NETWORKS AS LEVERS:

EMERGENCE, FUNCTIONING AND EXPORT OF TRANSNATIONAL NETWORKS OF ENERGY REGULATORS.

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“To my mother, and to Anna”.

Abstract

This thesis investigates the emergence, functioning and evolution of voluntary, informal networks of regulators. Via a combination of inductive and deductive reasoning, qualitative and quantitative methods, this research sheds light on thus far unexplored mechanisms of networked regulatory collaboration. These are: the conditions leading to spontaneous network emergence and consolidation into an institutional structure; the factors determining network members' ties to each other; the strategies that network members deploy to ensure network survival; the conditions facilitating network entrepreneurship; and the role of informal networks in the implementation of foreign policy agendas.

Through six empirical chapters, divided in three parts, this thesis explains why regulators network. The core argument is that regulators use networks as levers: they leverage their collective collaboration in order to obtain goals that are both individually and collectively desirable. The first part shows that they network for control: regulators form networks whenever they face concrete threats to the scope of their authority and the extent of their autonomy. The second part shows that regulators network for resources: similarity in the political economy and expertise explain the structure of regulators' relationships together with resources, as regulators rely on their peers to compensate for their scarce staff numbers. The third part shows that regulators network for survival, and that the institutional integration of networks facilitates regulators' network entrepreneurship. Further, it shows that international organisations and regulators deem informal networks capable of fostering policy change; hence, they export regulatory networks to target jurisdictions in the explicit attempt of replicating their success formula.

The thesis accomplishes this ambitious research agenda by focusing on four empirical cases of transnational/trans-jurisdictional networks of energy regulators: the Council of European Energy Regulators (CEER), the National Association of Regulatory Utility Commissioners (NARUC) of the USA, and their respective progeny, i.e. the Association of Mediterranean Energy Regulators (MedReg) and the Energy Regional Regulatory Association (ERRA) of Central and Eastern Europe.

Introduction: rationale of the research and key findings.

- *Why do you think regulators take part in these networks?*
- *The word "network", I think that's the answer.*

(interview 17)

The motivation for this thesis is to bring new theoretical, empirical and methodological perspectives to the study of regulatory networks. It is based on six empirical chapters divided in three parts and addressing four different literatures. The essential motivation for such an ambitious undertaking is that the wealth of contributions on regulatory networks examine them through a limited set of methodological and theoretical lenses. This research features new findings on regulatory networks of substantive academic and policy interest. By investigating the emergence, operation and the evolution of regulatory networks, it offers a different approach to the study of networks to those taken in the existing literature and opens new paths of inquiry.

The key argument of this thesis is that regulators use their networks as levers; networks afford regulators leverage, at both domestic and supranational level, to pursue goals that are both individually and collectively desirable. The focus of this analysis is on the inner workings of trans-national or trans-jurisdictional regulatory collaboration: how regulators relate to and rely on one another in their respective contexts. Specifically, I investigate the conditions leading to spontaneous, voluntary network emergence, way before endorsement by political principals (which is the point of departure of most existing literature). I also investigate the drivers of network collaboration, i.e. the factors explaining regulators' specific ties to their most regular, frequent collaborators. Finally, I explore the leverage that networks have even outside their jurisdiction (which I define as the sum of the territorial jurisdictions of network members), whenever they play a role in foreign policy agendas, and investigate why they choose to play such a role.

The research is innovative in several ways. First and foremost, my approach to the study of regulatory networks starts from within networks themselves and from the perceptions, evaluations, and actions of network members. This approach allows me to avoid taking the external environment of networks as a given, and to articulate their relationship with it in terms of resource dependency (Pfeffer and Salancik, 1978), as well as to explore how regulators navigate this dependency over time. Secondly, and relatedly, I show that there is a relationship between regulators' institutional self-interest and their contribution to regulatory policy, which is mediated by their networks. Regulators leverage their network to manage their relationship with their political interlocutors so as to strengthen and preserve their institutional status, while also proactively feeding into regulatory policy.

Thirdly, I relinquish the assumption, implicit in existing literature, that regulators are all the same: they differ greatly in the extent of their resources, in their expertise, in terms of the market they oversee and in the geographical location of those markets. I show these factors to affect regulators' choices regarding whom to network with, i.e. which relationships they maintain on a bilateral basis, beyond the policy requirements of their institutional setting. In turn, these choices determine the structure of the network. This structure is susceptible to change; in this thesis, I only manage to provide a snapshot of network structure in a given moment. If the structure of the network might change, the determinants of that structure are not likely to: expertise, resources, similarity in the political economy emerge from this thesis as the key drivers of regulatory informal networking.

