

Research Reports

THE REGULATION AND PRIVATISATION OF THE PUBLIC WATER SUPPLY AND THE RESULTING COMPETITIVE EFFECTS

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The liberalisation debate on water services in Germany has become a discussion about the modernisation of the water supply. However, even this modernisation strategy contains elements of competition as, according to the concepts of the Federal German Ministry of Economics, it includes, inter alia, the harmonisation of the supply of drinking water and disposal of wastewater with respect to taxation and legal aspects, the introduction of full coverage benchmarking, the tasking of private third parties, as well as incentives for increased co-operation in the water industry (Auer et al. 2003). In view of considerations on the part of the European Commission, following a new legal framework for public-private partnerships, to establish a general tendering obligation for services of water supply and wastewater disposal, the German water industry must now once again face the pressure of liberalisation. Against a backdrop of increased internationalisation in the water industry, the question arises as to how a change in the general framework of the free market in Germany could have an effect on the market structure and supply conditions. Reference points are offered by comparisons between countries with different types of regulation. In the following, the organisation of the water industry in various European countries and the prevailing privatisation models are described, and the effects to be expected from a liberalisation of water supply on the competitive situation are discussed.

Basic regulatory constraints

While the term “privatisation” relates to the ownership structure of the providers, the term “liberalisation” implies extensive free market ideas. Privatisation involves the outsourcing of public services

from the public authorities to a privately organised organisation (Meyer-Renschhausen 1996). In the process nothing, however, needs to change in terms of the market or the intensity of competition for the commodity in question. Within the framework of privatisation, it is also possible for a public monopoly to be transferred merely to a private monopoly. In addition, the term “liberalisation” also refers to basic regulatory constraints: liberalisation signifies the cessation of limitations to competition and supply monopolies and results in open competition between several suppliers to attract consumers.

In the supply of drinking water, the pipe network represents a natural monopoly but not the production of drinking water. As drinking water is provided in different qualities, it is not a homogenous commodity like electricity, for example. The operation of the electricity network by a monopoly can be separated from its supply by competing companies. The transport of drinking water by competing providers is essentially more problematic because a complete mixing of various qualities of water would have to be tolerated. The operation of the network and production of drinking water can be separated from one another only with difficulty. The public water supply in Germany therefore, as opposed to other infrastructure areas, is still an exception area under competition law. Despite isolated privatisation of municipal water supply companies, competition does not take place in the sense of a liberalisation of the market. The high fixed-cost component in the supply of water makes the laying of parallel networks by the competing bidder unprofitable – the classical case for a natural monopoly. This is characterised by subadditivity (i.e. a monopolist can supply the relevant market more cost-effectively than two or more companies) as well as through the irreversibility of investments (so-called “sunk costs”). With the presence of “sunk costs”, free entry into and departure from the market are not possible. The relevant market is thus not a contestable market in the sense of the theory of “contestable markets” (Spelthahn 1993).

For the German water industry, it is characteristic that environmental and health policy objectives are mainly pursued via the organisation of the water supply (provision of goods and services through regional monopolies in the public domain) and less through the employment of concrete instruments aimed at the respective environmental political objectives (Ewers et al. 2001). The water supply companies in Germany, well-known for their high quali-

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ty of drinking water, have in the past invested ca. 2.5 billion annually in a high technical standard that has increased costs and resulted in rising prices. The price of drinking water alone increased in the 1990s by 40 percent and wastewater charges by 80 percent. Therefore, with respect to municipal water, a high potential for rationalisation was presumed, and the question regarding operational efficiency and the participation of private bidders in water supply companies became increasingly important (Mecke 2000).

Regulation of the water supply in England, France and Germany

A liberalisation of the water supply can take place in different ways. The specific features depend on what form of regulation the market for drinking water is or should be subjected to. In an international comparison three basic types of regulation of natural monopolies for the public supply of water (and disposal of wastewater) can be differentiated: the Anglo-Saxon, the French and the German model. With all three models the aim of regulation is the efficient production of goods and services within the municipal water industry and their political control (Kraemer 1997). These three basic types of regulation of water supply have a specific influence on the form of privatisation in the respective countries. As shown below the degree of privatisation is higher the clearer the division between supervisory bodies and the operational business of water supply turns out to be.

