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Effects of Governance  
Models on Affordability,  
Sustainability and Efficiency  
of the Water Services in  
Three Transition Countries  
(Armenia, Hungary, Romania)

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# Effects of Governance Models on Affordability, Sustainability and Efficiency of the Water Services in Three Transition Countries (Armenia, Hungary, Romania)

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In cooperation with

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## Abstract:

The analytical framework of this paper is based on the general typology of the water organizations along the usual static dimensions of privatization and decentralization. However, other dynamic governance factors, primarily the incentives, the accountability schemes and the rule of law define the actual water service performance. Outcomes of water management are measured by affordability, sustainability and water service quality, which are also influenced by external factors, such as the level of economic development, geography, etc.

Our main hypothesis is that these are the critical factors which determine the transaction costs of water management. Transaction costs are identified broadly in this model, including economic slacks and costs of managing conflicts over critical issues of water management, such as capital investments, tariff setting and allocation of service risk.

The empirical evidences are based on the analysis of water sector decentralization and the privatization trends in two countries of Central Europe (Hungary, Romania) and one from the Caucasus region (Armenia). Our analysis supports the starting hypothesis, that it is not the general framework (privatization and decentralization) that influences the service outcomes primarily, but these other factors that determine the critical conditions of effective water service management.

**Keywords:** water sector, governance, affordability, efficiency, sustainability

**JEL Classification:** H11

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<sup>1</sup> The paper reflects the opinion of the three authors (Hegedüs-Péteri-Tönkő). The Armenian background studies were prepared by Lilit Melikyan., who at certain points did not share the view of the authors. These debated issues are marked later in the paper.

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# ABBREVIATIONS

<b>ANAR</b>	National Agency Romanian Waters (Agentia Nationala Apele Romane)
<b>ANRSC</b>	National Authority for Regulation of Public Services (Autoritatea Nationala de Reglementare a Serviciilor Comunale)
<b>ARA</b>	Romanian Water Association (Asociatia Romana a Apei)
<b>AMD</b>	Armenian Dram
<b>ASHMS</b>	Armenian State Hydro Metrological Service
<b>AWWC</b>	Armenian Water and Wastewater Company
<b>BMP</b>	Basin Management Plan
<b>CFOA</b>	Community Finance Officers Association
<b>CEE</b>	Central and Eastern Europe
<b>CIS</b>	Commonwealth of Independent States
<b>COE</b>	Council of Europe
<b>CRRC</b>	Caucasus Research Resource Centre
<b>CSJC</b>	Closed Joint Stock Company
<b>CMB</b>	Company Management Board
<b>CMU</b>	Contract Management Unit
<b>DFID</b>	Department for International Development (UK)
<b>EU</b>	European Union
<b>EIMS</b>	Information Analytical Centre of the Ministry of Nature Protection
<b>FSU</b>	Former soviet Union
<b>GOA</b>	Government of Armenia
<b>GDP</b>	Gross Domestic product
<b>IDA</b>	Intercommunity Development Association
<b>INS</b>	National Institute of Statistics Romania (Institutul National de Statistica)
<b>IWRM</b>	Integrated Water Resource Management
<b>IFI</b>	International Financing Institution
<b>ILCS</b>	Integrated Living Conditions Survey
<b>IBNET</b>	International Benchmarking Network for Water and Sanitation ...
<b>JBIC</b>	Japan Bank for International Cooperation
<b>KPI</b>	Key performance Indicators
<b>KfW</b>	Kreditanstalt für Wiederaufbau (Germany)
<b>LSGB</b>	Local Self Government Body
<b>LOC</b>	Law on Condominiums
<b>LC</b>	Lease Contract
<b>LMABM</b>	Law on Multi Apartment Building Management
<b>MABMB</b>	Multi Apartment Building Management bodies
<b>MADR</b>	Ministry of Agriculture and Rural Development Romania
<b>MAI</b>	Ministry of Administration and Interior Romania
<b>MDRT</b>	Ministry of Regional Development and Tourism Romania
<b>MFP</b>	Ministry of Public Finances Romania
<b>MMP</b>	Ministry of Environment and Forests Romania
<b>MS</b>	Ministry of Health Romania

MTA	Ministry of Territorial Administration (republic of Armenia)
MOH	Ministry of Health (Armenia)
MNP	Ministry of Nature Protection (Armenia)
MTEF	Medium term Expenditure Framework
MMC	Municipal Maintenance Companies
MC	Management Contract
NWC	National Water Council
NPD	National Policy Dialogue
NRW	Non Revenue Water
NSS	National Statistics Service (Armenia)
NGO	Non Governmental organization
OECD	Organization for Economic Cooperation and Development
O&M	Operation and Management
<b>p.e.</b>	population equivalent
PMU	Project Monitoring Unit
PSRC	Public Services Regulatory Commission (Republic of Armenia)
PFBP	Poverty Family Benefit Program (Armenia)
PPP	Public Private Partnership
PSP	Private Sector Participation
ROA	Republic of Armenia
<b>ROC</b>	Regional Operating Company
SCWS	State Committee for Water Systems (Armenia)
SWC	State Water Cadastre (Armenia)
SEI	State Environmental Inspectorate (Armenia)
SHAEL	State Hygiene and Anti- Epidemiological Inspectorate (SHAEL)
SWCIS	State Water Cadastre Information System
SNCO	State Non-Commercial Organization
<b>SOP</b>	Sectoral Operational Program
YWWC	Yerevan Water and Wastewater Company
UFW	Unaccounted for Water
USD	United States Dollar
UNDP	United Nations Development Program
USAID	United States Agency for International Development
UNECE	United Nations Economic Commission for Europe
<b>WTP</b>	Water Treatment Plant
WSUP	Water Systems Use Permit
WUP	Water Use Permit
WSC	Water and sewerage company
WSS	Water and sanitation service
WB	World Bank
WRMA	Water Resources Management Agency
WBMA	Water Basin Management Agency
<b>WWTP</b>	Wastewater Treatment Plant

# 1. Conceptual Background: Water Sector Governance

Political changes after 1990 have led to radical social and economic changes in the Central and Eastern Europe (CEE) and Commonwealth of Independent States (CIS) region, where decentralization and marketization of public services have been the two crucial processes in the public sector reform (Dabla-Norris 2006; Dillinger 2007). The countries of the region have started the decentralization process from a highly centralized system of state-owned enterprises within a planned economy, and have moved towards some form of private-sector dominated market economy. Our research presumes that the development in transition countries has a similar, common point of origin, but the emerging new institutional structure after the transition reflects the different historical, economic, and political realities of the individual countries; this has an effect on the success of the transition.

There are various discussions in the literature dealing with transitional economies; for example, about when the transition process will be over. Kornai (2000) argued that there are three conditions to be fulfilled for the transition to be considered complete: (1) the communist party has no monopoly of power; (2) the dominant part of the capital is under private ownership; and (3) market coordination has become vitally important. According to this definition, the transition phase has been over for several years (Svejnar 2002). Gelb (1999) sees the end of the transition where the social and economic problems of transition countries are similar to those of the societies/economies at an advanced level of development.

Our research attempts to provide a deeper understanding of the role of the changing institutional structure in the water sector of selected transition countries (Armenia, Hungary, and Romania). The basic question is: how has governance in the water sector influenced the effectiveness and equity of this important public service?

## 1.1. Understanding governance

There is a vast amount of literature dealing with the effect of the governance structure on performance in different sectors. The term “governance” has exploded from obscurity to ubiquity in economics since the 1970s. It has several meanings and usages (Dixit 2009). We can distinguish the interpretations of two main approaches to governance. One, the *normative approach*, is looking for the factors that guarantee efficient governance as a *condition of sustainable development*. Research on development policies showed that the most important constraint of the efficient use of donor support is the lack of “good governance,” which includes factors like transparency, rule of law, accountability, etc. Development literature focused

on how the quality of governance in developing countries affected the aid programs from which they benefited (Theisohn 2007; Lopes et al. 2004). The governance analysis often takes the form of a gap analysis that starts with an idea of what institutions should look like (generally idealized versions of the institutions of developed western countries) and compares actual performance to this to identify what is lacking. “As a result, this type of approach has been characterized as focused on the prescription of an often narrow set of strategies targeted at variables seen to be in short supply (such as participation, transparency, or accountability). While improvements in such variables may be desirable in their own right, strategies designed to achieve these have tended to focus on templates or blueprints which have not always engaged with realities of different contexts and have often failed to generate the change in developmental outcomes intended by donors” (Harris et al. 2011:3-4).

The other, *substantive approach*, is aimed at understanding the institutional structure of decision making and operation of a sector of the society. In this approach, “governance can be defined as the *process by which decisions are made* and implemented. Governance is the outcome of institutions (good or bad)” (Straub 2009:3; De 2010:1). In development literature this approach is termed “political economic analysis” (Collinson 2003), which focuses on the existing mechanisms and interplay of the political and economic processes in society. There is a long tradition of this approach in social science from the Marxist sociology to the new institutionalism.

Our research subscribes to the second school. We intend to explore the relations between the governance structure and performance in the water sector, using the example of three transitional countries.

