensuring sufficient lending to companies. The banking crisis led to problems of risk aversion for the banking sector after the panic created by the collapse of Lehman Brothers and the fears of a financial meltdown. A credit squeeze can have two effects. First, it can create liquidity problems in the short term both for weaker companies, such as Opel, and healthier companies, such as Peugeot and Renault. In addition, the deterioration of the lending volume and conditions results in a reduction in successful acceptance of applications for vehicle credit, with a significant negative impact in terms of sales (IHS Global Insight, 2009).

Second, the credit squeeze can cause problems for financing long term investments. In this sense, aid granted under the Temporary Framework has also the objective of correcting underinvestment in innovation, in particular in projects that significantly improve environmental protection, caused by imperfectly functioning markets. This was the rationale for the specific measure in the form of subsidized loans for the production of green products. It was particularly appealing to the car sector, which is pressured to meet stricter environmental standards. The subsidized loans to Peugeot and Renault were aimed at the development of green products. The schemes to support the production of green products in Italy, Spain and the United Kingdom were explicitly linked to the automobile sector.⁴²

⁴¹Commission Decision State aid No. N 80/2009 - Volvo Personvagnar Aktiebolag, O.J. C 172/2. Commission Decision State Aid No. N 541/2009 - Saab Automobile AB, O.J. C 96/2010.

⁴²Commission Decision State aid No. N 542/2009 - Italy Aid for the production of green products, O.J. C 25/09; Commission Decision State aid No. N 140/2009 - Spain Competitiveness plan of the automotive

Finally, equity concerns in granting aid under the Temporary Framework have also been important, with the fear of the crisis spreading all over the economy, causing bankruptcies, with their associated social consequences.

Incentive effects/crowding out The incentive effects related to R&D&I aid and R&R aid (discussed in paragraph 3.5 and 3.6) apply here. Given the particular circumstances of acute financial crisis under which aid was granted, we should partially correct the argument that capital markets have the incentive to provide finance if they think that firms are healthy. During the crisis, loans to the real economy were substantially reduced and the issuance of new loans virtually came to a halt between the end of 2008 and the end of 2009 (European Commission, 2011). In this sense, crowding out effects are probably less likely in this particular situation.

Distortions of competition and trade The distortive effects related to R&D&I aid and R&R aid (discussed in paragraph 3.5 and 3.6) apply here. In particular, with regard to R&D&I aid, the Commission recognised that the subsidized loans for green products might cause serious distortions of competition and “should be strictly limited to specific situations and targeted investment” (European Commission, 2009). Overall, the crisis measures could have led to the postponement of the necessary restructuring process in the car industry as they have not provided an incentive to adjust the supply in response to the fall in demand.

The adverse effects of temporary aid on trade should be emphasized. In particular, aid granted under the Temporary Framework is especially likely to provoke distortions of location decision. Subsidy races may have taken place both within Europe and on a global level. Within Europe, most member states approved schemes and the Commission attempted to correct the protectionist features of individual aid under those schemes.⁴³ However, it is not possible to ignore the features of local considerations in the aid under the Temporary Framework, where France and Germany supported their national car producers, respectively Peugeot and Renault, and Opel. The closure of an Opel plant in Belgium could be the outcome of this subsidy competition, in which there was no coordination in capacity reduction.

At the global level, the intervention of Europe as a whole to save its carmakers appears to support a strategic trade policy argument, stating that the industry was supported also as a response to the interventions in the rest of the world. For instance, the US granted a

sector - Realization of investments aimed at the manufacturing of more environmental friendly products, O.J. C 146/02; Commission Decision State aid No. N 72/2009 - UK Temporary aid for the production of green products, O.J. C 145/07.

⁴³Press release of the European Commission MEMO/09/411, date: 09/23/2009. State aid: Commission statement on aid for Opel Europe.

massive amount of aid to GM and Chrysler (Sturgeon and Van Biesebroeck, 2009). Support to carmakers was granted also in Canada, China and Russia.⁴⁴

3.8 Support granted by the European Investment Bank

Legislation The European Investment Bank (EIB) is the European Union’s long-term lending institution owned by the member states. EIB lending is project-based and long term oriented, between 4 and 20 years.⁴⁵ The lending portfolio of the Bank was equivalent to €84 billion in 2010, twice the level of the World Bank.⁴⁶

The Bank uses its AAA credit rating to fund itself on the capital markets and finance its lending activities. EIB loans do not incorporate any subsidy element, but the pricing is attractive due to the AAA rating of the EIB and the not-for-profit status. Those loans are also granted by a supranational authority, so strictly speaking they are not covered by article 107 of the TFEU, thus they should not entail state aid. However, according to article 175 of the TFEU, the Bank should support the policy objectives of the European Union. This article explicitly links the EIB with the Structural Funds (including the ESF). The latter are subject to compliance with state aid rules. Moreover, article 19 of the EIB Statute establishes that applications for financing should be subject to the Commission’s opinion according to the general compatibility rules set out in article 107(3):

Applications made through the Commission shall be submitted for an opinion to the Member State in whose territory the investment will be carried out. Applications made through a Member State shall be submitted to the Commission for an opinion. Applications made direct by an undertaking shall be submitted to the Member State concerned and to the Commission.⁴⁷

The opinion is issued by the Directorate General for Economic and Financial Affairs, which consults the Directorate General for Competition to establish whether the loans have selectivity profiles that can distort competition in the internal market. In practice, there is a check on the compliance of these loans with state aid rules, but this is an internal service consultation. No individual notification or substantial assessment is published.

The opinion of the Commission is not binding. In practice, it is nearly impossible (and hitherto unseen) that a loan is granted when the Commission delivers an unfavorable opinion.

⁴⁴An explicit statement by the French President Sarkozy, as reported by Evenett and Jenny (2009), supports this objective: “The situation in Europe means that you cannot accuse any country of being protectionist when the Americans put up USD 30 billion to support their automotive industry”.

⁴⁵http://www.eib.org/about/key_figures/index.htm

⁴⁶<http://web.worldbank.org/>

⁴⁷Statute of the European Investment Bank, art. 19(2). <http://www.eib.org/about/publications/statute>

If that is the case, the Board of Directors may not grant the finance unless its decision is unanimous. However, in the board there is a director nominated by the Commission who should abstain in order to approve the loan.⁴⁸

Relevance to the car sector The EIB has financed the automotive sector for projects located in less developed regions; for example, the BMW plant in Leipzig, which also benefited from regional aid granted by the German government. This and other EIB loans to finance the introduction of new models, or the establishment of new car plants resemble in their purpose regional aid granted under the *Regional aid Guidelines*. More recently, EIB loans are especially granted to finance R&D&I projects aimed at the transformation of the sector into a more sustainable one (European Investment Bank, 2011). The support granted under those projects resembles in its purpose R&D&I aid granted under the *R&D&I Framework*.

In addition, since 2009 the EIB has had a specialized lending instrument, namely the European Clean Transport Facility (ECTF), providing funding together with the European Commission. This Facility has been in effect throughout 2009-2012 and was approved by the Economic and Financial Affairs Council of the European Union in December 2008 to increase the lending to the transport industry in the economic crisis, and in particular to support R&D&I investments directed at emissions reduction and energy efficiency in the European transport industry. Its yearly budget is equal to €4 billion and its target is not only the automotive industry (manufacturers and suppliers), but also railroad, aircraft and shipping industries. Given their purpose, the ECTF loans bear a certain resemblance to the subsidized loans for green products under the Temporary Framework. The ECTF loans are, however, granted to individual automobile plants and for concrete investment projects.

Objectives The general objectives of the EIB are established in the Treaty and can be summarized in three points: (i) European integration and reduction of regional disparities (article 174 of the TFEU); (ii) R&D projects to make the European Union a world-leading knowledge-based economy (article 179 of the TFEU); (iii) support of sustainable development to protect and improve the natural environment (article 191 of the TFEU).

These three general objectives have translated into three types of aid to the car sector: (i) regional aid, where EIB financing for automotive manufacturing is especially targeting investments located in Convergence regions in the European Union⁴⁹; (ii) R&D&I aid granted especially on safety grounds⁵⁰; (iii) R&D&I aid granted on environmental grounds to meet

⁴⁸Statute of the European Investment Bank, art. 19(6).

⁴⁹European Investment Bank (2011), at point 73. Available at http://www.eib.org/attachments/strategies/transport_lending_policy_en.pdf

⁵⁰European Investment Bank (2011), at point 72.

the emission reduction targets.⁵¹

The general discussion on the objectives of regional and R&D&I aid apply here, so we refer to paragraph 3.3 and 3.5 for a detailed discussion. Furthermore, the EIB loans, especially under the ECTF facility, could help to address market failures in the form of imperfect and asymmetric information, in particular in crisis times which could hamper the access of car producers to finance. Given liquidity problems due to the crisis, the EIB loans could improve the flow of credit to car producers until banks resume their normal lending activities.

Incentive effects/crowding out The general discussion on the incentive effects of regional and R&D&I aid apply here, so we refer to paragraph 3.3 and 3.5 for a detailed discussion, as well as the discussion of incentive effects under the Temporary Framework in paragraph 3.7.

Distortions of competition and trade The general discussion on competition and trade effects of regional and R&D&I aid also apply here, so we refer to paragraph 3.3 and 3.5 for a detailed discussion as well as the discussion of those effects under the Temporary Framework in paragraph 3.7. With regard to trade issues, the EIB loans to the car producers may be targeted to help improve the competitiveness of the European car industry compared to its US, Japanese and Korean competitors and to keep a competitive edge when moving towards a low carbon economy.

3.9 Social public support granted by the European Social Fund and the European Globalisation Adjustment Fund

Legislation The European Social Fund (ESF) and the European Globalisation Adjustment Fund (EGF) are two European programs aimed at improving employment opportunities for workers and minimizing social costs of industry restructuring. The ESF is financed through European funds, but that funding can constitute state aid once it comes under the control of member states. Therefore, the ESF funds are subject to the same notification requirements and substantial assessment as regular state aid when the amounts are above the applicable thresholds. It is the responsibility of the managing authorities to make sure that this requirement is fulfilled (European Commission, 2008).

The EGF projects are funded by the EU in co-financing with member states. To receive EGF financing, member states should submit applications to the Commission.⁵² The assis-

⁵¹European Investment Bank (2011), at point 73.

⁵²The exact application procedure is described in Regulation (EC) No. 1927/2006 of the European Parliament and of the Council of 20 December 2006 on establishing the European Globalisation Adjustment

tance is given directly via member states to workers, and not to enterprises. The EGF funds are not meant to finance the restructuring of companies or sectors.