Fourthly, I also dismiss another assumption that is implicit in most existing literature; namely, that regulatory networks in different parts of the world have emerged independently of one another and can or should be studied as independent observations. In this thesis, I show that regulatory networks are interdependent. The histories of the networks examined in this thesis are entwined, and pertain to foreign policy agendas: regulatory networks are "exported" from economically advanced countries or regions to economically less advanced jurisdictions within the context of foreign policy programmes, in the attempt of entrenching or fostering policy change.

I examine the role that regulatory networks play in foreign policy programmes, once again, from the perspective of the regulators involved. In this regard, I find evidence of multi-causality: namely, the involvement of regulators into the export of their own "network formula" may correspond to different causal mechanisms. I identify two: network survival, and institutional entrepreneurship.

This thesis does not view networks as simply a metaphorical recourse to conceptualize informal relationships amongst groups of regulatory professionals. Those relationships create network structures that can be measured and modelled. In taking this approach, this thesis rediscovers and builds on some of the key tenets of the political science literature on policy networks (e.g. power dependence, policy influence, advocacy) but infuses them in with a dynamism that has largely been absent from existing scholarship, where networks have been largely static. By contrast, this thesis views networks as the results of generative processes, and structures that can change over time as regulators create new and sever old links, redefine the functions of the network and expand the mission beyond the realm of their territorial jurisdiction.

The thesis draws on, and contributes to, several literature strands; from public administration and public policy to political economy, international relations and international political economy. By talking to these different literatures, the research highlights the breadth of scope that the study of regulatory networks can and should have, and thereby reaches beyond well-trodden, low-risk paths of research. The thesis brings into the study of regulatory networks an emphasis on emergence, which is revelatory of actors and interests, incentives and ideas driving the establishment of networks. It adopts an evolutionary perspective: networks change over time as the external environment in which they are embedded changes; regulators learn, and modify their network ties accordingly. It takes serious the agency of regulators insider networks, which is invariably overlooked in existing literature. It also aims to break new ground by addressing a hitherto unexplored connection between networks and foreign policy.

The analysis is pursued through an examination of a single sector and four case studies. The first two cases are the network of energy regulators of the European Union, the Council of European Energy Regulators, (CEER) which is compared with the National Association of Regulatory Utility Commissioners (NARUC) in the United States of America (USA). The second two case studies investigate networks, which are the offspring of the first two. They are the Association of Mediterranean Energy Regulators (MEDREG), which brings together regulators from Southern European Member States, Balkan countries, Middle East and North African countries, and the Energy Regional Regulatory Association (ERRA) of energy regulators of Central and Eastern Europe. The comparative approach makes it possible to analyse and explain variance in networks of the same sector but across different time periods, macro-regional, and institutional contexts.

The reason to focus on networks of regulators of electricity and gas – for brevity, 'energy regulators' – is that these networks have been less often investigated than networks of other infrastructure sectors, notably telecommunications. Yet, the energy sector is one of the most controversial and politicized of all sectors subject to economic regulation. In addition, the characteristics of energy infrastructure are interesting to juxtapose to the study of networks of institutions charged with regulating it. Energy grids can cross national borders, but fall short of global reach. They link the local, the national and the transnational dimensions of regulatory governance. Moreover, the energy grid is nothing but a carefully structured, constantly balanced network. Hence, in this thesis the geographical and technological aspects of energy infrastructure feature prominently.

The thesis is divided into three parts. The first part speaks to the public administration literature that focuses on regulatory networks and their rationale. It stems from the acknowledgement that regulatory networks often emerge spontaneously (Kenis and Provan 2008) and are endorsed by political institutions (e.g. the European Commission, see Eberlein and Newman 2008 or Coen and Thatcher 2008) only later. It, therefore, asks: what are the conditions for spontaneous regulatory network emergence? In responding to this question, the two

chapters in this part rely on inductive reasoning and on a comparative research design. I carry out a comparative historical analysis of the emergence of the Council of European Energy Regulators (CEER) and the National Association of Regulatory Utility Commissioners (NARUC) on the basis of interview material (42 interviews with regulators from both networks), documentary and archival analysis (only in the NARUC case). I find that network emergence can be usefully distinguished from a slightly later phase, which I name "network consolidation". Network emergence results from the emergence of regulatory authorities which, in both cases studied, resulted from the emergence of the Regulatory State. New to their profession and tasked with reforming the mode of governance of sectors of crucial economic and political relevance, such as infrastructure sectors, regulators are alone in their territorial contexts, with no precedent to refer to and no peers.

