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**Economic Regulation and Antitrust Intervention:
Experiences in Gas, Electricity, and Railways in Italy**

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Abstract

The global experience with economic regulation shows that many industries which are subjected to economic regulation are characterised by persistent monopolistic features in at least some of the industry segments. Under such conditions, one or a few firms generally retain a monopolistic or dominant position within industry segments, that allows them to exert considerable influence also in those other segments of the industry which are opened to competitive pressures. Special issues arise, then, concerning the role played by both regulatory authorities and antitrust authorities in industries which are only partially opened to competitive pressure while retaining, in some segments, monopolistic traits, and how these authorities complement with each other in steering the behaviour of firms. These issues are discussed here on the basis of evidence provided by the experience with economic regulation in the gas, electricity, and railways industries in Italy. On the whole, the joint action of the sectoral regulator and the antitrust authority plays an important role to ensure that competition is preserved in the segments of the infrastructure industries where (legal or economic) barriers to entry are lowered by sanctioning collusive practices and that the firms which operate in the more monopolistic segments of the industry do not abuse of their dominant position for blocking the development of competition in the more competitive ones.

Key Words: Regulation, antitrust, gas, energy, railways.

Short biography

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Economic Regulation and Antitrust Intervention: Experiences in Gas, Electricity, and Railways in Italy

1. Introduction

Economic regulation is commonly understood as a way to fix market failure by means of rules and organizations that set, enforce, and change the allowed tariffs and service standards for service providers. In this sense, economic regulation is conceived as a functional equivalent to competition because it is intended to achieve allocative efficiency in spite of the presence of natural monopoly or externality conditions (Ogus, 1994). Alternatively, in a dynamic perspective economic regulation can be also seen as a provisional substitute to competition – that is, in Beesley and Littlechild's (1983, para. 4.11) words, as a way of “holding the fort until competition arrives”. In this sense, economic regulation is needed to steer the behaviour of firms which operate in industries that are not open to competition yet, or that are still unattractive to potential new entrants.

In a dynamic perspective, economic regulation is related to the state and evolution of industry structure. In monopolistic industries, economic regulation corrects the behaviour of the sole firm by constraining its production quantity, quality, and price decisions. In the absence of economic regulation, the monopolist would rationally maximise its profit by setting production quantity, quality, and price in such a way as to extract most of consumers' surplus. In competitive industries, instead, economic regulation is not needed insofar as firms tend to make production quantity, quality, and price decisions under competitive pressures. Even without any economic regulatory authority, consumers would maximise their utility by purchasing the products from the firm with the 'best' quality and price package deal. If industries evolve from monopolistic to competitive regimes, then, economic regulation would

eventually fade away as firms would try and outperform their competitors to win consumers' favours.

The global experience with economic regulation, however, shows that many industries which are subjected to economic regulation do not necessarily evolve into competitive regimes. Sectors like water, electricity, gas, railways, highways, and air transport, for example, are characterised by persistent monopolistic features in at least some of the industry segments (e.g., reservoirs, transmission and distribution networks, international pipelines, and transport infrastructure). Under such conditions, one or a few firms generally retain a monopolistic or dominant position within industry segments, that allows them to exert considerable influence also in those other segments of the industry which are opened to competitive pressures. Special issues arise, then, such as: What is the role played by regulatory authorities in industries which are only partially opened to competitive pressure while retaining, in some segments, monopolistic traits? What is the role played in these industries, instead, by antitrust authorities, which are expected to protect competition against the abuse of dominant positions and collusive practices? And, how do sectoral regulatory authorities and antitrust authorities complement with each other in steering the behaviour of firms? (Barros and Hoernig, 2004; Barros et al., 2008).

These issues are discussed here on the basis of evidence provided by the experience of economic regulation and antitrust intervention in three industries which include both monopolistic segments and competitive activities, namely the gas, electricity, and railways ones. The cases are drawn within the context of Italy, a country where regulatory reforms of various infrastructure industries were made and implemented during about the last two decades. Generally conducted in conjunction with privatisation and liberalisation policies, such reforms intended to trigger the evolution of infrastructure industries from monopolistic state ownership conditions to competitive regimes. As such, infrastructure industries in Italy

– including the gas, electricity, and railways ones – are exemplar of the kind of experiences (not quite uncommon in other countries as well) encountered when former monopolists are challenged by new entrants while trying and retain dominant positions within the regulated industries.

The rest of the paper is organised as follows. Next section will briefly review the rationales and models of economic regulation, with a specific focus on infrastructure industries. Sections three to five will describe the regulatory regimes of the gas, energy, and railways industries in Italy, respectively. Apart from providing an account of regulatory institutions, industry structure, and industry performance, these sections will also highlight the role played by antitrust authorities in correcting the behaviour of firms in those segments of the industries which are expected to work under competitive pressures. Section six, then, will discuss the role played by sectoral regulatory authorities and antitrust authorities in the energy and railways industries, and assess the complementary relationship between the two. Finally, section seven will draw the conclusions.

2. Economic regulation: rationale and models.

Regulation can be defined in many different ways, according to the assumptions that we hold on the relationship between regulation and the political process (Jordana and Levi-Faur, 2004). As highlighted by Baldwin et al. (1998), at least three general meanings of regulation can be formulated. In the first meaning, regulation refers to “the promulgation of an authoritative set of rules, accompanied by some mechanism, typically a public agency, for monitoring and promoting compliance with these rules” (Baldwin et al., 1998: 3). In the second one, regulation can be understood as “all efforts of state agencies to steer the economy” (Baldwin et al., 1998: 3). In this broader sense, regulation includes any form of governmental intervention, such as direct ownership, taxation, subsidies, and redistribution,

and any kind of intervention carried out by state agencies. In the third one, regulation can be viewed as any kind of mechanism of social control, by whomsoever exercised. In this broadest sense, regulation takes place through any system of influence of behaviour, either intentional or unintentional, either carried out by the state or any other agent.

The meaning of regulation varies across time and countries (Jordana and Levi-Faur, 2004). Until the end of the 1980s, outside the United States the term 'regulation' generally referred to the instruments used by governments for intervening and controlling the economy and the society. In the United States, instead, the term 'regulation' specifically referred to the activities of independent regulatory institutions. For example, Selznick (1985: 363) defined regulation as “the sustained and focused control exercised by a public agency over activities that are valued by a community”. Currently, the term 'regulation' is commonly understood as the various forms of intervention of the government in the economy and the society. As such, the term 'regulation' includes so diverse kinds of regulatory activities as those carried out by independent regulatory agencies as well as those performed through direct governmental interventions. It is in this 'medium-range' scope of its meaning that the term 'regulation' will be used in this study.