Relevance to the car sector Both instruments were used during the crisis to mitigate its negative social effects in the European car industry. In particular, the ESF was used to (i) support short-term workers by financing training and a part of wage and non-wage labor costs, (ii) support company and sector restructuring, (iii) finance retraining and (iv) anticipate change requirements and match skills. The ESF had already been used before the crisis to support restructuring within the automotive industry.⁵³

Member states also applied for co-financing of active social protection measures from the EGF in order to support workers who lost their jobs as a result of the economic crisis. The Commission revised the EGF rules to intervene more rapidly in the car sector to co-finance training and job placements for workers made redundant or to keep skilled workers in the labor market.⁵⁴

Objectives The relevance of social support in the car industry is mainly related to the financing of training. Therefore, the objectives illustrated for training aid in paragraph 3.4 are relevant. Furthermore, the ESF funds can be used to ease the effects of the restructuring process in the European car industry or the EGF funds can be used to respond to an emergency or crisis situation, and may thus be rather driven by equity considerations, especially if those funds are used to alleviate the social consequences of plant closures.

Incentive effects/crowding out Since the social support in the car industry is mainly related to the financing of training, the incentive effects illustrated for training aid in paragraph 3.4 are relevant.

Given the limited amounts granted by the European social funds to the car sector, the critique illustrated in paragraph 3.2 for aid granted under the GBER applies. Limited amounts of aid can be insufficient to effectively address relevant market failures, and may encourage the wasteful use of public funds.

Distortions of competition and trade The relevance of social support in the car industry is mainly related to the financing of training. Therefore, the distortions of competition

Fund, 2006 O.J. L 406/1.

⁵³Communication from the Commission - "Responding to the crisis in the European automotive industry" COM/2009/0104 final (hereinafter *Car Communication*).

⁵⁴Regulation (EC) No. 546/2009 of the European Parliament and of the Council of 18 June 2009 amending Regulation (EC) No. 1927/2006 on establishing the European Globalisation Adjustment Fund, 2009 O.J. L 167/26.

and trade illustrated for training aid in paragraph 3.4 are relevant.

In general, distortions of competition are moderate given the limited amounts. But a word of caution is warranted on the statement of the Commission, who proposes these instruments “*to retain jobs and combat unemployment in the automotive industry*”.⁵⁵ As underlined by Sturgeon and Van Biesebroeck (2009), there is no reason to maintain employment in a single industry. Falling unemployment in the automotive industry is also the expression of competitive dynamics. The Commission should help automotive workers to find jobs in other sectors rather than support a specific one. However, this critique is mainly true for some ESF projects, whereas the EGF financing and part of the ESF financing are totally aimed at re-training workers and helping them to find new employment.

3.10 Support granted through scrapping schemes

Legislation Scrapping schemes are government programs to promote the replacement of old vehicles with new and more environmentally friendly ones. The Car Communication - Annex 3, Guidance on scrapping schemes for vehicles, summarizes the policy of the European Commission towards scrapping schemes.

Scrapping schemes do not raise state aid concerns as long as they are non-discriminatory, i.e. open to all undertakings active in a member state. In practice, these schemes should avoid favoring only the sale of vehicles of domestic manufacturers by including, for example, car characteristics which could discriminate against similar cars coming from other member states. Moreover, the schemes should be compatible with the relevant Community legislation, in particular concerning type-approval of vehicles which requires, at present, Euro IV emission limit values.⁵⁶ As such, they are not subject to notification requirements to the Commission with regard to state aid. However, since scrapping schemes are based on technical specifications, as they encourage compliance of vehicles with certain technical specifications (such as CO₂ emissions or Euro IV emission limits), they have to be notified at draft stage to the Commission.⁵⁷ The Commission has the right to issue comments on the technical specifications where fiscal or financial incentives can potentially hinder trade in the internal market. However, there is no formal compatibility assessment of the scrapping schemes and no official decision of the Commission is published.

⁵⁵Car Communication, supra note 53, art. 2(d).

⁵⁶Commission Directive 2002/80/EC of 3 October 2002 adapting to technical progress Council Directive 70/220/EEC relating to measures to be taken against air pollution by emissions from motor vehicles, 2002 O.J. L 291/20.

⁵⁷Directive 98/34/EC of the European Parliament and of the Council of 22 June 1998 laying down a procedure for the provision of information in the field of technical standards and regulations, O.J. L 204/37.

Relevance to the car sector Many European countries have introduced large-scale scrapping programs as an economic stimulus to increase market demand for the car sector during the crisis. Scrapping programs have been formulated in a variety of ways. In Europe, they are mostly cash-for-replacement schemes, which require the replacement of an old vehicle with a new one (or an old but more environmentally-friendly one) to be eligible for the subsidies, but with different conditions on the duration of the program, the size of the incentive, the form of incentive (tax rebates, price discounts etc.), the age of the old vehicle to be scrapped, and the environmental requirements of the new vehicles. Several countries introduced schemes before the crisis, mainly with an environmental objective.

Objectives Scrapping schemes have a general objective of stimulating demand for vehicles to support the automobile industry, especially in the crisis that was accompanied by the worsening of confidence and degradation of households' access to finance. The introduction of schemes can pursue efficiency objectives, such as avoiding loss of regional spillovers and unemployment due to imperfect factor mobility.

Support for the car demand can also have a macroeconomic objective of fostering aggregate demand (Sturgeon and Van Biesebroeck, 2009). Due to its strong linkages with other parts of the economy and the overall importance for consumer and business confidence, the final impact of a shock in the car industry on the broader economy is considerable. The argument is that if public support helps alleviate the impact of that shock on the car industry, then aggregate demand will benefit from that as well.

Since scrapping schemes aim to remove inefficient, high emission vehicles from circulation, they have another efficiency objective, in particular with regard to the over-provision of a negative externality such as pollution.

Incentive effects/crowding out Different types of incentive effects are relevant for scrapping schemes. First, windfall profits arise when a consumer correctly anticipates the introduction of a scrapping program and delays the purchase of a vehicle that he would have bought anyway.

Second, scrapping schemes can result in an inter-temporal trade-off or substitution effect, which arises when a scrapping incentive induces sales of vehicles that would otherwise have occurred in the near future: i.e. car sales today at the expense of car sales in the future (European Commission, 2009 and Cooper et al., 2010). A consequence of this effect is the sharp decrease in sales following the expiry of the scheme. Both Adda and Cooper (2000) and Schiraldi (2011) find that the scrapping policies boost sales of new cars in the short-run, where bigger demand expansions in the short-run result in larger demand contractions in

the long-run.

Finally, scrapping schemes can crowd out demand for other durable goods. Higher car purchases can come at the expense of other products' purchases, especially of durable ones, such as furniture or electrical equipment, or used vehicles (European Commission, 2009). For example, in Germany, many people who traditionally opted to drive a used car, under the scrapping scheme purchased a new car for the first time (ACEA, 2010).

The presence of all these effects complicates the assessment of the effectiveness of scrapping schemes. The potential crowding out effects may offset the macroeconomic benefits of the scrapping incentives for cars.

Distortions of competition and trade Scrapping schemes can cause distortions of competition and trade. First, scrapping schemes can support inefficient production, by favoring inefficient car producers that produce small-sized cars that happen to comply with the environmental conditions linked to those incentives or generally benefit from those incentives if they produce low-priced small cars.

Furthermore, scrapping schemes can impact trade flows and distort location decisions. In particular, scrapping schemes are only attractive to certain models manufactured by a car producer and factor mobility across plants is limited. Thus, scrapping programs may result in uneven plant utilization. Some plants may be obliged to allocate workers on short-time working schemes, while other plants may have use overtime to meet the increased demand, as reported by Eurofound (2010) and by the carmakers themselves.⁵⁸ If scrapping schemes are *de facto* selective, they can cause subsidy competitions among countries, where each country designs the environmental conditions linked to those incentives (e.g. in terms of CO₂ emissions) to favor domestic producers over foreign ones.

4 Quantification of public support granted to the European car industry

4.1 Quantification challenges

We aim to quantify public support granted to the European car industry over the past decade. Ideally, we would like to estimate the state aid element, namely “the ultimate financial benefit contained in the nominal amount transferred to the beneficiary” for each instrument of public support.⁵⁹ We would then sum those aid elements up to obtain an

⁵⁸<http://www.fiatgroupreport.com/2009/bilancio.php?lang=en>

⁵⁹See Scoreboard - Conceptual and methodological remarks: [conceptual_remarks.html](#)

overall quantification of state aid granted to the European car industry. After that, we could examine the dynamics of state aid at country and company level: in particular, we could check both which countries tend to grant more aid and which car producers benefit more relative to the others. However, such a quantification exercise is challenging in practice for three major reasons:

1. *the degree of scrutiny of public support by the Commission.*

The availability of information on the state aid element of public support is dependent on whether a public support measure is scrutinized by the Commission or not. Public support that entails state aid according to article 107(1) of the TFEU raises competition policy concerns, and is subject to the state aid control by the Commission. The aid element is typically quantified and published by the Commission. But public support that does not entail state aid is not formally assessed by the Commission: The aid element is not quantified. The information on the nominal amounts of non-state aid support needs to be collected from the respective authorities that are responsible for the management of public funds. For instance, for the loans of the European Investment Bank, which are subject only to the opinion of the Commission that is not published, one needs to resort on the (scarce) information provided by the bank itself.

2. *procedural aspects linked to the instrument of support (denominated Case Type in the state aid register).*⁶⁰

As described in paragraph 2.2.3, aid can be granted in the form of schemes, which are open to all firms of one or multiple sectors that meet certain requirements, or directly to individual companies (*ad hoc* aid). For *ad hoc* aid the aid element is quantified in the decisions of the Commission, while for schemes the extent of publicly available information on the aid element varies.

We distinguish three types of schemes: (i) schemes that fall under the GBER, (ii) schemes exceeding the GBER aid thresholds, and (iii) schemes approved under the Temporary Framework. Schemes that fall under the GBER are not notified to the Commission: the aid element is not quantified. Schemes exceeding the GBER aid thresholds are notified and scrutinized by the Commission. The decision is published in the state aid register. The Commission does not usually quantify the aid element but reports the total budget of the scheme. The information on whether the budget has been exhausted or not is not published. Schemes approved under the Temporary Framework often do not even contain information on the total budget.

⁶⁰http://ec.europa.eu/competition/elojade/isef/index.cfm?clear=1&policy_area_id=3

Schemes can serve as a basis for granting aid to individual firms. Normally this aid is not individually notified. The names of individual aid recipients under a scheme are not known *a priori*. They become publicly known in three cases. First, when the scheme contains the requirement that individual aid needs to be notified or when the planned amounts of aid for individual projects exceed the thresholds specified in the scheme, then the aid is individually notified to the Commission. Individual state aid decisions are published in the state aid register of the Commission under the denomination of “individual application”. Second, the Commission has introduced a “Transparency system” under which member states submit information to the Commission *ex post* on large state aids (not individually notified) granted to individual companies under regional and R&D&I schemes. The Commission publishes this information on its webpage in a separate register.⁶¹ Third, the information on individual aid beneficiaries under the approved schemes can be followed from the reports of the European Commission or other publicly available sources, as in the case of the Temporary Framework.

