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COMPETITION, STATE AIDS AND SUBSIDIES

Background Note

-- Session I --

This background note was prepared for the Secretariat by David Spector, Paris School of Economics and MAPP. It is submitted under Session I of the Global Forum on Competition to be held on 18 and 19 February 2010.

The views expressed in this paper are the personal responsibility of the author, David Spector. They should neither be attributed to the OECD Secretariat nor to OECD member countries. The author welcomes comments and corrections of factual errors, which can be sent to him at the following email address: spector@pse.ens.fr.

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BACKGROUND NOTE

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COMPETITION, STATE AIDS AND SUBSIDIES

BACKGROUND NOTE[1]

1. Subsidies, state aids and state aid control: the current situation

1. Preliminary remark. As is explained below, many different types of government actions can be described as state aids or subsidies, and we do not stick to a single precise definition. In general, these two words are used interchangeably hereafter, except when referring to the European Union (where the standard expression is "state aids") or to the World Trade Organisation (which refers to "subsidies" in the context of the agreement on "subsidies and countervailing measures").

1.1 The importance of government subsidies to companies

2. Governments can subsidise companies in a multiplicity of ways. They can grant direct subsidies or tax breaks to specific firms, with or without any strings attached. They can subsidise inputs such as land, energy, water, bandwidth for telecommunication services, either because these inputs are under direct government control, or because they are marketed by state-owned enterprises. Governments can also guarantee the loans taken up by some companies, allowing the beneficiaries to borrow at a below-market rate. Government-owned banks, or banks that are under strong government influence for regulatory reasons, can also offer direct credit under preferential terms to targeted companies or sectors.

3. State-owned enterprises (hereafter, "SOE") are often an important conduit for, or recipient of, state aids. In many countries, governments devote considerable amounts to the subsidisation of SOEs, and in particular, loss-making SOEs. Historically, some countries have devoted substantial proportions of their national wealth to such SOE related state aid. For instance, in Sri-Lanka in the 1980s and 1990s, more than 30% of the budget, i.e., more than 10% of GDP was allocated to the "maintenance of SOEs".[2] In China, 95% of subsidies to SOEs between 1995 and 2005, were directed to loss-making SOEs.[3] Those countries have since embarked on significant reform and transformation processes, shifting towards improved governance and more market-oriented solutions. In many countries, governments also own utilities in order to provide selected companies with basic inputs, such as energy or water, at below-market prices.

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1 Prepared by David Spector, Paris School of Economics and MAPP. The author wishes to acknowledge the support of Antoine Chapsal (MAPP) for his contribution to this report. The views expressed in this paper are the personal responsibility of the author. They should neither be attributed to the OECD Secretariat nor to OECD member countries. The author welcomes comments and corrections of factual errors, which can be sent to him at the following email address: spector@pse.ens.fr.

2 S. Kelegama, 1993, Privatization in Sri Lanka: The Experience during the Early Years of Implementation. Colombo: Sri Lanka Economic Association.

3 China fiscal yearbook, China statistical yearbook.

4. Governments can also subsidise companies by purchasing from them at above-market prices, or, less directly, by forcing some other companies to purchase from them at above-market prices. In some cases, such overpricing is part of an overt policy aimed to meet some public policy goal. For instance, in many countries, utilities have an obligation to purchase renewable energy at regulated, above-market prices. In many countries, the military purchases domestic armaments, at prices that are usually far above export prices, suggesting the existence of an implicit subsidy.

5. Ascertaining whether a given government measure constitutes aid is not a simple matter. For instance, in the European Union (hereafter, the "EU"), where strict control of state aids exists, a considerable part of the debate surrounding individual cases concerns whether the government measure at stake indeed constitutes aid. Also, as is explained below, the definition of an aid varies across jurisdictions; for instance, some measures are considered to constitute aid according to EU definitions, but not according to World Trade Organisation (hereafter, "WTO") definitions; and vice-versa.

6. The recent financial crisis provides a striking illustration. With the quasi-closure of some segments of the credit markets, some fundamentally sound banks, whose assets were unambiguously worth more than their liabilities, were facing the threat of short-run bankruptcy because they were entangled in a liquidity crisis. Suddenly, such banks found themselves deprived of the possibility of using their long-term assets (e.g., a portfolio of very safe long-term loans) as collateral in order to borrow and meet their short-term financial obligations, because the flow of credit directed to these refinancing operations had suddenly dried up. Many governments provided liability guarantees to such banks (at a cost), in order to allow them to borrow on financial markets. Whether this constitutes aid, and, if so, what the amount of the aid, is a moot question. According to the recent practice of the European Commission in the context of the financial crisis, when a government provides a liability guarantee, the amount of the aid is deemed equal to the amount of the guarantee. However, one could estimate the amount of the aid, or even its existence, differently. For instance, in the case of a fundamentally sound bank, the existence of the guarantee is enough to ensure that the beneficiary bank will have access to credit markets (on almost the same terms as governments) and will be able to meet its short term obligations, which rules out bankruptcy in the short run, and hence the calling of the guarantee. If, in addition, the bank is fundamentally sound in the sense that the market value of its assets (in all foreseeable post-crisis contexts) exceeds its total liabilities, bankruptcy is also ruled out in the long run. On the basis of such reasoning, one could argue that since the probability that the guarantee will be used is zero, it entails no cost for the government, and it thus does not constitute aid. Still, another reasoning could be based on the value of the guarantee for the recipient bank, i.e., the amount it would be willing to pay in order to obtain it, or alternatively, some measure based on past market benchmarks (such as the pre-crisis price of credit default swaps).

7. Whether a measure should be seen as aid usually depends on its degree of selectivity. An overall decrease in the level of corporate taxes is never seen as aid; conversely, a tax break granted to a specific firm is usually considered to constitute an aid. However, intermediate cases are often less clear-cut. For instance, determining whether a tax break targeted to small companies constitutes an aid involves a certain degree of arbitrary judgement.

8. Despite this uncertain delineation, the existing estimates, based on heterogeneous definitions, point to the large magnitude of subsidies and state aids. Subsidies have been following a global long-term downward trend, as most countries shifted away from government intervention to an increased reliance on market mechanisms, and as the financial requirements of health care and pension systems increasingly constrained budgets, leaving less room for other types of spending. However, the financial crisis caused a short-term upsurge, as governments bailed out distressed financial institutions and other companies.

9. The most comprehensive data about state aids are those covering the European Union. They show that in spite of a strict control over state aids, their total amount, excluding measures related to the

financial crisis, was still €113.4 billion in 2008, or 0.94% of EU GDP.[4] Not taking aid to railways into account, the volume of aid has been halved between 1992 and 2008, from 1% to 0.54%. The inclusion of crisis measures changes the picture dramatically, since they amounted to €212.2 billion, or 1.7% of GDP.

10. The EU figures (even not taking crisis measures into account) show that even under a strict control regime, national governments are prone to providing sizable subsidies to companies. This alone, even absent very precise data about non-EU countries, suggests that the global amount of subsidies is likely to be very large.

11. Data about non-EU countries are less available and usually lack homogeneity. However, the figures that are available indicate the importance of state aids and subsidies. Aid to agriculture in OECD countries alone amounted to $318 billion in 2002. Van Beers and van den Bergh (2001)[5] also estimate worldwide subsidies to companies as representing 3.6% of world GDP in the mid 1990s. Another indication of the importance of subsidies is that out of the 63 cases brought before the WTO's settlement body between 2001 and 2008, 14, i.e., 22% of the total, concern subsidies.

12. Subsidies take a variety of forms. To mention just a few, global energy subsidies (including both the general subsidisation of energy, support to coal mining in many countries, and, conversely, support to renewable energies) are well above $100 billion per year, with Iran's alone amounting to $55 billion.

13. Some industries are particularly likely to receive subsidies, especially in times of crisis. For instance, total worldwide subsidies proposed for the car industry in 2008 were about $48 billion, both in developed and developing countries. In addition to the US direct subsidy of $17.4 billion to its three national companies, Canada, France, Germany, United Kingdom, China, South Korea, Argentina, Brazil, Sweden and Italy, among others, have also provided direct or indirect subsidies to their car industries which combined are very substantial. Other sectors, such as shipbuilding and airlines, are also regular recipients of subsidies, as recurring overcapacity reduces margins and causes governments to step in.

14. The motives for state aids are as varied as the nature of their recipients. Government subsidies have often been used to foster the development of new industries, in the context of an "offensive" industrial policy, especially in developing countries. [6]This is the case for instance of Brazil's long-standing aid to the aircraft producer Embraer, initially an SOE that was later privatised, of the investments made by Fundacion Chile in many different sectors, and of the subsidies granted in the past by South Korea in order to encourage conglomerates diversification into many sectors. Subsidies granted to innovative clusters are another example of an offensive industrial policy.

15. Subsidies are also often granted as part of a "defensive" industrial policy, when they are targeted towards distressed firms, with the goal of preventing foreign takeover, avoiding the disappearance of an activity deemed essential for the country's economy, or avoiding layoffs and the ensuing social troubles. Examples include the recurring support to carmakers, airlines, and coal mining across the world. In some cases, governments grant subsidies to fragile sectors such as these because they feel compelled to do so in order to re-establish a competitive balance, given the subsidies granted by foreign governments.

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4 Report from the Commission, state aid Scoreboard, Autumn 2009 Update.

5 C. van Beers and J. van den Bergh, 2001, Perseverance of Perverse Subsidies and Their Impact on Trade and Environment, *Ecological Economics*, vol. 36(3), 475-486.

6 See the documentation of the 2009 GFC Roundtable on Competition Policy, Industrial Policy and National Champions: http://www.oecd.org/dataoecd/12/50/44548025.pdf.

16. Another motive for granting aid is to encourage activities deemed to generate positive externalities in addition to the private return to the company undertaking them. Examples include aid to renewable energies, aid to research and development, but also aid to investment in distressed regions.

17. Countries also grant subsidies in order to attract greenfield investments, often by foreign firms. Such competition between national or local governments sometimes gives rise to subsidy races leading to the granting of considerable sums, both in developed and developing countries. Such subsidy races are particularly frequent in large federal countries.

1.2 The treatment of state aids by the WTO

18. State aids and subsidies seem to be at odds with the idea that market mechanisms, under free competition, are the best way to promote social welfare. State aids and subsidies interfere with price formation and with the "Darwinian" processes that competition fosters and that are usually considered to be one of the main forces leading to economic efficiency (at least if one believes in the principles underpinning competition policy). One could therefore expect them to be subject to the intense scrutiny of competition authorities worldwide. This is however not the case. Only in the EU does the competition authority (the European Commission) have the power to exert a stringent control over state aids. In some other jurisdictions, competition authorities have some control over the actions of public entities. However, by and large, starting with a global perspective on the approaches to controlling state aid, the discipline on state aid with the widest multilateral reach, is the one derived from the agreement on subsidies and countervailing mechanisms (hereafter, the "SCM agreement") entered into by all WTO members at the end of the Uruguay Round.

19. The SCM agreement does not provide for any *ex-ante* control.[7] It contains two broad sets of rules. "Track I" refers to the imposition by a Member State of countervailing duties on imports from another Member State granting a subsidy, if that subsidy hurts the duty-imposing country's domestic industry. "Track II" rules allow a Member State to challenge a subsidy granted by another Member State before the WTO dispute settlement body.

20. According to the SCM agreement, a measure constitutes a subsidy if (i) it involves a financial contribution by the government, (ii) it confers a benefit upon its recipients, and (iii) it is specific to a company, an industry, or a group of industries. In practice, criterion (i) is interpreted broadly in WTO law, in that an instruction by the government to private companies to grant an advantage to some companies is considered sufficient for the criterion to be met, even without any actual cost to the government. In contrast, the selectivity criterion is interpreted quite narrowly. For instance, a measure benefitting only small companies, or only companies in a given region, is not considered to meet condition (iii).

21. Not all subsidies are illegal under WTO law. Once a measure is classified as a subsidy, it can be considered as a prohibited subsidy, or an "actionable" subsidy. Export subsidies and import-substitution subsidies are prohibited per se under WTO law. All other subsidies are actionable, meaning that in order for a country to impose countervailing duties or to challenge them before the dispute settlement body, it has to prove that the subsidy causes harm to itself.

22. Fourteen cases involving subsidies were brought before the dispute settlement body between 2001 and 2008. However, this number does not allow us to measure the true impact of WTO rules, which is mainly by deterring governments from granting aid in the first place.