This meaning of regulation is also the one often employed in policy communities. For example, OECD works typically refer to regulation as “the diverse set of instruments by which governments set requirements on enterprises and citizens. Regulations include laws, formal and informal orders and subordinate rules issued by all levels of government, and rules issued by non-governmental or self-regulatory bodies to whom governments have delegated regulatory powers” (OECD, 1997). Any of these instruments constitute forms of regulation because they activate “a particular kind of incentive mechanism, namely, a set of incentives established either by the legislature, government or public administration that mandates or prohibits actions of citizens and enterprises” (OECD, 1994, 1997). OECD works also specify

that regulations are the product of regulatory systems, which are defined as “the processes and institutions through which regulations are developed, implemented, enforced, adjudicated and revised” (OECD, 1994, 1997).

Since the mid-1980s, the scholarly literature on regulation placed a special emphasis on infrastructure industries (although other sectors of the economy, such as the financial system, have also attracted a considerable amount of specialised interest). The regulation of infrastructure industries is generally justified on both social and economic basis. Social regulation is concerned with the protection of the public interest, in such terms as environmental preservation, safety, consumer protection, and achievement of social objectives (Groom et al., 2006). Economic regulation, instead, is concerned with providing a substitution for competition in relation to natural monopolies (Ogus, 1994; Joskow and Rose, 1989; Joskow, 2005). Economic regulation aims to fix market failure by means of rules and organisations that set, enforce, and change the allowed tariffs and service standards for the operators of regulated industries.

Infrastructure industries are generally considered as exemplar cases of market failure. Infrastructure industries are characterised by the typical features of natural monopolies (Joskow, 2005), such as employing expensive and specialised assets, providing services for which few substitutes exist, exhibiting cost structures which tend to favour the presence of one operator only, and experiencing the presence of network externalities. The firms which operate in infrastructure industries tend to adopt anti-competitive behaviour, for example by exploiting the high switching costs and lock-in effects of consumers in order to increase their market power (Farrell and Shapiro, 1988; 1989) or restricting network interconnection and access to new entrants or minor competitors (Economides and White, 1994). Infrastructure industries also pose special issues which should be tackled by social regulation, such as correcting misbehaviour of the operators which compromise the right of way in the network,

economic development, equity, safety, and environmental preservation.

Regulatory systems for infrastructure industries may be designed according to different 'models'. Gómez Ibáñez (2003), for example, identified four models of infrastructure regulation, namely – from the most to the least pervasive presence of the government in the economy – public ownership, franchise allocation, discretionary regulation, and private ownership in conjunction with liberalisation and regulation of access, prices, and quality. The first model of regulation – public ownership of infrastructure firms – builds on the expectation that mechanisms of political control and accountability lead to the pursuit of public interest goals (Tenbükén, 2006). Regulation through public ownership consists of the government holding ownership and control of the monopolistic firms. In this regulatory model, the problem of exposing customers to the risk of business companies' opportunism is resolved by preventing the business companies from managing infrastructure services. The private sector, at best, can only be partially or indirectly involved in the infrastructure industry, like for example when some activities are contracted out by the government to business companies under public supervision or when private investors are allowed to own minority shares of government-owned infrastructure firms.

The second model of regulation – franchise allocation – consists of the government awarding a concession to a business company, usually through competitive tendering, for managing infrastructure services in monopoly conditions (Ogus, 1994). By making business companies compete for access to the field (Demsetz, 1968), this kind of regulation is expected to make them reveal the lowest tariff at which they are willing and able to manage the infrastructure services. After the award of the concession, which may generally last up to a few decades, the government monitors the business company's compliance with the concession terms (e.g., tariff charges, performance standards, and investment programme) and may appeal to court in the case of infringement of the contractual provisions. Regulation

through public franchise allocation is expected to bring several benefits, in terms of reduction of information asymmetries, credibility of the contractual commitments, and incentives to improve cost-efficiency (Demsetz, 1968; Williamson, 1976). This kind of regulation, however, is also exposed to potential pitfalls, for example because of the difficulty for the government to second-guess consumer preferences when writing the concession contract, the risk of incompleteness of the concession contract, and the distortion of the incentives to invest depending on the criteria for asset transfer valuation at the end of the franchise period. Moreover, although Bishop and Walker (1999) argued that relatively few firms in the industry may be enough to ensure effective competition, in practice the highly specialised skills required to manage the franchise contract, the strict requirements for taking part in tender offer competition, and collusive behaviour between the bidders may significantly hamper the extent to which franchise markets really are competitive.

The effectiveness of regulation through franchise allocation has long been discussed in scholarly literature, and it deserves a few additional remarks. Schmalensee (1979) observed that “franchise bidding is hardly a breakthrough in natural monopoly technology. [...] A number of experiments with franchise bidding have been conducted, and virtually no promising results have been obtained”. Vickers and Yarrow (1998) noticed that “if investment in specific assets is important, as in major parts of the utilities, there is a serious danger either of underinvestment or of ineffective competition for franchises. Competitive bidding is therefore unlikely to be very useful for capital-intensive elements of natural monopoly industries, and its potential lies in less capital-intensive areas”. Such concerns are shared in more sector-specific literature. Referring to the regulation in the water industry, for example, Finger and Allouche (2003) highlighted that the degree of competitiveness in the market for tenders is seemingly not very high. In a recent review of the literature on regulation in the water industry, Massarutto (2007) concluded that, apart from a few exceptions (a few French

multinationals and some US and EU companies), generally water firms are not interested in taking part to franchise competitions outside the areas that they already serve. It seems that some degree of competition in the allocation of franchise takes place when the contract is tendered out for the first time. In the next tenders, the replacement of the incumbent happens in exceptional cases only (Lobina and Hall, 2003).

The third model of regulation – discretionary regulation – consists of a regulatory agency having the power to unilaterally set business companies' tariff and service standards. In this kind of regulation, the legislation broadly states the general principles that the regulatory agency must follow when setting tariff and service standards, but it leaves the detailed decision criteria unspecified in order to allow the regulatory agency some discretion. When making the actual tariff and service standard decisions, therefore, the regulatory agency can flexibly take into account unforeseen circumstances concerning the industry and the business companies. Discretionary regulation is expected to bring the benefits of allowing flexibility to fill in the details of the regulatory arrangement and of providing incentives to improve cost-efficiency. This kind of regulation, however, is also exposed to potential pitfalls, which arise, in particular, from the difficulty of the regulatory agency to second-guess consumer preferences, the risk of capture of the regulatory agency by any specific stakeholders' group, and the need for detailed information to assess the business companies' performance. The complexity of measuring infrastructure firms' performance and estimating their cost functions, for example, seriously limits the practical applicability of yardstick competition and other forms of benchmarking (Merrett, 1997; Amato and Conti, 2005; Massarutto, 2007).