England and Wales: full privatisation

With this form of privatisation, which is found in England and Wales, publicly operated monopolies are transferred as a whole to a private enterprise. Thus we speak of “full privatisation”. In this case a sale of the operator firms, including all tangible assets (such as, for example, pipelines, wastewater treatment plants and water catchment systems), to private investors takes place. In England and Wales ten water service companies have been created in this manner, which provide both the supply of drinking water and the disposal of wastewater, and whose shares are sold publicly (in Scotland and Northern Ireland water supply and wastewater disposal on the other hand are still maintained by the public authorities). In addition, there are 12 companies that supply only water (OFWAT 2005). The regulation system follows the principle of “specialised regulation”: it

consists of separate, independent advisory authorities for the drawing of water and discharge of wastewater, for the quality of drinking water and for water prices and supply conditions:

- The Environment Agency monitors the water quality of rivers and waters used for swimming as well as the environmental effects of the company activities.
- The Drinking Water Inspectorate is concerned with the assurance of the quality of drinking water.
- The Office of Water Services (OFWAT) sets the prices within a defined minimum and maximum, whereby the performance of the individual providers is evaluated.

Price regulation allows the companies to increase their average prices per year by a factor of $RPI + K$, with RPI being the retail price index and K the additional costs represented through the environmental- and quality-related conditions. The regulating authorities set the prices so that an efficient company can expect a fair rate of return on its original business capital (Kraemer 1997).

France: privatisation through delegation

Privatisation through delegation is the temporarily limited transfer of the responsibility for the operation of water networks to private operators as it is practised in France. In this case the responsibility for the water supply (as for the disposal of wastewater) lies fundamentally with the municipalities which, however, on the whole delegate the provision of services to private companies. The production of goods and services are put out to tender by the municipalities, the facilities for the supply of water, on the other hand, remain the property of the public authority. In the contracts between the municipalities and the companies it is stipulated which costs the private companies may include, as a maximum, in the bill. Three different forms of contract are to be found (Council of Experts for Environmental Questions 2000):

- The franchise agreement: here the private operator takes on the costs for new investment; the duration of the agreement is 20 to 30 years.
- The lease agreement: here the private operator does not bear the costs for new investment, the duration of the agreement is 10 to 15 years.
- The operating agreement: here only partial performances are transferred to the private operator, the duration of the agreement is 6 to 10 years.

Thus the operation of existing water systems can be transferred to a private company either for a relatively short period with the systems generally being retained as municipal property. On the other hand, the construction and operation of systems to be newly produced can be transferred to private companies, whereby at the end of the period the property is transferred to the municipality. Under a franchise agreement the franchise holder builds, finances and operates certain plants for the agreed period. He receives a contractual remuneration, as a rule calculated according to cubic metre of water or wastewater respectively (Kraemer 1997). In contrast to the Anglo-Saxon privatisation model, the ownership of tangible assets remains in the hands of the public authorities in the French privatisation model, i.e. the state and the municipalities or departments. Local government is authorized to choose between direct management or contract management. In the latter case only the operating responsibility is delegated to the private side. The operating licences are awarded by means of a bidding process.

In the six river catchment areas that were formed through the First National Water Law of 1964 two bodies regulate each water supply:

- The Comité de Bassin (Committee of the Catchment Area) and
- The Agence de l'Eau (Water Agency).

The amount of the water tariffs are determined by the Comité de Bassin. In this body, which represents a type of regional “water parliament”, the state, the regions, the departments and communes, as well as the water and surface water users are represented. The setting of the objectives and priorities for the various measures are documented in a water management plan. Parallel to the Agence de l'Eau, there is a state public body that carries out the water management measures, levies charges for water usage and water pollution, and allocates benefits for investments and costs for treatment operations (Langenfeld 2000).