A distinction should be made between planned and actual aid amounts. The decisions of the Commission (regarding *ad hoc* aid and schemes) are always published in the state aid register and contain the planned amount of aid that the Commission authorizes. The planned amount may differ from the actual amount awarded to the companies by the member state. But the register of the “Transparency system” (regional and R&D&I schemes) reports the actual aid amount. Note that the state aid register and the register of the “Transparency system” give information on different cases of state aid: the extent and the direction of the difference between the planned and actual aid amounts cannot be inferred from the available information. Finally, member states submit annual reports to the Commission, in which they report on the actual aid expenditure. The Commission uses the information in those reports to analyze the state aid evolution in the Scoreboard reports.⁶² The information contained in the Scoreboard is too aggregate (it is not published at industry level) and cannot be used in our quantification exercise.

3. *the form of state aid (denominated Aid Instrument in the state aid register).*⁶³

The aid element depends on whether the aid is granted in the form of grant, soft loan or guarantee. The Commission adopts the following set of assumptions to quantify the

⁶¹For regional aid: state_aid/register. For R&D&I projects: transparency.pdf

⁶²See for instance Commission Staff Working Document - Facts and Figures on State aid in the Member States - Accompanying the Report from the Commission State Aid Scoreboard - Autumn 2010 Update (COM(2010) 701 final).

⁶³http://ec.europa.eu/competition/elojade/isef/index.cfm?clear=1&policy_area_id=3

aid element for each form of state aid.⁶⁴

- grants: the aid element is equal to the nominal amount of aid granted. The same holds for debt write-offs, reduction of social security contributions, tax allowance and interest subsidies;
- soft loans, i.e. loans applied at advantageous conditions: the aid element is equal to the interest saved by the recipient during the period for which the loan is granted;
- guarantees: the aid element is lower than the nominal amount guaranteed. It is calculated as the difference between the market price of the guarantee and its reduced price. The aid is granted when a guarantee is given and not when the guarantee is invoked.⁶⁵

In conclusion, the aid element is quantified in the following cases: (i) *ad hoc* aid (planned amount); (ii) individual applications within a scheme (planned amount); (iii) cases falling under the “Transparency system” (actual amount). When the aid element is quantified, we use the estimate of the Commission, but when the aid element is not quantified by the Commission, we adopt a set of assumptions that follows as closely as possible the practice of the Commission. The next paragraph discusses these assumptions.

4.2 Quantification assumptions

For the quantification of state aid support to the European car industry, we adopt the following set of assumptions to recover the aid element.

Assumption 1 We treat *ad hoc* aid and schemes in different ways. We cover all cases of *ad hoc* aid (granted with different instruments and forms) because the aid element is consistently estimated. In contrast, we treat schemes separately and we cover them in our quantification in three instances: (i) when there is an individual application of state aid under the approved scheme and the respective state aid decision is published in the register of the Commission under the denomination of “individual application”, (ii) when the aid amounts, granted under the approved schemes, are published under the “Transparency system” of the Commission, and (iii) when the aid amounts can be followed from the Commission’s reports published *ex post* (especially in relation to the aid granted under the schemes of the Temporary Framework). In all other circumstances schemes are not covered in the quantification.

⁶⁴See Scoreboard - Conceptual and methodological remarks at [conceptual_remarks.html](#)

⁶⁵Commission Notice on the application of Articles 87 and 88 of the EC Treaty to State aid in the form of guarantees, 2008 O.J. C 155/10.

Assumption 2 We report the planned and actual aid amounts separately. The planned amounts are based on the state aid decisions reported in the register of the Commission. The actual amounts are published under the “Transparency system” or in the reports of the Commission.

Assumption 3 If the information on the aid element in the case of subsidized loans or subsidized state guarantees is not available, we follow the practice of the Commission in this respect when the aid element is not provided by a member state in its annual report on aid expenditure to the Commission: (i) in case of soft loans, we take 15% of the total amount of the loan as a proxy for the aid element, (ii) in case of subsidized state guarantees, we estimate the aid element to be 10% of the nominal value guaranteed.⁶⁶

If the soft loan was not repaid, we take the aid element to be equal to the amount of that loan (e.g. in the case of rescue aid to MG Rover in 2005).

Assumption 4 State aid can be granted for a project with multiple objectives (e.g. aid to finance regional investment and aid to finance training). In some cases the aid decision contains separate information on the amount of state aid granted for each objective. In other cases, when the information is not available, we refer the aid amount to the aid instrument based on the primary horizontal legislation under which the aid compatibility is assessed (e.g. regional aid if the primary legislative text used to assess the aid compatibility are Regional aid Guidelines, or training aid if the primary legislative text to assess the aid compatibility is the Training aid Communication).

Assumption 5 In cases where a state aid decision takes up several years, we attribute the aid to the year of the Commission’s final decision.

Assumption 6 When the aid is paid in installments, the Commission requires that data on the aid amounts are presented in the net present value at the moment when the aid was granted and calculated before any deduction of tax or other charge. We also express the aid amounts as gross grant equivalent in present value.

For the schemes approved under the Temporary Framework, the aid amounts are not notified individually, so there is no economic assessment by the Commission. The information on the actual aid granted under the Framework can only be followed from the reports of the Commission published *ex post*. Such reports usually state the amounts in nominal value. If the public authorities transfer the aid amount to the bank account of the beneficiary on

⁶⁶Scoreboard - Conceptual and methodological remarks: [conceptual_remarks.html](#)

Table 2: Quantification assumptions for state aid support

Assumption 1	Cover <i>ad hoc</i> aid and no schemes unless individual applications of aid, “Transparency system” or Commission’s reports
Assumption 2	Report actual and planned aid amounts separately
Assumption 3	Report the aid element based on Commission’s assumptions for various instruments of state aid
Assumption 4	Split up aids for the same project based on the primary regulation under which economic compatibility of the aid is assessed
Assumption 5	Attribute the aid to the year of Commission’s final decision
Assumption 6	Report the aid as gross grant equivalent in present value

Source: own assumptions following the practice of the European Commission.

the first day following the decision of the Commission, the nominal amount is identical to the net present value. Since in cases of individual aids granted under the Framework the Commission did not publish any decision and all the loans were granted at once, we assume that the nominal and net present values of such aid are equal.

Table 2 summarizes the quantification assumptions related to the state aid support. These general assumptions will be better circumstantiated for each type of state aid support if necessary.

With regard to non-state aid support, we state the total amount of public support that has been granted. In the case of EIB loans, we report the nominal amounts of loans signed by the Bank. In cases of social public support, we report the nominal amount of the support approved by the respective social funds, i.e. either the ESF or the EGF. In cases of scrapping schemes, we report the total amount of government budget for scrapping incentives.

Our quantification exercise covers nine Western European countries with a sizable automotive industry, namely Belgium, France, Germany, Italy, the Netherlands, Portugal, Spain, Sweden and the United Kingdom for the period 2000-2011.⁶⁷

For each type of public support, we describe the data sources, we quantify the amount of the aid element based on our assumptions, or state the overall amount of public support

⁶⁷We consider nine countries in our analysis, but in the tables we refer only to the countries for which we find decisions in the state aid register of the Commission, or information reported under the “Transparency system” of the Commission, or information on other types of public support from various sources discussed below.

Table 3: Aid granted under the GBER

Year		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Tot.
Country	Firm	€mil.	€mil.	€mil.	€mil.	€mil.	€mil.	€mil.	€mil.	€mil.	€mil.	€mil.	€mil.	€mil.
Spain	Ford										3.80			3.80
Tot. Spain											3.80			3.80
Per production (€)											1.76			0.12
Tot. by year											3.80			3.80
Per production (€)											0.33			0.02

Source: State aid register. This table reports the quantification of the aid element granted under the GBER related to the car sector for the period 2000-2011 in Belgium, France, Germany, Italy, the Netherlands, Portugal, Spain, Sweden and the United Kingdom. Amounts are expressed as gross grant equivalent in present value and relative to the units of production.

granted, and we analyze the results. Following this, we give a summary of overall findings as related to the estimates of total state aid granted to the European car producers, and an overview of public support instruments granted at country level.

4.3 Aid granted under the General Block Exemption Regulation

Sources State aid register and the “Transparency system” for regional investment projects and for R&D&I projects.⁶⁸

Analysis *Ad hoc* aid amounts and schemes that fall under the GBER are not notified to the Commission. It is only required that member states submit a summary description of the aid measure after its implementation. In the state aid register we identify several schemes under the GBER that are relevant to the car industry. The largest of those schemes is State aid No. X 59/2009 - Plan de Competitividad Sector Automocion in Spain, with an overall budget of €800 million. We found only one ad hoc aid relevant to the European car industry approved under the GBER in the state aid register (granted with a regional objective). Table 3 reports both the gross grant equivalent in present value for this aid case and the amount relative to total production. Several training aid cases that fall under the Training Block Exemption, which is part of the GBER, are published in the state aid register. We consider those cases together with other training aid cases in paragraph 4.5.

Apart from this *ad hoc* regional aid case approved under the GBER and training aid cases approved under the Training Block Exemption that are published in the state aid register, further information related to the GBER is published under the “Transparency system” of the Commission as specified in article 9(4) of the GBER. The article states that member states have to provide summary information (i) on R&D&I aid whenever it

⁶⁸ Available at http://ec.europa.eu/competition/state_aid/register/.

is granted under an existing aid scheme for R&D&I projects covered by article 31 of the GBER and the individual aid exceeds €3 million and (ii) on regional aid whenever individual regional aid is granted under an existing scheme for large investment projects that are not notified individually according to article 6 of the GBER. We identified several cases of aid granted under the GBER schemes with regional and R&D&I objectives published under the “Transparency system”. We treat those cases together with regional aid granted under the Regional aid Guidelines and R&D&I aid granted under the R&D&I Framework that are published under the “Transparency system” analyzed in paragraph 4.4 and in paragraph 4.6, respectively.

4.4 Aid granted under the Regional aid Guidelines

Sources State aid register and the “Transparency system” for regional investment projects. The “Transparency system” database is related to large investment projects granted under a scheme for which the individual notification is not required. Member states need to provide the information on these projects to the Commission under point 65 of the Regional aid Guidelines and under article 9(4) of the GBER. This database has been available since 2003.

The regional aid amounts published in the state aid register are usually expressed as gross grant equivalent in present value. Whenever the information is available only in nominal value, we transform those nominal values into present values using the average discount rate calculated on the basis of the other regional aid cases.

The regional aid amounts published under the “Transparency system” are expressed as discounted net (after taxation) grant equivalent before 2007 and as discounted gross (before taxation) grant equivalent after 2007. To convert those aid amounts from net to gross values, we assume that only corporate tax is paid on the aid granted, and use the average corporate tax for each country for our transformations. We also assume that the aid is fully subject to taxation in the year it is authorized.