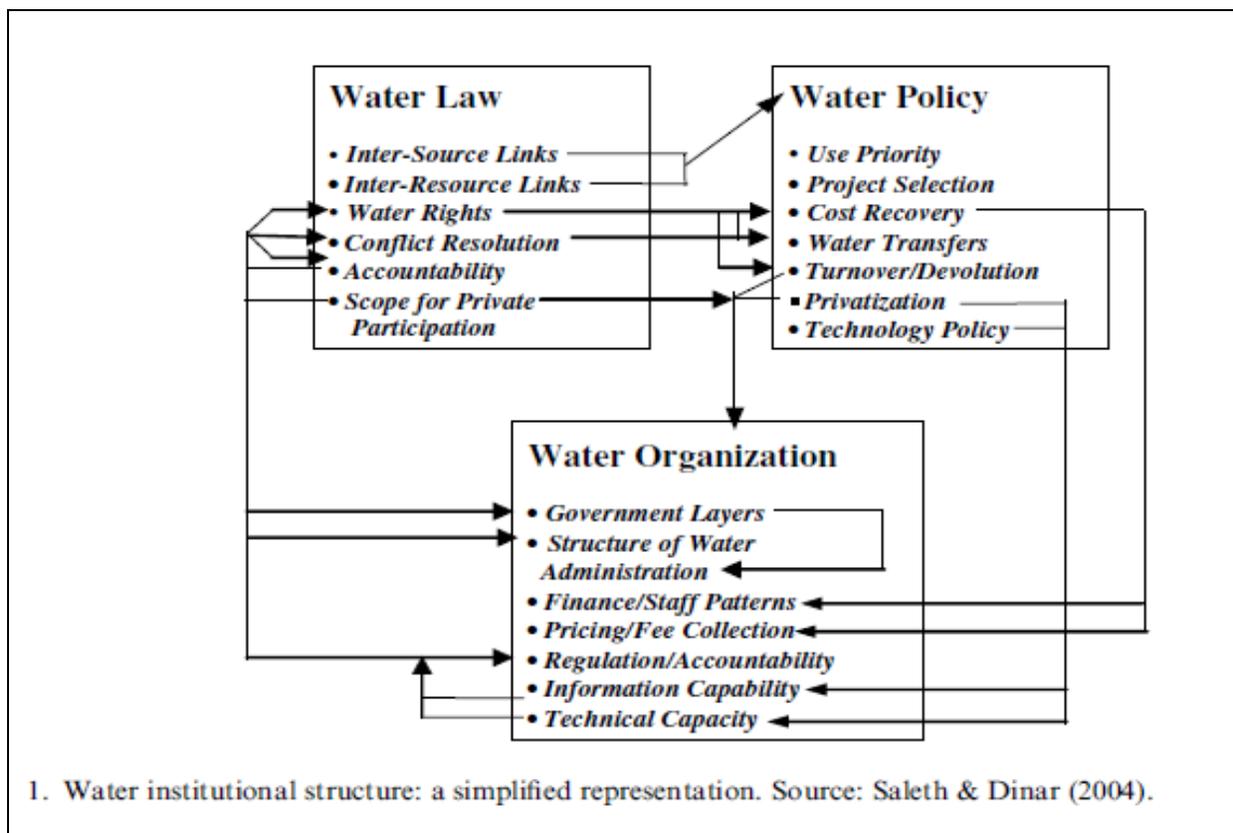
## **1.2. Institutional analyses of the water sector**

The water sector is an ideal field for the institutional economic approach; it can be placed in the cross section of social, economic, and geographical factors. The institutional structure of this sector and the change processes are well documented with varying details, contexts, and perspectives (see Saleth & Dinar 2004, 2005; Straub 2009).

However, the broad approach of institutional economics has to be structured in order to operationalize the link between governance-related factors and sector performance. The difficulty is well illustrated by Dixit’s approach (2009) to economic governance: It “includes the institutions and organizations that underpin economic transactions by protecting property rights, enforcing contracts, and organizing collective action to provide the infrastructure of rules, regulations, and information that are needed to lend feasibility or workability to the interactions among different economic actors, individual and corporate. Different economies at different times have used different institutions to perform these functions, with

different degrees of success. The field of economic governance studies and compares these different institutions. It includes theoretical models and empirical and case studies of the performance of different institutions under different circumstances, of how they relate to each other, of how they evolve over time, and of whether and how transitions from one to another occur as the nature and scope of economic activity and its institutional requirements change” (Dixit 2009:2.)

One of the most critical tasks of the institutional approach is to unbundle the complexity of institutions, break them down into manageable governance structures, separated from external factors (institutional background) (Saleth & Dinar 2005:3). There are different options for undertaking this exercise. Saleth and Dinar (2004) broke down the water institutional sector into three areas: (1) water organizations, (2) water policy, and (3) water laws, which constituted the endogenous factor of their mode, separated from the environmental factors like political system, legal system, etc.



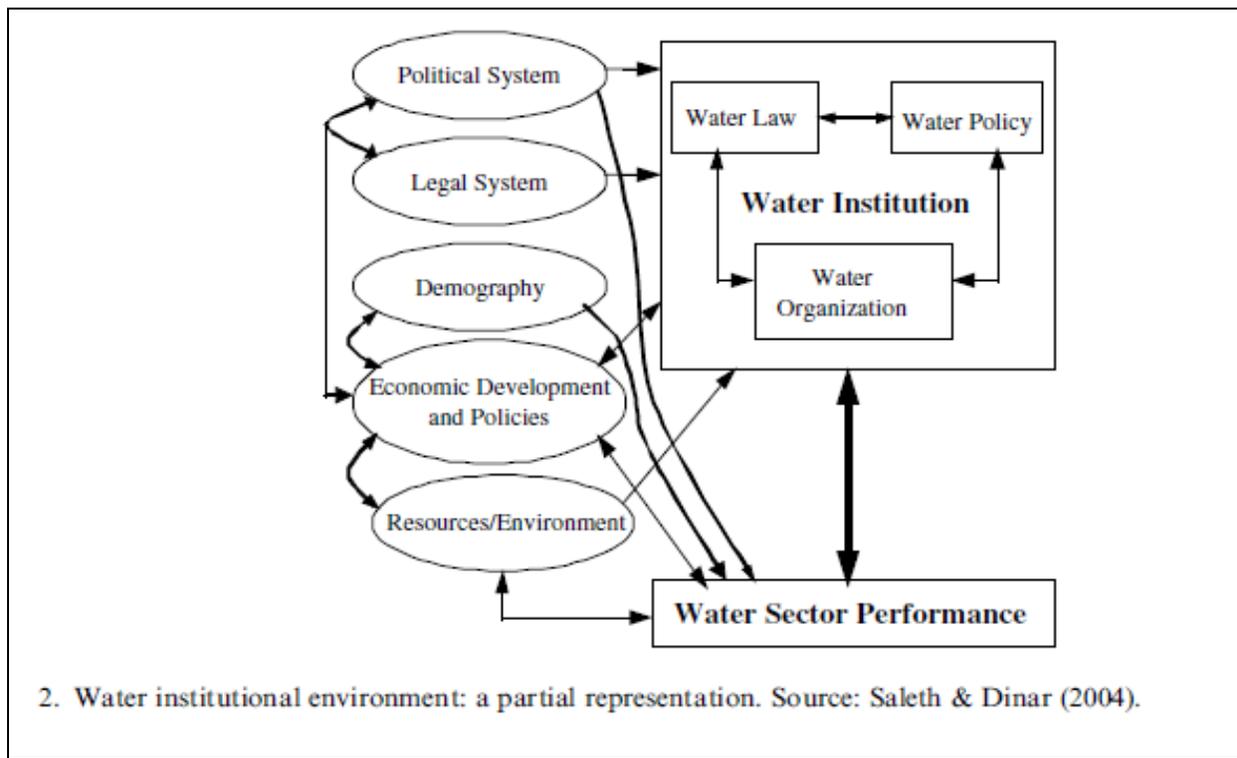


Figure 1. Unbundling the water sector, by Saleth and Dinar (2005)

### 1.3. The “robust” typology of the water organizations along privatization and decentralization

The main research focus was on determining the key features of the institutional structure of the water sector service in transitional countries, and to explore whether there is a causal relation between the governance type and the performance of the sector in terms of efficiency, sustainability and affordability. We had to “unbundle” the society and economy for the water sector analyses, and separate the water institutions from the external factors.

As a starting point we defined a “robust” typology, which described the institutional arrangement of the water service provision along two dimensions: decentralization and privatization. The service providers can operate in a decentralized institutional environment, where the sub-national government is responsible for the provision of water services, or in a centralized system, where this responsibility remains with the central government. The service can be provided through public companies/institutions, or can be transferred to private ownership. Consequently, in this way we set up a two-by-two typology matrix of water service providers.

Table 1: The robust governance models

	Public	Private
Centralized	Model I: Centralized model with public service provision	Model II: Centralized model with private service provision
Decentralized	Model III: Decentralized model with public service provision	Model IV: Decentralized model with private service provision

It is important to emphasize that our typology is tied to the water sector institutions, not to the general social structure (“soft” and “hard” exogenous factors, explained later in the text). The water sector decentralization and privatization processes may easily differ from the general trends. We discuss this problem later in this chapter, when differentiating between the exogenous and endogenous factors of the water sector.

According to public choice literature, we would expect to find (hypothesize) a causal link between the robust typology of governance and the performance. The centralized/state-owned service providers represent the least flexible type, that depend on the limited resources of the central budget, reflect the strong power of labor unions, are over-staffed, are financed partly through tax-revenues (subsidies), and help create significant bureaucratic slack (Busch 2002). Decentralized/public service providers show more openness towards the local needs (allocative efficiency); they are more accountable to the elected representatives (municipalities) of the consumers (subsidiarity), and have better information on local circumstances, conducive to more effective services provision.