Hence, they begin interacting with peers in their jurisdictional context in order to compare and contrast experiences and learning from each other. This learning effort is not just motivated by professional aims: regulators need to establish their legitimacy to make decisions of great distributional consequences and build their reputation. However, this remains a loose set of informal relationships driven by informational asymmetries and expertise. The spark for network consolidation occurs whenever regulators face the real threat of either losing their powers, or seeing the realm of their authority severely diminished, or both. Both the USA and the EU are systems of governance articulated across levels. As the Regulatory State took shape, in either context, regulatory competence was distributed across levels and horizontally across different institutions. Tensions for control and primacy of regulatory power ensued. As it became clear that these tensions would become permanent traits of the regulatory governance system, networks consolidated into semi-formal organizations, with a name, headquarters close to the centre of power, set budgetary contributions, work plans, etc.

The chapters identify a further key challenge for regulatory networks: in order to be viable, they have to be policy relevant. Regulators are constantly establishing and re-establishing their legitimacy at both domestic and supranational (federal) level: in

order to credibly claim their individual legitimacy, regulators have to prove their collective one by contributing to the policy process. In turn, feeding into regulatory policy allows regulators to access and influence the early stages of policy formulation, thus affording them an enviable position for furthering policy goals. In both the US and the EU, the interdependence across levels of governance creates a resource dependency between regulators and their supranational peers (the European Commission in the European case; federal regulatory agencies in the US case): the latter rely on the former for information on national (state) markets and companies; the former rely on the latter for political backing. Although these relationships have changed over time (particularly radically in the US case), interdependency between levels of regulatory governance has proven crucial for network consolidation.

Over time, however, the rationale underpinning this interdependency may decline in importance. Two reasons for this decline emerge from the chapters: in the US case, the gradually increasing legislative empowerment of federal agencies began eroding the state level regulators' sphere of control over utilities in their state, rendering the US regulatory federalism increasingly confrontational; in the EU case, the formalization of previously informal relationships, e.g. the establishment of a European Agency for the Coordination of the Energy Regulators, rendered the European Commission's reliance on the CEER for national market information redundant. The final finding of this first part of the thesis is that, in order to survive, networks resort to two strategies: layering and/or conversion. Chapter 3 shows that the CEER is converting its focus to topics it previously did not concern itself with, e.g. consumer policy, and acquiring new functions, e.g. training provision. Chapter 2 hints at the layering strategy deployed by NARUC, by gaining technical assistance functions in aid programmes, which is further detailed in chapter 6.

The second part of the thesis relies on deductive reasoning and focuses on explaining network structure by uncovering the drivers of regulators' informal ties to each other. It comprises chapters 4 and 5, and bridges between network theory and analysis and the political economy, as well as the public administration, literature. This part relies on original network data that I gathered from the full population of

European National Energy Regulatory Authorities, comprising 29 elements. I asked respondents to name the regulatory authorities with which their authority is most regularly in contact with as concerns exchanges of information, opinions and advice. I obtained replies from 28 regulatory authorities. For the missing one, I simply considered the ties they received as reciprocated. Respondents are all informed individuals at their national regulatory authority, because they are in charge of managing and/or supervising the external affairs. I rely on this data in both chapters in this part.

In chapter 4, I formulate several hypotheses as concerns the drivers of regulatory networking. The core hypothesis of the chapter is that regulators prefer to network with peers facing the same sort of sector structure and political economy. I operationalize national political economies by relying on the Varieties of Capitalism typology. The results of the Exponential Random Graph Model I develop in the chapter lend support to the hypothesis. Moreover, the analysis demonstrates the importance of expertise by showing that certain regulators (those overseeing more advanced energy markets) are relatively more sought after, as well as more active, than others. Finally, the results suggest that regulators with medium levels of resources are more active networkers than regulators with high levels of resources. The pattern of electricity interconnections across Member States also bears explanatory power for the observed network structure, confirming the relevance of sectoral characteristics in motivating regulators' ties. However, its importance was less compelling than the political economy factor.