Analysis We analyze the regional aid amounts published in the state aid register and under the “Transparency system” separately, since they report planned and actual aid amounts, respectively.

Table 4 reports both the gross grant equivalent in present value by country and year and the amount relative to total production by country and year for regional aid published in the state aid register. We analyze the figures over time and across countries and companies.

Over time, regional aid has declined. Most regional aid was granted in 2001 and 2002. This aid instrument was not used extensively during the last financial and economic crisis.

At country level, Germany is the largest granter of state aid. That is driven by a few large investment projects in 2001 and 2002. These projects are related to (i) BMW for the construction of a new car plant in Leipzig in 2002; (ii) Daimler for the establishment of a new greenfield engine production plant in Köllda; (iii) VW for the production of a future D1-model in a new car plant in Dresden. All those investment projects are located in East Germany. Italy is the second largest aid granter in absolute terms and the largest granter of state aid relative to production. Aid is most frequently granted to the domestic company Fiat.

At company level, BMW has been the largest beneficiary of regional aid for the Leipzig project, for which it received a loan from the EIB as well.

Table 5 reports both the gross grant equivalent in present value by country and year and the amount relative to total production by country and year for regional aid published under the “Transparency system”.

Over time, regional aid reported in the register of the “Transparency system” has also had a declining trend.

At country level, Spain has been the largest granter of regional aid since 2003, followed by Italy and Portugal. Spain has frequently granted aid to foreign car producers, especially to Peugeot and Renault. Relative to the size of production, Portugal has granted most regional aid, specifically to VW.

At company level, Renault, Fiat and VW are the largest beneficiaries of regional aid over time.

Overall, based on both tables, note that GM Europe and Ford have received regional aid in multiple European locations. Peugeot and Renault tend to receive more aid at their foreign locations (mostly in Spain) than at home. VW receives aid both at home and abroad, namely in Portugal. Fiat gets aid only domestically. There is no clear evidence that European governments favor only domestic car producers. Governments support foreign car producers as well, most probably to influence their location choice and generate employment for weak or underperforming economic regions.

4.5 Aid granted under the Training aid Communication

Sources State aid register.

Analysis Table 6 reports both the gross grant equivalent in present value by country and year and the amount relative to total production by country and year.

The biggest amount of training aid was approved in 2003, when the Commission autho-

Table 4: Aid granted under the Regional aid Guidelines

Year	Firm	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Tot.
Country		€mil.	€mil.	€mil.	€mil.	€mil.	€mil.	€mil.	€mil.	€mil.	€mil.	€mil.	€mil.	€mil.
Belgium	Ford			53.52										53.52
Tot. Belgium				53.52										53.52
Per production (€)				60.90										5.80
France	Fiat		3.72											3.72
	Peugeot		3.72											3.72
Tot. France			7.45											7.45
Per production (€)			2.04											0.22
Germany	BMW		484.18											484.18
	Daimler		76.29											76.29
	VW		98.84											98.84
Tot. Germany			175.13	484.18										659.32
Per production (€)			34.78	98.76										11.68
Italy	Fiat	36.95	46.59							37.35	15.82			136.72
	Tomaso						106.37							106.37
Tot. Italy		36.95	46.59				106.37			37.35	15.82			243.08
Per production (€)		21.71	30.37				106.89			45.71	19.80			18.70
Portugal	Opel		40.59											40.59
Tot. Portugal			40.59											40.59
Per production (€)			164.10											17.95
Spain	Ford		14.44							51.91		23.46		89.82
	Opel						7.40							7.40
	Renault		23.88											23.88
	Santana		8.83											8.83
	VW				25.00									25.00
Tot. Spain		8.83	38.32	25.00			7.40			51.91		23.46		154.92
Per production (€)		3.19	13.86	8.56			2.77			24.05		9.86		4.86
UK	Jaguar											27.91		27.91
	Nissan	9.09	72.36											81.45
	Peugeot							26.54						26.54
	Vauxhall			19.57										19.57
Tot. UK		9.09	72.36	19.57				26.54				27.91		155.48
Per production (€)		5.10	43.51	10.90				14.46						
Tot. by year		46.04	302.92	590.12	78.52	26.54	106.37	7.40		89.27	15.82	51.37		1,314.36
Per production (€)		2.86	18.68	36.83	4.94	1.67	6.85	0.49		7.66	1.22	3.95		7.37

Source: State aid register. This table reports the quantification of the aid element granted under the Regional aid Guidelines related to the car sector for the period 2000-2011 in Belgium, France, Germany, Italy, the Netherlands, Portugal, Spain, Sweden and the United Kingdom. Amounts are expressed as gross grant equivalent in present value and relative to the units of production.

Table 5: Regional aid reported under the Transparency system

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Tot.
Country	Firm	€mil.	€mil.	€mil.	€mil.	€mil.	€mil.	€mil.	€mil.	€mil.	€mil.	€mil.	€mil.
France	Renault								3.00	1.15			4.15
Tot. France									3.00	1.15			4.15
Per production (€)									1.19	0.57			0.12
Germany	BMW									6.25	6.25		12.50
	Ford								11.12				11.12
	Opel										20.02		20.02
Tot. Germany									11.12	6.25	6.25	20.02	43.64
Per production (€)									2.05	1.30	1.16	3.72	0.71
Italy	Fiat				116.81		26.78						143.59
Tot. Italy					116.81		26.78						143.59
Per production (€)					106.28		22.97						11.05
Portugal	VW		79.82				51.29						131.11
Tot. Portugal			79.82				51.29						131.11
Per production (€)			336.86				232.10						57.99
Spain	Ford				47.62								47.62
	Nissan						14.11						14.11
	Peugeot				25.27	25.27							75.80
	Renault				78.00	44.04	58.62				35.89		275.66
	VW						12.71						12.71
Tot. Spain			78.00	116.93	83.88	111.20					35.89		425.90
Per production (€)			26.70	40.05	31.68	41.68					15.09		13.35
UK	BMW						6.19						6.19
	Ford				9.08	45.36			15.35				69.79
	Nissan					9.00							9.00
	Vauxhall						12.59						12.59
Tot. UK					9.08	54.36	18.78		15.35				97.56
Per production (€)					4.95	30.53	11.58		9.48				5.39
Tot. by year			157.82	242.82	138.25	208.04			29.47	7.40	42.14	20.02	845.96
Per production (€)			9.92	15.29	8.90	13.66			2.08	0.63	3.24	1.54	4.74

Source: "Transparency system" for large regional investment projects. This table reports the quantification of the aid element granted under the Regional aid Guidelines and GBER related to the car sector for the period 2000-2011 in Belgium, France, Germany, Italy, the Netherlands, Portugal, Spain, Sweden and the United Kingdom. Amounts are expressed as gross grant equivalent in present value and relative to the units of production.

rized several training aid cases. No training aid was approved in 2009 or 2010. There may be several reasons for the decreasing trend in training aid granted to the car industry. First, it may be linked to the stricter approach of the Commission towards granting training aid to the car sector because of its side effects, as discussed in paragraph 3.4. Second, this instrument may not have been attractive to the European governments for tackling the emergency of the economic situation during the crisis because of the formal control of training aid by the Commission and related long-lasting substantial assessment procedures.

At country level, both in nominal terms and relative to production, Italy is a major granter of training aid, followed by Belgium and the United Kingdom. The case of Belgium is interesting because the country does not have any domestic car production. The granting of aid to the foreign car producers may be motivated by employment issues.

At company level, the biggest share of training aid has been granted to (i) Fiat in Italy; (ii) Ford and GM Europe at various European locations.

4.6 Aid granted under the Research and Development and Investment Framework

Sources The “Transparency system” for R&D&I projects. The “Transparency system“ is related to R&D&I investment projects over €3 million, which are granted on the basis of existing aid schemes. Member states are required to provide the information on these projects to the Commission under article 10.1.3 of the R&D&I Framework. This information has been published since 2007.

Analysis Table 7 reports both the gross grant equivalent in present value by country and year and the amount relative to total production by country and year. Several relevant projects have been approved in Germany and Sweden. Those projects range from €3 million to €10 million in value. All the projects are aimed at the production of cleaner vehicles. There are no *ad hoc* R&D&I cases granted to the car producers published in the state aid register in the period between 2000 and 2011.

Given the scarcity of the available information, we cannot perform an evaluation over time or across countries. One may only argue that the R&D&I aid instrument is not extensively used by the car producers, largely due to the reasons discussed in paragraph 3.5.

4.7 Aid granted under the Rescue and Restructuring Guidelines

Sources State aid register.

Table 6: Aid granted under the Training aid Communication

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Tot.
Country	Firm	€mil.	€mil.	€mil.	€mil.	€mil.	€mil.	€mil.	€mil.	€mil.	€mil.	€mil.	€mil.
Belgium	Ford	6.84					5.55		1.54				13.93
	Opel			13.04				1.94					14.98
	Volvo			5.80					3.15				8.95
Tot. Belgium		6.84		18.84			5.55	1.94	4.69				37.86
	Per production (€)	5.90		21.43			6.30	2.46	6.89				4.10
France	Matra			1.25									1.25
Tot. France				1.25									1.25
Per production (€)				0.35									0.04
Germany	BMW			0.45									0.45
Tot. Germany				0.45									0.45
Per production (€)				0.09									0.01
Italy	Fiat			34.03	4.57			21.25					59.85
	Tomaso											17.09	17.09
Tot. Italy				34.03	4.57			21.25				17.09	76.94
Per production (€)				26.59	4.16			17.13				21.39	5.58
Portugal	Opel												2.65
Tot. Portugal													2.65
Per production (€)													1.17
UK	Ford						14.22						14.22
	Nissan								0.11				0.11
Rover													12.88
Toyota									0.06				0.06
Vauxhall									9.82				9.82
Tot. UK									9.99				37.09
Per production (€)									6.17				2.05
Tot. by year		19.72	2.65	54.57	4.57	14.22	5.55	23.19	14.68			17.09	156.24
Per production (€)		1.22	0.17	3.43	0.29	0.92	0.36	1.48	1.04			1.32	0.88

Source: State aid register. This table reports the quantification of the aid element granted under the Training aid Communication related to the car sector for the period 2000-2011 in Belgium, France, Germany, Italy, the Netherlands, Portugal, Spain, Sweden and the United Kingdom. Amounts are expressed as gross grant equivalent in present value and relative to the units of production.