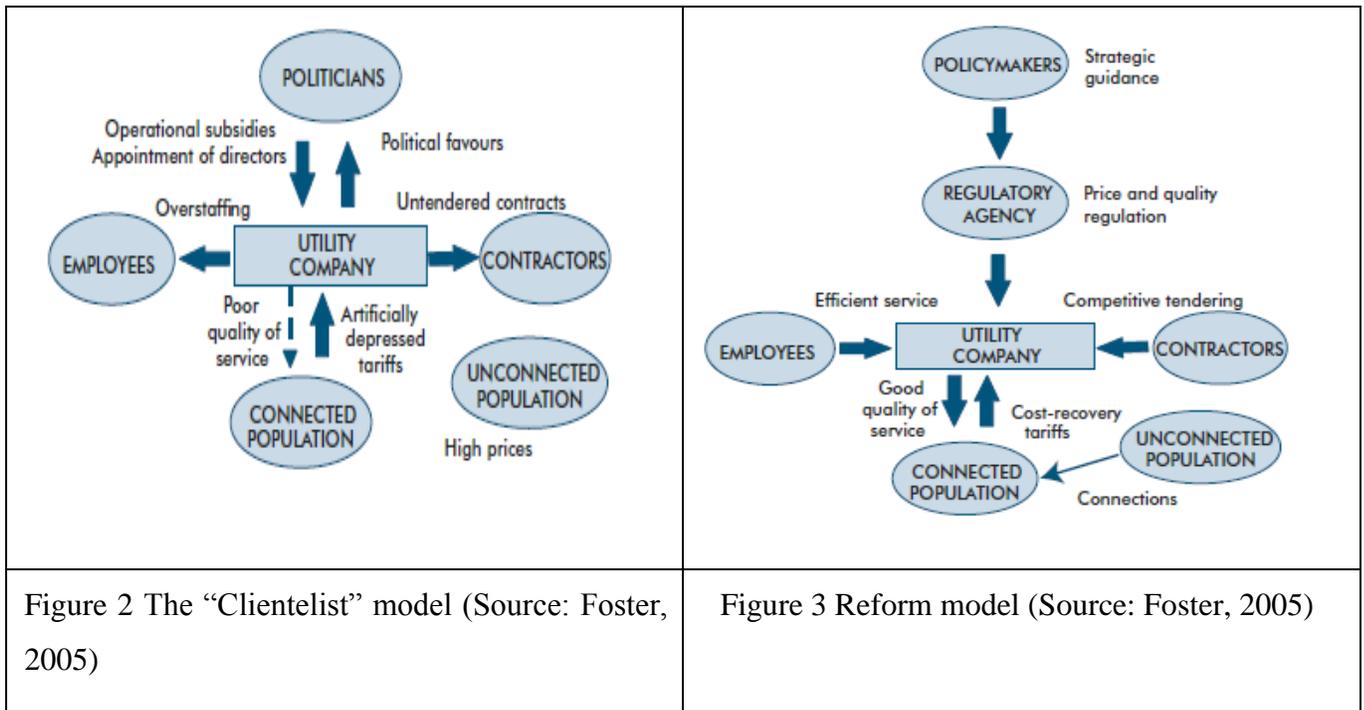
According to the pro-decentralization approach, it “creates the possibility of exerting stronger pressures on government performance both from below (the demand side), and from above (the supply side). Decentralization reshapes power relations among the local residents, local governments, producers of local government services, and higher levels of government (including central government). It sets new rules of the political game, helping new local leaders to emerge in the political competition. It thus redefines the interactions between local leaders and their constituencies. Similarly, as a result of new regulatory and financial powers over procurement and service delivery, the decisions and actions of local governments have a greater impact on local economies. Decentralization thus leads to new interactions and contractual relationships between local governments, between small and big private firms, and

between providers and producers of services, and communities and non-governmental organizations” (Yilmaz et al 2010:1).

However, the central-local relation is not a simple dimension, as the decision-making power of the sub-national governments in the water sector may vary significantly in the different decision areas, such as water quality control, investment finance, price setting, etc. Decentralization is a complex process, particularly in the water sector, which is an area of natural monopolies. The central government always retains certain tasks, for instance, usually the responsibility of overseeing the water sector activities, and ensuring that the public needs are met. Central public authorities, on the other hand, are usually responsible for setting and enforcing the performance standards. The literature on inter-governmental fiscal relations struggles with the definition of decentralization, because there are discrepancies between the legal framework and the actual autonomy of the sub-national governments (Laffin 2009).

Moreover, these hypotheses are questioned both on theoretical and empirical bases (Tanzi 1996; Prud’homme 2005; ILO 2001; Simpson 2001, among others). Critics argue that decentralization does not necessarily lead to a more democratic, more efficient system, and remind us that the risks of corruption, for example, could easily be higher in a decentralized than in a centralized system. Besides, the expectation is that decentralization would improve service delivery, in turn resulting in greater benefit for the poor (Yilmaz et al. 2010). However, we do not take sides in this discussion. We argue that it is not the robust typology in itself that determines the outcomes of the water sector (in terms of affordability, sustainability and service quality), but a number of other governance factors, which can be put under three headings: incentive structure, accountability relations, and rule of law.

Privatization is not any less debated in the literature. In theory, private service providers are considered to be more efficient because they work in a competitive environment, under constant pressure to maximize profit (decrease costs), and they are more flexible when it comes to decision-making and adjusting to changes. In the water sector, pure privatization is very rare; privatization typically means a form of private sector participation such as public-private partnership, usually a lease or concession contract, where the public authority will own the physical infrastructure, and the private company may take on the responsibility of constructing water works and manage service provision. Different factors may explain the need for private sector involvement, including the deteriorating water infrastructures, lack of public funds, costly capital investments, and the need to operate water companies more efficiently. The move toward privatization in the water sector was influenced by the “dissatisfaction with the traditional ‘clientelist’ model of water service provision ..., according to which state-owned water companies were more often being treated as part of the political apparatus than allowed to function as efficient service providers” (Foster 2005:1).



Privatization and competition have had a certain amount of success in some countries across various sectors (World Bank 2004). There is also evidence suggesting that private provision can improve the quality of services and the extent of provision (Levy 2007). At the same time, however, it appears that many of the institutional weaknesses underlying poor provision and low sustainability are not solved by allowing private investment, and in some sectors private provision is likely to have a comparatively minor role (Kenny 2007). The privatization policy has been challenged extensively by critics, especially in developing countries where the institutional-legal framework has not been developed (Hall and Lobina, 2001, 2006; Grusky 2001).

Discussions related to privatization and decentralization prove that the “robust” model may have a contradictory effect on the performance; hence there should be other governance factors which modify the outcomes.

### 1.4. Governance factors — beyond the robust typology

The research is aimed at identifying governance factors beyond the typology, based on decentralization and privatization. From the institutional economics point of view, the question arises as to how the different governance models manage the “transaction cost” of the water service provision (Williamson 1979). We define the transaction cost in a broad sense, which not only includes the potential use of the slacks in the economy (Bush 2002), but also conflict management among the different stakeholders over the investment, price-setting, and risk allocation.

## Institutional environment

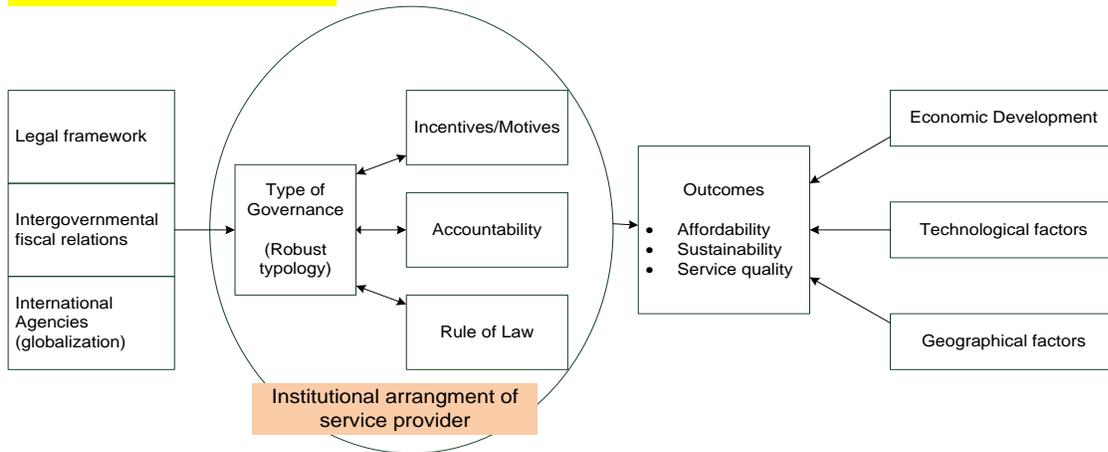


Figure 4. Logic of our approach: factors influencing service outcomes

We highlighted three governance factors that influence the operation of the water provision in each model defined along the privatization and decentralization dimensions: **incentives/motives**, **accountability**, and **rule of law**. Together, these factors comprise the “institutional arrangement” of the water sector (Saleth and Dinar 2004), and are separated from the “institutional environment.” It is assumed that there is a causal relation between the governance models (robust typology in interplay with the three selected factors) as independent variable, and sector outcomes (affordability, sustainability and service quality) as dependent variables. However, there are other, intervening, factors (e.g. the general economic level of the country, technological and geographical conditions) that can influence the outcomes, and have to be controlled for. We differentiate between two types of exogenous factors: “soft” and “hard” institutional environmental factors (Figure 1). The research understood the term “governance of water sector” in the sense of the institutional setting of the sector.

### 1.4.1. The existing incentive structure

The water sector has a very complex stakeholder (power) structure, which involves a complex and sometimes contradicting set of incentives and motives of its main actors (user households, industrial and agricultural users, service providers, regulators, service organizations, local governments). These actors all have their incentives in the price level, service level, service quality (cost and technological) level, efficiency of service provision, investment finance. etc. But at the same time they have organizational motives as well.

Based on le Grand’s classification of motivation systems of public policy actors (Le Grand 2003), we identify three motivational systems typical of the three basic sectors: (1) organizations with a strict

hierarchical structure follow the “command and control” behavior scheme; (2) some organizations are strongly committed to a “mission”; and (3) motivation/incentives of the organizations may be dominated by financial achievement, which is a typical characteristic of for-profit market organizations. Le Grand concludes that we can distinguish three models, depending on their dominant motive: (1) command and control, (2) network, and (3) market.

Organizations in the water sector combine these types of motives: a state enterprise can have strong mission-oriented motives depending on the cultural elements, or may follow the market logic of profit maximization, if it is an expectation of the decision makers at higher levels of the hierarchy.

Our main questions are: does the existing incentive structure create any internal conflict among the selected actors? Are there any distortions or perverse incentives in the system? And how do the different stakeholders deal with these problems? The incentive structure, defined by the contracts among the stakeholders, the price-setting procedure, business strategies, subsidy structure, investment finance, etc., in the four robust models may lead to unintended consequences. Our hypothesis is that the well-designed incentive structure could lead to better performance in the water sector, independent of the basic model.

#### **1.4.2. Accountability**

The accountability issue in the water sector can be defined as a special relation between the stakeholders, following the logic of the “principal-agent” problem, where the question is: how does the system manage the information asymmetry? In our robust governance models special accountability structures can be identified between the following: voters and institutions defining sector policy; central government ministries and local government; local governments and service organizations; owner and the executive management of service producers, among others. The accountability relations are multi-dimensional with regard to the different tasks of the water sector stakeholders, like employment strategy, price-setting, business strategy, investment and maintenance strategy, technological choice, and so on.