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[7] For a detailed presentation of WTO rules and a discussion of their relationship to EU rules, see C.-D. Ehlermann and M. Goyette, 2006, The Interface between EU state aid Control and the WTO Disciplines on Subsidies, *European state aid Law Quarterly*, vol. 2006 (4), 695-718.

1.3 State aid control in the European Union

23. Stringent control over state aids is exerted by the European Commission. State aid control in fact predates the creation of the EU (then the "European Community") in 1957, since it was already an essential part of the treaty instituting the European Coal and Steel Community in 1951 (with the same six founding members as the European Community, i.e., France, Germany, Italy, Belgium, the Netherlands and Luxemburg). At the time, the main rationale of state aid control was market integration between the Member States.[8] In particular, state aid control was meant to prevent artificial vertical integration on a national basis, with each coal producer selling under preferential terms to steel producers in the same country.

24. Article 107(1) of the Treaty on the Functioning of the EU prohibits state aid which distorts or threatens to distort competition in so far as it affects trade between Member States. However, state aid contributing to well-defined objectives of common European interest without unduly distorting competition between undertakings and trade between Member States may be considered compatible with the common market (Article 107(3)). A major difference between EU and WTO disciplines is that EU control takes place *ex ante*: a Member State planning to grant aid or to enact a measure that might constitute an aid (in case its characterisation as aid is uncertain) must start by asking for the Commission's permission. A major similarity is that each respective regime applies only to state aids where the distortion to competition occurs (at least partly) within the countries that are party to the respective arrangements.

25. In practice, especially after the issuance of the state aid Action Plan in 2005, the Commission's way of handling individual cases revolves around the "balancing test". The main elements of this test are, on the one hand, the identification of the objective of the aid, an examination of whether the aid measure is an appropriate policy instrument (in the sense that it will achieve the purported goal and no less distortive measure could achieve the same goal), and finally, a balancing between the expected positive impact of the aid and the expected competition distortions.

26. The first step of the analysis often involves the identification of market failures, which the aid measure is meant to correct. This is consistent with the general philosophy underlying competition policy, namely the idea that markets in general deliver efficiency. The second test is very important in practice. For instance, in cases where an aid measure is meant to compensate a company for the provision of a "service of general economic interest", it usually leads the Commission to ask why an open, non-discriminatory tender (not considered to constitute aid since the Altmark ruling[9]) could not meet the same goal as the aid. In other words, the second leg of the test strongly restricts governments' ability to grant aid.

27. These general principles have been the foundation of the various guidelines published by the Commission in the last years, covering different types of aid such as the General Block Exemption Regulation, guidelines on aid to research and development, on aid to promote risk capital investment in small and medium-sized enterprises, on aid for environmental protection, and on regional aid etc (this list is not exhaustive). With the commencement of the financial crisis in August 2008, the Commission also published rescue and restructuring guidelines, and various communications on the handling of the financial crisis, including as a starting point the "Commission communication on the return to viability and the assessment of restructuring in the financial sector in the current crisis under state aid rules". It also issued guidelines about aid in response to the crisis in the real economy (i.e., aid to non-financial companies

8 G. Grin, 2003, *The Battle of the Single European Market: Achievements and Economic Thought, 1945-2000,* London : Kegan Paul.

9 Case C-280/00 Altmark Trans GmbH, Regierungspräsidium Magdeburg v Nahverkehrsgesellschaft Altmark GmbH [2003].

negatively effected by the dramatic reduction of available credit), with the "Temporary Framework for state aid measures to support access to finance in the current financial and economic crisis".

28. While EU rules are generally perceived to be more stringent that WTO rules, this is not always the case. For instance, according to the European Court of Justice, a measure by which the government imposes an obligation to private entities to subsidise other private entities is not considered an aid under EU rules if it does not imply a direct cost to the government.[10] It is also noted that an element of the EU law is that it affect trade between the Member States (which is, of course, a smaller grouping of countries than the WTO).

29. A point worthy of attention is that the notion of affectation of trade between Member States or of distortion of competition by the Commission or Courts has evolved over time. To start with, the standard of proof has changed. Before the ruling of the Court of First Instance (CFI) in *Tubemeuse*[11], the European Commission tended to consider that these conditions were necessarily met as soon as aid was granted and that they therefore did not warrant a specific investigation. In that ruling, the CFI confirmed a decision of the European Commission prohibiting an aid granted by the Belgian government even though the recipient was selling mostly outside of the EC. It held that neither the importance of intra-European trade in the affected market, nor the magnitude of the aid, mattered for the finding of a risk of trade distortion or affectation of trade between Member States. The CFI also claimed that "*the relatively small amount of aid […] does not as such exclude the possibility that intra-Community trade might be affected*". The CFI thus considered that while the European Commission needed to formally address the competition distortion and affectation of trade conditions, it was subject to a very low standard of proof, in that it was enough for the European Commission to show that distortion of competition or affectation of trade could not be ruled out *a priori*.

30. The recent *Wam*[12] ruling may represent a turning point. While it is not the first ruling annulling a prohibition decision by the Commission, it did so by setting a standard of proof that appears to be more demanding that in most of the previous case law. The Court stated that the fact that the aid recipient was engaged in intra-European trade was not by itself sufficient for the Commission to conclude that the aid was going to 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.*"[13]

31. Beyond the issue of the standard of proof, the very meaning of these notions of competition distortion and affectation of trade has evolved over time as well. In Philip Morris[14], the CFI held that competition distortion relates to a change in the position of an undertaking compared with other undertakings in intra-Community trade. But in the Framework for Research, Development and Innovation (FRDI) the European Commission also mentions changes in the location of economic activity as a possible

10 Case C-379/98 – PreussenElektra AG v. Schleswag AG, [2001] ECR I-2099.

11 Case 102/87 [1988] ECR 4067.

12 CFI, 6 September 2006, Italy and Wam SpA v Commission, case T 304/04.

13 Author's translation of "*le seul constat de la participation de Wam aux échanges intracommunautaires est insuffisant pour étayer une affectation desdits échanges ou une distorsion de concurrence et, dès lors, nécessite une analyse approfondie des effets des aides*." (point 74).

14 Case 730/79 [1980] ECR 2671.

distortion[15], even though such changes may occur independently of any impact on competitors (for instance in the case of the granting of aid to a monopoly not threatened by potential entry).

32. The Commission's views as to which market structures make competition distortion more likely have also evolved over time. In several cases (Imepiel[16], Ramondin[17]), distortion was considered more likely if the affected market was highly competitive. This was even stated as a point with general relevance in the motor vehicle guidelines, as the Commission recalled in the DAF Trucks Decision: "*Under aid for modernisation and innovation, the guidelines stipulate that 'in the context of a genuine internal market for motor vehicles, competition between producers will become even more intense and the distortive impact of aid will be greater. Therefore, the Commission will take a strict attitude towards aid for modernisation and innovation'*."[18] However, in its recent R&D&I Guidelines, the Commission takes a different view, claiming that the distortion of dynamic incentives or State-aid-driven market power creation are less likely in highly competitive markets.[19]

33. State aid control in the European Union has progressively shifted from a purely legalistic approach towards an effects approach. This evolution, in the jurisdiction with the longest state aid control experience, testifies to the need for a better assessment of the economic consequences of state aid and subsidies across countries.

1.4 State aid control and control over government agencies outside of the EU

34. Some regional trade blocs also have specific state aid control rules. For instance, the West African Economic and Monetary Union ("WAEMU"), which regroups Benin, Burkina Faso, Côte d'Ivoire, Guinea Bissau, Mali, Niger, Senegal and Togo, adopted in 2002 competition guidelines, which prohibit anti-competitive agreements, abuses of a dominant position, and "public subsidies liable to distort competition by favouring specific companies or products". However, according to the WAEMU contribution, these rules have yet to be enforced efficiently, which would require greater support from the member states.

35. Other free trade zones, such as the Andean Community, have rules restricting subsidies since Decision 45725 aims at preventing or correcting the distortions in competition generated by subsidies in imports that are produced in Member States.[20]

36. Some domestic competition authorities in non-EU countries also have at least nominal authority over state aids. For instance, Russian competition legislation is applied not only to enterprises but to State executive authorities as well, which is the basis for state aid control in Russia. According to Articles 7 and 8 of Russia's antimonopoly law, actions and agreements of the bodies of executive authority that limit the economic independence of enterprises, create favourable or discriminatory conditions for certain enterprises shall be prohibited. A recent legislative change granted the Antimonopoly authority the power of preliminary control over the adoption of decisions of the bodies of executive authority. Decisions on the granting of any privileges to specific enterprises or groups of enterprises need approval by the Antimonopoly authority.

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15 R&D&I Framework, point 7.4.

16 OJ L 172/76, 27/06/1992.

17 OJ L 318/36, 16/12/2000.

18 OJ L 015 , 20/01/1996 P. 0037 – 0045.

19 Sections 7.4.1. and 7.4.2.

20 http://www.comunidadandina.org/normativa/dec/D457.htm

37. China's Antimonopoly Law which came into effect in 2008 includes a whole chapter comprising six separate prohibitions against certain forms of abuse of administrative power to eliminate or restrict competition. These prohibitions explicitly refer to some governmental initiatives (e.g., setting discriminatory inspection standards or undertaking repeated inspections in a discriminatory way) that may extend beyond the European definition of state aid.

38. Competition authorities in countries currently in the process of joining the EU, such as Croatia and Turkey, also have some control over state aids. In addition, several countries (such as Pakistan and Peru, among others) indicated in their submissions for this GFC roundtable that competition law applies to SOEs, but also more generally to public entities.[21]

39. Finally, many countries, such as Brazil, Australia, Hungary, Peru and Norway, have laws that provide for a "competitive neutrality principle" applicable to government agencies and SOEs[22]. "Competitive neutrality" generally means that Government businesses should not enjoy any net competitive advantage vis-à-vis other businesses simply as a result of their public sector ownership.[23] In some cases there are complaints mechanisms handled by agencies with competition responsibilities available to private companies and private individuals.[24] In addition, competition authorities in many countries are consulted on matters possibly involving state aids, for instance, on the design of public tenders or of privatisation processes.

1.5 Where subsidies meet competition law: predatory pricing and merger control

40. As well as the various regimes that directly apply to state aid discussed above, the enforcement of competition policy even within its "traditional" boundaries can lead competition authorities to deal with state aids, at least indirectly, in two sets of circumstances (even in the absence of legal instruments attaching directly to state aid).

41. The first, and most frequent one, is when companies (often, but not always SOEs) use government subsidies in order to engage in predatory pricing or other exclusionary behaviour. In the EU, the landmark case illustrating this issue is *Deutsche Post*.[25]

42. At the time of the practices at stake (the 1990s), Deutsche Post was an SOE active on two very different markets. On the one hand, it handled letter mail monopoly in Germany, at government-regulated prices, providing a government-regulated public service. On the other hand, Deutsche Post was active on the business parcel delivery market, which was open to competition, in particular that from United Parcel Service (UPS), Federal Express, and other private companies. UPS complained to the European Commission that Deutsche Post was using letter mail monopoly profits to subsidise the sale of its parcel delivery services at below-cost prices. In March 2001, the EC found that for five years Deutsche Post

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21 See http://www.oecd/org/competition/globalforum.

22 Add reference to the October 2009 OECD work on SOEs.

23 See for example, the Competition Principles Agreement between the federal, state and territory governments in Australia.

24 The same agreement provides that each member government must provide a complaints mechanism. In the case of the federal government it is Competitive Neutrality Complaints Office the Productivity Commission and in the case of regional governments include agencies such as the Queensland is the Queesland Competition Authority, Victorian Competition and Efficiency Commission and the Independent Competition and Regulatory Commission of the ACT.

25 Case COMP/35.141 (2001/354/EC).

failed to cover incremental costs in its pricing of parcel delivery service, thereby abusing its dominant position.

43. At first glance, one might consider that there is no dearth of predatory pricing cases and that there is nothing special about the predatory company being a SOE. This impression is misleading, however, because of two specificities of SOEs. First, the definition of the incremental costs associated to the activity on the competitive market depends on which costs are attributed to the public service. The *Deutsche Post* decision clarifies that all costs that are necessary to the meeting of public service obligations should be ascribed entirely to these obligations, even if they also contribute to the activities exerted on the competitive market. Similar cases involved the former telecommunication monopoly in South Africa, Telkom, which was accused of using the profits derived from its monopoly over regulated voice services in order to cross-subsidise its Internet access broadband, leading to the predatory pricing of broadband services. The contribution from Peru also mentions similar cases: "*to date, there have been six cases (…) in which the plaintiffs claimed that a State-owned hospital was providing medical services to patients which otherwise will be attended in private hospitals*."

