

# DECENTRALIZATION OF THE WATER INDUSTRY IN THE CONTEXT OF ECONOMIES IN TRANSITION (ON THE EXAMPLE OF THE CZECH REPUBLIC BETWEEN 1992-1998)

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**Abstract:** *This research focuses on network industries, specifically on water industry in the context of the Czech economy in transition between 1992-1998, primarily on describing the state of the water industry towards the end of the 1980s, on key legislative changes between 1991-92 that touched upon key administrative questions and the future ownership of the water network and water market – the Czech Republic chose a specific way to approach the transformation of the water industry by gratuitously transferring the ownership of the previously state-owned infrastructural properties to individual cities and municipalities. Next part of paper outlines the effectiveness of such (de)regulation process based on development of key industry indicators. Very slow development of industry indicators and lack of state financial support for capital investment in water infrastructure led to the subsequent privatization of water companies, which can be considered as a completely rational outcome of unsustainable market developments.*

**Keywords:** *deregulation, transition, transformation, privatization, water industry, public service.*

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## 1. INTRODUCTION

The water industry is one of the pillars of the so-called network branches and is one of the key segments of the economy. The distribution of drinking water and conducting away of sewage water via public piping is nowadays considered to be a matter-of-course service without which we could hardly imagine our day-to-day lives to exist. That is why providing this crucial infrastructure is one of the fundamental duties of the public sector. However, in the context of this infrastructure, many market failures and high costs for the government when rectifying potential damages are often pointed out (Klien, 2015; Cave, Wright, 2010). There are different opinions as well, based on the fact that even the water industry is a classic area of the so-called mixed economy, in which private and public interests clash (Mejstřík, 2004). Experiences from other network branches, such as railway transportation or energy industry, also show that the participation of the private sector provides many benefits in the form of higher efficiency and level of provided services (Klien, Salvetti, 2018; Cavalho, Marques, Berg, 2012; Amos, 2004). The Czech Republic at the end of the 1990s took this route since it allowed the private sector to enter the water industry and the transfer of water infrastructure into private hands (Hlaváč, 2006). This was however preceded by a rather complicated transformation process in the 1990s which directed the entire branch towards its current highly fragmented form. The analysis of this fragmentation process is the core of this text.

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The transformation and privatization of the water industry is also the focus of a number of foreign studies whose conclusions vary significantly. In several cases, the participation of the private sector in the water industry is seen as only “picking out” the rentable elements of the market which in the end leads only to a price increase which does not correspond with the appropriate level of effectiveness and productivity (Memon & Butler, 2003). Partial privatization and participation of the private sector in developing countries can on the other hand lead to the branch receiving large capital investments that later raise the overall level of services and enable significant revitalization of infrastructure and improve the purity of water itself (Pangare a kol., 2004). In most cases, the participation of the private sector is only partial – the ownership of the infrastructure remains in the hands of the public sector and the management of it is provided by the private partner via temporary lease. One of the few exceptions is the privatization of the water industry in the United Kingdom where the water infrastructure was sold to private operators. The entire branch is thereby solely private, of course under strict observation by the regulator. In this case the opinions differ about the development of effectiveness and productivity that the privatization brought. One side of the opinion spectrum states that the privatization significantly strengthened the technological facilities of the water industry but did not deliver the promised growth of productivity, thereby causing significant losses of overall effectiveness (Saal, Parker & Weyman-Jones, 2007). Another study however shows that the UK water industry experiences (thanks to the privatization) very quick technological development which leads to the constant decrease in operational costs (Bottasso & Conti, 2003).

The Czech Republic, similarly to e.g. Poland (Lis, 2015) or Slovakia (Havlicek, 2005), and Hungary (Péter, 2007; World Bank, 2015) chose a specific route for the transformation of the water industry. At first, it was not a typical privatization process – transfer of ownership of enterprises and their assets directly to private hands – but rather at first the so-called deetatization – one of the steps in the decentralization process connected to political and economic changes at the turn of the 1980s and 1990s and the transition from centrally planned communist economy to a certain version of market economy. It meant that the water infrastructure and its operational assets were at first transferred into the property of cities and municipalities.