The analysis reveals the existence of a divide between regulators from EU-15 and those from EU-13, particularly the newest Member States. This finding may be a function of time: newer Member States have been members of the CEER network (and of the European Union) for less time and may, therefore, have had less time to build stable relationships with peers from the EU-15. At the same time, however, this finding suggests that spontaneous regulatory collaboration may lead to the formation of cliques (i.e. small groups of close-knit communities) and that the establishment of a European Agency may have been necessary to ensure that the

flow of information across all European regulators, and coordination between them, actually occurred.

In chapter 5, I explore the link between regulatory networking and resources in more detail and develop the hypothesis that regulators use networks to compensate for lacking resources. Individual regulatory authorities are very different in terms of their resources. Even though their human and financial resources positively and strongly correlate with the extent of their population (a proxy, if imprecise, for the size of their market), the institutional economics literature argues that each regulatory authority needs to fulfil a range of expert tasks, whatever the size of their market (Glachant, Khalfallah et al. 2013). Hence, resource constrained regulators may struggle more than well-resourced peers to fulfil those expert tasks. I posit that, faced with those constraints, regulators resort to their network of peers in order to access the expert information they cannot afford. The result of the analysis lend support to the hypothesis. This suggests that, at least in the European context, even though regulatory coordination within networks had scarce impact on convergence, it may have had substantial impact in terms of improving national regulatory governance beyond what national resources would have allowed for.

The third and final part of the literature goes back to comparative historical analysis and inductive reasoning and asks: what explains US and European regulators involvement into foreign policy/external governance programmes such as those that led to the establishment of the ERRA and the MedReg? In order to respond to this broad question, in chapter 6 I retrace the history of the establishment of ERRA; in chapter 7, I retrace the history of the establishment of MedReg. This part of the thesis relies on interview material as well as documentary analysis. This final part of the thesis is very dense empirically and contributes to several strands of research. Besides contributing to the literature on transnational regulatory networks as tackled in the international relations and international political economy fields, it also addresses the literature on the politics of aid and technical assistance through network collaboration. Indeed, the two chapters in this part demonstrate that

informal networks are the deliberately chosen instruments of foreign policy and that fostering informal networks can be part of a security strategy.

The empirical chapters are followed by a short concluding chapter, where I draw together the findings of the research, its contributions and its limitations. I also outline two issues that represent promising avenues for future investigation of regulatory cooperation and coordination in the energy sector: electricity decentralization and the integration of digital and energy technologies.

1. Preparing the ground for analysis: from the literature to the structure of the thesis.

The literature on transnational/trans-governmental regulatory networks has literally boomed since the early 2000s. This literature, steeped in the international relations tradition, primarily focuses on regulatory networks of economic sectors of global extent, such as finance, securities, and banking (Slaughter 1997, Slaughter 2000a, Raustiala 2002, Slaughter 2004, Verdier 2009, Zaring 2009, Ahdieh 2010, Bach 2010, Bach and Newman 2010a, Bach and Newman 2010b, Cao 2012, Bach and Newman 2014, Farrell and Newman 2014, Newman and Posner 2016, Cao and Ward 2017, Henriksen and Ponte 2018). This literature understands and analyses networks through the lens of milestone contributions on neoliberal institutionalism (Keohane and Nye 1974, Keohane 1982, Keohane 1988, Keohane 1998) and international regimes (Haas 1975, Krasner 1981, Krasner 1982) as alternatives to realism to bring order into the anarchy of transnational relations.

In the same period, a burgeoning literature focused specifically on networks of European regulators also emerged, and has kept developing to this day (Eberlein and Grande 2005, Tarrant and Kelemen 2007, Coen and Thatcher 2008, Thatcher and Coen 2008, Lavrijssen and Hancher 2009, Levi-Faur 2011, Maggetti and Gilardi 2011, Yesilkagit 2011, Van Boetzelaer and Princen 2012, Maggetti 2013, Danielsen and Yesilkagit 2014, Egeberg, Trondal et al. 2014, Maggetti and Gilardi 2014, Blauberger and Rittberger 2015, Vestlund 2015, Blauberger and Rittberger 2015b, Mathieu 2016). For the most part, the contributions in this literature stem from an acknowledgement of the uniquely peculiar economic-political construction the EU is, and therefore tend to understand and analyse networks through that lens, variously relying on the insights provided by the public policy and public administration literature, as condensed in the more recent multi-level governance literature (Marks, Hooghe et al. 1996, Scharpf 1997, Benz and Eberlein 1999, Falkner 2000, Hooghe and Marks 2001, Hooghe and Marks 2003, Papadopoulos 2005, Piattoni 2010), which, in itself, has always had an almost exclusive focus on the European Union (Stephenson

2013). The European focus transcended the relevance of sectors: this literature has examined networks of European regulators from a variety of sectors, from the environment to competition policy to banking. Since, however, infrastructure sectors have always been at the core of the integrationist aspirations of the EU, many contributions in this literature focus on such sectors, primarily telecommunications and energy.

