Abstract

Various critiques have been made of the analytic narrative, which is a methodological approach that combines historical and comparative research with rational choice models. This paper discusses current limitations of the approach and ways for overcoming them on the basis of evidence provided by the case study of the implementation of the water reform in Italy in the period 1994-2001. The case study shows how attention to issues of case selection, formulation of causal hypothesis, and generalizability of findings is important in order to make analytic narratives contribute to the repertoire of tools of comparative public policy research.

Keywords: Analytic narratives, game theory, policy reform implementation.
Using Analytic Narratives in Policy Analysis:  
An Explanation of the Implementation of the Water Reform in Italy (1994-2001)

Analytic narrative is a methodological approach that aims to reconcile the use of historical and comparative research with rational choice models (Bates et al. 1998, 2000, Levi 2002). Building on the work of Douglass C. North (1981, 1990, 1996), analytic narratives intend to explain social outcomes on the basis of constraints and incentives provided by institutions, which are understood as self-enforcing equilibria that coordinate behavior. Analytic narratives – as the phrase suggests – brings together analysis and narrative (Levi 2002). The analysis part consists of building models derived from rational choice, particularly in the form of extensive form games. The narrative part provides the detailed and textured account of context and processes, with concern with both sequence and temporality. Taken together, the analytic narrative contributes explaining a chosen problem or puzzle by building a model “to explicate the logic of the explanation”, “to elucidate the key decision points and possibilities”, and finally to evaluate the model “through comparative statics and the testable implications the model generates” (Levi 2002: 6).

As a research approach, the combination of rational choice with case study narratives (especially in the form of game theoretic modeling) has been applied in works done within political science discipline. Instances of such an approach can be found in Kenneth Schultz's (2001) study of the Fashoda crisis in 1989, Frank C. Zagare's (2009) work on explaining the outbreak of the 1914 war in Europe, and Jay Ulfelder's (2010) oeuvre on dilemmas of democratization. Other examples within the study of the policy process include Claudio Radaelli’s (1998) research on the search for coordination in international tax policy, Oliver James’ (2003) book on the creation of executive agencies in the UK, Shlomo Mizrahi’s (2004) examination of water
policy in Israel, and Araral's (2009) analysis of strategic interaction between donors and bureaucrats. Setting aside these (and other) notable examples, however, it is probably fair to assess that the analytic narrative approach has not been widely employed as a research strategy so far. When it has been used, it has been often put into practice by following the assumptions and the deductive logic of rational choice institutionalism as an argumentative heuristics, rather than by developing formal game theoretic models (Bennett and Elman, 2006). This state of affairs is relatively surprising, provided that both the contribution of case study research and of formal modeling to advancing our understanding of the political and policy processes are generally acknowledged (Fiorina 1975, Moe 1979, Morrow 1994, Büthe 2002, Steinberg 2007, Clarke and Primo 2012).

The aim of this paper is to partially rectify this state of affairs by discussing some limitations of the analytic narrative approach and ways for overcoming them. The underlying rationale is the presumption that analytic narratives could be more widely used in public policy research (including the one of comparative sort) if researchers are more aware of the strengths of the approach and of the circumstances where it may be most effective. It will be argued, moreover, that existing scholarly literature still lacks an adequate number of “showcases” that expose the use of the analytical narrative approach for explaining within-case variation in the public policy cycle. The points made in the argument, then, will be illustrated by employing the analytic narrative approach in explaining the process dynamics of the case of the implementation of the water reform in Italy in the period 1994-2001.

The rest of the paper is organized as follows. Next section will review and discuss perceived weaknesses of the analytic narrative approach and some ways in which they may be overcome. Section three will outline the research design of the
case study on the implementation of the water reform in Italy in 1994-2001. Section four will present the analytic narrative of the case, which includes both the narrative of the episode and formal game theoretic modeling. Section five will discuss the findings of the case study and the implications for the advance of the use of the analytic narrative approach in scholarly inquiry. Finally, section six will provide the conclusions.

Theoretical Background: Analytic Narratives and Its Critiques

Since its formulation (Bates et al. 1998), the analytic narrative approach has been subjected to various critiques. A noticeable contribution in this respect was the one of Jon Elster's (2000), who dubbed the approach as “a case of excessive ambitions”. One main focus of concern of Elster's was that the recourse to rational choice theory (instrumental rationality in the pursuit of actors' objectives) was inadequate because people may not conform to canons of instrumental rationality. In contrast, Elster recalled that actors (both individually and collectively) often find it difficult to engage in complex calculations required in strategic interaction settings. He questioned whether one can believe that actors are able to perform complicated reasoning through inter-dependent (nested) games and infinite time horizons (while, in fact, individuals possess limited cognitive capabilities and incomplete information), why concerns for fairness or emotions should not play any role in actors' decisions, and in what sense preferences could be attributed to aggregate actors. He noticed that analytic narratives are not persuasive if little or no evidence is provided for the “mental states” of individuals within the described choice settings. He also condemned the explanatory logic of constructing models where the case outcome is “explained” by matching the observed behavior with the result of choices of actors.
who seek to maximize suitably defined interests.

The reply from Bates et al. (2000a) partially tackled Elster's critique. They argued that, although they confessed a preference for rational choice theory, it is not a necessary condition for an analytic narrative. Alternatively, researchers can use any theory of choice, provided that it is sufficiently developed to provide a consistent technique for deducing behavior. They also claimed that some among rational choice theorists highlight the importance for the researchers to develop an “hermeneutic understanding” of the experience studied. They objected to Elster's argument that little evidence is provided for individual’s “mental states” by pointing out that, as intentions are too difficult to discern, rational choice theorists rightly rely on revealed preferences and behavior. The admitted, in part, that Elster's point about giving up the “postulate of hyperrationality” is persuasive, but they also contend that the assumption that actors' behavior is instrumentally rational allows parsimonious explanations of case outcomes that would not be significantly affected or enriched if embracing bounded rationality.