## **2. MATERIALS AND METHODS**

Information about the transformation process were gathered from publicly accessible articles, studies, and legislative documents from the Office of the Government of the Czech Republic. For an objective evaluation of the development of the water market, tools of comparative data analysis were used that compare the development of key indicators of the water industry between 1992-1998 when the process of transformation was finished. The data for the comparative analysis was gathered from the publicly accessible database of the Czech Statistical Office, statistical yearly reports of the Ministry of Agriculture of the Czech Republic, and yearly reports of the branches of water systems and sewage systems published by the Ministry of Agriculture of the Czech Republic.

## **3. CZECH WATER INDUSTRY IN TRANSITION**

Not only in the Czech Republic but also in almost all countries of the former Easter Block, the water industry was highly underfunded before 1990. The pressure for a quick and extensive industrialization during the communist regime lead to corresponding building of water infrastructure, it was however not accompanied by securing enough conducting away or waste-water treatments which lead to a significant deterioration of the quality of natural water resources.

The ownership of the infrastructure and the providing of water services was in the hands of the government that primarily focused on price availability of services for the entire society and not on economic effectiveness (World Bank, 2015).

The transformation of Czech water industry started in 1992. The entire preparation process for this extensive transformation was initiated primarily by the Resolution of the Government of the Czech Republic NO 222 adopted on 3 July 1991, on the principles of the reforms and transformation processes of the systems of providing drinking water, sewage systems, and waste-water treatment. This resolution included a summary of the status quo, the agreement to the reform proposition, and individual gradual steps of the reform and of the transformation process, for which the former minister of agriculture was responsible for. In the same year, the Act No 92/1991 Coll. was established, on the transfer of property of the state to different persons which defined the course and form of privatization projects, thereby preparing all necessary institutional documents for the extensive transformation and restructuring not only of the water industry. The so-called water act (Act No 138/1973), adopted in 1975, defined the fundamental areas of water management, such as water protection, underground water, and supplying the inhabitants, watercourses and their management, water buildings, and other important segments, remained valid until 2002.

Besides the mentioned acts, the Ministry of Agriculture also worked on a study called “Zásady pro privatizaci státních podniků oboru veřejných vodovodů a kanalizací” (Rules for Privatizing State-Owned Enterprises in the Area of Public Waterworks and Sewage Plants). The objective of the study was i.e. to introduce foreign experiences to the issue and their recommendations for a healthy development of the branch, as well as appropriate setting of regular barriers for the functioning of the market environment. The study also stressed the advantages of bigger organizational structures that function more effectively and provide the users with high-quality services with appropriate tempo of price growth (Transparency International, 2009).

The actual process of transformation of the branch started in 1993, initiated by a gratuitous transfer of state-owned property of the water industry’s infrastructure and operational property to the self-government of cities and municipalities. In principle, every city or municipality became a sole owner of its water industry infrastructure and its operational property. All responsibility from these remained with the management of the municipalities. The second important aspect of the transformational process was the inception of the so-called water industrial business enterprises, whose goal was to connect the infrastructural property of municipalities and provide their management. The management of cities and municipalities had two options how to manage their water industry property:

- to keep the property ownership and supply of drinking water and sewage-water drainage of their citizens with their own powers;
- to transfer the property to a water industrial business enterprise that would provide the running, revitalization, and the connected services.

The privatization projects were at the same time constructed so that they secured the decisive influence of the cities and municipalities over the newly established water industry enterprise via having the majority of the shares in them. The beneficial interest of these enterprises (that the municipalities also received for free) was established by the value of their infrastructural property. Naturally, larger cities with a dense infrastructural network had a larger property share in the regional water industry enterprises than smaller municipalities with only several connections. Already at this stage, between 1992-1993, the state calculated the option of creating two different models of management:

- *Mixes model* – water industry enterprise owns and at the same manages the water infrastructure based on agreed upon norms and proper administration of the enterprise;
- *Separated model* – water industry enterprise only owns the water infrastructure and the management and connected services are provided by other natural or legal persons based on a contract (separation of ownership and management). Municipalities do not lose the oversight over the water and sewage prices.