These two strands of literature dominate the field of inquiry on regulatory networks. Indeed, their theoretical basis, methods and findings permeate also the much smaller set of contributions that devoted attention to regulatory networks in emerging markets (Berg and Horrall 2008, Horrall 2008, Jordana 2011, LaBelle 2012, Dowdle, Gillespie et al. 2013, Bianculli, Jordana et al. 2015, Fernández-i-Marín and Jordana 2015), also often focused on infrastructure sectors.

In this chapter, I outline the strands of literature that this thesis addresses and contributes to. I begin by noting that, somehow surprisingly, this rich literature on regulatory networks rarely relies on a body of knowledge, which is extremely relevant to the study of collaboration between public administrators, wherever in the world: the political science literature on policy networks. I then survey the key tenets and findings of existing approaches to the study of regulatory networks. Subsequently, I identify the main gaps in the literature as concerns approaches, topics and methods. I then justify the focus on energy regulators and explain the different challenges that they encounter compared to regulators of other economic sectors. Finally, I lay out the research questions and the hypotheses guiding this research, the methodological framework, and the rationale for case selection.

Transnational networks of regulators.

The literature on regulatory networks has an important, if rarely acknowledged, predecessor in the literature on group politics (John 2012). In turn, the theory of groups spawned the literature on policy networks and the many associated

definitional and substantive debates. Preceding the literature on networks is the US notion of "sub-governments", i.e. sub-systems of policy making composed of groups with privileged access to policy-makers (Ripley and Franklin 1980). The famous "iron triangles" label derives from this literature and described US policy making as happening within a triangle featuring Congressional committees, bureaucrats and interest groups (Freeman and Stevens 1987). This literature entered the study of British politics via landmark contributions such as Heclo and Wildavsky (1974), who studied the UK budgeting process and Richardson and Jordan (1979), who distinguished specific "policy styles" determining the structure of interpersonal relations in the networks of public policy making.

To the best of my knowledge, the only contribution understanding a network of regulators (more precisely, of national competition authorities) through the lens of the policy network literature is Cengiz (2013). In her book, Cengiz outlines the main features of the three recognizable European "schools" of studies on policy networks: the British, the German and the Dutch school. These three schools differ in their understanding of the function of policy networks, although they are relatively similar in their evaluation of the desirable outcomes of network collaboration: better policy. The British school understands policy networks as instruments of interest intermediation. Key contributions (Marsh and Rhodes 1992, Marsh and Smith 2000) focused on central-local government relations in the UK. The German school understands networks as instruments of governance and emphasises the importance of trust as the main engine of network collaboration for superior policy outcomes (Kenis and Schneider 1991, Schneider 1992, Schneider 2001). The Dutch school of policy network studies focuses primarily on network management techniques, which it considers essential to ensure productive network collaboration (Kenis and Schneider 1991, Raab and Kenis 2006, Provan and Kenis 2008, Kenis and Provan 2009)

The main criticism addressed to policy network studies concerns their inability to demonstrate that networks are a determinant of policy decision and their overly descriptive nature (John 2012). Policy network studies pioneered the usage of

network analysis in the study of policy relationships and their character (Brandes, Kenis et al. 1999), although, initially, mostly to descriptive purposes. Fierce critics of the policy network approach, such as Dowding (1995), (2001), contended that the policy network approach was of limited theoretical relevance and beset by inefficient analytical methods. At any rate, this literature was first in problematizing the complex patterns of informal networking among stakeholders, and seeking to evaluate their relevance to policy-making and influence on policy outcomes (O'Toole Jr 1997). The perceived failure of the policy network approach to explain how policy outcomes are due to networks may explain why contributions on transnational regulatory networks make scarce, if any reference to this important precedent literature. A further reason may be that, differently from policy networks, regulatory networks are homogenous: they comprise similar entities with similar tasks (Borzel 1997). Therefore, regulatory networks are more amenable to thorough analysis as they do not suffer from the boundary problem that Kassim (1994) identified in the study of European policy networks: networks comprising all sorts of actors are virtually boundless, rendering the network concept unable to clearly specify its object. Sectoral networks of regulators, instead, are not subject to definitional ambiguities.