Table 7: Research and Development and Innovation aid reported under the Transparency system

Year		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Tot.
Country	Firm	€mil.	€mil.	€mil.	€mil.	€mil.	€mil.	€mil.	€mil.	€mil.	€mil.	€mil.	€mil.	€mil.
Germany	BMW											7.50		7.50
	Ford											4.70		4.70
	Daimler											12.20		12.20
	Opel										4.50			4.50
	VW										9.30	9.50		18.80
Tot. Germany											13.80	33.90		47.70
Per production (€)											2.87	6.29		0.77
Sweden	Saab											5.60		5.60
	Volvo											7.40		7.40
Tot. Sweden											7.40	5.60		13.00
Per production (€)											57.48	31.48		4.68
Tot. by year											21.20	39.50		60.70
Per production (€)											1.82	3.04		0.34

Source: “Transparency system” for R&D&I projects. This table reports the quantification of the aid element granted under the R&D&I Framework and GBER related to the car sector for the period 2000-2011 in Belgium, France, Germany, Italy, the Netherlands, Portugal, Spain, Sweden and the United Kingdom. Amounts are expressed as gross grant equivalent in present value and relative to the units of production.

Table 8: Aid granted under the Rescue and Restructuring Guidelines

Year		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Tot.
Country	Firm	€mil.	€mil.	€mil.	€mil.	€mil.	€mil.	€mil.	€mil.	€mil.	€mil.	€mil.	€mil.	€mil.
UK	Rover						6.50							6.50
Tot. UK							6.50							6.50
Per production (€)							3.65							0.33
Tot. by year							6.50							6.50
Per production (€)							3.65							0.33

Source: State aid register. This table reports the quantification of the aid element granted under the R&R Guidelines related to the car sector for the period 2000-2011 in Belgium, France, Germany, Italy, the Netherlands, Portugal, Spain, Sweden and the United Kingdom. Amounts are expressed as gross grant equivalent in present value and relative to the units of production.

Analysis Since 2000 there has been only one instance of aid granted under the R&R Guidelines, in the form of soft loan. This is the rescue loan to MG Rover, granted for one week at a fixed annual interest rate of 7.5%, which was higher than the reference rate for the United Kingdom of 5.81%. As stated in the state aid decision, the loan was not repaid and the United Kingdom had to communicate the liquidation plan. To the best of our knowledge the loan has not been paid back, so we report the loan amount to be equal to the state aid amount in Table 8.

4.8 Aid granted under the Temporary Framework

Sources State aid register and various reports of the European Commission.

The state aid register contains decisions on the general schemes notified by member states

to the Commission under the Temporary Framework and two cases of *ad hoc* state aid to car producers in Sweden. To collect information on individual aid granted under those approved schemes, we rely on the studies of the European Commission related to the application of the Temporary Framework (European Commission, 2009, European Commission, 2010, European Commission, 2011) and on the responses of member states to the questionnaire of the Commission on the application of the Temporary Framework.⁶⁹

Analysis In response to the last financial and economic crisis, European governments announced their intention to support domestic car industries either directly by approving car industry-targeted plans of support or by supporting their car industries within the broader plans to revive their national economies. The implementation of those plans included demand-side measures of public support (for example scrapping schemes and tax reductions), aid measures within the approved schemes under the horizontal aid legislation and aid measures within the approved schemes under the Temporary Framework. We inventory the relevant initiatives of the European governments that may have benefited car producers and point out both the approved general schemes and actual cases of individual state aid granted under the Temporary Framework for each country.

Belgium approved a general stimulus plan to revive the Belgian economy at the end of 2008.⁷⁰ It notified several schemes to the Commission under the Temporary Framework: guarantees, risk capital and export-credit insurance. Under the guarantees scheme the Flemish regional government approved a subsidized guarantee on the loan of ING Belgium to Volvo Cars Ghent plant equal to €198 million in 2010.⁷¹ The loan had a duration of five years, with the objective of securing investments and jobs in the Ghent car plant.

The French program, denominated “Le pacte automobile”, was approved in February 2009 and contained: (i) a subsidized loan amounting to €6.5 billion to the domestic car producers Peugeot and Renault and other car companies to deal with the financial and industrial crisis and promote the development of green products; (ii) a subsidized loan of €2 billion to the internal banks of Peugeot and Renault; (iii) guarantees and funds for automobile suppliers.⁷² France notified all schemes to the Commission under the Temporary Framework. The loans to Peugeot and Renault (each €3.0 billion) had a duration of 5 years with 6% interest rate during the first two years, which could be raised to 9% afterwards. In that period, the rather low credit rating of both companies (BB+) would have implied

⁶⁹http://ec.europa.eu/competition/consultations/2010_temporary_framework/index.html

⁷⁰http://www.belgium.be/nl/binaries/herstelplan_tcm117-29600.pdf

⁷¹<https://www.media.volvocars.com/global/enhanced/en-gb/media/preview.aspx?mediaid=35852>

⁷²<http://www.gouvernement.fr/gouvernement/le-pacte-automobile>

an interest rate of around 8% for a loan with the same duration in the financial market.⁷³ In return, the car companies were required to maintain their employment levels in France, invest in green technology and not close any assembly plant in France for the duration of the loan. Peugeot and Renault received the loans in April 2009 but had already repaid them by April 2011, possibly due to the fact that the level of remuneration required was quite high and constituted an incentive to exit (European Commission, 2011).

Support to the German car industry was included into the general economy stimulus programs of the German government, denominated “Konjunkturpaket I&II”, that were approved in December 2008 and February 2009, respectively.⁷⁴ Germany notified all schemes to the Commission under the Temporary Framework. In particular, Opel received a bridging loan of €1.5 billion for six months at a 6.5% interest rate in the context of the Temporary Framework (European Commission, 2011) after the US parent company General Motors had already filed for bankruptcy. In those circumstances, the market would have been very reluctant to provide a loan to Opel. The loan allowed Opel to develop a restructuring plan. Eventually, Opel repaid the loan in November 2009.

The Italian plan to support the car industry as of February 2009 was included in a more general plan to support industrial sectors, denominated “Misure urgenti a sostegno dei settori industriali in crisi”. As related to the car industry, the plan included the introduction of a scrapping scheme to stimulate the demand for cars.⁷⁵ Italy notified all possible schemes to the Commission under the Temporary Framework, with the exception of the export-credit insurance scheme. Fiat did not benefit from any specific measures under the Temporary Framework.

The budget of the Spanish automotive competitiveness plan, denominated “Plan de competitividad sector automoción”, made up €800 million to support the optimization of production processes or reorientation of production in the car industry. That plan was officially approved by the European Commission under the GBER in 2009. Under the plan, Seat received a €100.7 million grant to build a new Audi model in Spain (Eurofound, 2009). That plan and the fleet renewal scheme Plan VIVE were part of the more general plan of the Spanish government announced at the beginning of 2009, namely “Comprehensive Plan Automotive”.⁷⁶ Spain notified three schemes to the Commission under the Temporary Framework: limited amounts of aid, guarantees and subsidized loans for green products.

During the financial and economic crisis, the Swedish government approved a series of

⁷³Source: fair value corporate curve (Industrial) by Bloomberg.

⁷⁴<http://www.bundesregierung.de>

⁷⁵<http://www.parlamento.it/parlam/leggi/090331.htm>

⁷⁶The Comprehensive Plan Automotive has been approved within the set of policies approved under the Spanish Plan to Stimulate the Economy and Employment (<http://www.sepe.es/>).

measures to support the automobile industry for the amount of €2.65 billion in the form of increased investment in research and development, rescue loans and state credit guarantees for raising EIB loans.⁷⁷ No scheme was notified to the Commission under the Temporary Framework except for the export-credit insurance scheme. The Swedish government issued two subsidized state guarantees on the EIB loans to Volvo and Saab that were notified to the Commission individually under the Temporary Framework.⁷⁸ The guarantees raised criticisms: they were issued to firms that had not been profitable for years (Saab) or had been only marginally profitable (Volvo).

The UK “Automotive Assistance Programme” was approved in 2009 and envisaged a package of £2 billion of loans and guarantees to the automotive industry. The measures included guarantees to unlock up to £1.3 billion of the EIB loans for investment in lower carbon initiatives and loans or loan guarantees to support up to £1 billion of lending for other projects related to lower carbon initiatives. In particular, Jaguar Land Rover received an EIB loan for R&D which was part of the “Automotive Assistance Package” (Eurofound, 2009). The UK notified three schemes to the Commission under the Temporary Framework: limited amounts of aid, subsidized interest rates and subsidized loans for green products.

Finally, in November 2008 the Dutch government approved a general stimulus package to support the national economy. Two schemes were notified to the Commission under the Temporary Framework: limited amounts of aid and export-credit insurance. In December 2008 Portugal approved a general stimulus package to support its national economy. One scheme related to limited amounts of aid was notified to the Commission under the Temporary Framework.⁷⁹ But in both countries we have not individuated any aid granted to car producers under those schemes.

Table 9 reports both the gross grant equivalent in nominal value by country and year and the amount relative to total production by country and year. Only Belgium, France, Germany and Sweden used the Temporary Framework to support their car industries. Although some schemes in Italy, Spain and the United Kingdom clearly targeted the car sectors, they were not used in practice by those member states. To calculate the aid element for subsidized loans and state guarantees, we used the assumptions stated in paragraph 4.2. For the Swedish state guarantees case, we used the information on market and subsidized premia from the two state aid decisions of the Commission on Volvo and Saab. Based on all the assumptions, the total state aid to the European car producers granted under the Temporary Framework amounts to €1.2 billion.

⁷⁷<http://www.livemint.com>

⁷⁸Supra note 41.

⁷⁹Those plans are mentioned in <http://www.sefalliance.org>

Table 9: Aid granted under the Temporary Framework

Year		Related scheme	Subsidised loans/ guarantees	Aid element			Tot.
Country	Firm		€mil.	2009 €mil.	2010 €mil.	2011 €mil.	€mil.
Belgium	Volvo	Guarantees	198.00		19.80		19.80
Tot. Belgium					19.80		19.80
Per production (€)					38.10		2.03
France	Peugeot	Green products	3,000.00	450.00			450.00
	Renault	Green products	3,000.00	450.00			450.00
Tot. France				900.00			900.00
Per production (€)				444.71			24.83
Germany	Opel	Subsidised loans	1,500.00	225.00			225.00
Tot. Germany				225.00			225.00
Per production (€)				46.86			3.64
Sweden	Saab	Guarantees	400.00		29.00		29.00
	Volvo	Guarantees	500.00		48.00		48.00
Tot. Sweden					77.00		77.00
Per production (€)					432.82		26.05
Tot. by year				1,125.00	96.80		1,221.80
Per production (€)				96.51	7.45		6.85

Source: State aid register, European Commission (2009), European Commission (2010), European Commission (2011). This table reports the quantification of the aid element granted under the Temporary Framework related to the car sector for the period 2000-2011 in Belgium, France, Germany, Italy, the Netherlands, Portugal, Spain, Sweden and the United Kingdom. Amounts are expressed as gross grant equivalent in nominal value and relative to the units of production.