Until 1993, there existed overall 11 state-owned water industry enterprises (9 regional and 2 in Prague that provided the management, renewal, and development of water industry infrastructure). The implementation of privatization projects and the transformation lead to the fragmentation of these large holes, in 1994 there were around 40 regional water industry enterprises and more than 1,200 additional small-scale operators.

To call the process until this point as a privatization process is completely false. It only came to the so-called deetatization – a transfer of the previously state-owned property (water industry and sewage infrastructure and connected operational property) to cities and municipalities. The original 11 water industry enterprises were by privatization projects fragmented into about 40 regional water industry enterprises whose new majority shareholders were the self-governments of cities and municipalities. The state also within this process created certain safeguards that were supposed to even prevent a complete privatization of this industry as a monopole. Such a safeguard was e.g. an option of using the state administration's influence in water industry enterprises in the form of a "golden share". In such a case, the state could block any fundamental planned changes in the water industry enterprises for which a certain number of shares would be needed at the general meeting. The state also as a part of the privatization projects worked in limiting rules regarding the transfer and selling of shares. The intent of this was to keep the planned owner structure and prevent the selling of shares to the hands of private enterprises. Privatization (selling of share into private hands) would be a serious breach of not only the rules of the water industry enterprises but also of the rules of the Commercial Code. The established water industry enterprises provided the supply of drinking water and drainage of waste-water for 90 % of the inhabitants of the Czech Republic. The remaining 10 % of the market was provided by small operators created by cities and municipalities that decided to not invest their gained infrastructure and operational property into the ownership of regional water industry enterprises in which the municipality could have their representative (Transparency International, 2009).

As the time progressed, it became obvious that the created regional water industry enterprises were not able to provide enough capital for the needed revitalization and development of water industry infrastructures that were in some areas almost in a desolate state and needed significant investments. Since the state refused to take responsibility for financing of these investment-heavy projects and cities/municipalities were not sufficiently capital-equipped, the entry of private investors needed to happen.

#### **4. FROM TRANSFORMATION TO PRIVATIZATION**

At the end of the 1990s, the tendencies towards gradual actual privatization of the water industry enterprises commenced via a direct purchase of shares. In many divisions of owners of water industry infrastructure, it came to the transfer of ownership of separable (operational) property. For example, in the South Bohemian Region in its water industry, already in 1998, the

relation to the property changed this way in more than 90 cities and municipalities. The consequent privatization was joined by more than 45 regional water industry enterprises (MZe, 1999).

The biggest interest of investors (mostly abroad) was in the shares of large cities that provided water to densely populated areas or in enterprises that provided the management of large areas. For example, the enterprise Pražské vodovody a kanalizace a.s. was privatized this way which provided the provision, draining, and cleaning of water for the entirety of Prague and parts of the Central Bohemian Region. Ownership of the Prague water industry infrastructure remained (and remains until today) in the hands of the enterprise “Pražská vodohospodářská společnost” that is 100 % owned by the Prague City. Similarly, privatization took place in other water industry enterprises that decided to separate their operational part from their ownership structure. They signed a contract between the operational enterprise and the city (or the alliance of cities and municipalities) lasting longer than 20 years. The sale of the operational parts of the enterprises meant that cities received sufficient amount of finances and the transfer of responsibility of the operations of infrastructure.

## 5. REGULATORY FRAMEWORK OF WATER INDUSTRY

Already in 1991, the state applied a regulatory tool in the form of determining the maximum price of water, which differed for households and other customers. The year 1992 brought only small changes in the form of the deregulation of the prices of water for other customers, the limits of the maximum price of water for households, which was valorized yearly.

The change in the approach to regulation came in 1993, when the price of water for households was regulated via a factual price regulation. This approach to regulation is based in the COS method (*cost of service regulation*) – regulation of prices based in the amount of costs of production of services or products. This most common method is based in the sum of relevant expenses in connection with the production of products or services and on calculating the desired rates of return of the capital invested. Such an approach has several disadvantages, e.g. the information asymmetry between the regulator and the regulated enterprise. The regulator from its position is not able to understand all conditions and connections of the running of the given branch. The enterprise that functions within this branch has a higher level of information and can misuse its position. In the interest of increasing the regulated prices it can e.g. superfluously and inefficiently increase its capital investments (Stigler, 1971). Such an approach to price regulation can also cause a significant deviation from the average price of water – water from large companies costs anything from 14 CZK/m<sup>3</sup> do 22 CZK/m<sup>3</sup>. Small enterprises were not able to compete with such low prices and their prices were higher by even 35 % (MFČR, 2019).