The fourth model of regulation, namely private ownership of infrastructure in conjunction with liberalisation and regulation of access, prices and quality, builds on the expectation that the mechanism of competition and the contestability of the market (Baumol,

1982) provide enough pressure on the business companies to constrain their exercise of market power and to improve their performance. This kind of regulation is expected to bring several benefits, in terms of incentives to improve cost-efficiency, encouragement of investments, and innovation of service provision (Rees, 1998; Beecher, 2001; Littlechild, 1986). This kind of regulation, however, is also exposed to potential pitfalls, which arise, in particular, from the barriers to entry raised by the incumbents, the asymmetry of information and uneven bargaining power between the business companies and the customers, and the possible corruption of the integrity of commercial law courts in the case of appeal against anti-competitive behaviour. Moreover, issues arising from the practical experiences of private ownership of infrastructure with liberalisation and regulation of access, prices and quality, such as for example the slowing down of investment programmes by the privatised English & Welsh water firms, has led to question whether private ownership of infrastructure is a viable way for pursuing public policies in the long term (Massarutto, 2007).

In general, no conclusion has been reached yet on what kind of regulatory model provides the best solution to the regulation of infrastructure industries. Glachant (2002) highlighted that several theoretical works done on the design of regulatory systems in the 'new institutional economics' approach showed that there is no single 'best solution' applicable to infrastructure industries (Goldberg, 1976; Williamson, 1976, 1985). A broad consensus has been reached among regulatory economics scholars, however, that infrastructure industries should be regulated according to the so-called 'standard prescriptions' (Joskow, 1996, 1997), which provide that the potentially competitive activities within infrastructure industries should be disentangled from those characterised by natural monopoly conditions, that regulations should be tailored in order to facilitate competition in the former activities and to restrain rent-seeking behaviour in the latter ones.

The separation between potentially competitive activities and those characterised by

natural monopoly conditions poses additional issues with respect to the application of antitrust laws to regulated industries. As highlighted by Joskow (1991), antitrust authorities have been traditionally hostile to vertical integration (either in the form of common ownership of firms in different industry segments, or of vertical contractual arrangements) because of the possibility for firms that enjoy monopoly conditions in any industry segment to expand their dominant position to potentially competitive segments of the industry. More recently, instead, vertical integration between segments of the same industry has been considered, in a rather more tolerant view, as contractual and organisational responses to the need to minimise transaction costs within the industry. Antitrust authorities, then, are called to exercise careful judgement when deciding whether to intervene against collusive practices or abuse of dominant position that hamper competition. In principle, interventions of the antitrust authorities should be directed to correct the behaviour of firms operating in the competitive segments of regulated industries. In practice, antitrust authorities may also intervene against the conduct of firms operating in the monopolistic segments of the industry, which are typically also subjected to some form of economic regulation.

3. The regulation of the gas industry in Italy.

The gas industry in Italy is regulated according to a combined system of discretionary regulation (for the import, storage, and transmission segments) and franchise regulation (for the local distribution and retail segments) which resulted out of reforms carried out in the late 1990s. Discretionary regulation is exercised by the authority for electricity and gas (Autorità per l'Energia Elettrica ed il Gas, AEEG), which addresses most of its attention to the conduct of ENI (Ente Nazionale Idrocarburi, established in 1953), the main operator of the industry. The regulatory system is provided by Legislative Decree 164/2000, which – by transposing EU directive 98/30/CE – liberalised the access to any segment of the gas industry, terminated

ENI's legal monopoly in gas extraction, required accounting or legal separation for gas storage and transport firms, and called local governments to issue 12-year gas distribution and retail franchises through tender offer competitions. In 2004, Act 239/2004 completed the transposition of EU directives (2003/55/CE) by providing derogation to tariff and access rules to firms which invested in infrastructure for gas imports, including liquified natural gas (LNG) plants.

The gas industry in Italy is characterized by heavy dependence on imports from abroad. During the last two decades, domestic production steadily declined while consumption boomed, especially after the 1986 ban on nuclear energy which was sanctioned by a popular plebiscite. Imports are mainly provided through pipelines from Algeria (amount to about 51% of the total), Russian Federation (37%), the Netherlands (12%) and Norway. Still a relatively small amount of imports are shipped by sea in LNG form, although their quota is expected to rise. Storage facilities, which generally consist of depleted gas fields, ensure continuity of transmission in face of demand fluctuations and interruption of supply from abroad. Distribution networks, which currently cover about 6,400 out of 8,100 local governments in the country, are managed either directly by local governments agencies or by business companies.

Until the late 1990s, the structure of the gas industry was vertically integrated. The state-owned company ENI enjoyed quasi-monopoly in both production and import, it controlled storage, transmission, and dispatching through its subsidiaries Stogit and SNAM, and it exerted a dominant position in distribution and retail through its subsidiary Italgas. After the legislation passed in the early 2000s, the gas industry has been moderately opened to competitive pressures, even if companies of the ENI group still play a pivotal role. ENI provides about 86% of domestic gas production and about 50% of gas imports (AEEG, 2010). The number of competitors in the segment of gas import increased in the last decade (from 3,

in 2000, to more than 20), but the emergence of competition was more apparent than real. While import quotas had been placed in order to limit the market share of ENI, the incumbent monopolist resisted to give up supply contracts by selling part of the gas shipped through international pipelines to other gas operators just outside the Italian border. ENI also controls one of the two LNG plants currently operating in the country, in Panigaglia (3.4 Gmc/year capacity), while the other in Rovigo (8 Gmc/ year) is owned by competitors (ExxonMobil, Qatar petroleum, Edison). Other LNG plants, controlled by competitors (e.g., E.ON, Iride, British Gas, ENEL), are currently under construction or pending approval (Gallottini 2009).

Also the segments of gas storage and transport are largely dominated by ENI-controlled firms, namely Stogit (managing 98% of storage facilities) and SNAM (96% of transmission pipelines) (Cavaliere 2007). The segment of gas distribution, instead, has been progressively consolidated (about 800 firms operated at the end of the 1990s, while 275 were counted in 2007; Giacomelli 2008), and nowadays the biggest 20 operators (e.g., the ENI-controlled Italgas, ENEL, local government-owned Hera, AEM Milan, and Iride, and E.ON) serve about 86% of the market. The segment of gas retail, finally, has been relatively stable over time, counting about 400 operators.