In another work, Bates et al. (2000b) tackled other critiques that were raised, within a Symposium issue of Social Science History, by Daniel Carpenter, Sunita Parikh, and Theda Skocpol. They acknowledged that the analytic narrative approach was still in its infancy and that it provided an attempt to provide researchers with a more disciplined and rigorous way of constructing explanations of specific episodes of history. They admitted that “showcase” examples of analytic narratives contained in their 1998 book might not fully appeal to the aesthetic sense of historians, because the inclusion of models spoiled the narratives of their literary appeal. In addition (and this may be more relevant for the present discussion), they also recognized that the focused concern of the cases included in the 1998 book on particular historical and
social puzzles could convey the sense that analytic narratives were directed to very specialized audiences. The findings of the analytic narratives contained in Bates et al. (1998), indeed, seem to remain relatively circumscribed within the narrow task of explaining particular episodes in history rather than contributing or calling for a wider cumulative research program.

The discussion around the role of narratives in model-based explanations also moved within the circles of the philosophy of history and methodology studies (Morgan 2001, Woodward 2003, Alexandrova 2008, 2009). A piece of work that is relevant here is the one of Alexandrova (2009), who posed the question of under what conditions we are justified in thinking that an analytic narrative provides a good explanation. Within her argument, she contributed clarifying how analytic narratives “produce” explanations, with implications that seem important for overcoming limitations of the approach. She pointed out that the explanation provided by analytic narratives does not consist of the logical argument contained in a model designed to match features of the case path and outcome. By themselves, in fact, models of game theory are not falsifiable. Rather, the models are intellectual constructs that are made to bear “some similarity” to the choices and trade offs the actor faced in the phenomenon in question and that contain “clues to the causal mechanism responsible for the phenomenon” (Alexandrova 2009: 15). Their function, in the view called “Open Formulae”, is the one of providing the conceptual framework for formulating a causal hypothesis about the claim that, within a type of circumstances, some factors result in a particular outcome under certain context conditions. The model provides a template or scheme for articulating the hypothesis that the narratives confirm by finding a “material realization of the causal relationship in the hypothesis” (Alexandrova 2009: 18).
Alexandrova’s (2009) work contributes elucidating how analytic narratives provide explanations. Her argument warns us that we cannot claim that the model explains anything, by itself; that we cannot claim that the model states the hypothesis that we try and confirm on the basis of evidence; and that we cannot claim that the mechanism proposed in the model is the one that realizes the observed effect. Rather, it helps clarifying that explanation stems from the confirmation of a hypothesis that originates from a specification of the general template provided by the model with respect to the particular scenario of the narrative. Conceivably, her argument leaves some questions unanswered and probes some further issues. How does the analytic narrativist craft the model? What does it mean that the model has to bear “some degree of similarity” to the experience? What does it mean that the hypothesis is “confirmed” by a material realization of the causal relationship that it contains? While her work pushes forward the inquiry into the methodological foundations of analytic narratives, still more work is needed for fully elucidating the conceptual and logical structure of explanations based on both narratives and models.

For the sake of the present discussion, the work of Alexandrova (2009) suggests some ways to try and strengthen the case for analytic narratives. The “Open Formulae” view corroborates the argument that models used in the analytic narratives can well rely on rational choice assumptions, provided that we do not really need to believe that actors behave according to canons of instrumental rationality only. The function of the models, in fact, is reduced to the one of generating templates for hypotheses to confirm at the individual or collective level, regardless of detailed concern with the thought process that takes place within actors. This view restates the possibility to accommodate analytic narratives with theoretical pluralism, provided that, if models serve as mere templates that provide the conceptual framework for
formulating causal hypotheses, then several kinds of social mechanisms can be introduced as a way to articulate the hypothesis to confirm. Accordingly, analytic narratives should be of interest to social science researchers regardless to whether they incline towards institutional rational choice or other theoretical approaches.

Another feature of analytic narratives that possibly restrains its wider adoption relates to whether the approach is able to result in generalizing theoretical arguments. Levi (2002) acknowledged that the aim of analytic narratives is to “go beyond” explaining particular cases and to elaborate more general conditions for institutional change. When it comes to matters of research design, however, analytic narratives tend to focus on explaining path and outcomes of particular episodes in history that often reflect researchers’ specific interests, but typically they do not explicitly contribute to wider research efforts to theorize about social phenomena. Admittedly, the criteria for case selection used by analytic narrativists “are closer to that of the historian than of generalizing social scientists” (Levi 2002: 7). It is argued here that this feature of the analytic narrative approach is the one that calls for more urgent repair. Certainly nothing prevents researchers who are specialists in particular areas of social science to employ analytic narratives to explain singular occurrences across history and world regions. If the aim of theorizing about conditions for institutional change is to be attained, however, the analytic narrative approach should be more attentive to issues of research design and case selection. Else, explanatory arguments may not really contribute to scholarly efforts to draw generalizations about phenomena of institutional change, with the effect that the analytic narrative approach may confine itself to serve as ad hoc methods of analysis that is useful for making sense of particular episodes, rather than as a tool for investigation within wider research programs.
Analytic narratives should be used within single or comparative case studies that are explicitly selected as way to contribute to theory-building efforts. In this respect, standard prescriptions for case study selection are relevant here (Ragin 1989, Ragin and Becker 1992, Stake 1995, Yin 2003, Gerring 2004, Flyvbjerg 2006, Eisenhardt and Graebner 2007). Analytic narratives should be employed for the analysis of cases that are adequately justified for the contribution that they make to the study of the kind of social phenomenon under consideration. Once this feature of the research design is clarified, the analytic narrative approach seems particularly suited to conduct well-structured case study analysis, especially of comparative sort. By design, analytic narratives typically include exercises of comparative static, where the researcher investigates “the effects of different models and context conditions on the path and outcome of institutional change” (Bates et al. 2000b: 694). The disciplined comparison between explanations of different trajectories of institutional change (between cases or within a given case, and across time or locations) can provide valuable contributions to generalizing research arguments that transcend historically focused interests.

An Analytic Narrative of Policy Reform Implementation: Research Design

This paper intends to contribute to the discussion of the role that analytic narratives play in comparative policy research, taking into account current discourse about the strengths and limitations of the approach. The contribution of this paper is based on the evidence provided by the analytic narrative of a case of policy reform implementation related to the episode of the post-enactment stage of the reform of water (drinking and wastewater treatment) services in Italy in the period 1994-2001. The case is selected because of distinguishing features that make it suitable to
researching a particular type of scenario of the policy reform implementation process, namely one where the implementation of regulatory reform of infrastructure takes place in the context of a multi-level governance system. Within such scenario, the political confrontation between the central government and sub-national governments has profound effects on the path and outcome of the reform implementation process, especially manifested in variation over time (i.e., the pace of implementation efforts) and across space (i.e., the uniformity or variety of implementation efforts across sub-national governments).