Germany: partial privatisation with regulation by the supervisory bodies

In Germany the privatisation debate must be viewed against the background of a traditionally strong municipal administration. The privatisation of the water supply in Germany, in contrast to France and the UK, is only one legal option but in no way a national action (Kraemer and Jäger 1997). The Ger-

man privatisation model prefers to regulate the privatised concern via its supervisory bodies. By sending representatives of the public authorities into these supervisory bodies, the business policy of the water provider can be influenced. The fixing of prices takes place according to the cost-covering principle. There are basically two different forms of this type of privatisation and one mixed form.

Formal privatisation or organisational privatisation: In this case the task of supplying water is retained by the previous administrator; only the operating agency is transformed into a business form under private law, for example by transforming a municipal department or a semi-autonomous municipal agency into a municipal enterprise. Despite formal privatisation, public structures are maintained which, however, with regard to independence and flexibility, should approximate the management of private companies.

Material privatisation or functional privatisation: Here the administrator delegates his tasks to a private party. The relinquishment of the public inventory of tasks can be revocable or final (Meyer-Renschhausen 1996). A regulation of the privatised company takes place in both cases through the creation of supervisory boards and the naming of supervisors within the company (Kraemer 1997).

Mixed form of privatisation: Well-known in Germany, the so-called “Berlin model” is a mixed form in which private companies participate in a municipal enterprise. With the partial privatisation of the Berlin Water Works (BWB) in 1998, a holding model was selected with which the Federal State Berlin received 50.1 percent of the shares in the strategic controlling holding, Berlinwasser Holding Aktiengesellschaft. The remaining 49.9 percent of the shares in the Berlinwasser Holding Aktiengesellschaft was acquired by an associated incorporated company established by an investor consortium. The business purpose of the Holding is the control and further development of the competitive business and the control of the Berlin Water Works. Thus, the legal form of the Berlin Water Works as a corporation under public law remained unchanged, but the competitive businesses were spun off and were transferred into the Berlinwasser Holding Aktiengesellschaft (Mecke 2000).

The responsibility for water pollution control and the management of surface waters in most of the

German Federal States is distributed over several levels. In the larger area states these are:

- The superior water authority (as a rule the Ministry of the Environment) with the responsibility for strategic decisions.
- The upper, higher or middle water authority which, as a rule, is assigned to the district committees or regional governments and is responsible for the regional water management planning.
- The lower water authority (cities, towns, urban and rural districts as well as water management offices) with monitoring, technical advice and executive functions.

The [German] Federal State Working Group Water (LAWA), which was established in order to harmonise Federal State water laws, is made up of the superior water authorities. The Federal States have also formed working groups for co-ordinating the management of river basins (Mecke 2000).

In the German model the municipal corporations and municipal public utilities are typical for the operation of the infrastructure systems necessary for the water supply, as are the inter-municipal agencies, which were established specifically for these tasks. The German model functions essentially without formal, external regulation of water rates, tariffs or returns on investment. As no private enterprise profit motive is present, only cost-covering rates and public fees for the municipal water services are charged.

Market structures

In the Anglo-Saxon model the existence of a permanent private monopoly has been accepted up to now. At the same time, however, efforts are being made to minimise its negative effects through external regulation. In England and Wales the supervisory authorities set for a certain period of time upper limits for charges to the end user. These limits allow the company to earn a fair rate of return. The state is thus an opposing force to the private enterprises and has to accept an asymmetry of information as long as it does not introduce far-reaching obligations for transparency. The advantage of this model lies in the clear separation between the supervisory authorities, the users of bodies of water and the companies controlled by them and also in the fact that the legislation and the regulation are developed and co-ordinated at the national level (Correia and Kraemer 1997).