In terms of performance, the gas industry is still far from satisfactory. Gas prices are relatively aligned to the average of EU countries (Eurostat, 2009) and do not exhibit any tendency to reduction because of competitive pressures (Cavaliere 2007; Giacomelli 2008). Investments in gas infrastructure are expanding, although it is not clear whether increased capacity is to enhance competition between operators. Part of the investments are directed to increase the supply of gas through international pipelines and storage capacity, but they are considered insufficient to erode ENI's quasi-monopolistic position in these segments. Part of the investments are channelled into LNG plants, but they are undermined by opposition of sub-national governments (especially the regions, which after the 2001 constitutional reform

were granted concurrent competences with the State on energy and the environment) and local communities [which often oppose the construction of new LNG plants nearby – the so-called NIMBY (Not in My Backyard) syndrome – or anywhere – the so-called BANANA (Build Absolutely Nothing Anywhere Near Anything) syndrome]. As a result, the country (which relies on gas for about one third of its energy needs) remains largely dependent on gas imports negotiated by the only ENI company. Notoriously, international gas contracts contain so-called 'take-or-pay' (ToP) clauses, for which gas is to be paid irrespective of the actual take. Such clauses, which reduce the risk for gas exporting countries and for investors in gas infrastructure, also place high fixed costs and relatively nil marginal costs to the gas import operators, which therefore do not engage in any price war in order to break even (Polo and Scarpa, 2002). Competition is also stifled in the distribution and retail segments because of the little number of tender offer calls which have been made so far (by 2007, only 4% of the gas concessions had been competitively re-assigned according to the new regulatory system; Giacomelli 2008).

Within the context of the gas industry in Italy, both the sectoral regulator AEEG and the national antitrust authority (*Autorità Garante della Concorrenza e del Mercato*, AGCM) jointly contribute to contain the ways in which ENI might abuse of its dominant position. An illustration of this point is provided by the episode of AGCM's intervention on ENI's policy to delay investments in the international pipeline that transports gas from Algeria to Italy through Tunisia (De Vincenti, 2010). In 2002, ENI-controlled Trans-Tunisian Pipeline Company (TTPC) negotiated contracts for gas transport with four competitors of ENI. In 2003, instead, ENI decided to suspend planned investments to expand the capacity of the pipeline on the basis of company forecasts of excess gas supply in the short term (so-called 'gas bubble) that threatened to push gas prices below the minimum provided by ToP clauses. On the basis of forecasts made by AEEG, however, AGCM rather expected a shortage of gas

supply because of the *lack* of transport infrastructure capacity. Within this scenario, AGCM assessed that ENI abused of its dominant position in the industry (hence violated paragraph 82 of the EC Treaty), sanctioned the company with a fine, and mandated it to accomplished the promised investment plan.

4. The regulation of the electricity industry in Italy.

Once regulated as a state monopoly since the early 1960s, the electricity industry in Italy was partially liberalised in the early 1990s by allowing private operators to generate electricity from renewable sources and 'assimilate' ones (i.e., from garbage incineration). In the early 1990s, the central government also partially privatised the state-owned company ENEL (*Ente Nazionale per l'Energia Elettrica*), which, since 1995, became subjected to regulation by the AEEG. In a further effort to open up the electricity industry to competition, in 1999 the government provided (Legislative Decree 79/1999) that ENEL's generation capacity should be partially de-merged into three new companies and that generation capacity caps should be placed. Generation plants owned by ENEL, then, were partially transferred to Elettrogen (for 5.4 GW capacity, acquired by a joint venture which included the Spanish electricity company Endesa and the local government-owned multi-utility ASM based in Brescia), Eurogen (7 GW, purchased by a joint venture led by Electricité de France), and Interpower (2.6 GW, taken by a joint venture which included the Belgian electricity company Electrabel and the local government-owned multi-utility ACEA based in Rome).

The 1999 reform also provided that the transmission and dispatching segments should be restructured by transferring ENEL's nation-wide infrastructure to a newly established company (Terna, mostly owned by the Treasury-owned company *Cassa Depositi e Prestiti*) and attributing the management of the grid to another newly established one (*Gestore della Rete di Trasmissione Nazionale* or GRDN, later renamed *Gestore dei Servizi Elettrici* or

GSE), that would guarantee access to the network to any third party. In the distribution and retail segments, each local government would award local franchises through tender offer competitions. ENEL could continue operating in these segment on competitive basis, through its subsidiaries ENEL Distribuzione (later renamed ENEL Servizio Elettrico) and ENEL Energia, which served the households and the business segments of the market, respectively.

Despite the reform and restructuring operations, ENEL still keeps a dominant role in the industry. In the segment of generation, the former monopolist provides about 30% of national production (while about 14% of electricity is imported, mostly from Electricité de France), while next larger producers (Edison and ENI) supply about 11% and 9%, respectively (AEEG, 2010). In those of distribution and retail, ENEL Distribuzione serves about 46% of customers (about 150 operators compete in this segment of the industry, but most of them are relatively small firms that operate in mountainous areas), while ENEL Energia, that operated in a more fragmented segment, supplies about 34% of the market (AEEG, 2010).

In terms of performance, the reform and the restructuring of the electricity industry did not result in remarkable benefits on tariffs, which are relatively high in comparison to other EU countries (Eurostat 2009). The high level of electricity tariffs in the country is commonly justified on the basis of various factors, which include the industrial structure of electricity generation, which is heavily dependent on expensive thermoelectric plants (i.e., oil and gas based); the surcharge for incentives which had been provided by the Inter-Ministerial Price Committee (decision no. 6 in 1992, also known as 'CIP6') to electricity generation plants from renewable sources or 'assimilated' (amounting to about 6-7% of the tariff); and various taxes and excises. On the whole, although the electricity industry has become more fragmented in the near past, AEEG still keeps under price caps and scrutiny the tariffs of both the retail and wholesale market segments rather than allowing prices to follow market trends. ENEL, in

fact, still retains a dominant position in generation and part of distribution segments, especially because of the relatively long periods of the electricity franchise contracts awarded at the local level, which last for up to 30 years. Competitive pressure, moreover, is hampered by potentially collusive practices, such as apparent 'mild' price aggressiveness between ENEL and EDF in the respective domestic markets.

Also within the context of the electricity industry in Italy, both the sectoral regulator AEEG and the antitrust authority AGCM jointly contributed to put the conduct of the main player – ENEL – under scrutiny and control (De Vincenti, 2010). In some episodes, however, the two authorities broadly aligned themselves into the same positions, while in others they partially dissented with each other. Before the opening of the electricity spot market (*'borsa elettrica'*) on 1st April 2004, for example, a large industrial customer appealed to AEEG against ENEL's offer to supply electricity for a period of three years (rather than one only as it used to be generally practised) and the inclusion of ENELs' right of first refusal in case of any better offer from the competitors. AEEG, then, issued a deliberation providing that electricity contracts which lasted more than one year should grant to the clients the right of unilaterally terminate the supply. ENEL complied with the AEEG deliberation, and, in doing so, the company also prevented AGCM to carry out a case procedure for abuse of dominant position. As a second example, ENEL also introduced in the electricity contracts clauses which allowed to increase prices in peak demand. AGCM, then, ruled (deliberation 36/2002) that qualified customers (i.e., those which consumed above a certain quota) could purchase electricity from the national grid management company at a regulated price – and also fined ENEL for abuse of dominant position.