## 6. KEY REGULATORY INSTITUTIONS

The regulation of the water industry and sewage systems is regulated by the Ministry of Agriculture of the Czech Republic, the Ministry of Finance, The Ministry of Environment, the Ministry of Health, the Ministry of Regional Development, the Office for the Protection of Competition, as well as the municipalities as owners of the water industry infrastructure (Hospodářská komora, 2015). For the end-consumers, the Ministry of Finance is key, whose functions in the area of water industry are the financial regulation and the overlooking of the rules of public regulations of prices of drinking water. The other institutions manage the issues of spatial planning of water industry objects, creating legislation in the area of water protection or water quality.

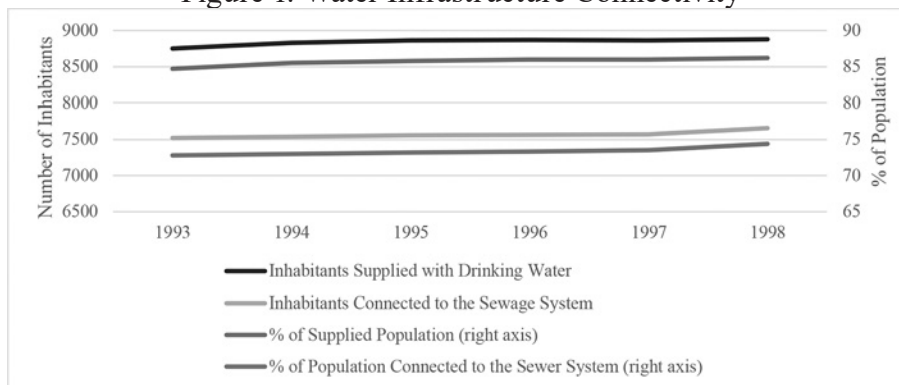


## 7. DEVELOPMENT OF KEY INDUSTRY INDICATORS

The form of the transformation process in the 1990s led to the original market structure to crumble, overall 11 state-owned enterprises became around 45 regional water management enterprises and more than 1,200 small operators. Within Europe, the Czech Republic is nowadays – thanks to this transformation of the water industry – absolutely unique for its number of owners and operators of the water infrastructure (in 2017, the number of owners was 6,795 and the number of operators was 2,878). The next part of the article illustrates how the key market indicators developed during the process of transformation which ended in 1998.

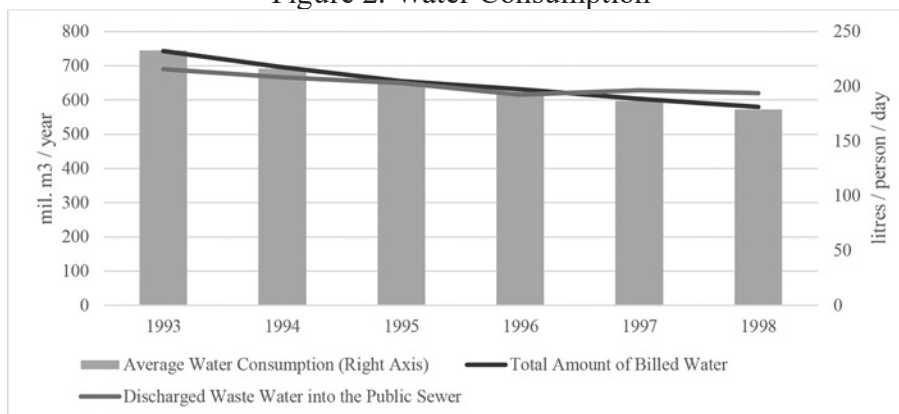
Drinking water has become somewhat more accessible for Czech consumers. While in 1993, 8.75 million citizens (figure 1) were connected to water infrastructure, which was 84.7 % of population, until 1998 the number grew to 8.88 million citizens (86.2 % of population). The number of people connected to the sewage system also slightly increased. In 1993, approximately 7.52 million citizens were connected to the sewage system. This number grew to about 7.66 million in 1998, which means that in 1998 74.4 % of Czech population were connected to the public sewage system.