In the French regulation model, an element of competition at regular intervals has arisen instead of a continuous, regulating supervision. Temporary contracts between municipalities and private companies regulate the operation of municipal water services. They include, as a rule, a complete packet of services from the operation of the water network via financing to strategic planning. Profits can be limited through the competition of private bidders for the contracts. Indeed, during the term of the contracts, barely any competition takes place. In contrast to the Anglo-Saxon model, the French municipalities still have some influence on the development of their technical municipal systems. This model leads to the formation of large, vertically integrated water and construction companies, which at the same time act as operators of the systems of municipal water supply and disposal of wastewater and as supplier of relevant goods and services.

The German model, on the other hand, is not a regulation model in the normal sense of the word “regulation”, as there is no external relationship between private providers or operators and the authorities. Instead of a control of natural monopolies from outside, the public authorities influence the operation of municipal water networks through rights of ownership as the municipalities are involved in the supply companies. Information asymmetries between public administrations and private companies therefore seldom occur. The water supply companies promote a “quasi-competition” as three out of four companies, in accordance with the Municipal Charges Law, raise public charges, which are approved by local governments under the supervision of the Federal States. Here, attention is paid to the principles of cost covering and equivalence in accordance with tariff law, which is examined in the form of price-performance comparisons by the municipal supervisory authorities. The remaining quarter of the providers raise payments under private law and are subject to the anti-trust control of abusive practices. The anti-trust price control is oriented to comparative market concepts and accepts price differences between providers on the strength of clearly defined criteria only (Grobosch 2003).

Effects on competition

In order to classify correctly the effects of different regulating systems on the competitive structure, it is necessary to differentiate between the municipal

water supply on the one hand and the water industry on the other. The former falls into the category of public services (even if they are performed by private parties) as does municipal wastewater disposal. The term “water industry” is, in contrast, more comprehensive; it includes, for example, the production of pipes, pumps and filters as well as measuring and control engineering equipment. Characteristic for the German model is that the operation of the water network is strictly separated from the production and supply of goods associated with the services. In contrast, global players of the international water business operate municipal water systems and are also producers of goods and plant for the supply of water and disposal of wastewater.

The three privatisation models described lead to three clearly distinguishable forms of competition:

- Yardstick-competition between private providers, which is simulated by the regulatory authorities.
- Competition between private operators for the right to temporary operation of natural monopolies.
- Competition in the goods and services markets within the field of water.

In the Anglo-Saxon model there is no direct competition between private providers, either for the consumers or for their supply areas. Yardstick-competition takes place in the form of benchmarking the providers, which is carried out by the supervisory authorities. The regulatory authority also requires information on the markets for goods and services in the field of water, because private providers and operator companies who are also suppliers of these goods can build up regional or sector monopolies or cartels in order to shift profits into non-regulated areas. This applies also to the French model where the competition for the limited operation of local water supply monopolies takes place in the form of a bidding process. In contrast, in the German model, there is no direct competition between municipal institutions; they maintain their natural monopolies at the regional level. Performance comparisons between the various bidders are made by the municipal operators themselves. On the other hand, competition in the water

industry is intense and these markets are characterised by numerous small and medium-sized companies. Operators of utilities and the water industry in Germany thus fall in essentially two groups that are clearly separable from each other (Kraemer 1997).

In France private water supply companies were established already in the nineteenth century: in 1853 the Société Générale des Eaux and 1880 the Lyonnaise des Eaux. In 1933 the third largest group, the Société d’Amenagement Urbain et Rural (SAUR), was founded (Spelthahn 1993). Today, these business groups and their successors have the largest shares of the market in the international water business. Under their umbrella all components for complex water management projects (plant manufacture, engineering, surface and subsurface civil engineering, development departments) are part of these competitively and vertically integrated international corporate groups. In the UK, the public facilities of water supply and wastewater disposal were privatised in 1989 in a large-scale national action. Thus the Water Service Companies were created under the umbrella of large, regional holding-companies. Several of these operators, such as Thames Water, Severn Trent Water, Anglian Water and United Utilities, are active internationally (Federal Ministry for Education and Research 2000).