As a third example, ENEL's conduct came under scrutiny of both AEEG and AGCM when the company made an agreement (called 'Team Energy Management' or TEM) with the three other electricity generators (Elettrogen, Eurogen, and Interpower) for exchanging

information on a daily basis for coordinating the production of energy for household consumers (i.e., those who did not have access to the energy market and purchased electricity at a regulated price). According to AGCM, such agreement constituted a scheme which restricted competition in violation of paragraph 81 of the EC Treaty. Partially sharing this view, AEEG provided to substitute TEM with another mechanism for coordinating production (*Sistema Transitorio delle Offerte di Vendita di Energia* or Stove, i.e., a transitory system of offers of sale of energy). AGCM, instead, considered both TEM and Stove as illegal arrangements, although it accepted AEEG's position to temporarily allow electricity generators to coordinate their production until the opening of the electricity spot market.

5. The regulation of the railways industry in Italy.

The railways industry in Italy is largely dominated by the state-owned incumbent, *Ferrovie dello Stato* (FS), which retains ownership of the rail infrastructure and operates (through subsidiaries) both freight and passenger transport services. At the EU level, three 'packages' of directives (2001/12, 2001/13, and 2000/14; 2004/881, 2004/49, 2004/50, and 2004/51; and 2007/58 and 2007/59) introduced the liberalization of freight transport and, in part, of passenger transport services, the requirement to separate infrastructure ownership from rail transport service, and the establishment of authorities to regulate rail transport services. In Italy, however, these regulations have been only partially implemented. Access to the industry was first opened in the freight transport segment, while liberalisation of passenger transport services has only recently been introduced. No proper system of economic regulation is in place, however, as tariff rules are within the competence of the Inter-Ministerial Committee of Economic Planning (Comitato Interministeriale di Programmazione Economica or CIPE) and most of safety regulation is carried out by the same FS. Some general supervision of the competition within the railways industry is

provided by the Office for the Regulation of Railways Services (Ufficio per la Regolazione dei Servizi Ferroviari or URSF) within the Ministry of Infrastructure and Transports.

The state-owned incumbent FS owns both most of the railways infrastructure (through the subsidiary *Rete Ferroviaria Italiana*, RFI) and the main passenger and freight rail transport operators, *Trenitalia* and *Trenitalia Cargo*. According to current regulatory framework, RFI grants licenses to rail transport operators at a fee, provided that they comply with maintenance and safety standards inspected by RFI-owned agency Cesifer, which is reputed to enjoy some degree of discretionary power (Bozzi 2009) on licensing rail transport operators, which it can exercise at the advantage of the incumbent companies of the same FS group. In the segment of freight transport, various operators have entered the industry, especially in the northern regions of the country. In the one of passenger rail transport, instead, *Trenitalia* retains almost complete monopoly – apart from a few regional players such as *Cisalpino* and *Ferrovie Centrale Umbra*, and start-ups like *Nuovo Trasporto Viaggiatori*. Both *Trenitalia* and *Trenitalia Cargo*'s revenues, however, cover a fraction only of operating costs and the central government provides yearly subsidies to maintain their activity (subsidies are estimated about €4.4 billion per year – including both operating and maintenance/investment costs) (Ponti 2009; Giuricin 2008).

Contrary to other EU countries that have taken more decisive steps towards the liberalisation of railways services (e.g., the UK and Sweden), railways traffic in Italy has slightly declined in both freight and passenger transport services during the last decades (Bozzi 2006; Giuricin 2007). With respect to other main EU economies, the railways infrastructure in Italy is relatively underdeveloped, especially in the segment of high-speed railways (HSR), which is managed by FS-owned company *Treno Alta Velocità* (TAV). About 564 Km HSR have been built so far, in comparison to about 1,548 in France and 1,030 in Spain (Giuricin 2007). Additional HSR investments are under way, although they have been

occasionally opposed by local communities (e.g., Turin-Lyon line; Boitani et al. 2007).

The performance of the railways industry is controversial in various respects. Transport tariffs are relatively low with respect to other EU countries (although the tariff system is rather complex because of the many price conditions offered for the same route), and they do not allow the main operators *Trenitalia* and *Trenitalia Cargo* to achieve financial self-sufficiency if not with the support of governmental subsidies. In principle, tariffs are regulated according to the terms of a price cap system (CIPE deliberation 173/1999), but in practice they have been often set by the Minister of Treasury – which generally aimed to contain tariff increase over time in order to contribute calming down inflation. Service quality is disputable at best – especially in terms of lack of punctuality (Gatti 2009) and speed of travelling (Congedo 2007). Investments in HSR generally proceed relatively slowly and the cost of new railways per kilometre is astonishingly high, in comparison to other main EU countries (e.g., average cost of HSR construction in Italy is about €/Km 32 million, while it is €/Km 10 in France and €/Km 9 in Spain; Giuricin 2008).

In the absence of a 'proper' sectoral regulatory authority, within the context of the railways industry in Italy AGCM plays a major role to contain FS' abuse of dominant position (De Vincenti, 2010). In freight transport, for example, AGCM intervened to remove the surcharge that FS (through the controlled RFI) asked from freight operators (*Rail Traction Company*, *Nord Cargo*, and *Railon Italia*) when the railways infrastructure was equipped with ground-based speed control systems. According to the terms of concession provided by the Minister of Infrastructure and Transport, in 2000 freight companies had been granted a discounted fee because of technological obsolescence of the railways network, which did not allow the operation of single-manned locomotives. Full fee would be charged, instead, once both the infrastructure owner RFI and the transport operators had installed the required equipment (i.e., ground-based and on board control systems). Freight operators had missed

upgrading their vehicles, but RFI contributed to this delay by not issuing the system's technical specifications. On the basis of these facts, in 2006 the Office for the Regulation of the Railways System of the Minister of Infrastructure and Transport provided that freight operators were still eligible to benefit from the discounted fee. AGCM, instead, considered FS's conduct as intended to raise operation costs for freight operators (and potential new entrants) by abusing of its dominant position. AGCM's investigation case was closed, however, when FS proposed to the freight companies to settle the dispute by either reimbursing discounts (about € 5.7 million) or by installing on board control systems on their trains (up to a total value of € 5 million).