Because of these features, the present case study is intended to extend the range of studies on policy reform implementation in ways that have not been much pursued in existing scholarly literature yet. Several studies on policy reform implementation take into account the role of the political confrontation between implementers and target groups (Bardach 1977, Berman 1978, Lipsky 1978, Wildavsky and Majone 1979, Mazmanian and Sabatier 1981, 1983, 1989, Sabatier 1986, Patashnik 2003, 2008; within the reform of water policy, Dinar 2000, Saleth and Dinar 2005). Relatively little attention has been granted so far, instead, to the jagged and ineffectual type of implementation that takes place when the execution of the reform mandate involves public authorities situated at different levels of the governmental systems. The scenario of multi-level governance, yet, bears particular traits that make the unfolding of the process of implementing reform policies different from what is generally observed in unitary countries (Eberlein 2000, Eberlein and Grande 2000). As a distinctive trait, sub-national governments play an influential role that relates to their functions as direct providers of public services within their respective territorial jurisdictions, to their political responsibility towards local communities, and to their prerogatives such as the exercise of veto powers provided
by the constitution and/or relevant legislation, the right to appeal to supra-national, constitutional, and administrative courts, and exclusive competences on the regulation of local public services (typically provided by the constitution and/or relevant legislation). Such role is unmatched by the one generally played by actors (such as governmental agencies or branches of the executive) that are typically involved in implementing a policy reform in unitary countries.

Data were collected from primary, secondary, and tertiary sources. Primary sources included parliamentary minutes about the making of the water reform, 13 yearly reports and 22 documents issued by the national water regulatory agency (*Comitato di Vigilanza per l’Uso delle Risorse Idriche* or Supervising Committee on the Use of Water Resources), and 20 interviews with informants based in the Supervising Committee on the Use of Water Resources (4), in the local regulatory authorities (11), in the water firms (3), in the association of water firms Federgasacqua (1), and in the research centre Istituto Ricerche Sociali (1). Secondary sources included 23 reports issued by the water research centers Proaqua, proceedings of the yearly conferences “H2Obiettivo 2000” organized by the water firms' association Federgasacqua, and 546 articles from the business press Il Sole 24 Ore. Tertiary sources included various scholarly works done on the water reform in Italy, such as Massarutto (1993, 2005), Barraqué (1995), Bigatti et al., (1997), Guffanti and Merelli (1997), Riccaboni and Grossi (2000), Muraro (2003), Gilardoni and Marangoni (2004), Fraquelli and Moiso (2004), Anwandter and Rubino (2006a, 2006b), Citroni and Lippi (2006), Citroni et al. (2007), Lippi et al. (2008), Carrozza (2008), and Danesi et al. (2008).

Data were stored and coded through the Nvivo software package. Originally, the coding frame was based on theoretically derived concepts and constructs that
originated from the review of the literature on regulation and regulatory reforms. During the process of examining the empirical evidence, the coding frame was progressively amended and enriched in order to reflect the variety of the discourse carried out in the water policy community in Italy in the period between 1994 and 2001. Coded data formed the basis for the analytic narrative, which included both the writing of narratives of parts of the episode of the water reform implementation and the design of game theoretic models. The design of game theoretic models followed the methodological guidelines provided by relevant references of the analytic narrative (Bates et al. 1998, 2000; Levi 2002) and public policy implementation (O’Toole 1997a) literatures. By itself, modeling the interaction between actors as a series of games is an analytical approach adopted in various public policy implementation studies (Scharpf 1990, 1991, 1994, 1997, Klijn et al. 1995, Klijn 1996, O’Toole 1997a, 1997b, Klijn and Koppenjan 2000, Hill and Hupe 2002, Meier and O’Toole 2003). The narrative provides cues about identifying the key players, formulating assumptions about their goals, and selecting features of the interaction that are expected to influence actors’ behavior. The games are fashioned in such a way that sub-game perfect equilibria parallel the observed path and outcome of the policy implementation process. Then, in the vein of the “Open Formulae” view, tentative hypothesis are formulated and subjected to scrutiny on the basis of the narrative evidence.

The implementation of the water reform in Italy (1994-2001)

Struggling against sub-national governments’ inertia (1994-1997)

In 1994, the central government of Italy passed a reform of the country’s water sector that intended to improve the sorry state of water infrastructure and water
service delivery. At that time, the water industry was largely fragmented (it counted more than 23,000 firms, mostly owned by local governments) and lacking adequate investments. The reform mandated the consolidation of the sector by requiring local governments to establish new water administrative areas (*Aree Territoriali Ottimali* or OTAs) and local water regulatory authorities (OTA authorities). OTA authorities were required to assign franchises to water firms that could serve each entire OTA on competitive tender basis. The reform, therefore, contained provisions for the liberalization of water service provision and its re-regulation through mechanisms of franchise allocation rather than direct public ownership (Gómez Ibáñez 2003).

After the reform came into force, local governments were expected to formulate proposals about the definition of the boundaries of the OTAs. This task would determine which local governments were to collaborate with which others in order to establish new water regulatory authorities at the local level (OTA authorities). The design of the OTAs bore important implications for the management of the rest of the water reform implementation. Larger OTAs implied that a higher number of local governments would pool together their water functions into relatively bigger firms. Smaller OTAs, in contrast, meant that relatively small water firms, which would operate in tiny user basins, would provide water services. Additionally, the establishment of the OTA implied that local governments would lose direct control of water planning and regulatory functions.

As a matter of fact, local governments generally brushed aside the demand to cooperate to establish the OTAs and the OTA authorities. Within local governments’ political economy, direct ownership and control of water firms had often allowed local politicians to affect water-related jobs and public contracts, that helped them to cultivate the electoral support of local constituencies. Without local governments’
assent, the regional governments could not pass legislation about the design of the OTAs and could not finalize the submission of water infrastructure development plans for EU funding (that especially worried the central governments’ Ministry of Industry of that time). In principle, the central government might override the inertia of local governments by appointing special commissioners for establishing the OTAs in place of the regions. The central government, however, never materialized the threat.