Because there is usually one regulatory authority (covering one or multiple sectors) per country, regulatory networks tend to be transnational – which attracted the interest of international relations scholars. Indeed, very often, literature reviews on transnational regulatory networks begin by mentioning Anne-Marie Slaughter's (2004c) influential contribution, which acknowledged the emergence of "a new world order". This contribution and the literature it spawned emerged at least a decade after the debate on policy networks in political science, and portrayed regulatory networks as embodying an important conceptual shift in the international system: from a system of unitary states negotiating within the framework of supranational institutions to a system of interactions among various (legislative, regulatory, judicial) components of the state, which interact across borders in disaggregated form. Trans-governmental networks, Slaughter (2004) contends, expand regulatory reach, build trust among their participants, exchange information

and develop best practices, besides offering technical assistance and professional socialization to their members. These findings are common to previous studies of policy networks. In her view, networks are the response to the globalization paradox of needing global government but fearing the centralization of authority in supranational structures: through the power of suasion and the lever of reputation, regulatory networks can create global rules in absence of centralized structures of power, while remaining accountable to their national principals[1].

After Slaughter's (2004c) contribution, scholarly interest in transnational networks of governmental officials blossomed. In particular, the focus has been on the extent to which they are able, and should therefore be relied upon, to improve global governance (Raustiala 1997, Slaughter 2002, Slaughter 2004b, Slaughter and Zaring 2006). Hence, the international relations literature also inherited the policy network literature concern with establishing clear links between networks and policy change, or policy outcomes. This quest, according to some, has proven just as elusive (Verdier 2009). The debate on transnational regulatory networks is now long standing and has come to include a vast range of issues, such as the accountability of networks (Slaughter 2000a, Slaughter 2004a, Maggetti 2010) and the homogenizing power of regulatory transfer of best practices throughout the world (Raustiala 2002). At any rate, this research agenda set the foundations of continued academic and policy interest in understanding transnational networks of regulatory officials.

The EU pioneered "regulation by networks" as a mode of governance when faced with the conundrum of trying to achieve the extent of regulatory harmonization necessary to bring about the Single Market while avoiding the delegation of administrative and regulatory powers to European institutions (Sutherland 1992, Hancher 1996, Dehousse 1997). The European Community's decision to encourage the coordination of regulatory practice between the representatives of national

[1] In her most recent book (Slaughter, A.M., 2017, "The chessboard and the web: Strategies of Connections in a Networked World", Yale University Press) the author goes further by advocating for a network approach in American foreign policy, much in line with the notion of transformational development discussed later in chapter 6.

administrations was meant to achieve the necessary degree of regulatory uniformity. Several contributions, notably Nicolaides (2004), Mintrom and Vergari (1998), Eberlein and Grande (2005), Eberlein and Newman (2008), Van Boetzelaer and Princen (2012), converge on identifying as the main rationale of European Regulatory Networks the task of filling the governance gap between the national and the supra-national/European level, thus engendering (the conditions for) harmonization. Recent refinements of this functionalist argument see the European Commission as an orchestrator of regulatory compliance via networks (Blauberger and Rittberger 2015).

In a similar fashion to scholars of policy networks, scholars of European regulatory networks have assessed their ability to affect policy and, specifically, to fulfil their stated aim of engendering regulatory convergence across the Member States (Maggetti 2009, Maggetti and Gilardi 2011, Maggetti 2014, Maggetti and Gilardi 2014). The findings of these contributions show a mixed record of effectiveness: for instance, whereas the network of European regulators of securities appears to have been able to design and implement soft rules across European Member States (Maggetti and Gilardi 2011), the network of European energy regulators does not (Maggetti 2014). I should note that, in this type of contributions, very little attention is devoted to the explanatory power of the sector itself in making sense of the ease with which regulators are, or are not able to foster regulatory convergence.

Other authors argue that expecting policy impact from informal regulatory networks is naïve: networks are created instead of formal cooperation frameworks whenever the distributional implications of regulatory harmonization would be politically damaging (Kelemen and Tarrant 2011, Tarrant and Kelemen 2017). According to this view, networks are created with the declared intent not to achieve convergence. It has also been suggested that the interest of regulators in networking may reside more in bureaucratic politics than in contributing to governance (Bach, De Francesco et al. 2016). Indeed, recent literature on regulatory networks in a European setting has relinquished regulatory convergence as its sole focus of analysis and gradually come to encompass the point of view of network members, i.e. regulators

themselves. Recent findings are that cooperation within networks has the effect of increasing regulators' powers (Maggetti 2013), even though not their budgets, expanding their autonomy (Yesilkagit 2011, Danielsen and Yesilkagit 2014), create new common resources (Vestlund 2015). Moreover, recent contributions have taken an historical perspective on European regulatory networks, given that, although apparently unable to bring about convergence, they have been operating for over two decades. These contributions have illustrated that, through their networks, national regulators were able to establish the dialogic relationship with European institutions and that they played an active role in consolidating the European regulatory framework, in the cases examined, in telecommunications (Mathieu 2016, Boeger and Corkin 2017).