An alternative interpretation of accountability is the power structure, i.e. who is accountable to whom, who controls whom, and whether or not these relations can be enforced. How is power distributed among the stakeholders (vertical, horizontal)?

#### **1.4.3. Acceptance of market mechanisms and consensus over the rule of law**

We may ask: how can contracts be enforced and efficiency in governance achieved in countries where the rule of law is ineffective? In the transition countries, private mechanisms — such as long-term relationships, arbitration, social networks to disseminate information and norms to impose sanctions — have sometimes emerged in place of formal, state-governed institutions. So, where can our countries and

their water sector be placed on the “rule of law continuum.” Our hypothesis is that lack of consensus on the basic norms and values (trust) can easily lead to instability, corruption, and the advent of the informal economy. There are several explanations to the non-rule of law situation. A typical situation is the non-funded mandates, when the law assigns a task to a stakeholder that cannot be fulfilled, either due to lack of technical capacity or lack of financial resources. Poverty may force households to follow unlawful behavior (non-payment for services). Moreover, the “unjust” allocation of the cost and gains of the sector among stakeholders may lead to conflicts, which could, in turn, lead to unlawful events.

The investigation of this broader governance scheme with additional factors will also help us understand the nature of the transition from centralized, planned economies to market based, decentralized systems. Our analysis on the varieties of governance in public service delivery in the water sector will support the sectoral policy design in countries with different development patterns. In principle, the intervening factors (the general economic level of the country, technological and geographical conditions), that can influence the outcomes, have to be controlled for.

The governance-performance relation (**Error! Reference source not found.**) is influenced by two types of exogenous variables. On the one hand there are the macro-social conditions, that are partly legal (laws, constitution, etc.), partly political (commitment to democracy, multi-party system, etc.) and partly ideological (democratic society, etc.); on the other hand there are more objective, technical factors (like the level of economic development, technological-geographic factors). We can say that there are “soft” and “hard” institutional framework variables.

## **1.5. Institutional change — interplay of exogenous and endogenous factors**

The “soft” exogenous factors include the governance elements, and this is the reason why they are not easy to separate from the institutional arrangements of the water sector. For example, the rule of the law issues are typically defined at the macro-social level, though at the water sector organization level they might be presented in different forms. How the organization follows the law (law avoidance) is another question, and it is an important factor in our explanation.

There is a special dynamic between the soft exogenous factors and our sector governance models. We should differentiate between the rational choice theory and the institutional approach. The former explains the institutional changes (strategies, norms, rules, values, etc.) through the response of the different

stakeholders to the change in environments.<sup>2</sup> However, the institutional approach includes the wider context in the explanation: in our research program it is not sufficient to study how the water sector organization adapts to the challenges, but its macro-level “soft” framework factors should also be taken into consideration. Consequently, institutional changes cannot be explained only by the adaptation mechanisms of the organizations; there are broader values and rules in the society that determine the framework of the social changes at the micro level.

This dilemma is not new in public policy literature. The welfare regime theory (Esping-Andersen 1990) uses the same approach, presuming that in modern societies there are general principles behind the welfare programs, which influence policy solutions in different public policy areas. Others argue that there is no such master plan in societies; in each sector, development is the result of the interplay of different stakeholders (Kasza 2002). In our view this is an empirical question; both approaches are right in a way, but the relative importance of the “soft” macro-level societal environment and the interplay of the organizational-level variables may play different roles.

Our robust typology supposed a stable system, where the given governance types have certain characteristics that have an effect on some performance elements of the system. However, when we modified the typology by introducing other governance factors, our approach moved from a static system to a dynamic one. The governance factors contributed to understanding the behavior of the organizations in the water sector.

When we try to explain the changes in the water sector, we will have to be able to determine whether these changes can be explained exclusively by the endogenous factors of our model, or whether the “soft” environmental factors play an important role as well. Our hypothesis is that there are periods when the exogenous factors play a major role in institutional changes (including the behavioral factors of the water organizations and stakeholder in the sector), and there are periods when the “soft” environment factors are stable, and do not explain the alterations. Therefore, we can state that the water sector is undergoing continuous change, but there is a difference between a continuous adaptation (for example, to the level of consumption, input price changes, etc.) and radical changes, when the basic principles of the institutional environment are changed.

In 1990, radical changes took place in the political systems of the whole region: there was the introduction of a democratic political setting, shift to market economy, and a drive toward decentralization. Not only was the behavior of the organizations changed, in several cases the organizations changed. For example,

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<sup>2</sup> Draft (2004) uses this approach to explain the emergence of the social enterprises. He argues that the existence of social enterprises is rooted in the wider social values.

the municipalities assumed new responsibilities; water companies were restructured, etc. “Path dependence” was an important factor of the changes, as several elements of the old structure survived, but in very different ways in the different countries.

## **1.6. Water sector in the economy — balanced or unbalanced relation**

The performance of the water sector is determined by “hard” external factors like geography, level of development, and technological elements (**Error! Reference source not found.**). It would be very difficult to control for the effects of these variables, even with a large sample. But our research includes only three countries with very different backgrounds.

Water is a basic need, with special economic characteristics. One of the factors that determine the level of the services is the wealth of the nation, although the geographic and technical conditions are not any less important. There is a correlation between the level of the services and the level of development. According to the “soft structuralist” approach, in a globalized world the governments have the choice to adapt to the changing conditions, which implies that they have a certain leeway. The economic and social policy choice is influenced by several factors (e.g. the effect of different lobbies, political preferences, etc.). Theoretically there are three possibilities vis a vis the relation between the water sector and the economic development: first, society “under-invests,” that is, the water services are of lower quality than the economic development would justify. Second, the water sector development is in proportion to the economic development. Third, the water sector is more developed than the economic development justifies. This last option is an interesting possibility, when a society may “over-invest” in the water sector, using a disproportionate share of its GDP for the enhancement of water services. We would argue that this kind of “unbalanced growth” distorts the system, and the water infrastructure becomes unaffordable to the economy, both to households and to the general budget. The consequence is that the society has to draw away resources from other sectors of the economy, which typically slows down economic development. There is a public discussion on whether the overuse of the EU structural funds for consumption infrastructure (as opposed to productive infrastructure) slowed down the economic growth, and exacerbated an affordability problem. The argument here is that the countries moved to a “reverse” unbalanced economic growth system.<sup>3</sup>

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<sup>3</sup> See the concept of unbalanced growth theory introduced by A.O. Hirschman, Hans Singer, Paul Streeten and W.W. Rostow as an alternative concept of the balanced growth theory.

“An interesting example is given by the case of Eastern and Southern Europe now joining the European Union. These countries are required by the accession agreements to pursue water quality and sanitation services that were reached in the city of Brussels only in the last few years. However, given that these countries have an income per capita much below the EU average, such a high level of service quality represents a huge financial burden (the cost has been estimated at around EUR 9 billion for Romania, equivalent to 16% of its 2004 GDP), and is therefore subsidized by the EU. Questions remain, however, as in other EU accession countries, about the affordability of the maintenance of these sophisticated systems” (Estache and Fay 2007;12).

## 2. Main hypotheses

Our research is based on an analyses of the development of the water sector in Armenia, Hungary and Romania. In the research process, each country's team has prepared sector studies and three case studies for their respective countries in order to explore the effect of the governance model on sector performance (governance-performance linkage).

The main research hypothesis was that the “robust” governance models in water service delivery alone do not explain the performance of the sector. We were looking for other relevant governance factors to explain the operation and performance of the sector, and grouped them under the headings: accountability schemes, incentives, and rule of law.

These factors influence the service outcomes. They are identified as: affordability of water services, sustainability of water management and quality of water provision. These dependent variables themselves are complex phenomena, so they cannot be easily operationalized. Identification and measurement of both parts of our refined model — the explanatory variables and the dependent variables — was heavily constrained by the methods available within the framework of the GDN project.

The interpretation of the governance factors raised the methodological difficulty of aggregating the individual-level concept of incentives, motives, and accountability at the organizational level (Coleman 1990). Public service motivation needs to be sufficiently high at all levels of the organization (from management to street level operations), in order to consistently monitor the efficiency, effectiveness, and equity of the results produced by the organization (Petrovsky 2009). Originally we were going to measure governance factors through the vignette method, but eventually decided to reject it, instead opting for the interpretive method to judge the incentives/accountability factors. Measuring the rule of law was more objective, but stakeholder perception played a significant role in its evaluation.

The “performance” of the service delivery companies, as outcomes, was measured with qualitative indicators. Affordability can be quantified by the level of arrears, sustainability through under-investment or the low level of cost recovery in tariff setting and the conflicts between the owners and management companies. The real difficulty of the quantitative method lies in the strong effect of the exogenous variables (geography, technology, etc.) on the service outcomes.

Even if we cannot measure the performance indicators precisely, we know that they modify (increase or decrease) the transaction costs in the water sector. From the point of view of institutional economics, the aim of governance is to decrease the transaction cost of the water sector. Therefore, we can reformulate our hypothesis: instead of trying to compare the performance indicators quantitatively, due to

methodological constraints, we will examine how sector transaction costs are affected by water sector governance in the different countries. Hence, our main hypotheses are:

Hypothesis 1: The governance type, according to the “robust” model based on decentralization and privatization (Table 1), does not influence the transaction cost in itself.

Hypothesis 2: Changes in the transaction cost depend on the three highlighted governance factors: incentive structure, accountability relations, and rule of law.

Hypothesis 3: There is a very close connection between the exogenous governance factors (institutional environment), and the three governance factors specified in Hypothesis 2.

One way to prove these hypotheses is by showing in the case studies that, regardless of the governance type according to the robust model, the existence of perverse incentives, unbalanced accountability relations, and lack of the rule of law increase the transaction costs both in economic and social terms.

The first step of the research was the preparation of the sector studies based on desktop research, following the common analytical framework. The task of the sector study was to provide a foundation for the case studies, which means summarizing the “soft” and “hard” external (or exogenous) factors (Figure 2).