The international markets for water and waste water services are dominated by French and British companies. The world market leaders are the French companies Suez Environnement and Veolia, each serving around 115 million people in 2004 with drinking water

Number of people served by water multinationals
million inhabitants

	Water supply	Waste water disposal	Altogether (with overlaps)
Suez Environnement, France	92.0	62.0	115.0
Veolia, France	87.5	43.5	113.0
Thames Water, United Kingdom	28.0	17.8	45.0
Agbar, Spain	27.4	13.9	30.0
Saur, France	25.6	9.5	27.0
Severn Trent, United Kingdom	11.3	15.6	18.0
Azurix, USA	8.3	7.9	10.0
Anglian Water, United Kingdom	6.6	8.1	8.0
Berlinwasser, Germany	4.0	5.5	7.5
Gelsenwasser, Germany	6.0	3.0	7.0
Biwater, United Kingdom	3.0	6.0	5.5
Remondis Aqua, Germany	0.2	4.0	4.0

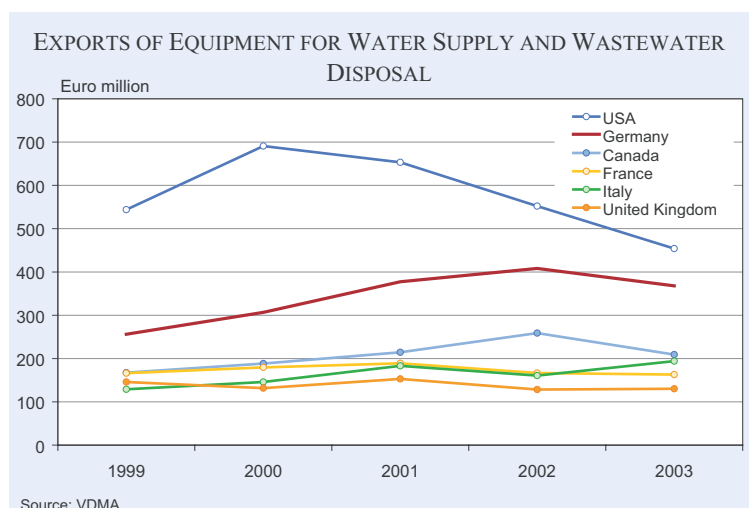
Source: Prof. Dr. K.-U. Rudolph GmbH, modified by author.

and/or waste water services (see Table). The next largest company is the British Thames Water with 55 million customers, which was acquired by the German RWE Group in 2001, but sold again at the end of 2006 to Kemble Water Limited, a consortium led by the Australian Macquarie's European Infrastructure Funds (EUWID 2006). With the takeover of Thames Water, RWE was the only German company that succeeded in catching up with the Global Players on the international water markets. Spanish Agbar lags behind with 30 million customers, followed again by French, British and US companies. The German companies Berlinwasser and Gelsenwasser serving 7.5 million customers and 7 million customers, respectively, are at positions nine and ten. Remondis Aqua serving 4 million people is at position twelve.

With the takeover of Thames Water, RWE has temporarily advanced into the foremost group of global players in the water market. Otherwise the majority of water supply and wastewater disposal companies in Germany is extremely small-sized, splintered and decentralised. 6,655 water supply companies operate 17,849 facilities and around 8,000 wastewater disposal companies operate more than 10,000 wastewater treatment plants (Ewers et al. 2001). Public ownership dominates: 15 percent of the water supply companies are managed as semi-autonomous municipal agency, 16 percent as inter-municipal agency, 6 percent as water and soil management associations, 10 percent as public companies and 20 percent as municipal enterprise. 29 percent are organised in public-private partnership and only 3.5 percent are under a majority controlling interest under private law. In German wastewater management, 20 percent of companies are organised as municipal departments, 43 percent as semi-autonomous municipal agencies, 17 percent as public law corporations, 13 percent as inter-municipal agencies or water and soil management associations and less than 8 percent as arrangement under private law (BGW – ATV-DVWK 2003). In Germany, there are 81 water providers per million customers. In England and Wales, on the other hand, there are only 0.46 and in France 0.07 companies per million customers. Some two thirds of the German companies supply an area with between 50 and 3,000 inhabitants and together deliver ca. 4 percent of

the total water quantity. Over 90 percent of the amount of water, on the other hand, is delivered by only one third of the companies (Grobosch 2003).