The literature on transnational networks often discusses the leading role of the USA and the EU on the global governance scene for standards and regulations in a variety of sectors. However, the conspicuous literature on policy diffusion across the USA rarely discusses its networked aspects (even though Mintrom and Vergari 1998 represent an important exception). The same could be said of the rich literature on the USA regulatory federalism (Gormley Jr 1983, Pierce Jr 1984, Hedge, Scicchitano et al. 1991, Lawton and Burns 1996, Gerber and Teske 2000, Cho and Wright 2004, McGuire 2006, Davis and Hoffer 2012, Radaelli and Meuwese 2012), which focuses overwhelmingly on the character of the relationships between and across bureaucratic as well as governmental levels. However, these relationships are usually phrased in terms of federalism and intergovernmentalism. Childs (2001) and Beecher (2012) are important exceptions. Their insights on the network relationships between US state level energy regulators will inform chapter 2.

The USA and the EU systems of governance share two key attributes, which render them suitable for comparison (as I explain in more detail later): both are premised on the choice of independent regulation as a means to achieve superior policy outcomes; and both are articulated across levels of governance. The literature on multi-level governance, however, has exclusively focused on the European Union. The concept of multi-level governance, formulated in a series of works by Marks and

Hooghe (Marks, Hooghe et al. 1996, Marks, Scharpf et al. 1996, Hooghe and Marks 2001, Hooghe and Marks 2003), represents the scholarly effort to integrate different territorial levels in a unified framework of analysis in order to conceptualize, explain and understand the workings of EU governance (Eising 2008). The initial conceptualization of the EU as a MLG system derived from analyses of the politics of the structural funds and the role of regions in the EU (Marks, Hooghe et al. 1996). Over time, the territorial focus of the MLG literature has broadened to include a more metaphorical connotation, portraying the complexity of interactions among actors placed at different political and sectoral levels (Stephenson 2013) as well as occurring at different times (Goetz 2010).

The kinship between MLG and policy networks is amply recognized in the literature (Eising and Kohler-Koch 2003, Kohler-Koch and Rittberger 2006) and drawn upon to convey the interdependence of actors across levels and their collaborative attempts to influence European policy-making. The popular notion of the EU as a "network governance" polity defines the formation of coalitions of interest around certain "issue areas" (Heclo 1978), encompassing different types of actors placed at different governance levels (Piattoni 2010). Networks of national regulators, however, exemplify a typology of network governance that is not adequately captured by the network governance metaphor (Piattoni 2010). First and foremost, networks of national regulators gather one type of actor (regulators) placed at one territorial level (national); they are, therefore, homogenous networks. Secondly, networks of national regulators define themselves along sectoral, not "issue area", lines. Thirdly, these networks feature representatives from all Member States, rather than variable constellations of actors.

These differences might explain why the MLG literature and the literature on regulatory networks have rarely met. Yet, the multi-level governance literature and the inter-governmental and cooperative federalism literature in the USA share important commonalities in terms of the goals they pursue and the questions they ask: what are the conditions for collaboration across levels of governance to deliver desirable outcomes? This question has often been asked in the literature on

regulatory networks. I contend that, besides focusing on outcomes, this literature should re-discover the importance of the collaboration process and how that fits into the broader policy process, what benefits it entails for network members, and how they concretely use their relationships to each other.

Regulatory networks are structures of interaction generated by the agency of individual regulators, given the structural constraints they face at both domestic and supranational (federal) level. They are held together by interdependencies and the realization, via networking, of both individual and collective benefits (de Bruijn and ten Heuvelhof 1995). Studying what these are leads enquiry from description to causal explanation and inference. Importantly, many of the assumptions implicit in existing literature need to be abandoned in order to break new ground in the study of networks. The assumptions debunked in this thesis are those of: stationarity (in the literature, networks never change in either shape, mission or rationale); homogeneity (although regulatory authorities are the same type of institutions, they differ greatly from jurisdiction to jurisdiction); passivity (network members are not merely implementing the directives of their political principals); and isolation (networks are often discussed as if they were isolated from their external institutional environment). There needs to be space in the literature for discussing the conditions leading to spontaneous network collaboration; how and when the rationale of network collaboration may change; and how the differences among network members in terms of resources, expertise, independence etc may affect patterns of collaboration.