*Explaining the faltering implementation process in the first period (1994-1997)*

The first step of the analysis is explaining why, after the enactment of the water reform, local governments did not define the boundaries of the OTAs. In order to tackle this question, we turn to modeling the interaction between actors in a game theoretic fashion. Let $R_i$ indicate any of the regions of the country. The reform statute provides that any $R_i$ can pass the regional legislation that establishes the OTAs only after local governments agree on the definition of the OTA boundaries. The agreement between local governments is conceived as an equilibrium of a coordination game, where local governments choose whether to be in accord with neighboring municipalities on the definition of the OTA boundaries or not. Let $LG_{ji}$ indicate any j-th local government within the i-th region. Any $LG_{ji}$ plays a coordination game with an unspecified number (tens or hundreds, out of about 8,100 local governments included in the country) of neighboring municipalities. Any local government could, in principle, negotiate the definition of the OTA boundaries with any bordering and surrounding municipalities. Modeling this coordination game in detail would be particularly complex, because (a) the number of players of the game is not given (i.e., any local government can choose whether to sit at the negotiation table or not) and (b) any player can participate to several games at the same time (i.e., any
local government can negotiate the definition of the OTA boundaries with different sub-sets of municipalities).

For the sake of simplicity, let us consider an overly simplified scenario where two local governments only, LG1 and LG2, play the coordination game. Players have infinite horizon and a time discount factor of \( \delta \in (0,1) \), that is assumed constant for all players. Each local government can choose whether to agree on the definition of OTA boundaries or not. If both local governments do not agree, then they maintain the status quo and get nil payoff. If any local government chooses to agree while the other does not, then no agreement can be reached and they both get nil payoff. If both local governments agree, then they allow the region \( R_i \) to pass regional legislation. In this case, local governments anticipate the expected payoff from executing the rest of the water reform statute. This payoff includes (a) the cost \( C_{lg1} \) of losing direct control of water planning and regulatory functions (which, if the water reform is implemented, are centralized into the OTA authority), (b) the cost \( C_{lg2} \) of losing direct control of water management functions (which, if the water reform is implemented, are centralized into the water firm that gets the franchise), and (c) the possibility to gain the benefit \( B_{lg1} \) of shared influence of larger organizations (i.e., the OTA authority, and possibly the water firm if the franchise is awarded to a firm owned by local governments). Costs (\( C_{lg1} \) and \( C_{lg2} \)) and benefits (\( B_{lg1} \)) take place at future times (\( t_1, t_2, \) and \( t_3 \)). Hence, the payoff that each local government can be generally written in the form:

\[
P_{lg} = \frac{-C_{lg1}}{(1 + \delta)^{t_1}} + \frac{-C_{lg2}}{(1 + \delta)^{t_2}} + \frac{B_{lg1}}{(1 + \delta)^{t_3}}
\]

Table 1 shows the payoff matrix of the game played by the two local
governments. If \( p_{lg} \) is negative, then the strategy not to define the OTA boundaries (ND) weakly dominates the strategy to define the OTA boundaries (D). Strategy (ND, ND) is a Nash equilibrium, i.e., if both local governments choose ND, then none of them would be better off by deviating to play D. Instead, (D, D) is not a Nash equilibrium, i.e., if at least one local government deviates to play ND rather than D, then both local governments would be better off by getting 0 rather than \( p_{lg} \). If \( p_{lg} \) is positive, then strategy D weakly dominates strategy ND. In this case, playing (D, D) is a Nash equilibrium, i.e., if both local governments choose D, then neither would be better off by deviating to play ND. However, in this case also strategy (ND, ND) is a Nash equilibrium, i.e., if one local government deviates to play D rather than ND, then it would be no better off than playing ND. Thus, even if \( p_{lg} \) is positive, local governments may be 'stuck' to play not to agree with each other to define the OTA boundaries.

When is \( p_{lg} \) positive? The value of \( p_{lg} \) is affected by four factors. First, \( p_{lg} \) is greater – *ceteris paribus* – the lower the value of the costs incurred by local governments for the loss of direct control of the water planning and control functions (\( C_{lg1} \)) and water management functions (\( C_{lg2} \)). Control of these functions is assumed to provide benefits to local governments in terms of influence on water-related jobs and public contracts. Second, \( p_{lg} \) is greater – *ceteris paribus* – the higher is the value of the benefits that arise from the joint control of larger organizations, once the water planning and control functions are pooled together into the OTA authority and if local government-owned water firms are merged together. These benefits (\( B_{lg} \)) may offset
the costs of the loss of direct local governments’ influence on water-related jobs and public contracts. The realization of $B_{lg}$, however, is dependent on setting up governance arrangements in the OTA authorities and in the merged water firms that protect the stakes of each local government. Local governments may not know in advance how well future governance arrangements will protect their stakes, hence they may be uncertain as to whether $B_{lg}$ is higher than the costs of the loss of direct influence on water-related jobs and public contracts.

The third and the fourth factors which affect the value of $p_{lg}$ are the time in which the costs ($C_{lg1}$ and $C_{lg2}$) and benefits ($B_{lg}$) will materialize ($t_1$, $t_2$, and $t_3$) and the discount rate ($\delta$). The earlier the costs and the later the benefits are believed to materialize, the lower the value of $p_{lg}$. If local governments believe that the costs of the loss of direct influence on water-related jobs and public contracts materialize relatively early, while the benefits which arise from the joint control of larger organizations materialize relatively late, then discounted $B_{lg}$ may be quite small with respect to discounted $C_{lg1}$ and $C_{lg2}$. The extent to which future benefits offset future costs is also affected by the discount rate $\delta$ (which is assumed as a given constant). The more local governments are “patient” or “forward looking” (i.e., $\delta$ is relatively low), the more future benefits at time $t_3$ may offset future costs at time $t_1$ and $t_2$.