44. Implementing the *Deutsche Post* criterion is sometimes complex. For instance, in a recent case involving maritime transportation between a French island and mainland France, where an expensive (and highly subsidised) vessel was used for the provision of both a regulated and subsidised public service (winter transportation) and a service in a competitive market (summer transportation), the predatory pricing test revolved around the following question: should the entire cost of the vessel be ascribed to the public service obligation, or should part of it be considered part of the incremental cost of providing the service on the competitive market (summer transportation), given that a smaller vessel could have been sufficient for winter transportation?[26] These examples show that even when addressing a standard, "traditional" antitrust concept such as predatory pricing, competition authorities may be led to assessing the cost of providing a regulated public service – which is very close to what the European Commission does when assessing whether government compensation for services of general economic interest constitutes a subsidy.

45. A second difference between SOEs and private companies, as regards predatory pricing claims or more general claims of exclusionary behaviour is that SOEs' objectives are often not profit maximisation, but rather the maximisation of some combination of profits and size.[27] This implies that even in situations where exclusionary behaviour is incompatible with the maximisation of the discounted flow of future profits (say, because recoupment is unlikely after the elimination of a competitor, due to the absence of entry barriers), SOEs may nevertheless be tempted to engage in such behaviour, while private companies in the same situation would not. This observation has prompted some authors to argue that the treatment of exclusionary abuses should be stricter when the defendant is an SOE, and that the "recoupment" test, which is part of the assessment of predatory pricing claims in the US, would lead to overly lenient enforcement.[28]

46. Another, less direct relationship between subsidies and competition policy is in the field of mergers. Governments wanting to deter some mergers between private firms, for "industrial policy" or economic nationalism reasons can in some cases threaten a reduction in subsidies, or more generally a

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26 French Competition Authority, Decision #04-D-79 ; Cour de cassation ruling, 17 June 2008.

27 See, e.g., W. Niskanen, 1971, *Bureaucracy and Representative Government*, Aldine Transaction; William Niskanen, 1975, Bureaucrats and Politicians, *Journal of Law and Economics*, vol. 18.

28 D. Sappington and G.Sidak, 2003, Competition Law for State-Owned Enterprises. *Antitrust Law Journal*, vol. 71 (2), 479-523 ; 2000, Are Public Enterprises the Only Credible Predators?, *University of Chicago Law Review*, vol. 67 (1), 271-292.

worsening of the terms of trade with the government (in the case of firms selling to government entities, or at government-regulated prices, or purchasing some inputs from public entities). For instance, it is sometimes alleged that when the Swiss pharmaceutical company Novartis and the French pharmaceutical company Sanofi competed for the acquisition of Aventis, the French government leveraged its influence over drug price negotiations in order to favour a merger between two French firms. This is consistent with the empirical observation that countries with a high share of foreign firm ownership tend also to impose relatively high corporate taxes.[29]

47. In spite of the abovementioned interactions between competition law and subsidies, the general observation is that, outside the European Union, there is relatively little control over state aids, since WTO disciplines only cover some categories of aid (those that cause harm to other countries and give rise to complaints before the dispute settlement body). This invites a discussion of the impact of state aids. A review of the possible adverse impact of state aids, and the circumstances possibly justifying their use will now follow.

2. The possible adverse impact of state aids

2.1 A background element: the cost of public funds

48. Before considering the possible usefulness of state aids and subsidies, it is important to remember that collecting public funds entails cost, both direct (administrative) and indirect (due to the distortive effect of taxation) and that the granting of aid comes at the expense of other, possibly highly productive public expenditures.

49. According to some empirical estimates, raising 100 dollars for the government entails a deadweight cost between 18 and 24 dollars: when the government raises 100 dollars, other economic agents lose not 100 dollars, but between 118 and 124 dollars.[30] These figures are for the United States and one can suppose that the cost of public funds is greater in developing countries.

50. On the expenditure side, the magnitude of subsidies is so large in some developing countries that reducing them would allow governments to dramatically increase their spending on health care or education. For instance, by diverting SOE operating subsidies (which are just a part of the total subsidies granted by governments to companies) to basic education the central governments of Mexico, Tanzania, Tunisia and India could increase central government education expenditures by 50, 74, 160 and 550 percent, respectively. Likewise, redirecting SOE subsidies to health care would permit the central government of Senegal to more than double health care expenditures in that country, and the central governments of Turkey, Mexico, Tunisia, and India to increase health care expenditures threefold, fourfold and fivefold, respectively.[31]

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29 H. Huizinga and G. Nicodème, 2006, Foreign ownership and corporate income taxation: An empirical evaluation. *European Economic Review*, 1223-1244.

30 C. Ballard, J. Shoven and J. Whalley, 1985, General Equilibrium Computations of the Marginal Welfare Costs of Taxes in the United States, *American Economic Review*, vol. 75 (1), 128-138; D. Jorgenson and K. Yun, 1990, Tax Reform and US Economic Growth, *Journal of Political Economy*, vol. 98 (5) ; D. Jorgenson et K. Yun, 1991, The Excess Burden of Taxation in the United States, *Journal of Accounting and Finance*, vol. 6 (4), p. 487.

31 D.A.C. Smith, and M.J. Trebilcock, 2001, State-owned Enterprises in Less Developed Countries: Privatization and Alternative Reform Strategies, *European Journal of Law and Economics* vol. 12 (3), 217–252.

51. These numbers are important because they imply that the opportunity cost of state aids is very large. According to existing estimates, the social return to public investment in education is about 8.5% in OECD countries, but above 20% in developing countries.[32] These numbers imply that state aids should be assessed against a strong standard. Aids that are tantamount to pure lump-sum transfers represent an enormous waste of resources (unless the lump-sum transfers contribute to some legitimate, well-identified distributive goal) since they use public funds that are costly to collect and that could have been put to a much more productive use had they been allocated to health care or education.

2.2 The magnitude and economic cost of subsidy races

52. One may wonder why governments would grant subsidies when more efficient uses of public funds would be possible.

53. A frequent answer has to do with the existence of negative externalities between jurisdictions, i.e., between countries or between regions within countries. In a nutshell, the granting of aid may seem to be sound policy from the narrow viewpoint of a local or a national government, but when such aid amounts to shifting economic activity from one region (or one country) to another one, it is globally almost useless and it amounts to a waste of public funds.

54. The deadweight cost of taxation and the opportunity cost of public funds are high and therefore state aids are likely to be wasteful even when they do not directly generate distortions (the observation that state aids, in addition, often generate serious distortions that are damaging to economic efficiency and to the environment, is explored later on in this study).

55. The mechanism behind the externality is the following. A firm's decision to set up, expand or maintain a plant in a country often generates sizable benefits for the host country or the host region: tax revenues (levied directly on the firm or indirectly, on employees' salaries), possibly a decrease in unemployment and in the associated costs, increased demand for the output of local suppliers, etc. It may also result into a transfer of skills to the local workforce, which can then benefit the economy more broadly as workers change firms. Each national or local government thus may have an interest in granting aid in order to lure firms into its territory. Competition across local or national governments wanting to attract or retain the same firms might result in large volumes of aid, shifting the location of firms' activities rather than creating new ones.

56. In theory, subsidy races might raise, rather than decrease, total welfare. This could be the case if two conditions were met: (i) the deadweight cost of taxation and the opportunity cost of government funds are low and (ii) the benefit derived from a firm's presence varies greatly across locations. In such a case, the countries or regions in which the presence of a firm would yield the largest benefits are willing to "bid" greater amounts than regions in which these benefits would be smaller. Just like price competition, cross-country competition would then reveal where the external benefits are greatest, and it would cause firms to locate where their presence is most valuable, which would be desirable.[33]]

57. If, as is generally the case, the deadweight cost of taxation and the opportunity cost of government funds is large (which is the case, as is explained above), and if subsidy races do not direct

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32 G. Psacharopoulos and H.A. Patrinos, 2004, Returns to investment in education: a further update, *Education Economics*, vol. 12 (2), 111-134.

33 W. Tiebout, 1956, A pure theory of local expenditures, *Journal of Political Economy*, vol. 64 (5), p. 416; T. Besley and P. Seabright, 1999, The Effects and Policy Implications of state aids to Industry: an Economic Analysis, *Economic Policy*, p. 15-53.

investments towards regions where they have the greatest positive external impact, then races are likely to be wasteful.

58. The available literature about the United States, where aid is not prohibited illustrates that competition across states to attract firms can be costly. States seem to engage in significant competition to shift activities from neighbouring states to themselves, often without creating new activities.[34] Simply changing the location of a business (as opposed to encouraging the creation of new activity) is unlikely to have net beneficial effects unless there is a markedly different cost / benefit balance in different regions within the one country. This cross-state competition also seems to have intensified lately,[35] and this has prompted some American authors to recommend a federal control over state aid.[36]

59. Even in the European Union, where state aid control is supposed to limit the occurrence of wasteful subsidy wars, and where one could expect subsidy competition to result only in "virtuous" outcomes, i.e., in directing investments where it generates the greatest positive externalities, the evaluation by the literature of existing aids is not very positive. According to a recent study, while regional policy aiming to attract firms to poor or peripheral locations apparently succeeded, they were very costly because the distortion of firms' location choices resulted into sizable inefficiencies.[37] The case for state aid as a tool for the alleviation of regional inequalities might thus not be so strong, and alternative policies, such as direct income transfers could be more efficient in many cases.[38]

60. The picture is not different in the developing world, where examples of highly wasteful subsidy competition abound, often within large, federal countries, where regional governments try to outbid each other in order to attract investment.

61. A recent example is the competition between various Indian states in order to attract a plant that Tata Motors was willing to build in order to produce a new, cheap car destined primarily for the Indian market. The location of the plant was finally decided to be in the state of West Bengal, after this state's government offered a highly attractive incentive package including preferential loans at a below-market rate of 1%, subsidised electricity (with a discount greater than 25%), subsidised land, and tax exemptions.

62. More interestingly, this example illustrates the intensity of competition across states. In particular, during the "bidding war", West Bengal offered a commitment to match the incentive packages offered by two other states (Uttarakhand and Himachal Pradesh). If, as is probably the case, what was at stake was the location of the plant, rather than the principle of its existence somewhere in India, it is likely that such a subsidy race was inefficient unless the cost / benefit balance varies considerably within the one country.

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34 R. Tannenwald, 2002, Are State and Local Revenue Systems becoming Obsolete?, *National Tax Journal*, vol. 55 (2), p. 467.

35 K. Chi and D. Leatherby, 1997, *State Business Incentives: Trends and Options for the Future*, Lexington, Kentucky: Council of State Governments.

36 P. Enrich, 1996, Saving the States from Themselves: Commerce Clause Constraints on State Tax Incentives for Business, *Harvard Law Review*, vol. 110 (2), p. 377.

37 K.-H. Midelfart-Knarvik and H.-G. Overman, 2002, Delocation and European Integration: Is structural spending justified?, *Economic Policy*, vol. 35, 322-359.

38 K.-H. Ulltveit-Moe, 2007, Regional policy design: An analysis of relocation, efficiency and equity, *European Economic Review*, vol. 51, 1443-1467.

63. This example is far from being isolated in developing countries. For instance, there has been in the late 1990s an intense subsidy war across Brazilian states trying to attract automotive plants.[39] For instance, in 1995 and 1996, the state of Parana and the municipality of Sao Jose offered Renault an attractive package, including a capital contribution of about $ 300 million and subsidised electricity, launching what became known as the "fiscal war" across Brazilian states.

64. Similar subsidy wars have taken place in East Asia as well. In 1996, Thailand and the Philippines engaged into a hard-fought battle to attract a General Motors car plant. In the end, Thailand won the contest by matching the Philippines' package and, in addition, offering a 100 per cent refund on raw materials for car exports and a $15 million grant towards setting up a General Motors training institute. Again, the interesting element is that General Motors had announced its intention to build a $ 500 million car plant in Asia, irrespective of subsidies. Therefore, the subsidies did not, in all likelihood, contribute to the creation of new economic activities, and simply had an impact of the location of a plant that would have been built notwithstanding the subsidies provided.

65. Such subsidy wars are by no means limited to the car industry. Since the mid-1990s, several East Asian nations have launched various incentive schemes, involving very generous tax exemptions for high technology investments.

66. One may question the economic rationality of such subsidy races, both at the individual level of the country or regions granting a subsidy, and at a more global level.