The research used the case study method. The aim of the case studies was to find evidence that beyond the robust model the governance factors (incentives, accountability and rule of law) have substantial influence on the performance of the sector. The key methodological challenge in the research was to control for the external factors related to the “soft” (institutional) and “hard” (geography, level of development, technology) environment. The reports were completed in 2011-2012, so they do not reflect the most recent changes in the studied countries. This is especially important in the case of Hungary, where radical reforms came into effect from 2013.

Three cases per country were selected, nine cases in all, which allowed us to use quantitative methods to control for the effect of external factors. Because of the small sample size, the “control” was more heuristic than systematic. The three countries represented very different levels of development.

The quantitative methods are mainstream research methods (gold standard in science), but generally causal relations cannot be stated by a qualitative method (Maxwell 2004). However, quantitative research method was rejected partly due to technical reasons, and partly because of the limited resource fund. There are several governance-related quantitative analyses on the water sector. Krause (2009), for example, tested the effect of the political governance factors on water sector performance, including governance factors like electoral systems, political and civil rights, systems of separation of powers, and

checks and balances. However, the reliability of the available data is always a critical issue, especially in the case of governance variables (see, for example, Estache and Fay 2007).

Beyond the problem of the number of cases, the quantitative method would not be of use here, because we were interested in the relative importance of the exogenous and endogenous governance factors. Most studies do not distinguish between these two sets of factors, which makes a quantitative analysis more manageable. We, on the other hand, intended to see the effects of governance factors on water sector performance in relation to a given external environment. In a later state of the research we could move toward a quantitative method, if we are able to operationalize the variables of the theory and control for the external (soft and hard) factors in a larger number of cases, as well as define clear endogenous governance factors in connection with the performance of the sector. However, our current research did not allow extensive data collection.

The aim of the case studies was largely to modify the theory; or to be more modest, the idea that we developed in the concept paper, using the evidences of the case studies. This would possibility help us improve (to put more “substance” into) the background study, and define more precisely the factors that influence the robust model. The case studies used desk reviews, and were based on key informant interviews and data collection (Crosthwaite et al. 1997). Each team followed the same outline and method (See Annex). In the case studies, we focused on issues and conflicts where the existence of the governance factors could be traced in the context of the analytical model. The task of the field workers was to reconstruct the “story” based on facts and stakeholder interviews, which methodologically is close to the interpretive method (McIntyre 1998).

## **3. Water sector in three countries**

### **3.1. General economic development of the countries**

#### **3.1.1. Armenia**

After gaining independence in 1991, Armenia endured a compound crisis. The country had to cope with the effects of the break-up of economic ties with the countries of the former Soviet Union (FSU), structural reforms, the consequences of the war with Azerbaijan, transportation blockade, the consequences of the 1988 earthquake, and the energy crisis. These led to a steep economic and social downturn in the 1990s, with impoverishment of the population and polarization of the society. The economic reforms were sustained, leading to improvement in income levels over the past decade and a half, with GDP growth at 12 percent on an average between 2001 and mid-2008, increased inflow of remittances and foreign investments, and high commodity prices. This, and improved social service provision, led to a sharp drop in poverty from over half of the population in 1999 to about 23.5 percent in 2008. "The financial and economic crisis had a very strong impact on the Armenian economy, with a decline of 14.1% of the GDP in 2009. By 2010, Armenia had moved from being a low- indebted country to a medium-indebted country. Despite important efforts by the Government to mitigate the social impact of the crisis, there was a drop in living standards: by 2010, 35.8 % of the population was poor and 21.3 % was very poor. Since then, the economy has resumed its upward trend: in 2011 growth was 4.7 %

#### **3.1.2. Hungary**

The economy of Hungary is a medium-sized, structurally, politically and institutionally open economy in Central Europe, and is part of the European Union's (EU) single market. The economy of Hungary experienced market liberalization in the early 1990s as part of the transition from a socialist economy to market economy, similar to most countries in the former Eastern Bloc.

The private sector accounts for more than 80 percent of the Hungarian GDP. Foreign ownership of, and investment in Hungarian firms are widespread, with cumulative foreign direct investment worth more than USD 70 billion ("Member States of the EU: Hungary")., EU, Retrieved 2010-01-18)

Declining exports reduced domestic consumption, and fixed asset accumulation hit Hungary hard during the Financial Crisis of 2008, making the country enter a severe recession with a –6.4 percent GDP drop, one of the worst economic contractions in its history. On 27 October, 2008, Hungary reached an agreement with the IMF and EU for a rescue package of USD 25 billion, aiming to restore financial stability and investors' confidence.

Because of the uncertainty of the crisis, banks gave fewer loans, which led to a decrease in investment. This, along with price-awareness and the fear of bankruptcy led to a downturn in consumption, which in turn increased job losses and decreased consumption even further. Inflation did not rise significantly, but real wages decreased. The economy showed signs of recovery in 2011 with decreasing tax rates and a moderate 1.7 percent GDP growth.<sup>4</sup>

### **3.1.3. Romania**

For about a decade after 1990, Romania registered economic instability and decline. From 2000 onwards, however, the Romanian economy was transformed into one of relative macroeconomic stability, characterized by high growth, low unemployment and declining inflation. In 2006 GDP growth in real terms was 7.7 percent, among the highest rates in Europe. In 2008, GDP growth was 7.1 percent and thereafter, due to the recession in 2009 and 2010, there was a -7.1 percent and -1.3 percent GDP drop respectively.<sup>5</sup> IMF estimated a GDP growth of 1.5 percent in 2011 and 4.4 percent for 2012. With a GDP of around USD 264 billion and a GDP per capita of USD 12,358 in 2011, Romania is an upper-middle income economy.

GDP per capita was 46 percent of EU average in 2010. Inflation in 2010 was 6.1 percent. Unemployment was 7.6 percent in 2010, which is very low compared to other middle-sized or large European countries such as Poland, France and Spain.<sup>6</sup> General government gross debt is also comparatively low, at 34.8 percent of GDP. Exports have increased substantially in the past few years, with a 13 percent annual rise in exports in 2010.

Since 2000, Romania has attracted increasing amounts of foreign investment. According to a 2011 World Bank report, Romania currently ranks 72nd out of 175 economies, scoring lower than other countries in the region such as the Czech Republic.

## **3.2. Geographical factors and water resources**

The **Republic of Armenia** is in South-Western Asia, on the southern side of the Caucasus. Forty percent of its communities are to be found in sparsely populated high mountains and mountainous regions (comprising 16.5 percent of the population). The areas located mainly on slopes, 1,700 to 2,200 meters above sea level have sufficient reserve territories, abundant natural resources and a diverse ecology, but are characterized by incomplete provision of engineering and transport networks, abandoned settlements,

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<sup>4</sup>. [▲ "Economy and Society, January–March 2009"](#) (PDF). Hungarian Central Statistical Office. Retrieved 2010-01-18.

<sup>5</sup> Data source: National Institute of Statistics

<sup>6</sup> Data source: Eurostat

and low population density. Approximately 56 percent of the total territory of Armenia is suitable for settlement.

Armenia's territory is notable for its developed and irregular hydrological system typical to mountainous countries. It accommodates around 9,500 small and medium rivers, the total length of which is 25,000 km. The adequacy of water resources is not a major issue for water and waste water services in Armenia; generally there is adequacy of resource throughout the country, with some limitations in a few areas. About 98 percent of the water supply comes from groundwater and/or springs, the remaining from surface water, mainly streams. Groundwater accounts for approximately 96 percent of the drinking water supplied to the public.

**Romania** is in South-Eastern Europe, north east of the Balkan Peninsula, on the lower course of the Danube and its Black Sea Delta. Romania's relief consists of three major levels: the highest one in the Carpathians (the highest peak Moldoveanu is 2,544 m above sea level), the middle one is the Sub-Carpathian hills and plateaus, and the lowest level — the plains, meadows and the Danube Delta — are at sea level.

Romania has all types of water resources (rivers, natural and artificial lakes, and ground waters). The largest source of water is rivers; 97.8 percent of Romania's hydrographical network belongs to the Danube River Basin. With an average water consumption of only 2,660 m<sup>3</sup>/inhabitant/year, compared to the European average of 4,000 m<sup>3</sup>, Romanian water consumption is relatively low.

**Hungary** is located in the Carpathian basin. Two-thirds of the country is lowland (84 percent of the territory is below the altitude of 200 m) and its climate is under strong continental influence. Twenty-four rivers bring water into the country from West, North and East, and only three leave the country towards South: the Danube, the Tisza and the Drava. The entire country is the river basin of the Danube.

About 95 percent of Hungarian water supply is based on groundwater (shallow groundwater, bank-filtered and karst water), which is more than in most European countries. About 65 percent of these resources are geologically vulnerable to anthropogenic influence, making the protection of groundwater resources a task of immense significance. Ninety-five percent of the surface waters are of foreign origin, and only four medium-sized catchment areas are located within the boundaries of Hungary. The long-term average inflow is among the highest in Europe (surface water resources count to 11,000 m<sup>3</sup>/cap/year); however, the contribution within the country is very small (only 600 m<sup>3</sup>/cap/year). So for water quantity and quality Hungary largely depends on the surrounding countries.

### 3.3. Technological factors of water

In **Armenia**, about half of the water infrastructure is old and dilapidated. Initial estimates indicate that short to medium term investment requirements (2011-2015) could account for about USD 179 million, needing USD 79 million in Yerevan and USD 100 million in AWSC (Armenian Water and Sewerage Closed Joint Stock Company). Of all the current investments planned, only Lori and Shirak regions (of the three regional utilities), envisage full asset replacement through the proposed KfW loan WB, 2011.

Although *the rural water supply* infrastructure is generally of more than sufficient capacity, there is a pressing need for renovation; some 50 percent of the systems should be renovated, as the average age of the infrastructure is about 35 years. The total investments needed for renovation, and also for optimization of the current infrastructure to reduce water consumption closer to EC figures, are estimated to be AMD 35 billion ( $\approx$  EUR 78 million).<sup>7</sup> Tariffs, the main source of revenue, are currently inadequate, not even sufficient to achieve the level of recovery of routine Operation and Maintenance (O&M) costs. The need to manage a system with high levels of Non-Revenue Water (with potential technical losses estimated at as much as 40-45 percent out of total losses of 85 percent) diverts scarce resources from system improvement.