This analysis suggests that local governments may not come to agree on the definition of the OTA boundaries because of two reasons. First, if $p_{lg}$ is negative, then local governments choose not to define the OTA boundaries because of avoiding negative outcomes. If $p_{lg}$ is positive, local governments choose not to define the OTA boundaries because they have no incentive to deviate from playing the defection strategy. The belief that $p_{lg}$ is positive, therefore, is a necessary but not sufficient condition for the local governments to agree to define the OTA boundaries. In other
words, the lack of negative payoff when playing the strategy not to define the boundaries of the OTAs has important effects on the outcome of the game interaction.

The features of the water reform design effectively put local governments in the position of “veto players”. A question arises, however, concerning whether the regions could pass the regional legislations anyway, irrespective of local governments' lack of agreement. In order to tackle this question, we model the game interaction between a region $R_i$ and any local government $LG_{ji}$ located within $R_i$. If the region passes the regional legislation while the local government does not define the OTA boundaries, then the region incurs the cost of a political conflict with the local government ($C_{r1}$), which would struggle to affirm its (constitutional and legislative) prerogatives on the organization of the water service areas. If the local government wants to define the OTA boundaries while the region does not pass any regional legislation (say, because the region wishes different OTA boundaries), then the region incurs the cost of a political conflict with the local government ($C_{r2}$). If the region passes the regional legislation that the local government wants, or if the region does not pass any regional legislation while the local government does not want to define the OTA boundaries, then the region does not incur any cost. The payoff matrix for this game is shown in Table 2.

<table>
<thead>
<tr>
<th>Region</th>
<th>Local Government</th>
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<tbody>
<tr>
<td>$R_i$</td>
<td>$LG_{ji}$</td>
</tr>
<tr>
<td>NP</td>
<td>ND</td>
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<tr>
<td>NP</td>
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<td>NP</td>
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The game in Table 2 presents two Nash equilibria. In the first Nash equilibrium (P, D), no player has any incentive to deviate to play another strategy: if the region plays NP, then it would get worse payoff $C_{r2}$; if the local government plays ND, then it would not improve its payoff. In the second Nash equilibrium (NP, ND),
as well no player has any incentive to deviate to play another strategy: if the region plays P, then it would get worse payoff $C_{r1}$; if the local government plays D, then it would not improve its payoff. This analysis suggests, then, that the regions cannot really affect the definition of the OTA boundaries. If the local government plays not to define the OTA boundaries, it would not deviate to play to define the OTA boundaries even if the region plays to pass the regional legislation.

Could the central government affect the definition of the OTA boundaries, then? In order to answer this question, we model the interaction between the central government CG, any region $R_i$, and local governments LG as a sequential game, as shown in Figure 1. In the first stage of the game, the region chooses whether to pass the regional legislation (P) or not (NP). If the region plays P, then it incurs the cost of the political conflict with the local governments ($C_{r1}$) while the central government gets the benefit of making this implementation task executed ($B_{ng1}$). If the region plays NP, then the central government can choose whether to exercise its substitutive powers (E) against the region or not (NE). If the central government plays NE, then it incurs the cost of having the region missing applying for EU funds for infrastructure development ($C_{ng2}$), while the region does not incur any cost. If the central government plays E, then payoff depends on the strategy played by local governments. Previous analysis showed that, even if the region plays the strategy to pass the regional legislation, local governments might not define the OTA boundaries anyway. If local governments play the strategy to define the OTA boundaries (D), then the central government gets the benefit of getting this implementation task executed ($B_{ng1}$) and incurs the cost of the political conflict with the region ($C_{ng1}$) while the region incurs the cost of having being spoiled of its competences ($C_{r2}$). If local governments play not to define the OTA boundaries (ND), then the central
government gets the cost of the political conflict with the regions ($C_{ng1}$) while the region incurs both the cost of the political conflict with local governments ($C_{r1}$) and of having being spoiled of its competences ($C_{r2}$).

< insert Figure 1 here >

In the last stage of this sequential game, local governments are indifferent whether to play D or ND. The central government, then, is uncertain whether the strategy to exercise the substitutive powers (E) brings a payoff $B_{ng1} - C_{ng1}$ (if local governments play D) or $- C_{ng1}$ only (if local governments play ND). Even if the central government believes that local governments play D, it would exercise the substitutive powers only if $B_{ng1} - C_{ng1} > - C_{ng2}$. If the cost of the political conflict with the region ($C_{ng1}$) is higher than the benefit of accomplishing the implementation task and avoiding the lack of infrastructure development ($B_{ng1} + C_{ng2}$), then the central government is better off by playing not to exercise its substitutive powers (NE). In the first stage of the sequential game, the region can anticipate that the central government plays NE. The region, therefore, is better off by playing not to pass the regional legislation (NP, which brings to the region a payoff nil) rather than playing to pass it (P, which brings to the region payoff $- C_{r1}$). This analysis suggests, then, that also the central government may not affect the definition of the OTA boundaries. Even if it plays to substitute the region in passing the regional legislations, local governments do not necessarily coordinate to define the OTA boundaries.

Implementing the water reform in Alto Valdarno (1994-1997)

Differently from the rest of Italy, in part of Tuscany the implementation of the
water reform proceeded at relatively fast pace. In one of such areas, called Alto Valdarno, local governments had been negotiating the centralization of water service provision since 1990 (Lobina 2005). At that time, the local government-owned gas firm Coingas, which was owned by the municipality of Arezzo, had proposed to the mayor to let the firm develop into a multi-utility company operating in the gas and water industries. Having gained the support of the center-left parties that backed up the city executive, in October 1992 Coingas submitted a plan which provided that the firm would be reincorporated as a “municipal company” and would be assigned the water concessions of Arezzo (which directly managed water services at that time) and of 24 other neighboring local governments. The Coingas plan was approved, first, by the Arezzo city council in December 1992 and, later, by all the other 24 local governments by October 1993.