67. At the individual level, since such subsidy races are mostly about attracting foreign investment (though not only, as the Tata Motors example shows), the relevant question is whether foreign investment generates large enough externalities to make the granting of subsidies rational. There is evidence that foreign direct investment generates benefits to other firms in the same sector or in vertically related ones (i.e., suppliers or customers). This evidence is so far more abundant in the case of developed countries. In the case of developing or transition economies, there is a (still admittedly small) body of evidence showing that the presence of affiliates of foreign-owned firms tends to increase the productivity of their local suppliers, but the evidence also shows that such effects vary a lot from one case to another.[40]

68. These findings imply that it may be rational for individual countries or regions to grant large subsidies in order to attract foreign investment. However, such behaviour is likely to be collectively irrational, in that a "prisoner's dilemma" is at play. In the end, most of the investments benefitting from subsidies would have taken place anyway, so that the main impact of subsidy races is a waste of public funds.

2.3 Strategic subsidisation in oligopolistic sectors: overcapacities and competition creation

69. In oligopolistic markets, state aid may also generate cross-country externalities by having an impact on the investment decisions of the rivals of the aid recipient. The underlying mechanism has been studied in the economic models of strategic trade policy,[41] and can be summarised as follows. In an

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39 This and the following examples are drawn from Andrew Charlon, 2003, Incentive Bidding for Mobile Investment : Economic Consequences and Potential Responses, OECD Development Centre, Working Paper No. 203.

40 B. Javorcik, 2004, Does Foreign Direct Investment Increase the Productivity of Domestic Firms? In Search of Spillovers Through Backward Linkages, *American Economic Review*, 2004, vol. 94(3).

41 J. Brander and B. Spencer, 1985, Export Subsidies and International Market Share Rivalry, *Journal of International Economics*, vol. 18, p. 83.

oligopoly, in which firms earn rents derived from their market power, a firm's profit increases if its rivals decrease their investment (to be understood in a broad sense, including R&D, advertising, set-up costs in order to operate in a new country, etc.) Therefore, a national government may have an interest in inducing the foreign rivals of one of its national champions to scale down their investments.[42] State aid may achieve this result in some circumstances. For example, if country A grants investment aid to a firm, competitors in country B may expect an expansion of the recipient of the aid, and thus a reduction in the residual demand facing them. This expectation may in turn induce them to scale down their investment. The overall result is a shift of part of the oligopoly rents towards the recipient of the aid, at the expense of its rivals.[43]

70. The granting of aid may thus allow the recipient to pre-empt a part of the demand which, absent any aid, would have been served by foreign rivals. This mechanism involves a cross-country negative externality because when a government grants aid, it fails to take into account the harm to foreign competitors.

71. Such logic is probably at work in sectors such as the automotive industry. As recalled above, governments across the world, in developed and developing countries alike, have granted massive subsidies to their automotive industries, with the total commitments estimated at $ 48 billion in 2008. Many governments justify the granting of aid by the need to re-establish competitive balance and to compensate for the subsidies granted by foreign governments.

72. In theory, the impact of such subsidies on social welfare is ambiguous, because they may generate a positive cross-country externality: if the recipient of aid expands production, or investment, consumers may benefit, not only in the country whose government granted the aid, but also abroad. A government caring only about the welfare of domestic economic agents would fail to take this effect into account. If this positive externality is more important than the abovementioned negative one (the one on foreign producers), it could be the case that, even absent state aid control, governments grant too little, rather than too much aid! [44]

73. Leaving theory aside, it is clear that such strategic subsidies impose a large cost to the global economy, at least in the automotive sector, because they hinder the much-needed balance between production capacities and global demand.

74. This result is however not universal. In some cases, especially when the subsidy is used in order to create a new competitor in a market lacking competition, it may be welfare-increasing. The positive externality at stake is the impact on the degree of competition. For instance, creating Airbus yielded benefits not only in the form of profits from the sale of aircraft, but also in the form of a decrease in the (quality-adjusted) prices of Boeing aircraft, which shifted monopoly rents away from US shareholders to airlines around the world (and their clients). The same can be said of the creation of Embraer, the Brazilian aircraft producer. The main finding from empirical research is that the impact of such competition-creation subsidies is very complex and multidimensional. For instance, it has been estimated that because of the increased competition in the aircraft sector fostered by the creation of Airbus, the corresponding subsidies

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42 See GFC 2009 Roundtable on Competition Policy, Industrial Policy and National Champions (cf. Footnote 6 above).

43 In some circumstances, the causality may be reversed. For example, a firm facing a decrease in its residual demand may have greater incentives to engage into R&D so as to re-establish a better market position.

44 D. Collie, 1998, State aid in the European Union: The prohibition of subsidies in an integrated market, *International Journal of Industrial Organization*, vol.18, 867-884; D. Collie, 2002, Prohibiting State aid in an Integrated Market, *Journal of Industry, Competition and Trade*, vol. 2 (3), p. 215; D. Collie, 2005, State aid to Investment and R&D, *European Economy, Economic Papers*, vol. 231, p. 1.

significantly raised European welfare, but decreased the global economic surplus (once the losses to pre-existing aircraft manufacturers are accounted for).[45]

2.4 Distortions caused by subsidies

75. The main source of inefficiency caused by subsidies, besides their possible wasteful nature (in which case the inefficiency results from the opportunity cost of public funds) is that they tamper with market signals. This can result in two types of inefficiencies. *Allocative inefficiencies* arise when the relative quantities produced and consumed of various goods are not optimal. Technical inefficiencies arise when, taking total output as given, production does not use the cost-minimising combination of inputs (taking environmental costs into account).

76. This interference with market signals can take two broad forms. When state aids amount to a general, across-the-board subsidisation of inputs, the inefficiency results from the discrepancy between the prices perceived by economic agents, which are affected by subsidies, and the "true", cost-based prices.

77. When state aids target specific firms, they alter the "Darwinian" mechanism by which capital is allocated to the most efficient firms, which tends to minimise total production costs. This effect can play both at the intra-sectoral and at the inter-sectoral level. At the intra-sectoral level, state aids may channel capital and labour to less efficient firms, thereby generating productive inefficiencies. At the inter-sectoral level, state aids may affect the relative magnitude of various sectors, leading to overproduction in subsidised sectors and underproduction in others.

78. These various mechanisms are highlighted hereafter with the help of a few examples. For illustrative purposes, we focus on examples from developing countries and on distortions having an impact on the environment. We also consider a few examples drawn from the recent financial crisis and bank bailouts.

Price distortions

79. The most striking example of economically and environmentally costly distortions caused by subsidies is that of energy subsidies.

80. These subsidies are quantitatively important, both on the consumption and on the production side, in developing and developed countries alike. Iran's fuel subsidies amount to about $ 55 billion per year. India's fuel subsidy has been estimated at $ 15 billion annually at least, 90% of which accrue to agriculture. Quite interestingly, large fossil fuel producers and exporters are most likely to heavily subsidise energy consumption: beyond the extreme case of Iran, Saudi Arabia and Venezuela, two of the world's largest oil producers, are also among the most important providers of domestic energy subsidies ($ 26 billion and $ 17 billion annually)[46]. The reason is probably that such subsidies are perceived as almost costless by governments. They are costly when the market price of oil is high, which also happens to be the time when governments earn large revenues from oil exports.

81. Even in the European Union, despite the existence of strict state aid control mechanisms, some fossil fuels benefit from very large production subsidies. Over the decade 1994 to 2005 over €80 billion in state aid for the coal industry was approved. In Germany the operating aid in 2004 was equivalent to over €86 per tonne suggesting that the cost of German coal production was more than twice the world market

45 D. Neven and P. Seabright, 1995, European Industrial Policy: the Airbus Case, *Economic Policy*, vol. 21, 313-358.

46 International Energy Agency, 2008.

price. On the consumption side, the persistence of a complex scheme of regulated electricity prices in France, well below the true marginal costs of electricity generation, is another case of tampering with price signals.[47]

82. Such subsidies have hugely distortive effects. On the consumption side, the long-term elasticity of demand for gasoline has been estimated to be around -0.7 in the sense that a 1% decrease in the price of gasoline causes demand to rise by 0.7% in the long run.[48] This relatively large number (in absolute value) implies that the abovementioned subsidies have a sizable impact on oil consumption. From a purely economic viewpoint, they tend to discourage conservation efforts and induce economic agents to behave without taking into account the true marginal production costs of fossil fuels. They are also environmentally damaging since they directly counter efforts to limit emissions.

83. The case of energy subsidies to Indian farmers is particularly interesting. The provision of cheap electric power since the 1970s was meant to support farmers (which formed, and are still forming the majority of the population, and are overwhelmingly poor) and encourage them to purchase and operate pumps to irrigate their crops. Obviously, the subsidisation of electric power meant that in many cases, the ensuing production decisions, while individually rational, were in fact value-destroying if considered on the basis of the true costs of electricity generation. This subsidisation policy also generated environmental damages. Because the cost of pumping water was artificially lowered, many farmers planted thirsty crops, which depleted water resources and increased salination.[49]

84. The case of European coal subsidies illustrates the various channels by which subsidies can be distortive. In principle, the level of subsidies was calculated so as not to change the "merit order" between different types of fuels, i.e., in order not to make coal-fired power plants artificially more economical than, for instance, gas-fired power plants. This limit on the subsidy plan was one of the reasons that led the European Commission to accept it. However, even with this restriction, the subsidy scheme was bound to create distortions. The reason is that it amounts to increasing the global supply of coal, i.e., to adding an artificially inflated amount of European coal on the global market, with the consequence of lowering the market-clearing price, thereby generating some substitution away from other energy sources towards coal.

85. Coming second just behind energy, water is probably the most heavily subsidised commodity in the world. In the developing world alone, it is considered that water subsidies amount to about $ 45 billion annually, leading to overconsumption and lack of investment in pipe networks (to reduce leaks).

Productive and environmental inefficiencies caused by capital misallocation

86. Another importance source of inefficiencies concerns the provision of selective subsidies to specific firms – in particular SOEs. The source of the inefficiency is that if such subsidies are directed to inefficient firms, they shift production towards less efficient units, thereby increasing total production costs. This can also entail large environmental costs, since inefficient firms tend to use more inputs per unit of output, and hence to pollute more.

87. The order of magnitude of the subsidies to SOEs is very large. The fact that, in some countries, almost the entirety of subsidies were allocated to loss-marking companies is consistent with the view that

47 D. Spector, 2007, *Electricité: Faut-il désespérer du marché?*, Editions Rue d'Ulm.

48 J. Hamilton, 2008, Understanding Crude Oil Prices, NBER Working Paper #14492.

49 R. Tongia, 2007, The Political Economy of Power Sector Reform in India, in *The Political Economy and Institutions of Power Sector Reform in the Developing World*, Victor, D. and Heller, T. (eds.), Cambridge University Press, Cambridge.

subsidies were often not allocated on the basis of a cost/benefit calculation, or by taking into account the presence of market failures in need of corrections, but merely by the need to keep inefficient production units afloat.

88. In addition to direct government subsidies, SOEs are often supported by preferential access to credit from state-owned banks.[50] These direct and indirect subsidies are directing resources to inefficient production units, implying a deadweight cost which can represent a non negligible percentage of industrial output.[51] This estimate is striking because it is an average across all SOEs, some of which are very efficient, especially after the Chinese government started to reform them by introducing private-sector style corporate governance rules.

89. In addition to this purely economic deadweight cost, the subsidisation of inefficient SOEs causes significant environmental costs. A burgeoning but convergent empirical literature finds that SOEs tend to be less environment-friendly than private firms. Some studies[52] find that SOEs can emit up to ten times more pollutants than private firms, everything else being equal. One of the reasons seems to be that SOEs are less monitored for environmental compliance than private firms[53]. But another likely reason is that since subsidies keep inefficient production units in activity, these units use up more inputs in general for a given amount of output, implying that they also pollute more.

90. Aid recently granted to financial institutions by many governments around the world can also have other sub-optimal effects. Government support was mainly directed to the larger banks, deemed essential for systemic stability. The result was that large banks had better access to credit than smaller ones, because creditors felt that they benefitted from an implicit government guarantee. According to a recent estimate, banks with more than $100 billion in assets are borrowing at 0.34 points lower than other banks. This may induce a squeeze and further strengthen the larger banks at the expense of their smaller rivals. This creates an inefficiency, and it was the sheer size of the largest banks, and the perception that they were 'too big too fail', which acted as a contributory factor in triggering the financial crisis.[54]

91. In developed countries, support to loss-making companies is less pervasive, but can sometimes take place to a significant extent when governments come to the rescue of "national champions". For instance, the United States' antitrust agencies' contribution to the 2009 OECD Competition Committee's roundtable on financial markets[55] cites the government's provision of loan guarantees to Chrysler Corporation in 1980 as another example of a failed effort which may have had adverse competition consequences. According to the U.S. paper, should Chrysler have failed, the assets could have devolved to

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50 L. Brandt and Z. Zhu, 2000, Redistribution in a Decentralized Economy: Growth and Inflation in China Under Reform, *Journal of Political Economy*, vol. 108, 422–439.