Figure 1: Water Infrastructure Connectivity



Source: Ministry of Agriculture, Czech Statistical Office

Figure 2: Water Consumption



Source: Ministry of Agriculture, Czech Statistical Office

Although the number of inhabitants connected to the water system grew by 128 thousand between 1993 and 1998, the overall yearly volume of invoiced water decreased by 163.1 mil. m<sup>3</sup> of water. The explanation for this decreasing trend of invoiced water can be found primarily in the always decreasing average consumption of water. In 1993, the average water consumption

was 223 l per inhabitant per day, this value decreased to about 179 l daily in 1998 (figure 2). The decreasing trend is of course also caused by the development of technologies that brought more economical appliances to Czech households. With the decreasing water usage, the volume of water released into the sewage system also decreases. In 1993, the overall volume of water released into the sewage system was 666.2 mil. m<sup>3</sup> per year, by 1998 the overall yearly volume decreased to about 620 mil. m<sup>3</sup>.

To connect more inhabitants to water infrastructure, it was necessary to revitalize and expand it properly. The overall length of the water infrastructure network grew from 1993 to 1998 by 4,054 km (table 1). The length of the sewage system infrastructure was lengthened by 2,329 km since 1993. A crucial indicator are the losses of water in the pipe network. Between 1993 and 1998, these losses were able to be lowered to an average amount of 71 liters per person and day, which meant a decrease by 29.7 %.

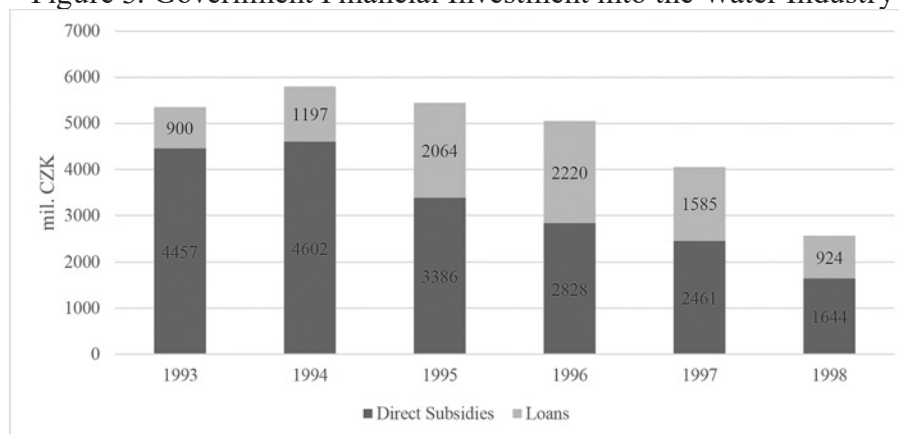
Table 1: Water Infrastructure Development

	1993	1998	Change (%)
Length of drinking water infrastructure (km)	45 579	49 633	+ 4 054 (+ 8,89 %)
Length of waste water infrastructure (km)	17 493	19 822	+ 2 329 (+ 13,31 %)
Water loss (liters/person/day)	101	71	- 30 (- 29,7 %)

Source: Ministry of Agriculture, Czech Statistical Office

Figure 3 illustrates the development of state investments into the water industry. Already in 1994, the volume of direct investments was constantly decreasing. In 1994, the state directly invested financial sources in the amount of 4,602 mil. CZK. Until 1998, the volume of these investments decreased to 1,644 mil. CZK. The decrease of these investments was partially compensated by a higher volume of loans, although even this indicator significantly decreased until 1998.