In 1995, the support for the Coingas plan dissolved after the formation of a new center-left coalition executive in Arezzo. Following the political orientation of the regional branch of the leftist Democratici di Sinistra (DS), the new mayor favored the formation of mixed public-private ownership companies rather than municipal companies for the management of local public services. The Coingas plan was overruled, and in February 1996 the city council of Arezzo established a local government majority-owned water company, whose ownership was shared with surrounding municipalities. Within a few years, the organization of local public services through local government majority-owned companies gained attention in several local governments in Tuscany and in other regions, too. In the national academic and water community circles, it became to be addressed as “the Tuscany model”, because of its very first conception and practical application in this region of the country.
Explaining within-case variation across space

The narrative showed that some parts of Italy deviated from the overall pattern of non-implementation after the water reform came into force. In order to explain this part of the episode, we focus on modeling the interaction between local governments in the Alto Valdarno area in the same fashion of the coordination game of defining the OTA boundaries shown in Table 1. For the sake of simplicity, we consider again an overly simplified scenario where two local governments only, LG1 and LG2, play the coordination game. Each player can choose whether to agree on the definition of the OTA boundaries or not. The payoff structure is equivalent to the coordination game presented in the first step of the analysis. If both local governments agree to define the OTA boundaries, they both get a payoff that includes the cost of losing direct control of water planning and regulatory functions ($C_{lg1}$), the cost of losing direct control of the water management functions ($C_{lg2}$), and the benefit of influencing the activities of the OTA authority and the water firm if this is awarded the franchise ($B_{lg1}$).

As shown in the first part of the analysis, coordination between local government may arise if players perceive $p_{lg}$ to be positive. Differently from the rest of the country, particular conditions, which apply to the Alto Valdarno area, play an important causal role in setting the value of $p_{lg}$. Local governments of the Alto Valdarno area had already negotiated the merger of their water firms well before the enactment of the water reform. Even if the negotiation did not result in any reorganization of local water service provision, local governments could form the belief that future benefits of pooling together their water firms offset the costs of losing direct control of the water functions within their respective municipal service areas. We can also hypothesize that the past experience of negotiation could facilitate
a mechanism of emergence of cooperation (Axelrod, 1984) between local governments when they played the game to define the boundaries of the OTAs. Local governments of the Alto Valdarno area, moreover, were especially receptive of the political orientation of the regional branch of the party Democratici di Sinistra (DS), which favored the formation of mixed public-private ownership firms for water service provision. Local governments of the area could form the belief that the other municipalities of Alto Valdarno shared equivalent views about how to reorganize water firms. Local governments, then, expect that future benefits of pooling together the water functions materialize relatively fast, i.e., that little negotiation would be required to agree on the governance institutions of the centralized water service provision.

Taking these conditions into account, we can infer that local governments of the Alto Valdarno believe (a) the costs of losing direct control of the water planning and regulatory functions ($C_{lg1}$) and of the water management functions ($C_{lg2}$) to be lower than believed by local governments in other areas of the country, because preparatory actions have been taken already to give up their direct involvement in water service provision, (b) the benefits of influencing the activities of the OTA authority and the merged water firm ($B_{lg1}$) to be higher, and (c) the time in which benefits materialize to be shorter because of shared views about reorganizing water service provision. Additionally, we can argue that not defining the OTA boundaries bore negative implications for local governments of the Alto Valdarno area, because of the loss of the political capital that had been accumulated when forming the consensual view about the benefits of pooling together water services in a jointly owned water firm. Taken together, these conditions account for relatively higher net benefits from the definition of the OTA boundaries that local governments of the
Alto Valdarno expect to get with respect to local governments in other areas of the country.

**Defining the OTA boundaries (1997 onwards)**

In 1997, the central government enacted a piece of legislation (Act 344/1997) that allocated public funds for a program intended to improve the sorry state of the sewage and wastewater treatment infrastructure. The program was mainly intended to comply with the environmental standards set by 91/271/CE directive, that the EC Commission had issued in 1991 and that the Italian government had not implemented yet. The legislation passed in 1997 provided that the central government would assign funds to the regions on the basis of plans prepared on an OTA-by-OTA basis. The definition of the OTA boundaries, then, was required in order to appropriate shares of the budget for infrastructure development. The 1997 legislation also included the provision that, if local governments did not come to an agreement on the definition of the OTA boundaries, these water administrative areas would correspond to the territories of the provinces.

After the 1997 legislation came into force, the issue of OTA formation quickly raised up in local governments' agenda. Local governments were eager to appropriate funds for infrastructure development within their jurisdictions. They were also interested, however, in asserting their prerogatives on the organization of local water services. After lengthy negotiations about the design of OTA authorities, local governments agreed to establish them along traditional jurisdictional boundaries. In twelve regions, the OTA boundaries resulted equal (or very proximate) to those of the provinces, and in five other regions they were set as corresponding to the same regional territories. Only in Tuscany and Campania were OTAs defined according to
geographical watershed areas.

After the OTA boundaries were defined, local governments moved on to establish the OTA authorities. Local governments' attention towards this issue grew as they became increasingly exposed to information about other parts of Italy where OTA authorities had been established. The early experiences of implementing the regulatory reform in Tuscany, in particular, were a common reference within the ongoing discourse of the national water policy community. In Alto Valdarno and neighboring OTAs, local governments had progressed relatively fast in the establishment of the OTA authorities. Water policy experts, who maintained contacts with each other especially through the national association of municipal water and gas companies Federgasacqua, channeled accounts of Tuscany's experience as advantageous for local governments. In Alto Valdarno, for example, local government-owned firms had merged into a relatively large business company partially owned by Suez-Lyonnaise des Eaux and local financial investors. Far from losing their influence on local water industries, local governments understood that they had rather gained the opportunity to generate job appointments and public contracts at a much larger scale than the municipal service areas.

All in all, the number of OTA authorities established in the country grew steadily from 1997 onwards. While the first OTA authority was established in Alto Valdarno in 1997, the total number of OTA authorities raised to 30 by the end of 1999, to 48 in 2000, and 74 in 2001 – out of 89 OTAs that had been defined by that time. Within a few years' time, then, most local governments had come to centralize their water planning and regulatory functions. While the implementation of the water reform had languished during the initial period 1994-1997, after a “turning point” in 1997 the process speeded up and resulted in an increasing number of local water
regulatory authorities being established in the next years.