Water management competence in Germany is clearly settled at the municipal level. Admittedly this affects their ability to compete. In contrast, in France the communes, which, in comparison with Germany, are considerably smaller, are not in a position to carry out the supply of drinking water themselves due to the lack of specialist staff and knowledge (Spelthahn 1993). An important advantage of the structures in the German water supply is that the strong communal anchoring of the German providers ensures a high degree of political involvement. The management of surface waters thus has a solid basis as it is oriented towards precaution. Up until now this system has met with strong acceptance by the general public. The high level and efficiency in the technical management are guaranteed because of the close co-operation between water supply companies, industry and government agencies, and the activities of technical-scientific associations that set the rules. Due to the strong functional and organisational fragmentation, the impact of the German water industry on the decision process in the European Union is, however, rather small. Because of the strong division of organisational competence (water supply and wastewater disposal companies, construction firms, plant constructors, component suppliers, consulting firms, engineer offices, water laboratories and research institutes), the German water industry fails to create an integrated appearance on the international market. As a result, Germany cannot compete in the steadily growing market segment of complete turnkey solutions (planning, construction, operation, maintenance,



invoicing and customer service), in which, above all, enterprises from France and the UK dominate (Federal Ministry of Education and Research 2000). For France, on the other hand, the high share of the private supply of drinking water can, to a considerable extent, be traced back to its historical development. The commodity water was seen as a normal “commercial” good and not, as in Germany, as a part of the existing public precautions.

The argument that the German water industry has a structural competitive disadvantage is, however, no longer as strong if one takes into account not only the markets for drinking water or complete solutions but also the market for water and wastewater technology. Here Germany, with a share of world trade of 16.3 percent, takes second place after the US with a 20.1 percent share. The export quota of German water technology rose from 26 percent in 1999 to 43 percent in 2003, and that with a company structure characterised by small and middle-sized businesses. On average, suppliers and producers of water processing and wastewater treatment systems employ a staff of 50 (Oberhäuser 2004). As US exports declined, Germany was catching up in the years 1999–2003 followed by Canada with 9.3 percent and Italy with 8.6 percent market share (see Figure). France’s water and wastewater technology branch follows at position 5 with a share of 7.1 percent of world trade, followed by British companies with a share of 5.7 percent. This suggests that the large, vertically integrated water supply enterprises demonstrate competitive weaknesses in the market segment of water and wastewater technology, because they face too little competitive pressure in their home markets.

Conclusions

In an international comparison, there are three basic models for the regulation of natural monopolies in the public water supply: the Anglo-Saxon, the French and the German model. The delimitation between supervisory bodies and operations in water supply is strongest in the first and weakest in the last. This has led to three basic types of privatisation: “full privatisation”, “privatisation through delegation” and “privatisation with regulation by the supervisory bodies”. These types have led to three clearly distinguishable forms of competition: yardstick competition between private supply-enterprises simulated by the regulation authorities, competition between

private operators for the right to the temporary provision of water supplies, and competition in the product and service markets for the provision of water.

The international markets for the operation of water supply systems and complete solutions are dominated by French and British companies. The typical German plant constructor either does not achieve the critical size for a global player or he lacks the necessary references as an operator of water supply systems. On the other hand, the water supply and wastewater disposal operators lack the financial power in order to compete with the world market leaders. This disadvantage is, however, compensated by the worldwide leading role of German water and wastewater technology. In order for German companies also to be present on the market for complete solutions it would be necessary to make up for a large competitive backlog compared with foreign water companies. To do this, the current strong municipal anchoring of the water industry in Germany would have to be relaxed in favour of the development of vertically integrated water corporate groups that can be competitive in international markets. An adjustment of the market and concentration in the German water sector would be the necessary prerequisite for such an internationalisation. However, the structures of German water supply, proven with regard to the safety of supply and drinking water quality, would have to be sacrificed to achieve this level of competition.