51 S. Claro, 2005, How Uncompetitive is the State-Owned Industrial Sector in Chinao, Documento di Trabajo N° 305, Pontificia Universidad Catolica de Chile, Instituto de Economia.

52 See for example H. Wang and Y. Jin, 2002, Industrial Ownership and Environmental Performance: Evidence from China, Discussion Paper 2936, World Bank Policy Research Working Paper; S. Pargal and D. Wheeler, 1996, Informal Regulation of Industrial Pollution in Developing Coun- tries: Evidence from Indonesia, *Journal of Political Economy*, vol. 104, 1314–1327.

53 S. Gupta and S. Saksena, 2002, Enforcement of Pollution Control Laws and Firm Level Compliance: A Study of Punjab, India, paper presented at 2nd World Congress of Environmental and Resource Economics, Monterey CA; H. Wang, N. Mamingi, B. Laplante, and S. Dasgupta, 2002, Incomplete Enforcement of Pollution Regulation: Bargaining Power of Chinese Factories, World Bank working paper.

54 D. Cho, Banks 'Too Big to Fail' Have Grown Even Bigger, *Washington Post*, August 28, 2009.

55 Competition and Financial Markets, OECD 2009 : http://www.oecd.org/dataoecd/45/16/43046091.pdf

a more efficient competitor, and the industry's competition position could have improved.[56] Similarly, according to the U.S. Federal Trade Commissioner William Kovacic, the provision of financial assistance to the distressed aircraft manufacturer Lockheed in the early 1970s generated large productive inefficiencies. Had Lockheed been allowed to fail, its assets would have gone to a then more efficient carrier, McDonnell Douglas, the MD10 producer. Today's landscape could have been very different, according to Commissioner Kovacic, with at least three effective major manufacturers of long-range commercial aircraft: Boeing, Airbus, and McDonnell Douglas. [57]

2.5 Another cost of subsidies: the soft budget constraint and the cost of rent-seeking

92. State aids can also have adverse effects on economic efficiency through two more mechanisms. The first one is the so-called "soft budget constraint". The striking characteristic of this mechanism is that the source of the inefficiency is not the granting of subsidies itself, but rather the expectation that failing firms could be bailed out and subsidised. If it is expected that failing firms will be rescued by governments with some probability, companies may be encouraged to undertake overly risky investments, or to adopt lax management practices. More generally, a firm's incentives to become more efficient so as to cut costs, raise quality or innovate are likely to be dampened if it expects that the resulting competitive advantage will be offset by the granting of aid to its lazier rivals. This idea has been formulated by the economist Janos Kornai when analysing attempts by the Hungarian government to partly liberalise the economy: *"Although state-owned enterprises were vested with a moral and financial interest in maximising their profits, the chronic loss-makers among them were not allowed to fail. They were always bailed out with financial subsidies or other instruments. Firms could count on surviving even after chronic losses, and this expectation left its mark on their behaviour"*.[58]

93. This type of mechanism is difficult to measure, because it does not involve a direct causal link between a specific aid and a measurable inefficiency. However, a recent study of the performance of Korean SOEs lends support to the view that the soft budget constraint, i.e., the expectation of bailout by the government in case of failure, has a strong impact on companies' operating efficiency. This study[59] finds that Korean SOEs increased their operating efficiency and their profitability between 1998 and 2002, at a time when they were facing the prospect of privatisation because of a commitment by the government in that direction. Hence, the source of the increased efficiency was not privatisation (which in fact did not take place for most of the companies considered), but simply the removal of the expectation that they would be bailed out in case of failure.

94. The recent debate about Air India's bailout provides another illustration of this mechanism of soft budget constraint. The government indicated that this was the "first and last time" that it would bail out the airline. As in any such situation, making this commitment credible was an important part of the overall strategy meant to force managers to make tough but necessary decisions, including staff reductions.

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56 Note by the United States, OECD Competition Committee Roundtable: Competition and Financial Markets, DAF/COMP(2009)11ADD1, at 225-29, available at http://www.oecd.org/dataoecd/45/16/43046091.pdf. The paper also cites federal aid to Penn Central as another example of failed state aid (at 228, fn 10).

57 W. Kovacic, participant in Industrial Policy and Competition Law and Policy Roundtable ("Industrial Policy Roundtable"), 2006 Fordham Comp. L. Inst. 239-40 (B. Hawk ed. 2007).

58 J. Kornai, E. Maskin and G. Roland, 2003, Understanding the Soft Budget Constraint, *Journal of Economic Literature*, vol. 41 (4), p. 1095. See also J. Kornai, 1986, The Soft Budget Constraint, *Kyklos*, vol. 39 (1), p. 3.

59 J. Kim and H. Chung, 2008, Empirical Study on the Performance of State-owned –enterprises and the Privatizing Pressure : The Case of Korea, paper presented at the Utrecht conference on "(Re)Regulation in the Wake of Neoliberalism. Consequences of Three Decades of Privatization and Market Liberalization", available at http://regulation.upf.edu/utrecht-08-papers/jkim.pdf.

However, outside observers considered this commitment not to be credible, inter alia, because Air India, like most national carriers, was "too big to fail", because of its symbolic weight and, last but not least, because it was an SOE."[60] Similar stories can be found in many countries, including in Europe.

95. In some sense, the financial crisis of 2008 is an extreme instance of the damage wrought by the existence of a soft budget constraint. One ingredient that contributed to excessive risk-taking by banks was the implicit government guarantee they felt to be enjoying (and that they indeed were enjoying, as has been revealed by the various, costly rescue plans). Here again, the damage caused by the excessive risk-taking was not caused by the granting of aid, but by the expectation that aid would be granted should the need arise. This remark should not be construed as meaning that the bank rescue schemes were inappropriate; even though there is scope for disagreement on their details; few economists deny the need for some kind of government rescue. However, this observation highlights the possibly major economic costs implied by the expectation of government aid.

96. All these effects share the striking characteristics that the harm is not caused by the subsidies themselves, but rather by the expectation that subsidies might be granted in the future. Such effects cannot, therefore, be accounted for on a case-by-case basis, when evaluating the merits and the costs of a given subsidy.

2.6 The political mechanisms behind inefficient subsidies

97. The above list of mechanisms which can lead to inefficient subsidies being granted fall into two broad categories: negative externalities across jurisdictions and an intrinsic propension of governments to make inefficient decisions. While wasteful subsidy races and the competition for rents in oligopolistic markets, leading to a global excess of production capacities, can be explained by the presence of negative externalities between rational, welfare-maximising (local, regional or national) governments, many other mechanisms are at play that explain why governments tend to grant subsidies that make little economic sense, even from their own narrow point of view.

98. One can find many examples of subsidies that obviously did not make sense from a collective interest viewpoint and can be better explained by rent-seeking or political motives - an extreme example is aid granted in the 1990s by the State of Michigan to various firms on job-creation grounds at a cost more than 2 million dollars per job4.[61] More generally, the ability of private interest groups to sway economic policy in their favour at the cost of others has been amply documented,[62] just as the impact of firms' political connections on business outcomes, both in developed and developing countries.[63] For example, according to existing literature, the degree of tariff protection enjoyed by various industries in the United States is directly correlated to the level of donations to political parties.[64] There is also evidence that sector- or firm-specific public policy (for instance trade policy) is in general tilted in favour of declining

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61 See R. Tannenwald, 2002, Are State and Local Revenue Systems becoming Obsolete?, *National Tax Journal*, vol. 55 (2), September, p. 467.

61 See R. Tannenwald, 2002, Are State and Local Revenue Systems becoming Obsolete?, *National Tax Journal*, vol. 55 (2), September, p. 467.

62 T. Persson and G. Tabellini, 2000, *Political Economics: Explaining Economic Policy*, MIT Press.

63 B. Roberts, 1990, A Dead Senator Tells No Lies: Seniority and the Distribution of Federal Benefits, *American Journal of Political Science*, vol. 34 (1), 31–58 ; R. Fisman, 2001, Estimating the Value of Political Connections, *American Economic Review*.

64 P. Goldberg and G. Maggi, 1999, Protection for Sale: An Empirical Investigation, *American Economic Review*, vol. 89 (5), p. 1135.

industries. This is a quite general pattern. It can be observed both in US trade policy[65], and in European state aid policy: for instance, many European governments spent billions of euros trying to keep inefficient coal mines afloat, only to delay their closure by a few years.

99. A recent econometric study of state aid in Europe[66] finds that the more a country's political system makes the provision of targeted aid politically profitable (e.g., in countries with small electoral constituencies, little ideological distance between parties, and little party unity), the greater the share of aid to firms that is indeed targeted ("sectoral", in EU parlance), as opposed to "horizontal". This suggests that the provision of support to specific sectors may be based, to some extent, on electoral considerations – despite strict control by the European Commission.

100. These findings have two consequences. First, rent-seeking and politically motivated decisions may affect the nature and destination of subsidies, often leading to an inefficient use of public funds and to productive and allocative inefficiencies. In addition, the more subsidy granting lends itself to capture by private interests, the more companies are likely to invest in rent-seeking activities, which represents a waste of resources: according to various estimates, the cost of rent-seeking activities is very high.[67]

101. The handling of the recent financial crisis is a case in point. Some observers argue that the U.S. bailout scheme was tilted in favour of banks' shareholders rather than to a potentially more efficient scheme, which would have involved the nationalisation of some insolvent banks.[68] Similarly, an analysis of US congressmen's voting patterns regarding the Emergency Economic Stabilisation Act ("EESA") in October 2008, which according to the authors of the study "transfers wealth from tax payers to the financial services industry" reveals that "higher campaign contributions from the financial services industry are associated with an increased likelihood of voting in favour of the EESA".[69]

102. Subsidies sometimes create new vested interests that engage in rent-seeking, for instance by pursuing the perpetuation of industrial policies which should in fact be interrupted because of changing circumstances. The Concorde project, sponsored by the British and French governments, illustrates this

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65 G. Hufbauer and H. Rosen, 1986, Trade Policy for Troubled Industries, Policy Analyses in International Economics 15, Institute for International Economics Washington, D.C.; G. Hufbauer, Gary, D. Berliner and K. Elliot, 1986, Trade Protection in the United States: 31 Case Studies, Institute for International Economics, Washington, D.C. ; E. Ray, 1991, Protection of manufactures in the US, in D. Green, *Global Protectionism: Is the US playing on a level field?* Macmillan, London.

66 U. Aydin, 2007, Politics of state aid in the European Union: Subsidies as Distributive Politics, University of Washington, Political Science Department, unpublished.

67 In the United States, total expenditures on transfer activity have been estimated at 25% of GDP (D. Laband and J. Sophocleus, 1992, An Estimate of Expenditures on Transfer Activity in the United States, *Quarterly Journal of Economics*, vol. 107(3), 959-983). Other estimates, based on regressions of gross national output on the relative number of lawyers (supposed to be a proxy for the magnitude of rent-seeking activities) and physicians or engineers (supposed to be a proxy for the magnitude of productive activity) point to similar or even higher costs of rent-seeking (S. Magee, W. Brock and L. Young, 1989, *Black Hole Tariffs and Endogenous Policy Theory: Political Economy in General Equilibrium*, Cambridge University Press; K. Murphy, A. Shleifer and R. Vishny, 1991, The Allocation of Talent: Implications for Growth, *Quarterly Journal of Economics*, vol. 106(2), 503-530.)

68 M. Richardson and N. Roubini, Nationalize the Banks! We're all Swedes Now, *Washington Post*, February 15, 2009.

69 A. Mian, A. Sufi and F. Trebbi, 2009, The Political Economy of the U.S. Mortgage Default Crisis, NBER Working Paper # 14468.

point.[70] The launch of a supersonic plane made sense in the cheap oil world of the 1960s, but the project lost its economic rationale after the oil shock of 1973. However, its advanced stage implied that the large group of civil servants and businessmen with a stake in the Concorde project had a strong interest in the continuation of the project. Ultimately, this group prevailed over market signals and the project went ahead, at a considerable cost to both governments.