4.9 Support granted by the European Investment Bank

Sources Project database of the EIB-financed projects.⁸⁰

Analysis Table 10 reports both the loans to the car industry approved by the EIB by country and year and the amount relative to total production by country and year. The EIB does not provide precise information on the interest rate applied to its loans. It can offer loans at or even below Euribor or LIBOR base rates (plus customized credit risk margins) on a long-term basis without commitment or structuring fees.⁸¹ The EIB loans are subject to the opinion of the Commission, but the substantial assessment of those projects is not published.

The amounts of loans granted by the EIB to the European car producers have been quite stable over time, with an average amount of €580 million per year until 2008. EIB loans are granted to car producers with regional and R&D&I purposes. During the last financial and economic crisis, an unprecedented amount of EIB loans were granted to the automotive industry. The loans may have encouraged companies to continue investing in a sustainable future, even during a period in which access to credit was very difficult. But the assessment criteria for the evaluation of these loans by the Commission are not disclosed: it is not possible to judge whether these funds effectively had an incentive effect and did not alter the competitive arena.

At company level, BMW got 26% of the EIB loans on a cumulative basis over the last decade, Ford Corporate (including its Jaguar Land Rover subsidiary during 2000-2008) received 19% and Daimler obtained 14%.

BMW in Germany has obtained the largest amount of the EIB loans in absolute terms. This is mainly due to a large loan granted by the EIB in 2002-2004 for the construction and fitting-out of a car manufacturing plant in Leipzig, Saxony. The project was also supported by the German government with regional aid. The EIB loans to the BMW plant were justified by regional motives, given the plant's location in a disadvantaged area for which European Structural Funds can be allocated. The loans to BMW in 2006-2008 were given with R&D&I and environmental motives, specifically for the development of hydrogen-powered passenger cars or for the general improvement of environmental sustainability of cars. Also in 2009 and 2010 the EIB granted loans to BMW under the ECTF facility to finance R&D&I projects. In 2011 BMW obtained EIB financing for the development of a complete system of components for hybridization of passenger vehicles' powertrains on existing sites in Germany.

Ford Motor Company, with its UK subsidiary Jaguar Land Rover, is the second largest

⁸⁰<http://www.eib.org/projects/loans/list/index.htm>

⁸¹<http://www.eib.org/infocentre/faq/index.htm>

loan recipient after BMW. Ford received EIB loans to finance R&D&I projects with environmental targets, such as the development of cleaner engines and the adaptation of plants to environmental standards. In 2004 Ford obtained an EIB loan to finance the program that should also support the UK automotive industry and contribute to the creation and maintenance of employment in the context of extensive restructuring and downsizing by most vehicle manufacturers during the past few years in the United Kingdom. Land Rover received support in 2003, also with regional motivations. Finally, Jaguar Land Rover received support in 2003 and 2006 for the development of two new versions of existing Land Rover models.

Daimler received around a third of the amount of the EIB loans granted to BMW. In particular, the EIB loan given to Daimler in 2001 was aimed at the production of a new generation of minivans in Ludwigsfelde, Brandenburg. The biggest portion of the EIB loans to Daimler was granted under the ECTF program. Those loans, authorized by the EIB in 2009 and 2010, were aimed at R&D financing to optimize fuel efficiency and reduce carbon dioxide emissions. In 2011 Daimler received an EIB loan for the R&D&I of the company's truck division to improve fuel consumption, reduce emissions and enhance overall efficiency of fleet.

4.10 Social public support granted by the European Social Fund and the European Globalisation Adjustment Fund

Sources The European Social Fund (ESF) and the European Globalisation Adjustment Fund (EGF) webpages and publications.^{82,83} We have not found any aid cases related to these funds requiring a separate notification and approval by the Commission in the state aid register.

Analysis Table 11 reports both the absolute amount of funds granted to the car industry under the EGF by country and year and the amount of funds relative to total production by country and year.

The EGF support has been granted to the car industry to ease the effects of major structural changes in world trade before the crisis or to alleviate the consequences of the last financial and economic crisis. In particular, applications for public support from the EGF increased in correspondence of the crisis. The Fund has been in operation since January 2007. The EGF provides support for active market labor policies, such as occupational

⁸²<http://ec.europa.eu/esf/>

⁸³<http://ec.europa.eu/social/main.jsp?catId=326&langId=en>

Table 10: EIB loans

Year		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Tot.
Country	Firm	€mil.	€mil.	€mil.	€mil.	€mil.	€mil.	€mil.	€mil.	€mil.	€mil.	€mil.	€mil.	€mil.
France	Peugeot		120.00				250.00				400.00	200.00		970.00
	Renault										400.00			400.00
	Toyota	225.00	65.00											290.00
Tot. France		225.00	185.00				250.00				800.00	200.00		1,660.00
Per production (€)		67.77	51.78				84.98				395.30	104.04		49.15
Germany	BMW		150.00	100.00	300.00	200.00		400.00	500.00	400.00	400.00	380.00	325.00	3,155.00
	Daimler		240.00								400.00	400.00	400.00	1,440.00
	VW									95.00	400.00			495.00
Tot. Germany		390.00	100.00	300.00	300.00	200.00		400.00	500.00	495.00	1,200.00	780.00	725.00	5,090.00
Per production (€)		77.44	20.40	61.09	39.86			75.89	88.96	91.15	249.94	140.48	130.57	89.93
Italy	Fiat										400.00		250.00	650.00
Tot. Italy											400.00		250.00	650.00
Per production (€)											489.46		436.17	50.89
Portugal	VW									155.00				155.00
Tot. Portugal										155.00				155.00
Per production (€)										924.82				69.69
Spain	Daimler		270.00		30.00									300.00
	Nissan										200.00			200.00
Tot. Spain			270.00		30.00						200.00			500.00
Per production (€)			97.64		10.27						92.64			17.21
Sweden	Volvo											500.00		500.00
	Saab											400.00		400.00
Tot. Sweden												900.00		900.00
Per production (€)											5,082.33			324.11
<i>UK</i>	<i>Ford</i>	<i>300.00</i>				<i>350.00</i>	<i>245.00</i>							<i>551.00</i>
	<i>Jaguar Land Rover</i>			<i>300.00</i>	<i>250.00</i>			<i>297.00</i>						
	Ford Corporate	300.00		300.00	250.00	350.00	245.00	297.00				551.00		2,293.00
	Jaguar Land Rover										391.00			391.00
	Nissan										200.00	220.00		420.00
Tot. UK		300.00		300.00	250.00	350.00	245.00	297.00			200.00	942.00	220.00	3,104.00
Per production (€)		168.44		167.03	137.02	190.72	137.58	183.24				741.47	173.17	172.50
Tot. by year		525.00	845.00	400.00	580.00	550.00	245.00	697.00	750.00	650.00	2,800.00	2,822.00	1,195.00	12,059.00
Per production (€)		32.56	52.10	24.97	36.47	34.63	15.77	45.75	47.91	45.93	240.19	238.40	100.95	73.29

Source: Project database of the EIB. This table reports the loans granted by the EIB related to the car sector for the period 2000-2011 in Belgium, France, Germany, Italy, the Netherlands, Portugal, Spain, Sweden and the United Kingdom. Loans are expressed in absolute value and relative to the units of production.

Table 11: Support granted under the European Globalisation Adjustment Fund

Country	Year	2007	2008	2009	2010	2011	Tot.
	Firm	€mil.		€mil.	€mil.	€mil.	€mil.
Belgium	GM					14.80	14.80
Tot. Belgium						14.80	14.80
Per production (€)						284.79	15.18
France	Renault					37.70	37.70
Tot. France						37.70	37.70
Per production (€)						17.13	1.04
Portugal	Lisboa-Alentejo	4.80					4.80
Tot. Portugal		4.80					4.80
Per production (€)		28.32					1.99
Spain	Cataluna				4.30		4.30
Tot. Spain					4.30		4.30
Per production (€)					1.81		0.13
Sweden	Volvo			15.10			15.10
Tot. Sweden				15.10			15.10
Per production (€)				117.29			5.11
Tot. by year		4.80		15.10	4.30	52.50	76.70
Per production (€)		0.31		1.30	0.33	4.04	0.43

Source: EGF webpage. This table reports the amount of public support under the EGF related to the car sector for the period 2007-2011 in Belgium, France, Germany, Italy, the Netherlands, Portugal, Spain, Sweden and the United Kingdom. Amounts are expressed in absolute value and relative to the units of production.

guidance and training. For instance, in 2009 the EGF issued a €9.8 million grant to help the 1,500 most disadvantaged workers to return to employment from three Volvo Car plants and 23 suppliers and customers.

Support granted under the ESF consists of two clearly-defined cases regarding the car industry in the ESF project database. The first project took place in Sweden in 2010 to finance a job-centre project aimed at helping employees to update their skills and making them more adjustable to the job market. This project of €1.8 million was co-funded together with Volvo Cars, AB Volvo and several suppliers. Another project of €225,000 supported Volvo plant in Belgium. Moreover, the ESF funds have been used to co-finance measures of requalification and training during short-time working in Germany (Eurofound, 2009), but the exact amount is not disclosed.⁸⁴

⁸⁴To collect more detailed information on the ESF projects, national authorities responsible for the management of the Structural Funds of the European Union need to be contacted, which has however not been feasible given the limited duration of our project.

4.11 Support granted through scrapping schemes

Sources The sources are the following: (i) France: the Ministry of Ecology, Sustainable Development, Transport and Housing⁸⁵, (ii) Germany: the German Federal Office of Economics and Export Control⁸⁶, (iii) United Kingdom: the UK Society of Motor Manufacturers and Traders⁸⁷.

Reports from Germany and the United Kingdom provide complete information on scrapping programs to assess the amount of public support granted to individual car producers. For France the information on scrapping schemes is fragmented, so the discussion will be more limited.

Other countries such as Italy, the Netherlands, Portugal, and Spain have approved the scrapping schemes as a response to the financial and economic crisis as well. In some countries scrapping schemes were in effect before the crisis (for instance in Italy, Portugal, Spain). Since there is no detailed information on those schemes, especially across car producers, we have to exclude those countries from the detailed analysis of scrapping programs.

Analysis Table 12 reports the absolute amount granted to the car industry under the scrapping schemes in Germany, France and the United Kingdom by country and year.

The German and UK reports contain the detailed information on the number of new vehicles purchased (and one-year old cars in case of Germany). We have multiplied those numbers on the new car purchases by the amount of the incentive - €2,500 in Germany and £ 1,000 in the United Kingdom - to calculate the total amounts of benefits in the form of scrapping consumer incentives to individual car producers.

The German scrapping scheme was the most generous in terms of government budget (€5 billion). The program promoted the sales of both domestic (VW, Opel and Ford) and foreign (Fiat and Renault, in particular Dacia) brands.

In the United Kingdom the scrapping scheme especially benefited foreign car producers Hyundai, Ford, VW, Fiat and Toyota. Among the car producers, only Toyota produces cars in the United Kingdom. The program was not very successful for the domestic brand Vauxhall.