In passenger transport, in 2008 AGCM was called to intervene by *Nuovo Trasporto Viaggiatori*, that complained about the delay of RFI to allow access to maintenance infrastructure areas in Naples train station and to space in stations to set up sale and assistance desks. AGCM considered the issue about the availability of space in stations not to be relevant with respect to antitrust concerns, and it would be settled through joint negotiations between *Nuovo Trasporto Viaggiatori*, RFI, and the companies managing train stations (*Grandi Stazioni* and *Cento Stazioni*). The issue about the lack of access to maintenance infrastructure areas, instead, could potentially be related to anti-competitive behaviour from the side of RFI, which proposed (as a condition for AGCM closing the investigation case) to put at disposal of *Nuovo Trasporto Viaggiatori* a dismissed area in Naples, that could be set up as an independent maintenance centre.

6. Discussion.

The cases of economic regulation and antitrust intervention in the gas, electricity, and railways industries in Italy exhibit some commonalities and differences. Common traits include the feature shared by all these industries that the process of liberalisation and

regulatory reform originated from initial conditions that included state-ownership of national monopolists (ENI, ENEL, and FS), and resulted (so far) in the partial opening of industry segments to competitive pressures. In both industry, however, the former monopolists still retain a dominant or highly influential position, which they seem to exploit for curbing the development of competitors. In the gas industry, ENI maintains a strong role in international gas supply and in the control (through subsidiaries) of storage and transport infrastructure. In the electricity industry, ENEL plays a major role in generation and operates as main player in the distribution and retail segments. In the railways industry, FS both owns (through the subsidiary RFI) the transport infrastructure and operates the main freight and passenger transport companies.

Significant differences can be drawn between the three cases. In the electricity industry, for example, the transmission infrastructure was unbundled from ENEL, while in the gas and railways industries both ENI and FS remain vertically integrated (i.e., ENI operates in all segments from import and production, to storage, to transmission, to distribution and retails; FS controls both transport infrastructure and transport service providers). Electricity generation and, to some extent, distribution and retail segments have been opened to competitive pressures, while access to the gas and to the railways industries is relatively harder because of ENI's solid position in international gas supply and FS' control of transport infrastructure. While both the electricity and gas industries fall under the regulation of AEEG, however, the railways industries sets itself apart because of the substantive absence of any independent regulatory authority. The conduct of RFI as the owners of transport infrastructure and of railways operators is only subjected to directives issued by the Minister of Infrastructure and Transport, which is not endowed with monitoring, enforcing, and sanctioning powers comparable to a sectoral regulator.

Because of these characteristics, the gas, electricity and railways industries in Italy are

illustrative of various 'degrees' in which infrastructure sectors are opened to competitive pressures. On the one hand, the electricity industry stands as an instance of how selected segments of an infrastructure sector can be opened to competition (i.e., generation, distribution, and retail) while others are retained as regulated monopolies (i.e., transmission network). On the other hand, the railways industry is exemplar of how vertically integrated monopolies limit the development of competitive markets in the potentially contestable segments (i.e., freight and passenger transport services). The gas industry lays somewhere in the middle ground, as some segments (i.e., distribution and retail) have been opened to competition while others (i.e., international gas supply, storage, transmission) are largely influenced by the vertically integrated incumbent. Curiously, it is the industry with stronger monopolistic traits – the railways one – that actually misses a 'proper' sectoral regulatory authority, as regulatory functions are partially played by ministerial offices.

The cases of the gas, electricity, and railways industries in Italy also show that, alongside economic regulation, the conduct of the infrastructure operators is affected by antitrust interventions. We could expect the antitrust authority to be especially relevant in sanctioning the abuse of dominant position and collusive behaviour in those segments of infrastructure industries opened to competition. In fact, the interventions of AGCM were largely influential in all the three industries, where the antitrust authority placed its attention on the ways in which incumbent operators seemed to exploit their control of monopolistic segments of the infrastructure industries for hampering the development of competitors in the competitive segments. AGCM, for example, investigated ENEL's potentially collusive behaviour (by coordinating production schedule with competitors) and contractual practices (which apparently aimed to raise customers' switching costs and raise barriers to entry) in the competitive (generation, distribution and retail) segments. The antitrust authority, however, also inquired into practices that potentially related to efforts to foreclose access to 'essential

facilities', such as suspending investments in the capacity of international gas pipeline and preventing the use of railways maintenance infrastructure.

It should be also clarified, at this point, the statutory roles and responsibilities that inform the activities of both the national antitrust authority and the sectoral regulators. Established in 1990, the Competition Authority (AGCM) in Italy is an independent institution with the aim to guarantee the compliance with the laws that prohibit anti-competitive agreements between firms, the abuse of dominant position, and the concentration of firms that may create or strengthen dominant positions that pose a threat to competition. The aims of the Competition of Authority are to improve the wellness of citizens, also in the form (as provided by 2007 legislation) of protecting the consumers from unfair commercial practices and misleading advertising. The policy aims pursued through the Competition Authority include (a) to ensure the conditions for freedom of business initiative, including the possibility for economic operators to access the market and compete under equal conditions, and (b) protect the consumers by containing price increase and triggering quality improvement of products as resulting from the free competition between business enterprises.

The statutory roles and responsibilities of the sectoral regulators are only partially overlapping with those of AGCM. With respect to the electricity and gas industries, AEEG (established in 1995) is an independent authority with the task to regulate and control electricity and gas industries in Italy. It pursues the aims to guarantee the promotion if competition and efficiency and ensure adequate levels of service quality in these industries. More precisely, AEEG seeks to ensure the access and diffusion of electricity and gas services all over the national territory, define a transparent tariff system, and promote the protection of the interests of users and consumers. It should take care of balancing the economic and financial objectives of electricity and gas firms with general-interest aims relating to social equality, environmental preservation, and efficient use of resources. AEEG provides to the

Competition Authority information regarding instances of possible infringement of anti-competition and consumer protection laws by electricity and gas firms. With respect to the railways industry, instead, we can hardly locate any regulatory 'authority', as entry to the industry and economic behaviour is subjected to interventions from the side of various actors – FS, CIPE, and URSE, which pursues the aims to invigilate the competition within railways services market independently from the owner of the railways infrastructure.

The interventions made by the antitrust authority complement the activity carried out by the sectoral regulator in significant ways. To some extent, however, the cases remind us that economic regulation and antitrust interventions may have different attitudes towards the regulated firms and are driven by different objectives. Within the case of the gas industry, for example, AEEG and AGCM considered the Stove agreement in different terms, as the former regarded it as legitimate while the latter tolerated it until the opening of the electricity spot market only. Such differences may be plainly related to the divergence of statutory goals that the two entities pursue – the economic regulator being concerned, by statute, with the promotion of competition and efficiency, the guarantee of adequate levels of service quality, the diffusion and ease of access to services, the adoption of a fair and transparent tariff system, and the protection of the interests of the users and consumers, while the antitrust regulation being focused on the application of antitrust rules against the abuse of dominant position and collusive behaviour that hampers competition. AEEG, therefore, may regard the behaviour of the dominant firm in a more benevolent way if this ensures continuity and reliability of service, even at the expense of the persistence of entry barriers to the more competitive segments of the industry.