References

- Auer, J., B. Böttcher, H.-J. Frank, S. Heng and E. Heymann (2003), “Traditionelle Monopole: Wachstum durch mehr Wettbewerb”, *Deutsche Bank Research* no. 261, Frankfurt am Main.
- BGW – ATV-DVWK (2003), *Marktdaten 2003 – Ergebnisse der gemeinsamen Umfrage zur Abwasserentsorgung*, Aachen, Berlin, Hennef, Koblenz.
- Federal Ministry for Education and Research, ed. (2000), *Aktionskonzept nachhaltige und wettbewerbsfähige deutsche Wasserwirtschaft*, Karlsruhe.
- Correia, F. N. and R. A. Kraemer (1997), “Institutionen der Wasserwirtschaft in Europa, Einleitung” in F. N. Correia and R. A. Kraemer, eds., *Dimensionen Europäischer Wasserpolitik*, Berlin, Heidelberg.
- Council of Experts for Environmental Questions (2000), *Umweltgutachten 2000 – Schritte ins nächste Jahrtausend*, Stuttgart.
- EUWID (2006), *Europäischer Wirtschaftsdienst Wasser und Abwasser* no. 43.
- Ewers, H.-J., K. Botzenhart, M. Jekel, J. Salzwedel and R. A. Kraemer (2001), *Optionen, Chancen und Rahmenbedingungen einer Marktöffnung für eine nachhaltige Wasserversorgung*, final report.
- Grobosch, M. (2003), *Grundwasser und Nachhaltigkeit – Zur Allokation von Wasser über Märkte*, dissertation, University of Tübingen.
- Kraemer, R. A. et al. (1998), *Vergleich der Trinkwasserpreise im europäischen Rahmen*, Berlin.

Kraemer, R. A. (1997), "Öffentliche und Private Wasserversorgung und Abwasserbeseitigung in Europa", in F. N. Correia and R. A. Kraemer, eds., *Dimensionen Europäischer Wasserpolitik*, Berlin, Heidelberg.

Kraemer, R. A. and F. Jäger (1997), "Deutschland", in F. N. Correia and R. A. Kraemer, eds., *Dimensionen Europäischer Wasserpolitik*, Berlin, Heidelberg.

Langenfeld, F. (2000), Agence de l'Eau Rhin-Meuse, Metz: *Das System der flussgebietsbezogenen Wasseragenturen in Frankreich*, paper presented at the conference on water 2000, Berlin, October.

Mecke, T. (2000), *Das Berliner Modell – weltweit gültig?*, paper presented at the conference on water 2000, Berlin, October.

Meyer-Renschhausen, M. (1996), "Die Auswirkungen der Privatisierung öffentlicher Dienstleistungen auf die Umwelt am Beispiel von Energiewirtschaft und Abwasserbeseitigung", *Zeitschrift für öffentliche und gemeinwirtschaftliche Unternehmen* 19(1), 79-94.

Oberhäuser, N. (2004), "Saubere Wasserlösungen – Die deutsche Wasser- und Abwassertechnik ist international mit vorn. Wachstum erzielen die Mittelständler zurzeit vor allem im Export", *Handelsblatt* 29 November, supplement Journal Mittelstand.

OFWAT (2005), Office of Water Services, *International Comparison of Water and Sewage Service: 2005 Report*, Birmingham.

Pricewaterhouse Coopers (2001), *Optimierung der kommunalen Wasserver- und Abwasserentsorgung im Rahmen einer nachhaltigen Wasserpolitik*, final report, Vienna.

Rudolph, K.-U. and T. Block (2001), *Der Wassersektor in Deutschland: Methoden und Erfahrungen*, study for the Umweltbundesamt and the Bundesministerium für Umwelt, Naturschutz und Reaktorsicherheit in co-operation with the Internationales Transferzentrum für Umwelttechnik, Berlin.

Spelthahn, S. (1993), *Privatisierung natürlicher Monopole – Theorie und internationale Praxis am Beispiel Wasser und Abwasser*, Berlin.