The information on the French scheme is available jointly for the years 2008 and 2009, and jointly for two scrapping schemes “superbonus” and “prime à la casse”. Around 60% of vehicles that were sold under the schemes were domestic brands. The benefit of the domestic brands from the scheme appears to be higher compared to Germany and the United Kingdom.

⁸⁵<http://www.developpement-durable.gouv.fr/La-prime-a-la-casse-un-tiers-des.html>

⁸⁶http://www.bafa.de/bafa/de/wirtschaftsfoerderung/umweltpraemie/publikationen/ump_abschlussbericht.pdf.

⁸⁷<https://www.smmmt.co.uk/2010/05/scrapping-registrations-total-395-500-units/>.

This outcome may be linked to the CO₂ condition on the purchase of new cars in France that could have favored domestic cars more than foreign ones.

4.12 Overall quantification of public support to the European car industry

Table 13 provides a summary of the amount of public support granted to the European car industry over the past decade.

With regard to state aid support, we sum up the aid elements that we can estimate consistently based on the state aid decisions published in the Commission’s register: GBER aid, regional aid, training aid, R&R aid and aid granted to car producers under the Temporary Framework. Our estimates of state aid support reflect the planned aid amounts, but the actual aid expenditure may differ. The Commission does not estimate the difference between the planned budget and the actual aid amount granted to companies. We assume that, on average, the planned and actual amounts do not differ much. On the one hand, once the aid is authorized, member states are likely to grant at least the amount approved by the Commission because the aid is necessary for the execution of investment projects by companies. On the other hand, member states may be unwilling to grant amounts of aid higher than the authorized ones because of possible controls by the Commission triggered by the annual report on aid expenditures, or by external complaints on unlawfully-granted aid.

Our overall estimate of state aid is a lower bound estimate of state aid granted to the European car producers over the past decade. In particular, our estimate does not include the aid granted in the form of schemes, unless (i) the aid is individually notified under the approved scheme to the Commission, and the aid decision is published in the register, or (ii) we can infer the information on the granted aid amounts from the Commission’s reports published *ex post*. In the case of aid granted under the Temporary Framework, the aid figures report the actual aid amounts which are equal to the planned aid amounts as announced by the Belgian, German, French and Swedish governments. We do not consider other cases of aid granted on the basis of schemes in our overall quantification exercise for two reasons: (i) either the information is not available, (ii) or in case of the aid granted through schemes and published in the register of the “Transparency system”, we do not include the regional aid and R&D&I aid amounts that reflect the actual aid awarded to the car producers. As we have seen from the example of regional aid, the amounts granted based on the regional schemes might be at least as high as the amounts of regional aid authorized in the individual state aid decisions.

Table 12: Support granted under scrapping schemes

Country	Year Firm	2008-2009		2009-2010	
		Estimated benefits €mil.	Budget share %	Estimated benefits €mil.	Budget share %
France	Fiat	29.00	4.80		
	Ford	33.90	5.60		
	Opel	26.00	4.30		
	Peugeot	240.80	39.80		
	Renault	156.10	25.80		
	Toyota	23.00	3.80		
	VW	25.40	4.20		
	Other brands	70.80	11.70		
Tot. France		605.00			
Germany	Hyundai			125.11	3.19
	Fiat			273.70	6.97
	Ford			258.80	6.59
	Nissan			102.60	2.61
	Opel			400.93	10.22
	Peugeot			255.09	6.50
	Renault			340.69	8.68
	Suzuki			84.80	2.16
	Toyota			172.02	4.38
	VW			1,503.31	38.31
	Other brands			407.16	10.38
Tot. Germany				3,924.21	
UK	Fiat			34.56	7.78
	Ford			49.78	11.21
	Honda			14.18	3.19
	Hyundai			87.71	19.76
	Mazda			12.74	2.87
	Nissan			17.41	3.92
	Peugeot			31.39	7.07
	Renault			15.93	3.59
	Suzuki			13.81	3.11
	Toyota			32.31	7.28
	Vauxhall			29.65	6.68
	VW			51.86	11.68
	Other brands			52.62	11.85
Tot. UK				443.94	
Tot. by year		605		4,368.15	

Source: French Ministry of Ecology, Sustainable Development, Transport and Housing, German Federal Office of Economics and Export Control and UK Society of Motor Manufacturers and Traders. This table reports the public support granted under the scrapping schemes related to the car sector for the period 2008-2010 in France, Germany, and the United Kingdom. Estimated benefits are expressed in absolute value. Budget share is calculated as percentage of the sum of scrapping incentives granted on a producer's car sales in terms of the total scheme's government budget in a respective country.

Table 13: Summary of quantification of public support for the European car industry

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Tot.
	€mil.	€mil.	€mil.	€mil.	€mil.	€mil.	€mil.	€mil.	€mil.	€mil.	€mil.	€mil.	€mil.
State aid support instrument													
GBER										3.80			3.80
Regional aid	46.04	302.92	590.12	78.52	26.54	106.37	7.40			89.27	15.82	51.37	1,314.36
Training aid		19.72	2.65	54.57	4.57	14.22	5.55	23.19	14.68			17.09	156.24
R&R aid						6.50							6.50
Temporary Framework										1,125.00	96.80		1,221.80
Tot. by year	46.04	322.64	592.77	133.08	31.11	127.09	12.95	23.19	14.68	1,214.27	112.62	68.46	2,698.90
Per unit of production (€)	2.86	19.89	37.00	8.37	1.96	8.18	0.85	1.48	1.04	104.16	8.67	5.27	15.13
Non-state aid support instrument													
EIB loans	525.00	845.00	400.00	580.00	550.00	245.00	697.00	750.00	650.00	2,800.00	2,822.00	1195.00	12,059.00
<i>“aid element”</i>	<i>78.75</i>	<i>126.75</i>	<i>60.00</i>	<i>87.00</i>	<i>82.50</i>	<i>36.75</i>	<i>104.55</i>	<i>112.50</i>	<i>97.50</i>	<i>420.00</i>	<i>423.30</i>	<i>179.25</i>	<i>1,808.85</i>
EGF support								4.80		15.10	4.30	52.50	76.70
Scrapping schemes									19.19	4,057.17	1,334.90	12.00	5,423.26

Source: own estimations. This table reports the quantification of the public support for the European car sector for the period 2000-2011 in Belgium, France, Germany, Italy, the Netherlands, Portugal, Spain, Sweden and the United Kingdom. State aid support is expressed as gross grant equivalent in present value and relative to the units of production. Non-state aid support is expressed in nominal value. In the case of state aid support instruments, we show the aid element, whereas in the case of non-state aid support instruments, we report the total amount of public support (the aid element can only be approximated for EIB loans). Empty cells mean that no relevant public support is awarded in those years.

The overall state aid to the European car industry has declined over the past decade, but peaked in response to the financial and economic crisis in 2009. After the crisis it decreased in 2010 and 2011 to a level even lower than the average level over the pre-crisis period.

With regard to non-state aid support, we discuss the amount of support granted under each instrument separately. Our findings are threefold. First, the EIB loans were intensively granted to the car sector before the crisis, and went up considerably in response to the crisis in 2009 and 2010, and decreased by more than half in 2011. The loans granted in 2009 and 2010 were almost five times larger than the average yearly volume of loans granted over the pre-crisis period. EIB loans do not constitute state aid, but since they are granted at lower than market interest rates, we calculated the financial benefit of those loans to the car producers (the so called “aid element”). As the information on the actual interest rates is not available, we followed the practice of the Commission and took 15% of the total amount of the EIB loans as a proxy for the “aid element”.

Second, the EGF funds granted to the car industry also increased following the crisis to ease the consequences of the restructuring process in the car industry. In the EGF project database, we observe a long lag between the actual application date for the funds and the date when the funds are actually released to beneficiaries. This might explain the increased amount of funds granted under the EGF in 2011. The exact amount of public support

through the ESF funds is difficult to quantify because public information is scarce.

Third, member states granted an unprecedented amount of public support through the scrapping schemes to foster the local demand for cars in the crisis times. We estimate the total amount of financial benefits in the form of scrapping consumer incentives to the European car sector on the basis of government budgets. On the grounds of the available information, we can cover only three countries (France, Germany and the United Kingdom), while scrapping schemes were used also in other European countries: we can then provide only an underestimation of the financial benefits to the European car producers through the scrapping incentives.

Note that when the crisis peaked in 2009, the amount of state aid granted under the Temporary Framework was lower than the public support granted to the European car producers in the form of scrapping schemes and EIB loans. Therefore, while analyzing public transfers to companies, it is important to consider various instruments of public support to get a complete picture of public interventions in the car industry.

Finally, we consider the mix of instruments that member states have chosen to grant public support to the car industry. Table 14 visualizes these instruments by country. GBER aid is only found in Spain. Regional aid and training aid were granted by almost all countries in our sample. R&R aid was granted only once in the United Kingdom. R&D&I aid was rarely granted, but large amounts of the EIB loans were granted to the industry with the same purpose. The Temporary Framework probably substituted aid granted for R&R and R&D&I purposes. It was used by four countries: Belgium, France, Germany and Sweden. Scrapping schemes were introduced in almost all countries over the past decade.

Table 14: Mix of forms of public support for the European car industry

Country	GBER	Regional	Training	R&D&I	R&R	Temporary Framework	EIB loans	Social support	Scrapping programs
Belgium		+	+			+		+	
France		+	+			+	+	+	+
Germany		+	+	+		+	+		+
Italy		+	+				+		+
Netherlands									+
Portugal		+	+				+	+	+
Spain	+	+					+	+	+
Sweden				+		+	+	+	
UK		+	+		+		+		+

The table reports the nine instruments of public support for the European car industry for the period 2000-2011 in Belgium, France, Germany, Italy, the Netherlands, Portugal, Spain, Sweden and the United Kingdom.

5 Conclusion

Economic assessment of different instruments to support the car industry Our research suggests that economic analysis in controlling state aid to the car sector carried out by the European Commission clearly identifies the objectives, incentives and side effects of aid measures. Despite the recognition of the fact that aid to the car sector can be particularly distorting, the Temporary Framework has *de facto* implied a relaxation of state aid rules, and in particular of R&R aid and R&D&I aid to the car sector during the crisis. Under the Temporary Framework, large amounts of aid were granted to car companies without the usual requirements of notification and individual assessment. Moreover, the loans provided by the European Investment Bank for R&D&I projects increased considerably during the crisis. EIB loans resemble in their purpose regional aid or R&D&I aid. However, they are subject only to a non-binding opinion of the Commission, while regional aid and R&D&I aid fall under the scrutiny of the Commission. The substantial assessment of EIB projects is not published, so we cannot infer the criteria applied by the Commission in the assessment. We recommend increasing the transparency of the evaluation process, both due to the large amounts at stake and due to the importance and the particular value of innovation in this industry.