7. Conclusions.

The experience with economic regulation in the gas, electricity, and railways industries

in Italy shows how regulatory reforms, in conjunction with liberalisation policies, may result in the wide reconfiguration of former state monopolies by unbundling the most competitive segments of the industry from those which are characterised by more monopolistic ones (as it was the case of electricity and, partially, gas). The experience studied also suggests, however, that incumbent firms may continue playing a dominant role in all the industry segments (as it was the case, especially, of railways). Advance in the liberalisation of infrastructure industries may take place, but it seems hampered by the lack of a 'proper' independent regulatory authority (as again the case of railways shows).

The same experience also shows that sectoral regulation may not ensure that infrastructure firms do not engage in anti-competitive practices. In this respect, the joint action of the sectoral regulator and the antitrust authority plays an important role to (a) ensure that competition is preserved in the segments of the infrastructure industries where (legal or economic) barriers to entry are lowered by sanctioning collusive practices (e.g., coordination of production schedule, as it was the case of electricity) and (b) ensure that the firms which operate in the more monopolistic segments of the industry do not abuse of their dominant position for blocking the development of competition in the more competitive ones (e.g., delaying investments in capacity, as it was the case of gas). The antitrust authority, then, supplements the work done by the sectoral regulator by correcting ex post anti-competitive practices, while the sectoral regulator is generally more concerned with providing ex ante direction (and constraints) to the operation of the infrastructure firms.

The joint operation of both the sectoral regulator and the antitrust authority seems inescapable. Because of their very nature, infrastructure industries are characterised by the concatenation of both segments which retain monopolistic traits and those in which markets are more contestable. The unbundling of these segments is a significant advance, in terms of industrial organisation, with respect to the vertically integrated monopolies that once operated

in infrastructure industries. Protecting the 'pockets' of competition formed within such organisation of infrastructure industries is needed in order to prevent firms that dominate the monopolistic segments of the industry to exert influence on those open to competitive pressures. To some extent, then, the experience with economic regulation in Italy also suggests that the sectoral regulators may not be able to guarantee the protection of competition within infrastructure industries, because they may lack monitoring, enforcement, and sanctioning powers. In this respect, the exposure of infrastructure industries to the intervention of antitrust authorities seems beneficial in order to correct (or act as a deterrence against) companies' anti-competitive behaviour.

These empirically-based research arguments may contribute to a line of inquiry on the optimal structure of regulatory institutions in the context of concurrent regulation provided by different authorities (i.e., the competition authority and sectoral regulators). Within this area, Barros and Hoernig (2004) showed that the quality of decisions made by different regulatory agencies (e.g., the competition authority and the sectoral regulators) is higher if they act independently, otherwise they are exposed to institutional bias and lobbying efforts. Barros et al. (2008) also showed that if agencies collaborate (compete), the competition authority spends more effort on the industry with the more (less) consumer-biased sectoral regulator. This paper showed some mechanisms and conditions under which the competition authority and the sectoral regulators jointly contribute to ensure competition and prevent monopolistic or dominant practices. It seems hard to detect, however, whether the relationships between the two authorities are conducive to better quality of the decisions, as institutional bias and lobbying efforts may 'soften up' the extent to which the competition authority effectively contradicts the sectoral regulator (especially when functions of the latter are carried out by actors which operate, or have a stake, in the regulated industry, as in the railways case).

The relationship between sectoral regulators and antitrust authorities raises further

policy and strategic issues. Infrastructure firms are exposed to regulations and rulings that may partially differ from each other, therefore regulatory uncertainty is increased. Companies and consumers may appeal to both the sectoral regulators and the antitrust authorities, therefore the industry may be plagued by more litigation cases. On some occasions, the sectoral regulator and the antitrust authority may express contradictory policy directions, if they do not engage in mutual exchange of information and collaborative practices. As the role played by antitrust authorities to protect competition in infrastructure industries seems indispensable, such issues need to be tackled and will presumably constitute a persistent feature of the regulatory regime of infrastructure industries in the future. A question that deserves further investigation, then, is whether regulatory uncertainty, litigation cases, and contradictory policy directions may undermine investments made by potential new entrants and incumbents alike. This issue may be especially relevant in the context of industries, such as energy and railways, where technology or regulations may not afford to undertake relatively small steps while climbing up the 'investment ladder' (Cave, 2006). When relatively high-value assets are required in order to enter the infrastructure industry, for example in the form of vital industrial facilities or minimum installed capacity, then exposure to multiple regulatory authorities with loosely defined (or partially overlapping) statutory roles and responsibilities may deter entry of the more risk-averse operators.

References

- AEEG (2010), Rapporto al Parlamento. Rome: Autorità per l'Energia Elettrica ed il Gas.
- AGCM (2010), Rapporto al Parlamento. Rome: Autorità Garante per le Comunicazioni.
- Amato, A., and M. Conti (2005), *The Economics of the Water Industry: Technology, Ownership, and Efficiency*. Milan: Franco Angeli.
- Baldwin, R., C. Scott, and C. Hood (1998), *A Reader on Regulation*. Oxford: Oxford University Press.
- Barros, P. P. and S. Hoernig (2004), "Sectoral Regulators and the Competition Authority: Which Relationship is Best?", *Centre for Economic Policy Research*, Discussion Paper No. 4541.
- Barros, P. P., S. Hoernig, and T. Nilssen (2008), "Keep both Eyes Wide Open: The Life of a Competitive Authority among Sectoral Regulators", Memorandum No. 12, Department of Economics, University of Oslo.
- Baumol, W. J. (1982), "Contestable Markets: An Uprising in the Theory of Industry Structure", *The American Economic Review*, 72(1): 1-15.
- Beecher, J. A. (2001), "Privatization, Monopoly, and Structured Competition in the Water Industry: Is there a role for regulation?", in F. Holzwarth and R.A. Kraemer (eds), *Umweltaspekte einer Privatisierung der Wasserwirtschaft in Deutschland: Dokumentation der internationalen Fachtagung vom 20 und 21*. Berlin: Books on Demand.
- Beesley, M., and S. C. Littlechild (1983), "Privatization: Principles, Problems, and Priorities", *Lloyds bank Review*, July, reprinted in M. Beesley (1992), *Privatization, Regulation, and Deregulation*. London: Routledge.
- Bishop, S., and M. Walker (1999), *The Economics of EC Competition Law: Concepts, Application and Measurement*. London: Sweet and Maxwell.
- Boitani, A., M. Ponti, and F. Ramella (2007), "TAV: le ragioni liberali del no," *Istituto Bruno Leoni Briefing Paper* 41.
- Bozzi, A. (2009), "Trasporto Ferroviario: serve una riforma per settori," *Istituto Bruno Leoni Briefing Paper* 65.
- Cavaliere, A. (2007), "The Liberalization of Natural Gas Markets: Regulatory Reform and Competition Failures in Italy," *Oxford Institute for Energy Studies Working Paper*.
- Cave, M. (2006), "Encouraging Infrastructure Competition via the Ladder of Investment", *Telecommunications Policy*, 30(3-4): 223-237.
- Congedo, V. (2007), "Un piano a bassa velocità," *La Voce* 26th November (www.lavoce.info).