The condition of piped water within the building boundaries of the old multi-apartment housing stock is also very poor.

**In Romania**<sup>8</sup> 86 percent of the population from 256 urban localities (about 11.5 million inhabitants) is supplied water through centralized networks. The water supply network has a total length of 47,778 km and continues to extend. The quantity of drinking water supplied to consumers in 2005 was around 1,089 million m<sup>3</sup> (46 percent lower than in 1995), out of which 628 million m<sup>3</sup> was for domestic usage. In the last 10 years, the total quantity of water supplied through the network decreased, mainly due to the metering systems and the curbing of industrial usage. The distribution networks are mainly made up of sub-standard materials (reinforced concrete and lead) and about 30 percent of the pipes are made of iron. Of the current pipes, 70-75 percent have to be replaced.

Romania has 1,398 Wastewater Treatment Plants, out of which 797 WTPs are supplying water in communities with less than 5,000 inhabitants, 25 percent of which do not comply with water quality standards; and 601 WTPs are supplying water in communities with more than 5,000 inhabitants.

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<sup>7</sup> Institute for Applied Environmental Economics (2008): National Policy Dialogue on Financing Strategy for Rural Water Supply and Sanitation in Armenia. A project for the State Committee for Water Systems in Armenia, managed by the EAP task force, and with financial support of the European Union under the EU Water Initiative, Author: Jochem Jantzen

<sup>8</sup> Data Source: National Institute of Statistics (INS), National Administration Romanian Waters (ANAR), SOP Environment.

At the end of 2005, 693 localities had sewerage networks, with total length of 18,381 km, out of which 16,397 km were in urban areas. About 11.5 million inhabitants benefit from the sewerage service; out of these 90 percent live in urban areas. Only 52 percent of Romania's population is connected both to water and sewage services; 67 percent of the inhabitants of rural areas do not have access to water supply, and more than 90 percent are not connected to sewage systems. The water supply networks in rural areas registered some improvements during the period 1998-2005, with their range increasing from 16,245 km in 1998 to approximately 22,660 km in 2005. About 70 percent of the households in rural areas use wells for water supply.

The **Hungarian** water sector has been facing serious challenges from the beginning of the 1990s. On the one hand, the centralized water sector needed to be restructured (due to excess capacities, low price and high price subsidy, low efficiency, etc.); on the other hand, because of the low level of services — especially the water quality and the lack of sewage systems — huge investments were needed (Hegedüs-Papp 2007).

There is a serious gap between the water and sewerage supply in Hungary, despite the significant investments into new network developments from the early 1990s. By the year 2001, almost all the settlements (99.9 percent) had been provided public water, while at the end of the 1990s this rate had only been 80 percent. The percentage of households connected to public water provision is high as well: 93 percent of the households had water in their house in 2001. By contrast, the rate of settlements and households connected to the public sewerage network is much lower. Furthermore, many households do not want to connect to the existing sewerage network because of the high service charges.

The length of the water supply pipelines has grown in the last 20 years, from 44,000 km to 65,000 km, and the number of connected households has increased from 2.9 million (80 percent of households) to 4 million (93 percent of households). However, the consumption decreased from 900 million m<sup>3</sup>/year to 546 million m<sup>3</sup>/year, mainly because of the decline in industrial and agricultural production. The size of water sources and the capacity of the waterworks are actually sufficient; only 43 percent of the drinking water production capacity is realized annually. The sewage system developed at a higher rate: the length of the pipes has increased from 12,000 km to 38,000 km; the number of connected apartments increased from 1.5 million to 3 million — that is an increase from 40 percent to 80 percent.

By 2007, 75 percent of the collected sewage had been treated; the rest of it had been discharged untreated.

### 3.4. Impact of economic, geographical and technological factors on water quality

These external factors, particularly the poor technological conditions of the water supply systems have a great impact on water quality, especially in Armenia and Romania.

**Romania** has to comply with the provisions of the EC Directive 98/83/EC on the quality of water by the end of 2015, and with the provisions of EC Directive 91/271/EEC on the urban wastewater treatment by the end of 2018. Currently, the water and wastewater quality differs from operator to operator, but for most of them the compliance with standards is above 95 percent for water quality and above 85 percent for wastewater quality.

Non-Revenue Water (NRW) is relatively high for many regional companies in Romania, but lately the situation has started improving due to the large investments made for the rehabilitation of the water and wastewater networks. NRW is, on an average, 45 percent on the national level and varies across operators from about 35 percent to above 60 percent.

As in the case of Romania, **Hungary** too has to comply with the provisions of the EU, so the service quality standards are set by the central government, as per the EU quality standards. The 24-hour availability of water is ensured everywhere in the country. The services are uninterrupted. In case of water restrictions lasting more than 12 hours, or affecting more than 500 people, or more than 20 percent of the drinking water supply, alternate access to drinking water must be provided.

The former Hungarian standards in terms of water quality were less stringent for certain components than those of the EU. According to the EU requirements, 75 percent of the waterworks need additional treatment (in order to remove iron, manganese, ammonium, organic material, arsenic, or the combination of these). The most serious economic consequences stem from the high arsenic content in South and South-Eastern Hungary, which influences more than a million inhabitants in 400 settlements. The solution to this problem should be based on the use of new water resources and the development of advanced water treatment methods with high capacity for arsenic removal. NRW is 31 percent on the national level, and varies across operators from about 20 percent to more than 35 percent. The smallest and the biggest companies tend to have the lowest NRW, while the medium-sized companies have higher losses.<sup>9</sup>

In **Armenia**, the water quality and supply interruptions are still important issues, especially outside Yerevan. According to the Integrated Living Conditions Survey by the National Statistics Service (NSS), 27.4 percent of non-poor households, 37.8 percent of poor households and 38.1 percent of the extremely

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<sup>9</sup> Data from Hungarian Association of Water Management, 2010

poor households rated the situation with the water supply as “poor” . According to the Ministry of Health (MOH), there is strong evidence of secondary contamination of drinking water supplied by centralized systems because of the worn-out water intake structures, treatment plants, and distribution networks. There is also the lack of methods for defining leaks and breakdowns, especially in rural water supply systems operated by small communities.<sup>10</sup> In Armenia, the first priority in terms of compliance is the microbiological quality criteria. According to the water quality laboratory control data, violations of microbiological or chlorination parameters do happen. There is also no reliable data with regard to chemical contamination levels, including radionuclides.<sup>11</sup> The quality of water supplied by local community-managed systems is particularly poor: 60 percent of the 883 rural systems do not have any facility for disinfection.

## **3.5. Decentralization and privatization in the water sector**

### **3.5.1. Water organizations in a centralized structure**

Water service provision is a compulsory task of the local governments in all the three countries. However, we can find some centralized service provider models both in Hungary and Armenia. Water organizations are considered to be a centralized structure with all the main functions (policymaking, regulation, asset ownership, corporate oversight and service provision) being the responsibility of the central government. We can find this structure in Hungary in the five state-owned regional companies, which provide water and sewage services to 25 percent of the population. In this case, because of technological factors, institutional and organizational interests of the central government did not pass over the management and ownership of the regional waterworks, and the concerned municipalities signed a service contract with the state-owned companies.

In Armenia, the water distribution networks were spun off to local authorities in 1997. But by 1998-99 the situation has changed. According to our interpretation, central authorities — claiming that water tariff collection was poor and that the need for capital investment was too great for most communities (and could be better achieved by the central government) — forced the largest and potentially most profitable of the communities signing over their water management responsibility to the national government for a

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<sup>10</sup> There are no national standards on permitted products, materials, constructions used in water systems; no data on the health impacts of recreational waters or man-made enclosed recreational water environments (spas, pools); no safety standards, regulations and requirements for drinking and recreational water.

<sup>11</sup>Ministry of Health, Armenia: “Water pollution prevention, and control in Armenia” by Aida Petikyan

period of 10 years (which was later extended to 50 years).<sup>12</sup> The state then engaged a management contractor for service provision.

### **3.5.2. Water organizations in a decentralized structure**

When water supply and sanitation services are decentralized, the main functions of the sector are shared or divided between the different levels of government. Central governments retain an important role even when service provision responsibility and asset management remains at the sub-national level. This role may include, for example, the development of sector strategy, common approaches and core contractual/regulatory principles for private participation, quality and price regulation, etc.

In **Romania**, public provision of water and wastewater services is currently organized on a regional basis. Regionalization is based on three key institutional elements:

- The Intercommunity Development Association (IDA): an association of municipalities that represents the interests of its member municipalities vis a vis the water and wastewater service, focusing especially on the general strategy, investments and tariff policy.
- The Regional Operating Company (ROC): a commercial company, owned by all or a part of the IDA member municipalities, to which the management of the water and wastewater service is delegated, through the Delegation Contract.
- The Contract of Delegation of Services' Management

The regulation of the water and wastewater sector is carried out centrally, by the National Authority for Regulation of Public Services (ANRSC).

In **Hungary** there is a fragmented system; nearly 400 municipally owned water companies operate in the country. The proportion of water companies that provide services only to one settlement is relatively high. The number and size of settlements to be serviced by one company is not determined by any technical, technological, or economic concerns. Also, local governments are the price-setting authority, and there is no central regulatory agency in the country.

In **Armenia**, municipalities that did not sign over their water provision to the state either opt for some form of private sector participation (PSP), in the case of Yerevan, or use the public water supply. Decentralized water supply predominantly offers public provision where the water systems are owned by the village council. These are sometimes registered as community enterprises, but predominantly they are

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<sup>12</sup> There is another interpretation of the process as well. According to the author of the Armenian Country Study, the government didn't "force", just "led" the process, and many municipalities were glad to hand it over- to get rid of the responsibility which they could not meet,

operated without such registration. Currently around 560 communities, comprising more than 800 thousand people (around 25 percent of the population), are not serviced by the water supply and sanitation companies. Operation and maintenance as well as revenue collections are handled by local village councils, with no significant external support. Local authorities can make decisions about service provision and asset management only in Yerevan (for Yerevan Jur) and in the small villages, while in all the other cases (under centralized supply), the State Committee on Water Systems (SCWS) is in charge of these decisions. The economic regulation of the sector is done by a state agency: the Public Services Regulatory Commission (PSRC), independent from the Government.