103. This type of harmful causal chain occurs in a variety of situations. In contrast to the high-technology example of the Concorde project, the policy followed by many Indian states that subsidised electric power for farmers in order to foster water pumping and irrigation created a similar lock-in effect. Faced with cheap power, many farmers acquired pumps and invested know-how in the growing of thirsty crops. This financial and human investment reinforced the demand for cheap power: basically, the idea is that subsidising a good (in this case, electric power) creates an incentive for the recipient of the subsidy to invest in a complementary good (in this case, electric pumps and the know-how regarding the growing of thirsty crops), which increases the demand for the original subsidy. In the end, the political pressure for the continuation of subsidies to electric power became the main driver of the continuation of this policy, long after politicians had realised how harmful it was.

104. The large subsidies to agriculture in many countries are another case in point. For instance, the common agricultural policy put in place by the European Union were initially justified on efficiency grounds, on at least two counts. First, it was meant to encourage European farmers to adopt more efficient technologies, which involved in some cases very difficult adjustments, such as exchanges of parcels of land between farmers so as to end up with farm shapes that lent themselves to modern techniques. Second, it was meant to bring Europe towards food self-sufficiency, which in the 1960s would have been a worthy goal, as in the context of the cold war the notion of "food security" made sense. However, by the 1990s these justifications had all but disappeared. One could have imagined that it would be easy to decrease the amount of subsidies to agriculture, but that did not happen because the beneficiaries of the subsidies had become a powerful political constituency. Similarly, subsidies to increase ethanol production in the United States, initially intended to develop an alternative to fossil fuels, turned out to be economically unsound when in 2007 and 2008 the price of corn and sugar cane (used to produce ethanol) started to rise. However, there was strong pressure to maintain the status-*quo*, in particular because the ethanol subsidies had been capitalised in land prices, which made a policy turnaround difficult.

105. A recent study of the investment decisions made by sovereign wealth funds confirms that the more politicians are involved, the more they tend to use these funds as vehicles for the subsidisation of domestic companies.[71] This study finds that sovereign wealth funds where politicians have a greater involvement in management tend to invest more in domestic companies (which is consistent with the view that they use such funds to reward friends rather than to diversify their countries' assets) and that they tend to invest in companies with higher price/earnings ratios, which have on average a negative valuation change after the investment. This last finding suggests that sovereign wealth funds where politicians have a greater involvement tend to subsidise the firms in which they invest, by supplying them with capital on terms that are below those that would have led to normal rates of return.

106. The recent spate of bailouts of troubled firms, in the wake of the financial crisis, illustrates the tendency for governments' funds to be handed out on the basis of somewhat-unclear economic criteria. For instance, in Russia, Vneshekonombnak (VEB), the state development bank, announced in 2009 plans to

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70 D. Myddlteon, 2007, *They Meant Well: Government Project Disasters*, Institute of Economic Affairs Monographs, Hobart Paper No. 160.

71 S. Bernstein, J. Lerner, A. Schoar, 2009, The Investment Strategies of Sovereign Wealth Funds, Harvard Business School Working Paper 09-112.

lend about $ 50 billion to distressed companies, with the possibility to convert loans into government shares should the beneficiaries be unable to repay. However, many observers, including in Russia, criticised the lack of objective criteria governing either the choice of the beneficiaries, or the nature of the assistance (and in particular the absence of any conditions attached to the granting of aid), to the point that some observers claimed that "a $50 Billion Bailout in Russia Favours the Rich and Connected"[72]. For instance, the carmaker Avtovaz received in 2009 a $ 730 million interest-free loan, a $ 230 million loan from state banks at a favourable rate, and a commitment by state-owned banks to help it raise an additional $ 2.6 billion from banks. In exchange, no commitment was demanded in terms of management, in spite of the broadly held view that Avtovaz is far from the efficiency frontier in the automotive industry. As a result, the Russian Union of Industrialists and Entrepreneurs called for the creation of transparent, public standards for financial aid distribution and warning about the dangers of favouritism. The financial advisor who originated this bailout strategy even criticised the "frittering away of funds, directing them toward inefficient companies with political connections".[73]

107. Another mechanism leading to inefficient subsidies is at play in the case of countries where a large share of government revenues comes from the export of raw materials, such as oil. Public knowledge of the windfall revenues that fall into government coffers in times of high world prices create a popular pressure for redistribution, and governments often feel that the least risky way for them to redistribute part of the windfall revenues is by subsidising the raw material that generated the windfall in the first place. This is because such a redistribution entails an automatic "fiscal stabiliser", since its cost is directly proportional to the windfall revenues. However, this redistribution mechanism is highly inefficient because it distorts price signals, as explained above. A possible solution is the creation of offshore funds allowing governments to tie their own hands, such as those created by Norway, Kuwait or Azerbaijan.

108. According to Rodrik (1995)[74], the subsidisation of nascent industries in East Asian countries in the last decades was relatively immune to rent-seeking, unlike the situation observed in most developing and many developed countries. As Rodrik (2004)[75] points out, the presence of rent-seeking does not by itself suffice to conclude against targeted subsidies and industrial policy, no more than rent-seeking in education justifies an end to the public provision of education. However, these findings plead against policies that endow governments with tools allowing them to arbitrarily favour specific firms. More across-the-board instruments, or aid targeted to new firms and new activities, on a temporary basis, would probably limit the scope for rent-seeking.

109. There exist good reasons for governments to grant subsidies to companies in specific circumstances. These reasons (often, but not exclusively falling into the category of "industrial policy") do not, however, justify signing a blank cheque for subsidies. As the above examples show, political dynamics may imply that a subsidy that is initially sound from an economic viewpoint creates vested interests that make its removal very difficult even after it has lost its initial justification. Also, as is explained hereafter, the existence of theoretical justifications for subsidies in some cases does not imply that governments, even benevolent ones immune from the pressure of special interests, can easily identify which subsidies are "right" and which would be wasteful.

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72 *New York Times*, 31 October 2008.

73 A. Kramer, Russian Auto Bailout Protects Jobs, Not Efficiency, April 7, 2009 ; the ISCIP Analyst, An Analytical Review, vol. XV (4), 6 November 2008 ; P. Pan, Russian élite look to Kremlin for aid as wealth evaporates, *Washington Post*, 17 October 2008.

74 D. Rodrik, 1995, Getting Interventions Right: How South Korea and Taiwan Grew Rich, *Economic Policy*, vol. 10(20).

75 D. Rodrik, 2004, Industrial Policy for the twenty-first century, Harvard Kennedy School Working Paper 04-047.

3. The possible justifications for state aids and their limits

3.1 A quick overview of the most frequent justifications for state aids and subsidies

110. The most frequent justification for state aids and subsidies is that they allow governments to correct market failures of various kinds.

111. For instance, markets may fail to deliver a distribution of income that is considered to be fair or politically desirable. In principle, the proper tool to address this type of market failure is not the granting of subsidies, but rather fiscal policy. However, in some circumstances, especially when governments' goal is to provide income support to a category of the population that is defined by its economic activity (for instance, agriculture), rather than by its monetary income, they choose to subsidise an economic activity directly.

112. Another frequent justification for the granting of subsidies to private companies is the goal of saving jobs, when a company faces the prospect of bankruptcy, or the "threat" of foreign takeover sometimes deemed to threaten jobs.

113. However, the most frequent justification for state aids and subsidies is the presence of positive externalities generated by some activities, i.e., the idea that the social value of some activities exceeds their private value. Unless the gap between the social and private value is filled by subsidies, private agents have an insufficient incentive to engage into a socially valuable activity. This idea is at the root of the subsidies that are part of "industrial policy".

114. The various mechanisms possibly justifying the granting of subsidies are reviewed hereafter. We also highlight the limits and the risks associated with the granting of subsidies even when objective justifications seem to exist; and we illustrate hereafter how the new economic approach implemented by the European Commission assesses the various possible justifications for state aids.

3.2 Subsidies as income support

115. The most natural instrument to redistribute income is taxation and transfers to individuals. However, in some cases, interest-group politics push governments to redistribute income not on the basis of monetary criteria, but on other grounds, such as supporting the members of certain professions. An obvious example is agriculture. For instance, the average income transferred to an average individual farmer in France, through the common agricultural policy, was €17,000 in 1999,[76] even though farmers are not, on average, poorer than the average population.

116. Subsidies are in general an inefficient way to redistribute income because they generate price distortions. For instance, the welfare loss induced by the common agricultural policy before its reform (which started in 2004) has been estimated at 0.9% of European GDP, which is a lot given that agriculture accounts only for 2% of European GDP.[77]

117. This example highlights that subsidies are not an efficient way to redistribute income. It creates vested interests that make the removal or even the mere adaptation of subsidies difficult, and creates significant economic costs.

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76 P. Messerlin, 2004, Forging a deal on Agricultural Trade Reform, communication at the conference entitled "Breaking the Deadlock in Agricultural Trade and Development", Oxford, June 2004.

77 B. Borrell and L. Hubbard, 2000, Global Economic Effects of the EU Common Agricultural Policy, *Economic Affairs: Reforming the CAP*, N° 20.

118. Another weakness of the use of subsidies as a redistributive tool, rather than direct income taxation and redistribution, is that subsidies often miss their goals because they may end up being appropriated by agents that are not the intended beneficiaries. Again, aid to agriculture is a case in point. The factor in agriculture is land, whose supply is inelastic, rather than labour. As a consequence, economic theory predicts that subsidies are most likely to be reflected in the price of agricultural land, rather than in the income of agricultural labourers. This reasoning has been confirmed by experience: from 1983 on, New Zealand drastically reduced its subsidies to agriculture, dividing them by 10. As a result, the income of agricultural labourers fell sharply in the first two years. However, this fall was followed by a large rebound, as the price of land fell, and the income of agricultural labourers' soon recovered and finally reached its initial level. This highlights the fact that subsidies are an awkward redistributive instrument.[78]

119. In order to tackle this difficulty, many countries, including the members of the European Union and the United States decided to reform agricultural policy by shifting from the subsidisation of production to direct income support, in the form of lump-sum transfers, the amount of which is determined on the basis of "historical" rights, depending on the amount of subsidies received in the past under the previous, price-distorting system. This type of subsidy seems to be less inefficient in that it is supposed not to alter production decisions. This is why the WTO (then GATT) agreements tend to view such subsidies favourably (meaning, technically, that they are classified as "green box" subsidies). However, in practice, even such subsidies appear to be somewhat distortive, because they may lack credibility. Agents tend to believe that since past activity gives a right to a lump-sum transfer today, then present activity might entitle them to some transfer in the future. Existing studies of the evolution of agricultural policies around the world therefore tend to caution against the view that lump-sum transfers are a panacea. While they are less distortive than direct production subsidies, they may still be distortive.[79]

3.3 Subsidies as a way to palliate credit and financial market imperfections

120. Credit market imperfections in many cases create a wedge between the social and the private value of economic activities. The reason is that firms that could engage in productive activities may be prevented from doing so because of insufficient access to credit, due to informational asymmetries between lenders and borrowers. Credit rationing has become particularly acute lately as a consequence of the financial crisis. The simple claim that governments know no better than banks which firms deserve credit, and that subsidising credit makes therefore little sense. As standard economic theory has shown, the private supply of credit may be suboptimal in the presence of asymmetric information, which may in principle justify the subsidisation of credit even if governments are no better informed than private lenders.

121. Directly or indirectly subsidised credit is prevalent in many countries, especially in developing ones. For instance, Indian law requires banks to direct at least 40% of their credit to "priority sectors", which include agriculture, agricultural processing and "small scale industry". Another important instance of subsidised credit is the case of microfinance institutions in developing countries, which provide small loans, often backed by subsidies from governments or aid organisations.

122. One difficulty in ascertaining the relevance of subsidies as a tool to palliate credit rationing is the risk that publicly subsidised lending will simply crowd out private lending rather than expand the total volume of lending and increase production, resulting in a purely distributional effect.

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78 Gilles Saint-Paul, 2007, Commentaire, in P. Chalmin and D. Bureau, Perspectives agricoles en France et en Europe, Conseil d'Analyse Economique.

79 A. Bouet, J.C. Bureau, Y. Decreux, and S. Jean, 2004, Multilateral Trade Liberalisation: The Contrasting Fortunes of Developing Countries in the Doha Round, Discussion Paper No. 60, Institute of International Integration Studies, Trinity College, Dublin ; E. O'Donoghue and J. Whitaker, 2006, How distorting are direct payments?, paper presented at the 2006 American Agricultural Economics Association conference.