An unprecedented amount of public support has also been granted through the large-scale scrapping programs introduced by many member states in response to the crisis. Scrapping subsidies do not constitute state aid since *ex ante* these measures are assumed not to be selective, namely granted without discrimination. But the environmental requirements to obtain the subsidy could *de facto* discriminate across producers. The Commission does not evaluate whether scrapping programs are selective after their implementation.

The existence of multiple aid instruments at different levels may create coordination problems and lack of transparency despite the efforts of the Commission in this respect. In general, international coordination across countries to reduce overcapacity in the world clearly failed during the crisis. It is an open question as to whether the Commission managed to coordinate these instruments at least within the European Union. The cases of France and Germany, where national car producers largely benefited during the crisis, seem to suggest a negative answer, although we recognize the role of the Commission in limiting subsidy races between countries.

Quantification of public support to the car industry The quantification of state aid to the European car industry is a challenging task for three main reasons. First, the availability of the information on the state aid element depends on whether a public support

measure is scrutinized by the Commission or not. Second, the extent of available information depends on whether state aid is granted to individual companies or is in the form of schemes to multiple companies. Third, the quantification of the aid element depends on whether state aid is granted in the form of a grant, soft loan or guarantee. Consequently, we quantify the aid element whenever this is possible. For non-state aid support, we report the total amount of public support granted under each instrument.

With regard to state aid support, regional aid was the most used aid instrument before the crisis. Overall, it declined during the last decade. In nominal terms, the largest regional aid granter has been Germany, followed by Spain and Italy. Portugal has granted most aid relative to production. At the company level, the largest aid recipient is BMW, followed by Fiat and Ford. Training aid was the second largest aid category before the crisis. In nominal terms and relative to production, Italy has granted the most training aid, followed by Belgium and the United Kingdom. At company level, the biggest share of training aid belongs to Fiat in Italy, followed by Ford and GM Europe in various European locations. R&D&I aid and R&R aid were rarely granted to the car sector during the past decade. Those two instruments were not used during the last financial and economic crisis, when aid with similar purposes was primarily granted to car producers under the Temporary Framework. Especially France, Germany and Sweden used the Temporary Framework to support their domestic production. Italy, Spain and the United Kingdom notified some schemes targeted at the car sectors but did not use them.

With regard to non-state aid support, EIB loans were granted in large amounts to the car industry before the crisis and increased considerably as a response to the crisis, in particular to guarantee the necessary flow of credit to car producers until banks resumed their normal lending activities. The EGF applications also increased following the crisis. The exact amount of the public support through the ESF funds is difficult to quantify because publicly available information is scarce. Finally, an unprecedented amount of public support was granted to the European car producers during the crisis through scrapping programs to foster the local demand for cars. The scheme in France clearly benefited domestic car producers, whereas the schemes in Germany and the United Kingdom benefited both domestic and foreign car producers. The success of home products in France may be attributed to a domestic bias of consumers, or to the CO₂ emission requirements specified by the French scrapping scheme. The British and German schemes did not specify those requirements.

Our lower bound estimate of overall state aid to the European car industry suggests that the aid has declined during the last decade, but increased in response to the crisis in 2009 and decreased even below the average pre-crisis level in 2010 and 2011. However, in 2009 European car producers received higher amounts of public support through scrapping

schemes and EIB loans than regular state aid. This support might have caused distortionary effects on competition and trade. When analyzing public transfers to the car industry, it is therefore important to consider all different instruments of public support.

In conclusion, the quantification of public support for the car industry at national and European level is a challenging exercise. Although the European Commission analyzes the evolution of state aid in its Scoreboard reports, it publishes no analysis of state aid at the industry level: One cannot follow whether some industries are treated more favorably than others and how the industry-specific aid has evolved over time. We recommend more clarity on the part of the Commission concerning the existence of various public support instruments and regarding the ways of notifying (*ex ante*) and monitoring/reporting (*ex post*) public support measures. This could allow an easier quantification of state aid and non-state aid support granted to any industry or sector, and increase the transparency of state aid control and enforcement.

References

- ACEA**, “European Union Economic Report,” March 2010.
- Adda, Jerome and Russell Cooper**, “Balladurette and Juppette: A Discrete Analysis of Scrapping Subsidies,” *Journal of Political Economy*, August 2000, 108 (4), 778–806.
- Bermudez, Andrés Garcia and Christophe Galand**, “Recent training aid cases in the car industry,” Competition Policy Newsletter No.1 Spring 2007.
- Besley, Timothy and Paul Seabright**, “The effects and policy implications of state aids to industry: an economic analysis,” *Economic Policy*, 04 1999, 14 (28), 13–53.
- Bhaskar, Krish**, *The effect of different state aid measures on intra-community competition* Deadline 92, a frontier-free Europe, Luxembourg: Commission of the European Communities, 1990.
- Brander, James A. and Barbara J. Spencer**, “Export subsidies and international market share rivalry,” *Journal of International Economics*, February 1985, 18 (1-2), 83–100.
- Cini, Michelle**, “From Soft Law to Hard Law?: Discretion and Rule-making in the Commission’s State Aid Regime,” EUI-RSCAS Working Papers 35, European University Institute (EUI), Robert Schuman Centre of Advanced Studies (RSCAS) Sep 2000.
- Cooper, Adam, Yen Chen, and Sean McAlinden**, “The Economic and Fiscal Contributions of the "Cash for Clunkers" Program - National and State Effects,” Technical Report, CAR Research Memorandum 2010.

Copenhagen Economics, “State aid Crisis rules for the financial sector and the real economy,” Technical Report, European Parliament, 2011 2011.

de Cervin, Almero Rubin and Christina Siaterli, “State Aid to Research, Development and Innovation,” in “EU Competition Law,” Claeys & Casteels, 2008.

Eurofound, “Recent restructuring trends and policies in the automotive sector,” Technical Report, Background paper 2009. European Foundation for the Improvement of Living and Working Conditions.

– , “Social Dialogue and Recession in the Automotive Sector,” Technical Report, Luxembourg: Publications Office of the European Union 2010. European Foundation for the Improvement of Living and Working Conditions.

European Commission, “Vademecum Community law on State Aid,” Technical Report, European Communities 2008.

– , “Product Market Review 2009: Microeconomic Consequences of the Crisis and Implications for Recovery,” Technical Report, European Economy 11/2009 2009.

– , “Report on Competition Policy 2010,” Technical Report, European Commission 2010.

– , “The effects of temporary State aid rules adopted in the context of the financial and economic crisis,” Technical Report, Commission Staff Working Paper 2011.

European Investment Bank, “EIB’s 2011 Transport Lending Policy,” 2011.

Evenett, Simon J. and Frédéric Jenny, “Bailouts: how to discourage a subsidies war,” in “The collapse of global trade, murky protectionism, and the crisis: Recommendations for the G20,” A VoxEU.org publication, 2009.

- Friederiszick, Hans W., Lars-Hendrik Röller, and Vincent Verouden**, “European state aid control: An economic framework,” in “Handbook of antitrust economics,” Paolo Buccirossi, 2008.
- Glowicka, Elzbieta**, “State Aid and Competition Policy: The Case of Bailouts in the European Union.” PhD dissertation, Humboldt-Universität zu Berlin 2008.
- Greene, David L.**, “How Consumers Value Fuel Economy: A Literature Review,” Technical Report EPA-420-R-10-008, U.S. Environmental Protection Agency March 2010.
- Griliches, Zvi**, “The Search for R&D Spillovers,” *Scandinavian Journal of Economics*, Supplemen 1992, *94* (0), S29–47.
- IHS Global Insight**, “Impacts of the Financial and Economic Crisis on the Automotive Industry,” Technical Report, European Parliament’s committee on Industry, Energy and Research 2009.
- Lyons, Bruce, John Van Reenen, Frank Verboven, and Xavier Vives**, “EAGCP Commentary on Rescue & Restructuring Aid Guidelines,” Technical Report, European Commission - Economic Advisory Group on Competition Policy 2008.
- Neven, Damien J. and Paul Seabright**, “European Industrial Policy: The Airbus Case,” *Economic Policy*, Jun 1995, *21*, 313–358.
- **and Vincent Verouden**, “Towards a More Refined Economic Approach in State Aid Control,” in N. Pesaresi W. Mederer and M. Van Hoof, eds., *EU Competition Law*, Vol. Volume IV: State Aid, CLAEYS & CASTEELS, 2008.

Nicolini, Marcella, Carlo Scarpa, and Paola Valbonesi, “Aiding car producers in the EU: money in search of a strategy,” "Marco Fanno" Working Papers 0115, Dipartimento di Scienze Economiche "Marco Fanno" Feb 2010.

Nitsche, Rainer and Paul Heidhues, “Comments on State Aid Reform Some Implications of an Effects-based Approach,” in Max Albert, Stefan Voigt, and Dieter Schmidtchen, eds., *Conferences on New Political Economy*, Vol. 24 of *Conferences on New Political Economy*, Mohr Siebeck, Tübingen, Decembrie 2007, pp. 321–344.

OECD, “Global Forum on Competition. Roundtable on Competition, State aids and Subsidies,” Technical Report DAF/COMP/GF(2010)5, Organisation for Economic Co-operation and Development 2010.

– , “Global Forum on Competition,” Technical Report DAF/COMP/GF/A(2010)1, Organisation for Economic Co-operation and Development 2011.

Oxera, “Should aid be granted to firms in difficulty? A study on counterfactual scenarios to restructuring state aid,” Technical Report, Luxembourg, Publications Office of the European Union 2009.

Pesaresi, Nicola and Marc Van Hoof, “State Aid Control: an Introduction,” in “EU Competition Law,” Claeys & Casteels, 2008.

Röller, Lars-Hendrik and Christian von Hirschhausen, “State aid, industrial restructuring and privatization in the new German Länder: competition policy with case studies of the shipbuilding and synthetic fibres industries,” CIG Working Papers FS IV 96-13, Wissenschaftszentrum Berlin (WZB), Research Unit: Competition and Innovation (CIG) May 1996.

Schiraldi, Pasquale, “Automobile replacement: a dynamic structural approach,” *The RAND Journal of Economics*, 2011, 42 (2), 266–291.

Sturgeon, Timothy J. and Johannes Van Biesebroeck, “Crisis and protection in the automotive industry: a global value chain perspective,” Policy Research Working Paper Series 5060, The World Bank Sep 2009.

Takalo, Tuomas, Tanja Tanayama, and Otto Toivanen, “Estimating the Benefits of Targeted R&D Subsidies,” *The Review of Economics and Statistics*, forthcoming.

Zapata, Clovis and Paul Nieuwenhuis, “Exploring innovation in the automotive industry: new technologies for cleaner cars,” *Journal of Cleaner Production*, 2010, 18 (1), 14 – 20. The Roles of Cleaner Production in the Sustainable Development of Modern Societies.