### **3.5.3. Private sector participation in water organizations**

PSP in the water sector appears in all three countries, typically as a concession contract.

In **Romania** privatization is quite exceptional; the central water policy prioritizes regional companies because of the big investment needs in the water and sewage sector, especially in the countryside. However, there are two private operators providing water and wastewater services in two big cities, Bucharest and Ploiesti. Apa Nova Bucharest, a commercial company of Générale des Eaux, Group Veolia (80 percent) and the Municipality of Bucharest (20 percent) operates based on a 25-year Concession Contract. Apa Nova Ploiesti, a commercial company having as shareholders Générale des Eaux (73 percent) and the Municipality of Ploiesti (27 percent), is also based on a 25-year Concession Contract.

In **Hungary**, as per the law, the utility networks and their equipment have to remain fully under public ownership and only the management can be privatized, but local authorities must keep the majority of the shares. Privatization has concerned only eight companies so far, mainly in big cities. All PSP arrangements are concession contracts for a period of 25-35 years.

In **Armenia** currently the majority of the population is serviced by three water and wastewater utilities under PSP arrangements:

- “Yerevan Water” WSC (Water and Sewerage Company): serving a population of 1 million under a lease arrangement with Veolia since 2006. Prior to that, a five-year management contract was signed with an Italian company, A-Utility, from 2000 to 2006, as a result of a competitive bidding process. The lease contract was originally signed with the State Committee on Water Systems, but in 2009 it was changed and now the contract is with the Yerevan city municipality;
- Armenian Water and Sewerage Company (AWSC, where SCWS owns 100 percent of shares ): servicing 0.62 million people under a Management Contract. The contract was signed with the State Committee on Water Systems.

- Three Regional Utilities (Nor Akunq, Lori and Shirak): servicing 0.32 million people. Since 2009 the three companies are managed under a three-year management contract, with a one-year contract extension option, signed between the State Committee of Water System (SCWS) and a consortium of MVV Decon, MVV Energie AG and AEG Service. Here SCWS owns 51% of the shares of the companies and the municipalities own 49%.

## 4. Main findings

Our research started with the statement that governance matters: governance structure in the water sector determines the performance. Because of the methodological constraints, we narrowed our interest in the direction of the change of transaction cost (defined as economic slacks or social conflicts). So despite the fact that we were not able to fully quantify the variables of our model and to test the causal relationship in a rigorous way, the case study method helped us formulate some interesting statements. The findings are summarized below.

### 4.1. Distortion caused by immature institutional arrangement — unbalanced growth

In the theoretical introduction to our thesis we mentioned that if expectations from the sector are too high compared to the economic performance, an affordability problem is inevitable. This in view of the fact that even a society with weak economic performance can provide a high level of services for a small minority group (for example, the colonial societies), but when they want to expand these services to the majority, they will face a huge affordability problem. Development literature argues that the affordability problem is caused by the low efficiency of the services, which is connected to governance factors. We accept the validity of this argument, but it has a misleading element and creates the illusion that by improving the governance, the affordability problem can be solved. For a low income country, attempting to achieve cost recovery and affordability while at the same time providing high quality service is an impossible task, which necessarily leads to conflicting regulations. Our research proved that the problems of the governance structure are often the consequence of an unbalanced growth path, when countries are expected to adopt a service quality standard that their economy cannot afford.

A society may “over-invest” in the water sector, using a disproportionate share of its GDP for water services. But this necessarily affects other areas of the economy, because the society has to draw resources from other sectors. In Armenia, the planned level of water services is, arguably higher than the level that the society may be able to afford, which means that the share of financial sources other than tariffs (like taxes and transfers) are increasing<sup>13</sup>. In Hungary and Romania, the EU water directives set high standards, leading to high maintenance costs, to a large extent covered by the EU structural funds. These elements distort the system, which in turn affects the institutional structure of the sector.

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<sup>13</sup> By transfers the authors mean external transfers financed by donor countries as well as charities. The author of the Armenian studies argues that we can only say that state subsidies are used in the case of some companies.

The chain of poorly designed incentives leads to a negative feedback mechanism, where the service provider becomes increasingly incapable of maintaining the quality of the infrastructure, because the fee revenue is limited partly due to economic reasons (households cannot afford to pay) and partly because of the legal environment. This is the case in Armenia, where for example KPIs for AWSC push the company to achieve longer supply duration, which put extra burden on the infrastructure, while its investment capacity remains very limited. According to the authors, a typical danger in this situation is that if the operational deficit has reached a certain level, the possibility for cost recovery becomes so far from being unattainable, to the extent that the company might lose the incentives to improve efficiency through utilizing its “slacks” or finding any saving possibilities. In some cases, the legal constraints faced by management companies limit their leeway (in terms of hiring and firing the workforce, re-channeling investment and maintenance costs, etc.). In Hungary, the new national regulation to decrease the utility price by 10 percent (announced in December 2012 by the government) raises the same problem — that there will be conflict between the cost recovery principle and the rule of law.

## 4.2. Refined governance factors influence service outcomes

Different institutional environments (legal framework, regulation, administrative structure of the country, investment decisions, the role of the donor agencies) can create very different incentives and accountability relations even **within the same robust governance model**, which has a significant impact on the outcomes of service providers. This is illustrated by the third model (decentralized model with public service provision).

In the case of **Romania**, there are very strict and precise legal regulations, and a central regulatory agency with real power and influence on the sector. The regulatory agency sets prices based on a detailed calculation method, and exercises price control. Large EU investment funds are distributed centrally, and the service providers are responsible for developing investment plans in their service area. The accountability relation between the local governments and the service providers is quite weak and indirect, because the water sector associations (IDA) stand between the local councils and the service provider. IDA is responsible for technical and financial oversight of the provider, and also for approving investment plans and tariff increases. As a consequence, there are no major differences in the behavior of the service providers (they are basically following the rules set by the regulatory agency, having the same incentives), local governments have no real power over water management, while it is the service providers who assume the real responsibility. The accountability of the service providers is weak towards the end-users as well, because the complaints of the households (voice option) have no direct effect on the

operation of the water companies. This system has the advantages of economies of scale and efficient use of development funds, but it is also characterized by low level of transparency and accountability.

In **Hungary**, legal regulation is very weak and it is hardly enforced. Local governments are the owners, strategy makers (they decide about developments and investments), and main regulators, so they have a very strong position in the system. Consequently, different local governments have different incentives, and the service providers' main incentives can also differ from case to case. Depending on the size of the utility and the service area (covering one single municipality, or several municipalities), accountability relations can differ significantly. In general, we can say that the accountability relation between a local government and its service provider is very strong, much stronger than in Romania. Transparency and accountability are also more advanced. However, the Hungarian system is characterized by over-investment (less efficient use of development resources partly for reasons of economies of scale), risk of system sustainability (in some cases local governments are not interested in full cost recovery but in keeping the prices lower), and local governments' preference for keeping full control over the investment and operation, resulting in a fragmented structure. Unlike in Romania, investment and operation decisions are under the control of several organizations, which creates serious conflicts, and leads to a less efficient system both on micro and the macro level.

In **Armenia** there is a centralized water management system, with several regulatory agencies (sometimes with overlapping functions), central price regulation (below full cost recovery) and ad-hoc central grants for operation and maintenance. The central government has so far by and large neglected the decentralized service providers, focusing on centralized service provision and PSP.. Small villages, that are not part of the central system most often have not formed companies for water supply service provision, or seek individual solutions without any central support. In some villages this leads to low service quality and no developments in their water system.

In the following section we will show — based on the case studies — how the different governance factors influence the transaction cost; this, while focusing on the critical governance elements such as perverse incentives, lack of accountability and uncertainties in the rule of law.

### **4.3. Poorly designed incentives have unintended consequences**

When the client municipality and the service provider company have **conflicting interests in long-term financial issues and investment strategies**, it can result in increased transaction costs, regardless of the specific governance model. This is the case in Hungary (Model III), when the owner (the local government) responsible for investments is interested in carrying out developments with low investment

and high operation costs. The operator, however, is interested in the application of technologies with lower operation costs (which would ensure lower water prices), as after all the operator will be responsible for providing the service as soon as the investment is done. Conflicts in investment strategies exist in Armenia as well (Nor Aqunq, Model II), where the operator's strategy to extend service area and undertake the necessary investments is hindered by the government's (as majority shareholder) inability to make the required financial contributions.

Conflicting interests appear in Model IV as well, both in Romania and Hungary. Some private operators (although not all of them) are more interested in short-term financial gains in water fee collection than in network maintenance and reconstruction. However, some other cases with PSP (e.g. Szeged in Hungary) prove that properly developed incentive schemes between the owner and operator, and appropriate capital investment financing schemes, can put an end to these types of conflicts.

**Central price regulation mechanisms** can also create perverse incentives. As a result of this mechanism, local governments in Hungary, where the cost of the water is extremely high receive a specific targeted grant. This is a kind of “deficit grant” that typically gives negative incentives to the actors: the higher your deficit, the larger your grant.

In Romania, the actual price increase cannot exceed the inflation rate, measured by the consumer price index. It is called an “initial tariff,” which is obviously modified by the accepted cost elements.<sup>14</sup> The water charges calculated locally according to these conflicting requirements are subject to approval by ANRSC, the regulatory agency. The nationally set affordability ratio puts a rigid limit on price increase and absolute level of water tariffs. The price regulation is very similar to that of Hungarian regional companies (Model I).

The Romanian country study drew attention to two specific distortions in their price-setting mechanism. First, that the water tariff can be increased more easily in the case of private operators. This means that the public service providers are probably politically controlled, so they are reluctant to raise the prices to full cost recovery level. Second, the market mechanisms are distorted by the modified input costs as well. In the Romanian practice the volume of raw water consumed by the operator is not accurately measured, meaning that its environmental costs are not reflected by the water prices (this is true in the case of both public and private operators).