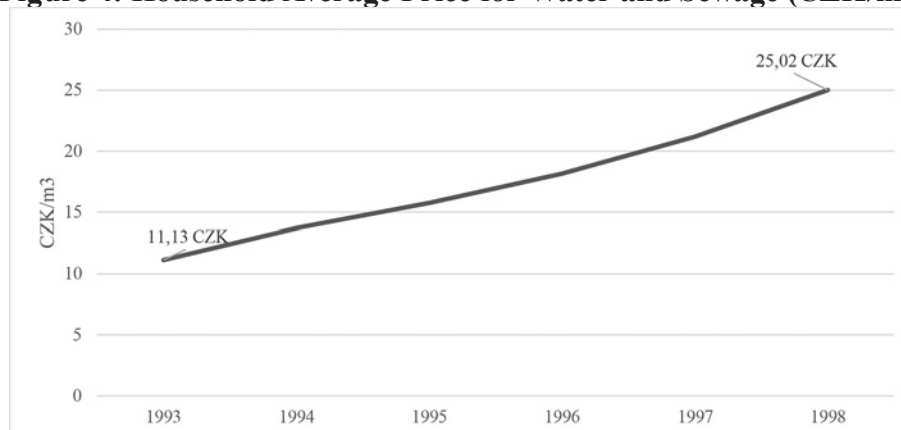
Figure 3: Government Financial Investment into the Water Industry



Source: Ministry of Agriculture

The last figure (figure 4) illustrates the development of the average price of water and sewage per household. Still in 1993, the average price per water and sewage was 11.13 CZK. Until 1998, this price grew to 25.02 CZK which means an increase of 125 %.

**Figure 4: Household Average Price for Water and Sewage (CZK/m<sup>3</sup>)**



Source: Ministry of Agriculture

An interesting comparison is included in Table 2. It illustrates how the purchasing power of the average wage changed over time. Meaning, what amount of the stated goods we could buy for the average wage in 1993 and 1998. In 1998, the Czech consumer could with an average wage purchase 429.75 kWh of electricity and 515.97 liters of petrol more than in 1993. The increase in price for water and sewage did not correspond with the increase in the average wage, which meant that water became more expensive. The average Czech consumer could therefore purchase 63.57 m<sup>3</sup> fewer of drinking water than in 1993. Such a quickly increasing price of water could be one of the reasons for more economic behavior of Czech households whose average water usage significantly decreased.

Table 2: Purchasing power of average wage

	1993	1998	Change (%)
Average wage	CZK 5,904	CZK 11,801	+ 5,897 (+99.98 %)
Water (m <sup>3</sup> )	553.85	490.28	-63.57 (-11.48 %)
Fuel (l)	338.53	584.50	+515.97 (+ 72.66 %)
Electricity (kWh)	6,945.88	7,375.63	+429.75 (+ 6.19 %)

Source: Czech Statistical Office

## 8. CONCLUSION

The Czech water industry has come a long way since the 1990s. The deciding factor for the future of this branch was the transformation process, during which the infrastructural property was transferred to cities and municipalities that were supposed to then decide how to manage the newly gained property. The implementation of privatization projects leads to the fragmentation of the original 11 water industry enterprises into more than 40 regional water industry enterprises to which the municipalities were able to voluntarily invest their infrastructural property and still decide on the questions of management together with other representatives of cities that decided on the same approach. As a part of the privatization projects, newly established regional water works were constructed so that they could secure the deciding influence of cities and municipalities via major share ownership. The beneficial interest of municipalities of these newly established water enterprises (that municipalities received free of charge) was determined by their infrastructural property that they invested in the enterprise. Although the statutes of these regional waterworks allowed direct sale of shares only between the current owners (primarily cities) – which was supposed to prevent privatization of enterprise – the extensive process of privatization started in 1998 when the market was opened to domestic and foreign investors.



As seen by the development of key indicators of the branch, the water industry developed only slowly in the period of transformation. The number of inhabitants connected to the water and sewage infrastructure increased only slowly, as did the length of infrastructure. The decreasing average use of drinking water and the connected decreasing volume of invoiced water would additionally mean a significant loss of revenue for the water industry enterprises, which were therefore compensated by a relatively high increase in prices of water and sewage. Between 1993 and 1998, the average price of water and sewage increased by 125 %. Due to the insufficient state financial support of capital investments into water industry infrastructure, the later privatization process and entry of private investors onto the market was absolutely the rational conclusion of the unsustainable market development. The questionable development of the transformation process of the water industry also fragmented the entire market into the current state of more than 6,700 owners of water infrastructure.

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