- Demsetz, H. (1968), “Why Regulate Utilities?”, *Journal of Law and Economics*, 11(April): 55-66.
- De Vincenti, C. (2010), “Regolazione a antitrust nelle public utilities, ovvero il 'passo a due’”, in C. Rabitti Bedogni e P. Barucci (eds.), *Studi Celebrativi del Ventennale dell'Autorità Garante della Concorrenza e del Mercato*. Torino: Giappichelli.
- Economides, N., and L. J. White (1994), “Networks and Compatibility: Implications for Antitrust”, *European Economic Review*, 38: 651-662.
- Eurostat (2008), *Electricity Prices: Data in Focus*. <http://epp.eurostat.ec.europa.eu/>.
- Farrell, J., and C. Shapiro (1988), “Dynamic Competition with Switching Costs”, *The RAND Journal of Economics*, 19(1): 123-137.
- Farrell, J., and C. Shapiro (1989), “Optimal Contracts with Lock-in”, *The American Economic Review*, 79(1): 51-68.
- Finger, M., and J. Allouche (2003), *Water Privatisation. Transnational Corporations and the Re-regulation of the Water Industry*. London & New York: Spon Press.
- Gallottini, R. (2009) “Il ruolo dei rigassificatori: il caso italiano,” *Idee per il Libero Mercato: Istituto Bruno Leoni* 68.
- Gatti, C. (2009), *Fuori Orario: Da Testimonianze e Documenti Riservati le Prove del Disastro FS*. Milano: Chiarelettere.
- Giacomelli, S. (2008), “La distribuzione del gas naturale in Italia: l'attuazione della riforma ed i suoi effetti,” *Questioni di Economia e di Finanza: Banca d'Italia Occasional Papers*.
- Giuricin, A. (2008), “Ferrovia dello Stato: l'illusione del risanamento,” *Istituto Bruno Leoni Briefing Paper* 57.
- Glachant, J.-M. (2002), “Why Regulate Deregulated Network Industries?”, *Journal of Network Industries*, 5: 1-17.
- Goldberg, V. P. (1976), “Regulation and Administered Contracts”, *The Bell Journal of Economics*, 7(2): 426-448.
- Gómez Ibáñez, J. A. (2003), *Regulating Infrastructure: Monopoly, Contracts, and Discretion*. Harvard University Press.
- Groom, E., J. Halpern, and D. Ehrhardt (2006), “Explanatory Notes on Key Topics in the Regulation of Water and Sanitation Services”, *Water Supply and Sanitation Sector Board Discussion Paper Series*, The World Bank, No. 6.
- Jordana, J., and D. Levi-Faur (2004), *The Politics of Regulation: Institutions and Regulatory Reforms in the Age of Governance*. Northampton, MA: E. Elgar.

- Joskow, P. L. (1991), "The Role of Transaction Cost Economics in Antitrust and Public Utility Regulatory Policies", *Journal of Law, Economics and Organization*, 7 (Special issue), pp. 53-83.
- Joskow, P. L. (1996), "Introducing Competition into Regulated Network Industries: from Hierarchy to Markets in Electricity", *Industrial and Corporate Change*, 5(2): 341-382.
- Joskow, P. L. (1997), "Restructuring, Competition and Regulatory Reform in the U.S. Electricity Sector", *Journal of Economic Perspectives*, 11(3): 119-138.
- Joskow, P. L. (2005), "Regulation of Natural Monopolies", *Center for Energy and Environmental Policy Research*, Working Paper No. 05-008.
- Joskow, P. L., and N. L. Rose (1989), "The Effects of Economic Regulation", in R. Schmalensee and R. Willig (eds), *Handbook of Industrial Organization* (vol. II), North Holland, 1450-1506. North Holland, 1450-1506.
- Littlechild, S. (1986), "Economic Regulation of Privatized Water Authorities and Some Further Reflections", *Oxford Review of Economic Policy*, 4(2): 40-67.
- Lobina, E., and D. Hall (2003), "Problems with Private Water Concessions: a Review of Experience". <http://www.psir.org>.
- Massarutto, A. (2007), "Liberalization and private sector involvement in the water industry: a review of the economic literature", *MPRA – Munich Personal RePEc Archive*, paper No. 5864.
- Merrett, S. (1997), *Introduction to the Economics of Water Resources*. Lanham, MD: Rowman & Littlefield.
- OECD (1994), *Improving the Quality of Laws and Regulations: Economic, Legal, and Managerial Techniques*. Paris: OECD.
- OECD (1997), *OECD Report on Regulatory Reform*, Synthesis. Paris: OECD.
- Ogus, A. (1994), "Competition and Regulatory Structures", *Law & Public Policy*, 26(3/4): 329-346.
- Polo, M., and C. Scarpa (2002), "The liberalization of energy markets in Europe and Italy," *IGIER Working Paper* 230.
- Ponti, M. 2009. "Un treno carico di sussidi," *La Voce* 27th May (www.lavoce.info).
- Rees, J. A. (1998), "Regulation and Private Participation in the Water and Sanitation Sector", *Natural Resources Forum*, 22(2): 95-105.
- Selznick, P. (1985), *Focussing Organisation Research on Regulation. Regulation Policy and Social Sciences*. Noll: Berkeley.

Tenbücken, M. (2006), “The Regulation of Network Infrastructure in the New European Union”, PhD thesis, Universität Konstanz.

Vickers, J., and G. Yarrow (1988), *Privatization: an Economic Analysis*. Cambridge, MA. MIT Press.

Williamson, O. E. (1976), “Franchise Bidding for Natural Monopoly – in General and with Respect to CATV”, *The Bell Journal of Economics*, 7: 73-104.

Williamson, O. E. (1985), *The Economic Institutions of Capitalism*. New York: Free Press.