In the case of AWWC (Armenia) there is a special PSP arrangement (management contract) – --: although there is a private operator, their **interests are distorted by the special involvement of the World Bank**. “The World Bank initiated the project, and through the International Development

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<sup>14</sup> See Romanian case study, Annex III, page 90.

Association (IDA), it funded the project preparation phase and finances the management contractor's fixed fee, the performance incentive compensation and the Contract Monitoring Unit. It also finances the procurement of goods, services and works needed for the company's operations as well as investments in the networks and facilities" (OECD 2008, pg 18)<sup>15</sup>. The company now received also a loan from ADB. The large funding from IFIs, while important for improving service delivery potentially distorts the incentives of the Government to undertake tariff reforms to achieve full cost recovery **Inadequately defined KPIs and service standards can** also create perverse incentives, as shown in the case of Armenia. Theoretically, the government should be interested in setting NRW as one of the KPIs for AWSC, but does not, since it cannot commit the necessary funding for the capital investment, while at the same time it is setting service duration standards that are too high. This leads to further erosion of capital infrastructure and affects service outcomes, in particular the supply interruptions and water quality issues.

Another area of concern in Armenia is that all stakeholders **lack incentives to invest in intra-building infrastructure (condominiums)**. This is equally true for the companies, municipalities, condominiums, as well as the residents. It leads to the lack of investment in water network and affects the service outcomes, in particular the service duration and water pressure

#### **4.4. Unbalanced accountability relations lead to conflicts**

Privatization conflicts stem from the allocation of the gains achieved through privatization efficiency (that municipalities consider to be unbalanced at their expense). Successful privatization, on the other hand, depends on the political agreement between the owner, regulator and service provider.

The chances of distortion, opportunistic or perverse behavior are high if some of the stakeholders have disproportionate control over the operation, without check and balance by other stakeholders. In the decentralized public model the risk is that municipalities may misuse the water services as an additional development resource (indirect tax) levied on water users (distorting of the behavior of the households) and on water service providers (taking away the necessary maintenance resources), uncontrolled by the regulatory agencies. But unbalanced distribution of the risks, cost, and gains may emerge in a privatized service model if the service providers use their power secured by information asymmetry and the lack of the control capacity of the regulatory agencies (central or local) to maximize their profit. The water system has to use the households' voice options to put a limit on price settings in the case of a mass

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<sup>15</sup> The author of the Armenian Country report questions the validity of this statement of the OECD Report. However, for the authors of this paper it seems well justified.

affordability problem. The centralized model may work efficiently under a well-developed central regulation, if the service provider assumes responsibility for the costumers directly or through municipal governments.

The results of privatization in the three countries examined are mixed. In Hungary we can find examples for both well-functioning PSP solutions, and cases where the privatization failed. The successful cases (e.g. Szeged) show that a mutually beneficial water management system can be developed when the city officials and private partners are able to design and introduce a financial scheme, and a method of communication that leads to a balanced relationship. In some other cases (e.g. Pécs) the lack of trust and inadequate communication (accountability relations) between the partners resulted in the termination of the concession contract.

Privatization is a much debated issue in each of the countries, especially in Hungary, where after 2010 the government committed itself to a policy toward centralization and re-nationalization. Originally, the main rationale for privatization in larger cities was to attract investment capital and improve the management. However, at the time of concluding the contract, there was always an uncertainty as to how much profit could be realized by rationalization. After several years of operation, the authorities responsible for service provision assumed that the gains were higher than originally expected and they tried to re-negotiate the contract.<sup>16</sup> The exact details of the contract depended on the service provider's strategy, and the level of trust between the different stakeholders. In Hungary, the case of Pécs proved that the lack of cooperation may lead to unlawful political measures adopted by the municipality (the rule of law problem), and the termination of the contract. Nevertheless, the case study of Szeged indicated that the municipality and the private company can share the profit in a peaceful way. (In Budapest, the municipality also bought back the shares from the water company.)

In Armenia, the planned level of water service with PPP arrangement in the capital city is higher than the level the society may be able to afford, which leads to underinvestment and also means that financial sources other than tariffs are used for financing water supply.. In Hungary and Romania, the EU water directives set high standards, leading to high maintenance costs, although a large part of the investment cost was covered by EU structural funds. The elements of unbalanced growth distort the system, affecting the institutional structure of the sector. The water infrastructure becomes unaffordable to the economy. There is public discussion that the overuse of EU structural funds for consumption infrastructure (as opposed to productive infrastructure) slowed down economic growth, and increased an affordability

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<sup>16</sup> Based on the case studies, we do not have real information on the real size of these gains; we only have evidence for the existence of the conflicts related to this issue.

problem. The argument here is that the countries moved to a “reverse” unbalanced economic growth system.

As a conclusion, it can be stated that if tariff setting is assigned at the level of the local authorities, they may combine various pricing techniques. Tariff-setting is a critical factor of the general governance model, and rather diverse practices are followed by countries with a similar scope of decentralization. Within these systems the actual user charge setting methods are also different in the case of public and private service organizations. So these specific rules and practices define the incentives of the service organizations, and influence the accountability relations through the price-setting methods.

## **4.5. The rule of law and affordability issues**

Local attitudes towards privatization are also shaped by the perception of corruption. Usually corruption risks are considered to be higher when private companies are involved in public service provision; in reality though, this is not always the case. For example, in the case of Szeged, after the first couple of years, when the foreign managers left, a careful human resource management policy with regular rotation followed. The executive director was replaced every 3 – 4 years in order to avoid enhanced local influence, embedded relations and consequently to minimize corruption risks through this rotation policy. This is not always the case with public companies.

Affordability is a key issue for the countries in transition. The case studies proved that water affordability is a sensitive question in each of the countries, and the central price regulation in Romania and Armenia takes into consideration the macro-economic possibilities and affordability. In Hungary, the tariff was not centrally controlled until 2010, but after the new law on the water sector, the water tariff became centrally defined.

Social policy measures and welfare mechanisms are important components of the regulatory environment in the water sector. The service is primarily financed by user charges, but affordability influences the level of water tariffs, so the local governments and the water companies have to deal with social problems as well. The regulations in this field are different in Hungary and in Romania.

However, regardless of the differences in social-welfare mechanisms of the two countries, the water companies are highly motivated to minimize arrears, because user charges are their main revenue sources. The nationally set affordability ratio in Romania and the local revenue raising pressure in Hungary influenced local policies. In both cases revenue collection became a high priority for the water company, so revenue administration was made more efficient and a system of early notifications was developed (e.g. in Hungary when unpaid bills reach EUR 30). However, when the local governments are faced with the

social consequences of high water tariffs in a decentralized system, they develop targeted and effective methods of social assistance. In Hungary, prevention and counseling is widely used in social problem solving. This clearly shows the new dimension of social accountability, as the companies have financial interests in solving these social problems.

In Hungary, however, the companies are very reluctant to disclose the total amount of arrears, because a transparent management of the problem would make it impossible to cross-finance the non-payment based losses by well-paying consumers. While there are clear steps to increase the efficiency in fee-collection, the companies prefer to hide the fact of cross-financing. There is, however, a limit to the burden that companies can pass on to well-paying middle-class consumers.

#### **4.6. The interplay of models and its effect on organizational behavior**

According to the literature, large state-owned companies are expected to be less efficient, less flexible (with limited adjustment options to local needs), and depend on the scarce central resources. The examples of the five Hungarian regional companies, however, show that in certain institutional environments these statements are not entirely valid. First, there is a rather significant path dependence in the system, which has a great impact on the outcome, especially at very high service levels. Before transition, the water sector had a privileged position in the political system, characterized by high level of professionalism in the management of the water companies. After transition, most of the new water companies were transferred to the municipalities, and found themselves under strong financial pressure, which could, to some extent, be alleviated by sacrificing the quality of the service, and prioritizing cost-effective methods. In the case of the regional companies, this pressure was less intense, which explains why in their case the primary strategy objective is still the quality and quantity of the service, while cost-efficiency only comes afterwards. Nonetheless, this does not mean that these companies are neglecting the efficiency component. As they are functioning in a competitive market environment, increasing the efficiency levels is crucial for them as well. In the last few years many efficiency-enhancing investments took place, especially in the area of energy rationalization.

Another argument against big state-owned companies is that they are less transparent, and accountability relations with other stakeholders are weaker. This statement is also just partly true in our cases. Indeed, these companies have almost no legal accountability towards the local governments and the consumers. However, local governments and consumer groups represent an important political and social power, and

under some circumstances they can make the operation of the utility companies more difficult. Recognizing this situation, the regional companies developed exemplary communication practices with the public (local governments and consumers), and are responsive to their needs.

Competition in the water sector is limited because of the natural monopoly of the service. The incentives for the service providers to expand the scope of the services vary along the different types of companies. The regulatory environment (price-setting mechanism, etc.) influences the behavior of the service providers. If the expansion of the service area increases the revenues more than the cost, water companies (and typically their owners) are interested in expansion. The Hungarian regulations to date basically guaranteed that if the municipality is willing to accept the cost-price, the profit is guaranteed. However, the expansion would need special effort on the part of the staff (more work, sometimes more complicated areas) and even some financial risk (investments). In this respect, in Hungary there has been competition between the service providers to expand their service area, especially in the case of privatized companies. However, in a system where the water price is centrally regulated, and the price is equalized among service areas, the incentives to expand the service are not so clear. In Romania, for example, to expand the service area means higher cost and higher development need without proper compensation.

Both the Armenian and Romanian cases show that PSP brought about improvements in service quality and collection rate. In both the countries the water pressure problems and supply interruptions decreased, the share of metered residential connections increased and the collection rate also improved. However, the local political environment can modify the original incentives of the private operator by setting limits on how far they can go with laying off their employees, increasing the tariffs or proper management of arrears. On the other hand, private companies themselves are also very cautious to assume the political costs of restructuring. We can conclude that though the “robust” governance models do not explain the performance of the water sector by themselves, they may, in some areas have a significant impact on sector indicators, especially in the privatized/PSP cases, be it in a centralized (Armenia) or decentralized (Hungary, Romania) model.

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