*Explaining the acceleration of the implementation process after the turning point (1997-2001)*

Next step of the analysis is to explain why, after the 1997 legislation, local governments accelerated the implementation of the water reform. The analysis will focus on two questions in particular, namely, why local governments defined the OTA boundaries and why they also established the OTA authorities. In order to tackle the first question, we model the interaction between local governments and the regions in the same fashion of the game shown in Table 2. Any region $R_i$ can choose whether to pass the regional legislation by including the default definition of the OTA as equaling the provincial territories ($P$) or not to pass it ($NP$). Any local government $LG_{ij}$ included in the region $R_i$ can choose whether to coordinate with other municipalities to define the OTA boundaries ($D$) or not ($ND$). Similarly to the model shown in Table 2, if the region plays $P$ and the local government plays $D$, then payoff is $(0, p_{lg})$. If the region plays $NP$ while the local government plays $D$, then payoff is $(-C_{r2}, 0)$. Differently from the model shown in Table 2, if the region plays $P$ while the local government plays $ND$, then payoff is $(-C_{r1}, p_{lg} - C_{lg3})$, i.e., the region incurs the cost of a political conflict with the local government ($C_{r1}$), while the local governments gets the discounted net benefit $p_{lg}$ minus the cost incurred for having been overridden in the definition of the OTA boundaries. If the region plays $NP$ while the local government plays $ND$, then payoff is $(0, -C_{lg3})$, i.e., the region does not incur any cost while the local government suffers the cost for having been overridden in the definition of the OTA boundaries anyway.
The game shown in Table 3 presents one Nash equilibrium only, (P, D) (while the one shown in Table 2 contains two Nash equilibria). If the region plays P and the local government plays D, no player has any incentive to deviate to play any other strategy. Strategy (NP, ND) is not a Nash equilibrium, instead. While the region would not deviate to play P rather than NP (because it would get payoff \(- \text{C}_{r1}\) rather than nil), the local government would be better off if playing D rather than ND (because it would get payoff nil instead of \(- \text{C}_{lg3}\)). We note, however, that strategy (NP, D) is not a Nash equilibrium either, because, if the local government plays D, then the region would be better off by deviating to play strategy P (because of getting payoff nil instead of \(- \text{C}_{r2}\)). In sum, if we assume that the imposition of the default definition of the OTA as equaling the provincial territories is perceived by local governments as a cost (because it overrules their competences on the organization of local water provision), then both the regions and the local governments end up better off if they cooperate to define the OTA boundaries and passing the regional legislation.

In order to tackle the second question, namely why local governments established the OTA authorities after the regions passed the regional legislations, we again model the interaction between local governments as a coordination game. Let us assume, for the sake of simplicity, that two local governments only (LG\(_1\) and LG\(_2\)) are located in the same OTA. Each local government can choose whether to establish the OTA authority (E) or not (NE). If both local governments choose to establish it (E), then they incur the costs of losing direct control on the water planning and regulatory functions because of centralizing them into the OTA authority (the cost \(\text{C}_{lg1}\) is
incurred at the present time) and of the water management function if franchise is not awarded to a local government-owned firm ($C_{lg2}$ at future time $t_1$), and get the benefit of jointly controlling larger organizations ($B_{lg1}$ at future time $t_2$). Local governments, therefore, get the payoff:

$$q_{lg} = -C_{lg1} + \frac{-C_{lg2}}{(1 + \delta)^{t_1}} + \frac{B_{lg1}}{(1 + \delta)^{t_2}}$$

If both local governments choose not to establish the OTA authority (NE), then they incur the cost of political blame for not implementing the water reform ($C_{lg4}$). If any local government chooses to establish the OTA authority while the other does not, the former gets payoff nil while the latter receives payoff $C_{lg4}$. The payoff matrix of this game is shown in Table 4. Any local government's strategy depends on the value of $q_{lg}$. If $q_{lg}$ is greater than $-C_{lg4}$, then strategy E dominates strategy NE, hence strategy (E,E) is a Nash equilibrium. If $q_{lg}$ is less than $-C_{lg4}$, then the game shown in Table 4 has no (even weakly) dominant strategies: if any local government plays E, then the other plays NE, while if any local government plays NE, then the other plays E. In this case, the game has two Nash equilibria when one local government chooses to establish the OTA authority while the other does not [(E,NE) and (NE,E)]. Local governments, therefore, are not able to coordinate a joint strategy to establish the OTA authorities.

< insert Table 4 here >

This analysis shows that the values of $q_{lg}$ and $C_{lg4}$ are important in order to determine whether local governments establish the OTA authorities or not. The establishment of the OTA authorities is more likely to happen the higher the value of
qlg and the higher, in absolute terms, the value of C_{lg4}. As for qlg, its value is higher – ceteris paribus – the lower are the costs incurred by local governments for the loss of direct control of the water planning functions (C_{lg1}) and of the water management function (C_{lg2}), the higher is the value of the benefits which arise from the joint control of larger organizations (B_{lg1}), the earlier the benefits will materialize in time (t_2) with respect to the costs (t_1), and the lower the discount rate (\delta). The value of C_{lg4}, is higher in absolute terms if the cost of the political blame charged on the local governments for not implementing the water reform is relatively high.

Particular conditions of the water sector after 1997 could play an important causal role in the establishment of the OTA authorities. The narrative showed that, at that time, local governments had started to become exposed to accounts of early experiences of implementing the water reform, with the Alto Valdarno being a frequent reference. This information could make local governments believe that the benefits of pooling together the water planning and regulatory functions and the water management functions offset the costs of losing direct control of these functions. Local government, then, could believe that the value of qlg is relatively high with respect to C_{lg4}, with the effect that local governments chose to coordinate to establish the OTA authorities. We may hypothesize that a mechanism of imitation, activated when playing strategic games (Levine and Pesendorfer 2007), could affect local governments' beliefs in such a way as to make the emergence of cooperation more likely to happen.