123. While the situations are undoubtedly diverse, there is some evidence that subsidised lending in developing countries has an impact on economic activity and on small firms' ability to invest. A recent study of the abovementioned directed lending programme in India finds that subsidised credit is not used as a substitute for private credit, but rather as a complement. It has indeed been found that when changes in rules increased some firms' eligibility to the program, their total borrowing and their total production increased. While this study does not present an overall cost-benefit analysis, it shows that the subsidy at least meets its purported goal of expanding the production opportunities of small firms.[80]

124. Similarly, a study of microfinance institutions in South Africa found that rate subsidisation had an impact on takeup rates by the targeted populations, i.e., poor populations in developing countries.[81]

125. Credit rationing is not the only type of financial market imperfection. More generally, financial markets may be unable to provide instruments allowing companies to reallocate risk optimally. Nuclear energy is a good illustration of the wedge between the social and the private value of some investments. For countries deprived of fossil fuel resources, nuclear energy is a way to reduce the exposure to the fluctuations of fossil fuel prices. However, from the viewpoint of private companies, the fact that the cost of nuclear-generated electricity is insensitive to fossil fuel prices is a risk, because electricity prices are mostly determined by fossil fuel prices (since they are determined at every instant by the marginal cost of the marginal means of production, which is almost always a fossil-fuel burning plant, even in countries with large nuclear generation capacities). Therefore, the return on an investment in a nuclear plant is sensitive to the fluctuations of fossil fuel prices, unlike the returns on an investment in a fossil-fuel fired plant. If financial markets were perfect, firms engaging in nuclear investments could issue bonds that would be indexed on fossil-fuel prices and hence shift the risk to the market. However, such refined financial instruments barely exist, and the wedge between the social value of limiting the exposure to the volatility of fossil-fuel prices and private incentives cannot be bridged by market mechanisms alone. This reasoning explains in part why the U.S. government decided to subsidise investment in nuclear generation in its Energy Policy Act (2005), providing tax credits and insurance against construction delays.

3.4 Subsidies as a way to account for discovery and agglomeration externalities

126. The concentration of firms active in the same sector, in a given region, is often considered to generate local positive externalities. Three types of mechanisms can be distinguished, on the basis of the existing empirical studies. The first is input sharing: the concentration of firms in the same sector in a given area attracts input suppliers, which lowers all firms' costs. The second is labour market pooling: a concentration of firms attracts a large pool of workers with the requisite sector-specific skills, leading to reduced search costs for both workers and firms. The third is knowledge spillovers: a company's R&D efforts may benefit other companies because new knowledge diffuses outside the company undertaking R&D, through social and business interaction (for instance between suppliers and customers), or as a consequence of employees moving across companies. A variant of these arguments, especially relevant to developing economies, involves informational externalities: whenever a firm is established in a new sector, other agents observe its performance and learn about the prospects in that sector. According to Rodrik (2004)[82], this discovery process generates positive information externalities and therefore warrants government intervention aiming to identify promising sectors and to encourage firms to enter them.

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80 A. Banerjee and E. Duflo, 2002, Do Firms Want to Borrow More? Testing Credit Constraints Using a Directed Lending Program, MIT Department of Economics Working Paper No. 02-25.

81 D.S. Karlan and J. Zinman, 2008, Credit Elasticities in Less-Developed Economies: Implications for Microfinance, *American Economic Review*, vol. 98(3), 1040–68.

82 D. Rodrik, 2004, Industrial Policy for the twenty-first century, Harvard Kennedy School Working Paper 04-047.

127. The empirical evidence is twofold. On the one hand, there is a lot of evidence that positive agglomeration externalities exist, thereby making the theoretical claim for industrial policy reasonable. On the other hand, the evidence on governments' attempts to emulate the Silicon Valley or to jump start activity in a new sector is mixed. Many such attempts failed, and several success stories appear to owe little to governments. However, in some instances, especially in developing countries, government intervention played a key role in the successful development of entirely new sector, as is explained below.

128. The importance of agglomeration effects and sector-wide economies of scale has been substantiated by a series of convergent studies. Their magnitude is likely to be quite large: for instance, according to a recent study, a doubling in the regional scale of an industry leads on average, in Japan, to a 4.5% increase in productivity[83]. As opposed to intra-firm economies of scale, such intrasectoral economies of scale in theory justify public intervention in order to help industries reach a large enough scale. The various underlying mechanisms have been measured as well. The input sharing assumption has received empirical confirmation: the more firms are concentrated in an area, the more outsourcing one observes, which reflects the greater availability of outside inputs.[84] The best-documented type of local externality is knowledge spillovers. For instance, Agrawal et al (2006) showed, by studying patent citations, that the knowledge created by an inventor is applied disproportionately in locations where the inventor lived previously, which can be explained only by the importance of personal connections[85], and Audrestch and Feldman (1996) highlighted the geographic concentration of innovations.[86]

129. There is evidence that many developing countries' specialisations owes more to the development of sectors in which there was an initial presence, because of agglomeration and informational externalities, than to genuine comparative advantage. For instance, as Hausman and Rodrik (2003)[87] note, countries with nearly identical resource endowments end up with very different specialisations: Korea exports microwave ovens but no bicycles, while Taiwan exports bicycles but almost no microwave ovens; Bangladesh is one of the main exporters of hats worldwide while Pakistan exports almost none. These findings suggest that specialisation patterns are largely explained by random events occurring at the initial stage of development, i.e., on random attempts by lone entrepreneurs, which then give rise to self-reinforcing dynamics. If that is the case, then there would be a case for the temporary subsidisation of new sectors by the government.

130. Interestingly, there is some evidence pointing towards the fact that positive local spillovers (adjusting for firm size) are less important when a large firm settles in a region than when a small firm does.[88] This is probably because large firms have less need for interaction with outsiders. However, there

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83 R. Nakamura, 2005, Agglomeration economies in urban manufacturing industries: a case of Japanese cities,*Journal of Urban Economics*, vol.17, 108-124.

84 T.J. Holmes, 1999, Localization of Industry and Vertical Disintegration, *Review of Economics and Statistics*, vol. 81(2), 314-25.

85 A. Agrawal, I. Cockburn and J. McHale, 2006, Gone But Not Forgotten: Knowledge Flows, Labor Mobility, and Enduring Social Relationships, *Journal of Economic Geography*, vol. 6(5); see also E. Moretti, 2004, Workers' Education, Spillovers and Productivity: Evidence from Plant-Level Production Functions, *American Economic Review*, vol. 94(3).

86 D.B. Audretsch and M. Feldman, 1996, R&D Spillovers and the geography of innovation and production, *American Economic Review*, vol. 86, 630-664.

87 R. Hausman and D. Rodrik, 2003, Economic Development as Self-Discovery, *Journal of Development Economics*, vol. 72.

88 Rosenthal, S. S. and W. C. Strange, 2003, Geography, Industrial Organization, and Agglomeration, *Review of Economics and Statistics*, vol. 85 (2), 377-393.

also is some anecdotal evidence in the other direction, pointing to the importance of large firms in the success of some innovative clusters (like Nokia in Finland).[89]

131. In contrast to the accumulation of knowledge about the nature and magnitude of agglomeration externalities, the evaluation of the public policies supposed to stimulate them yields mixed results. Many governments' attempts to emulate the Silicon Valley have proved inconclusive, even in the United States where first-hand, detailed information was available. A comprehensive study of innovative clusters by the OECD highlights the diversity of the mechanisms that allowed some clusters to flourish and concludes that (i) it is very difficult to measure the contribution of public policy to the success of some of these clusters, and (ii) there is no single, one-size-fits-all policy prescription. Tellingly, one of the most successful technological clusters in the developing world, in the Bangalore region, appears to have been caused by a series of serendipitous events (such as IBM's refusal to let Indian shareholders purchase 60% of its Indian subsidiary, which led IBM to leave India and forced Indian software professionals to turn towards open platforms, thereby acquiring the skills that would prove highly valuable more than ten years later).[90]

132. Conversely, Rodrik (2004)[91] argues that some industrial policies followed in Latin America and East Asia succeeded in taking into account informational externalities and fostering the development of entirely new sectors. For instance, in Chile, the public agency Fundacion Chile started to subsidise salmon farming in the 1970s. Whereas this industry was inexistent in Chile prior to this policy, Chile is now one of the main exporters of salmon. Similarly, Rodrik argues that the launch of orchid production by government firms in Taiwan, that is, with government funds, was a good way to reveal the profitability of this sector in order to stimulate private investment and the development of a new sector. According to Rodrik (1995), the case of the Korean conglomerate Hyundai is a stunning illustration of the usefulness of a properly implemented policy targeting a national champion. On the one hand, government support to diversification allowed Hyundai to internalise labour market externalities, as managers who had acquired skills in the cement and construction industry could then apply them to other sectors, as Hyundai developed new activities, such as car manufacturing and shipbuilding. On the other hand, the government's direct and indirect subsidisation (including in the form of implicit purchase guarantees for the ship building division, as explained above) encouraged Hyundai to catch up with foreign incumbents in terms of efficiency.

133. However, Rodrik stresses the limitation of such policies. Unless subsidies to investors in new sectors are strictly limited in their scope (with a restriction to really new sectors) and duration (long enough for discovery to occur, but not longer) and made conditional on some market-based measure of performance, they may well be inefficient.

134. The general implication of the empirical literature on agglomeration effects is that while they are important, the appropriate policy tools to deal with them are complex and not yet fully understood. In particular, while some kind of industrial policy is likely to be helpful, there seem to be good reasons to focus them on smaller firms at an early stage of development rather than on existing champions, because the various abovementioned externalities are likely to be more acute in the case of small firms.

135. In the European Union, the possible use of public funds to foster the development of innovative clusters has been recognised. The FRDI[92] states that *"Aid for innovation clusters aims at tackling market*

89 See the chapter on Finland in OECD, Innovative Clusters, 2001.

90 H. Pack and K. Saggi, 2006, Is There a Case for Industrial Policy? A Critical Survey, The World Bank Research Observer, vol. 21(2).

91 D. Rodrik, 2004, Industrial Policy for the twenty-first century, Harvard Kennedy School Working Paper 04-047.

92 Community Framework for state aid for Research and Development and Innovation (http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:C:2006:323:0001:0026:en:PDF).

failures linked with coordination problems hampering the development of clusters, or limiting the interaction and knowledge flows within clusters. State aid could contribute in two ways to this problem: first by supporting the investment in open and shared infrastructures for innovation clusters, and secondly by supporting cluster animation, so that collaboration, networking and learning is enhanced."

136. The detailed recommendations of the Community Framework highlight the way in which it is possible to tread the fine line between subsidising truly externality-generating activities and wasting public funds. The Commission recognises the positive externalities often generated by clusters and acknowledges that they may justify the granting of subsidies, but it also mentions two safeguards. First, the maximum authorised aid intensity is 15% (with exceptions for some underdeveloped regions or Member States). Second, and more important maybe, aid should be targeted to expenses that directly relate to the externalities, i.e., those that contribute to the functioning of the cluster without their benefits being directly appropriated by specific companies. The expenses include for instance "marketing of the cluster to recruit new companies to take part in the cluster, management of the cluster's open-access facilities, and the organisation of training programmes, workshops and conferences to support knowledge sharing and networking between the members of the cluster."

3.5 Subsidies to research, development and innovation as a way to account for knowledge spillovers

137. More generally, research, development and innovation (R&D&I) is often considered to give rise to externalities. As is explained in a recent commentary of the new Framework on Aid to R&D&I published by the European Commission, positive externalities may be present for the following reasons: "R&D&I activities generate new knowledge, which is beneficial to society because it can be used by many companies to invent or improve products and services. However, from the perspective of a single company, only the private benefits from investing in R&D&I are accounted for. As a result, R&D&I activities are sometimes not undertaken by private companies, because they consider the resulting private benefits too limited, whereas the benefits for society, due to the knowledge spillovers of R&D&I, could be important. R&D&I activities generate new knowledge, which cannot always be protected (e.g. through patents). Private companies may thus refrain from investing in R&D&I because they are afraid that the results of their investments may be used by competitors and they consequently cannot generate any profit from their investments. Imperfect and asymmetric information: R&D&I activities are particularly risky and uncertain. This means that they are affected by imperfect and asymmetric information. As a result, too few human and financial resources may be invested in R&D&I projects, which would however be highly valuable for society. Coordination and network failures: R&D&I activities are often unsure and complex and it is not easy for private companies to work together, identify suitable partners and coordinate R&D&I projects. As a result of these coordination and network failures, R&D&I projects that could have been conducted in common between a group of firms are sometimes not undertaken at all, whereas society as a whole would have benefited."[93]

138. All the praise lavished on aid to R&D&I notwithstanding, some caveats must be borne in mind. True, R&D&I combines externalities (due to knowledge spillovers) and informational asymmetries (which may result in underfunding). But these asymmetries also imply that aid to R&D&I may give rise to inefficiencies.