**Discussion: Explaining Policy Reform Implementation through Analytic Narratives**

The present case study provides some evidence for explaining the process of
institutional change that takes place in the implementation of a policy reform within the context of a multi-level governance system. The explanation of the path and outcome of the implementation of the water reform in Italy suggests that various factors jointly contribute affecting the process dynamics of implementing regulatory reforms in this type of scenario. Factors that figure prominently in the explanation for the faltering part of the implementation process include initial conditions (the fragmentation of the water industry, diffused local government ownership, and local governments' stakes in the local water industries), features of the policy content (the mandate to consolidate water services and centralize water regulatory functions), and features of the policy process (the procedural rules of the water reform statute that required cooperation between local governments), together with characteristics of the particular type of scenario (constitutionally and legally sanctioned autonomy of local governments on the organization of local public services and allocation of powers across the multiple governance layers). Factors that help accounting for the particular trajectory of the water reform implementation in Alto Valdarno include, instead, special features of initial conditions (negotiated agreement between local governments on the consolidation and centralization of water services) and of the policy process (the formation of an advocacy coalition in favor of consolidating and centralizing water services). Factors that contribute explaining the country-wide acceleration of the water reform implementation after 1997, finally, include changed features of the policy content (the provisions for infrastructure funding allocated on OTA-by-OTA basis) and of the policy process (the activation of the national policy community of water experts and the “de-coupling” of the execution of implementation tasks, i.e., the definition of the OTA boundaries became a separate issue from negotiating the establishment of OTA authorities, that could be postponed at later stage).
In part, these findings from the case corroborate existing generalizing arguments about the importance of changes of institutional arrangements and positive feedback effects (Patashnik 2003, 2008) on the trajectory of policy reform implementation. Particular conditions attached to the scenario of the multi-level governance context, however, suggest some qualifications of previous scholarly works. The political confrontation between sub-national governments, in fact, may result in a deadlock of the policy reform implementation process, especially when conditions include the presence of a relatively large number of actors who have entrenched stakes in the reformed policy domain. In such circumstances, other actors of the multi-layered system of governance may be ineffective to affect the behavior of inactive implementers, for reasons that may be related to the structure of strategic interactions rather than the lack of formal powers or resources. In addition, past experience of collaboration between implementers and other favorable circumstances may account for a hypothesized mechanism of emergence of cooperation (Axelrod, 1984) that helps explaining variation of institutional change across local instances of reform implementation. Finally, changed features of the policy content (especially related to distributional rules of additional resources) and the activation of “brokers” between different sites (McAdam et al. 2001) help accounting for a hypothesized mechanism of imitation (Levine and Pesendorfer, 2007) that provides an explanation for variation of institutional change process over time.

In addition to that, the present case study suggests some reflections on the use of analytic narratives within comparative public policy research. First, the case study makes more apparent that analytic narratives can provide findings that contribute to wider research programs but explaining instances of institutional change that are intrinsically interesting for a relatively narrow and history-oriented scholarly
community. Second, the 'Open Formulae' view helps clarifying the logical structure of the argument that leads to the formulation of hypothesized causal relationships and the function that features of the type of scenario under consideration play in the explanatory argument. Finally, issues related to the lack of realism of the assumptions concerning actors' rationality cannot be neglected, but they seem to play a relatively minor role with respect to the outcome of the case study, namely the one of identifying tentative explanations for observed trajectory of institutional change on the basis of the combination of selected causal factors and mechanisms.

Analytic narratives, moreover, should be properly understood as an iterative cycle. Once tentative explanations are formulated, the researcher is stimulated to probe the inquiry into more accurate accounts of the observed trajectory of institutional change. In the present case study, for instance, further issues arise concerning questions such as: How exactly does past experience of cooperation make policy implementers more likely to cooperate? How precisely is behavior of policy implementers affected by what other implementers do in parallel local settings? In face of these questions, the simplified assumptions of utility maximization appear relatively inadequate to account for the complexity of cognitive and social dynamics that is related to changes of actors' attitudes and beliefs. The researcher, then, could comfortably surrender the relative parsimony of rational choice assumptions for the sake of attaining more accuracy in understanding the “cogs and wheels” of social interactions that result in the institutional change process under consideration.

**Conclusions**

A lesson that may be taken from the present case study is that, under certain conditions, sources of resistance to reform sectors of the economy that originate from
“governmental protectionism” (Landy et al., 2007) may be successfully overcome. In part, the findings of this case study support the argument that opening up regulated sectors of the economy to competitive pressures and reducing governmental ownership and control of public service providers can be effectively blocked by adverse governmental authorities – as it was the case during the largely obstructed part of the water reform implementation episode before 1997. The case study, however, also shows that governmental authorities may became favorably inclined towards implementing regulatory reforms when the policy content includes appropriate rules for resource allocation and when an advocacy coalition that supports change can leverage on past instances of apparently successful change experiences and on a cohesive policy network for diffusing ideas and messages. Accordingly, policy-makers should make good use of the repertoire of policy tools at their disposal in such a way as to contribute framing implementers' understanding of the interaction setting and to provide appropriate inducements and constraints for orienting implementers' behavior. Experiences of “early movers” in the execution of implementation tasks should be exploited as sources of evidence for the viability and advantages of implementing the policy reform mandate.

Another lesson of the present work relates to the use of analytic narratives for comparative public policy research. When combined with an appropriate argument for case selection and for the intended contribution to an existing scholarly discourse around an area of study, the approach can be fruitfully employed to analyze a slice of history and to draw tentative generalizations on the basis of the explanation for the path and outcome of the experience studied. When cast in this light, analytic narratives can enrich the variety of research approaches for tackling issues of relevance within the political science and policy studies disciplines. This does not
clear all of the theoretical and methodological concerns that critics raise towards the approach, and that remain partially unanswered. When put into practice, moreover, the approach also entails pragmatic issues such as the one (that may be admittedly relevant here) of compressing adequately detailed narratives and appropriately reasoned models within standard academic paper length. Further methodological work is needed, therefore, in order to make analytic narrative a sharper instrument in the research toolbox of political scientists and public policy scholars.
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Tables

Table 1. Payoff matrix of local governments' coordination game of defining the OTA boundaries.

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<th>Not to define the OTA boundaries (ND)</th>
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Table 2. Payoff matrix of the game played by the region and any local government.

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Table 3. Payoff matrix of the game played by the region and any local government after 1997.

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Table 4. Payoff matrix of local governments' game of establishing the OTA authorities.

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<th>Not to establish the OTA authority (NE)</th>
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Figure

**Figure 1.** Sequential game between the region $R_i$, the central government $CG$, and local government $LG$. Payoff refers to (the regions, the central government).