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93 T. Kleiner and R. Repplinger-Hach, 2007, "The new community framework for state aid for research and development and innovation", *Competition Policy Newsletter,* vol. 1.

139. One of the main reasons is that subsidised R&D may crowd out privately funded R&D, since firms may misrepresent the extent to which their R&D investments are sensitive to the granting of aid.[94] Some recent European state aid cases illustrate this difficulty. In its Quaero decision[95], the Commission granted subsidies to a joint public-private research program. Its reasoning was based on the following two elements. First, the existence of an externality induced by the private firm's R&D expenditures, since the results of this effort would be disseminated by its public (academic) partners rather than appropriated privately. Second, in order to assess whether the aid was likely to have an impact on the private firm's R&D investment, the Commission relied on the beneficiary's internal estimates of the resources it was planning to devote to the R&D project at stake, according to the level of aid. This type of assessment is probably the best that can be conducted. However, it is strikingly simple when compared to the economic analyses undertaken by competition authorities investigating mergers for instance, and one may wonder whether it might be easily manipulated by companies lobbying for public funds without a real public interest justification.

3.6 Environmental subsidies

140. As is explained above, many existing subsidies have harmful effects on the environment, if only because they shift production away from more efficient to less efficient companies, which are often less environment-friendly.

141. However, many subsidies are also targeted to the development of renewable energies, as part of a global effort to curb carbon dioxide emissions. In the European Union, such "environmental aid" represent a quarter of total aid to industry (about $ 13 billion in 2008), and the Commission issued in 2008 the Community guidelines on state aid for environmental protection, which allow national governments to engage in a variety of measures, ranging from subsidised credit for all kinds of environment-friendly actions (such as the replacement of a polluting industrial equipment with a cleaner one) to feed-in tariffs, i.e., guaranteed prices at which the government commits to purchase electricity produced from renewable sources, such as wind and solar.

142. As a result, 18 EU countries were using feed-in tariffs in 2007, and as such tariffs also exist, among others, in Canada, China, Israel, and several Australian states. At first glance, the rationale for such subsidies is obvious, since environment-friendly investments are a pure case of a positive externality. However, the rationality of such subsidies is far from obvious, because the combination of various environmental subsidies often amounts to an incoherent combination, with each mechanism assigning a different price to carbon dioxide emissions. As an example, the current feed-in price for solar energy in France involves an implicit price of about € 1,000 per tonne of carbon dioxide. This amount can be compared to the current price in the European Emissions Trading Scheme, that is below € 20, and to the level of the "carbon tax" envisioned by the French government, i.e., €17.

143. As the Stern report[96] highlighted, the least costly way to curb emissions is to provide a uniform price signal (through a tax or a cap-and-trade permit system), inducing all economic agents to make all emissions-reducing decisions whose cost falls below a certain threshold, without deciding arbitrarily how emissions should be reduced. Direct subsidies to specific ways of reducing emissions may in the end increase the cost of the emissions reduction effort, and make this effort less effective. One may, however, qualify this view by arguing that certain renewable technologies, still at an infant stage, deserve specific

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94 P. David, B. Hall, and A. Toole, 2000, Is public R&D a complement or substitute for private R&D? A review of the econometric evidence, *Research Policy*, vol. 29(4-5), 497-529.

95 Case N° C-243/02, http://ec.europa.eu/community_law/state_aids/comp-2007/n469-07.pdf.

96 N. Stern, 2007, The Economics of Climate Change: the Stern Review, Cambridge University Press.

support, precisely because of the type of informational externality discussed above in the context of aid to new sectors.

4. How should state aids and subsidies be controlled?

4.1 The limits of economic analysis: measurement issues

144. In an ideal world, the policy prescription would be that benevolent governments should assess each potential subsidy on its specific merits, evaluating whether a positive externality is present, possibly quantifying it, assessing the incentive impact of the aid, and conducting an overall cost-benefit analysis.

145. However, this type of assessment, that would be based on a neutral presumption and would consider each aid measure on its merits alone is unrealistic, because many of the abovementioned positive and negative consequences of state aids do not lend themselves to measurement.

146. The assessment of the impact of an aid bears some similarities to the assessment of the competitive impact of mergers. In both cases, the goal is to assess how the market will be affected by a given change. However, in the case of state aid, this exercise is far more complex that in the case of mergers.

147. The assessment of unilateral effects, which lies at the heart of horizontal merger control, provides for a helpful comparison. Its ambition, compared with the scope of the questions raised by the analysis of state aid control, is relatively narrow: it limits itself to short-run effects, and takes market structure as given (except for the merging parties, of course). It lends itself to the econometric technique of merger simulation, which yields quantitative predictions based on parsimonious data requests. Yet, even within this well-delineated framework, merger control is far from being completely predictable, especially as regards the assessment of efficiencies.[97]

148. The questions which need to be addressed in order to assess a state aid measure are both more numerous, and often less liable to quantification than unilateral effects.

149. Consider for example aid to R&D. One of the main justifications for the granting of aid to R&D is the existence of a positive externality due to knowledge spillovers. But how can the likelihood of such spillovers be proved in an individual case? The empirical research on this topic almost never proceeded by identifying the presence of spillovers in individual cases; but rather by studying large datasets and identifying the existence of knowledge spillovers on average, using sophisticated statistical techniques. Besides, even this approach fails to end up on firm ground, since the findings of the various studies are significantly divergent. In the case of mergers, the study of past mergers in the same market can often be considered to have some predictive value. But in the case of R&D, such an approach is less promising, because of the difficulty of finding relevant precedents, especially when the goal is to assess an innovation which has not yet occurred and the nature of which is uncertain by definition. This difficulty is reminiscent of the one faced by firms making efficiency claims when defending a merger. Such claims are often rejected for want of verifiability up to competition authorities' high standards. But the problem may be even more acute for state aid control, since the innovations purportedly encouraged are more radical, and thus more uncertain and less verifiable, than the incremental improvements representing the majority of efficiency claims in merger control. If and when spillovers can be shown to be likely, one should also ascertain whether the amount of R&D is sensitive to the volume of aid. Answering this question requires one to know not only the cost of funds available to the firm and the possible credit constraints facing it, but also the list of alternative possible investments for the recipient of the aid, the impact of the R&D effort on

97 D. Gifford et R. Kudrle, 2005, Rhetoric and Reality in the Merger Standards of the United States, Canada and the European Union, Antitrust LawJournal, vol. 72, p. 423.

the firm's future production costs, as well as an estimate of market demand and rivals' marginal costs, so as to calculate how a given cost reduction, if achieved thanks to R&D, will affect profits. In many cases, the question is even more complex because R&D often aims to create new products rather than to decrease the cost of producing existing ones. Therefore, in order to calculate whether the firm's behaviour is likely to be impacted by the aid, one needs to make assumptions about the demand function in the hypothetical post-R&D world, i.e., for example, about the elasticity of substitution between rivals' goods and the hypothetical, not yet existing new good which the subsidised R&D might – or might not – bring into existence.

150. This difficulty is by no means limited to R&D, as can be seen by moving to the question of dynamic inefficiencies - which is often, and probably rightly, mentioned as a justification for state aid control. There is no simple way of quantifying with full certainty to what extent the granting of an aid will change economic agents' expectations in the long-run, and thus their investment and innovation behaviour. Answering this question would require one to assess the impact of any given aid on other firms' expectations as to the likelihood of being granted state aid in the future under different types of circumstances, and to measure the impact on this change in expectations on firms' future behaviour (excessive risk-taking or "X-inefficiency" resulting from the reinforced soft budget constraint, diversion of resources from productive to rent-seeking activity, etc.)

151. Finally, any quantitative assessment of the welfare impact of a state aid must start by making an assumption about the cost of public funds, because, when calculating the overall impact of an aid on welfare, the loss to taxpayers is usually a major element. In fact, in all simple models of distortive state aid, as well as in simple models of subsidy races, there is no harm at all unless this deadweight cost of taxation is large enough.

152. These observations appear to indicate that a presumption that state aids are neutral for competition may not be justified. Since the available evidence points towards a negative impact of most subsidies, this should support the idea that it is up to the government granting the aid to demonstrate that the benefits of such a measure outweigh its negative effects on competition. Such an approach would signal the concerns with a systematic policy of granting state aids, leaving however room for the necessary flexibility through a case-by-case assessment.

153. While the recourse to economic analysis should not be seen as a panacea justifying a neutral a priori presumption, it can still be very helpful in order to assess whether a given aid measure is likely to be beneficial to social welfare. In particular, economic analysis can play a crucial role in identifying the presence of market failures and whether a proposed subsidy is likely to remedy it without creating serious offsetting distortions.

4.2 Meeting the goal of "less and better targeted state aids"

154. The above developments point, overall, to the dangers of state aids and subsidies. On the one hand, even benevolent governments, local, regional or national, may rationally engage into destructive subsidy races, at an enormous cost to public funds. On the other hand, it is very difficult for state aids to escape the pressure from special interests, and they also contribute to creating special interest groups with then push for the continuation of the granting of aid even after it has lost its initial justification. Even in the European Union, where control is strict, there is evidence that aid often lacks proper justification and does not make for a very efficient use of public funds.

155. Since one should not be overly confident in the ability of any government of specialised agency to evaluate each possible subsidy on its merits, it makes sense to consider that countries should enact rules that make the granting of subsidies difficult on a general basis, while leaving some margin of flexibility (since aid is sometimes justified).

156. Currently, many countries have no strict state aid control rules, and even the controls that do exist leave room for much aid to be granted.

157. All in all, one could think of the following actions that governments could take in order to limit the granting of wasteful subsidies and encourage those with positive effects on the long run for their economies.

158. In the case of large federal countries, one might envision some federal control over the incentive packages that sub-federal government levels can offer to companies.

159. Bankruptcy laws should limit governments' incentives to bailout firms simply in order to save jobs. In other words, they should allow companies to fail at a minimal cost to employment and activity.

160. The development of offshore funds could help governments resist the temptation of subsidising raw materials of which their country is an exporter. Similarly, improvements in the tax system and in governments' ability to redistribute income directly can decrease the political pressure to use distortive subsidies for redistributive purposes.

161. Competition authorities should hold SOEs and government agencies to the same standards as private companies regarding the control of anticompetitive behaviour. In particular, the implausibility of recoupment of losses should not be deemed an acceptable defence in predatory pricing cases and in cases involving other types of exclusionary behaviour. This could be complemented by the "public sector competitive neutrality rules" already existing in many countries.

162. Countries or regional grouping not yet equipped with competition rules on state aids and subsidies should consider introducing them. Even in the absence of such rules, competition authorities should use the tools they possess (especially as regards the repression of anticompetitive unilateral behaviour) in order to address the competition-distorting effects of state aids as much as they can. Since there are many ways for governments to grant aid under the guise of non-targeted, general policy measures, advocacy by competition authorities is also an essential part of the effort to limit the wasteful granting of subsidies.

163. Competition authorities should therefore be consulted prior to making decisions on state aids with significant potential effects on the markets in a given sector. Finally, cooperation between competition authorities and the relevant Ministries can only facilitate a better evaluation of the pros and cons of specific subsidies.

164. More generally, some criteria inspired by the recent overhaul of European state aid control policy could probably be adapted in domestic competition laws, subject to taking into account institutional and cultural settings. The most important ones are, (i) the requirement that each subsidy be the focus of an economic analysis precisely identifying which market failure is in need of correction, and the extent to which the aid measure is likely to correct it; (ii) the requirement that a subsidy be granted only if it can be proved that a more transparent, less discriminatory measure (such as an open public tender), or one less costly for public funds (such as the provision of a long-term loan or the purchase of shares by the government, rather than the granting of aid) cannot meet the same goal; (iii) rules limiting the magnitude and duration of aids, and the ability of the same recipient to be granted subsidies on a regular basis; and (iv) a rule implying that when large, distressed firms receive subsidies, they must give away some compensation concession, such as divesting some activities or committing to refrain from using the aid in order to engage in exclusionary behaviour.

165. Transparency and the availability of *ex post* assessment mechanisms should also be ways to limit special interests' ability to extract subsidies deprived of any economic justification.