The gaps in the literature: the emergence and the evolution of transnational regulatory networks.

First and foremost, I contend that enlarging the time span of analysis of regulatory networks is paramount in order to seriously investigate their impact on policy and on the structure of policy-making. Existing literature is overwhelming ahistorical and focused on the time horizon that Paul Pierson recognized as increasingly prevalent in

the social sciences: the time horizon of a tornado, which develops rapidly and only lasts for a short period; *"In choosing what we seek to explain and in searching for explanations, we focus on the immediate; we look for causes and outcomes that are both temporally contiguous and rapidly unfolding. In the process, we miss a lot."* (Pierson 2003, p. 178). Many contributions focusing on European Regulatory Networks (ERNs) are clear examples of these attitude: on the one hand, contributors disregard the voluntary networks of regulators that preceded the establishment of ERNs and emerged as a result of the bottom up initiative of national regulatory authorities (see for instance Maggetti 2013a and 2013b); on the other hand, virtually no contributors have seriously attempted to explain the persistence of these voluntary networks once the corresponding European Regulatory Network or even the corresponding European Regulatory Agency had been created (although see Thatcher 2011).

The contribution by Kaiser (2009) represents a notable exception in studies of EU governance in that it explicitly calls for more historical research into the emergence, the evolution and the impact of networks of politicians, bureaucracies, industry and other stakeholders in European governance. In his comprehensive review, however, Kaiser (2009) does not mention networks of regulators. Although recent literature has engaged in investigation of regulatory networks in a historical perspective (Boeger and Corkin 2012, Mathieu 2016), it has focused on networks of telecommunication regulators, on the emergence phase only and on the relationship with the European Commission rather than of regulators with each other within the network.

Second, I consider that the predominant functional approach to explaining the existence of regulatory networks is overly constraining in analytical as well as conceptual terms. Moreover, it attributes all the agency of establishing and maintaining networks to the single goal of achieving regulatory convergence. Recently, the literature has begun shifting its attention to the study of networks from the perspective of regulators, emphasising their rational motives (see Bach and Ruffing (2013), Maggetti (2013), Bach, Ruffing et al. (2014), Danielsen and Yesilkagit

(2014)). However, these studies either study networks from the outside, or rely on a very limited number of cases in order to gauge regulators' perceptions of their networks. Although studies emphasising the socialization aspect of regulatory networks exist (Bianculli 2013, Danielsen and Yesilkagit 2014) and represent an additional analytical nuance, they rarely venture beyond description. In this thesis, socialization is understood as a mechanism promoting network longevity.

Third, the literature has scarcely relied on the power of comparative analysis in its study of networks. Many contributions consider more than one network; however, they do not carry out comparative analysis, but rather consider similarities and differences between networks in how a given independent variable affects them or in how these networks affect a given dependent variable. Other contributions either discuss networks in very general terms, or focus on a single case. In the latter case, within case analysis is rare. Contrarily to existing research, this analysis exploits the leverage offered by systematic case comparison in order to perform a reasoned quest for discovering the rationale of transnational regulatory cooperation. Specifically, this research looks within networks to find these responses, rather than outside networks, and investigates their thrust through the perceptions, the memories and the assessments of regulators.

This point leads to the main contribution that this thesis makes to existing scholarship: investigating the reasons, the perceptions, and the expectations of the agents that are embedded in transnational regulatory cooperation – the regulators. Too often the motives of regulators for collaboration within networks are assumed away, or simply neglected. This attitude is common to both enthusiasts and sceptics of regulatory networks and is deeply problematic because, by overlooking the motivations of the agents of cooperation, it neglects its very essence. Relational patterns within networks as well as between networks and political referents (in the case of networks of regulators in a macro-regional or federal setting, like the European Union or the United States, these exist at both domestic and supranational/federal level) represent a wealth of opportunity structures for regulators to further their preferences, which current research ignores.

The fifth limitation of existing scholarship addressed in this thesis concerns the methods of investigation. At first sight, it is surprising to notice that the vast majority of the literature on regulatory networks does not rely on network analysis in order to investigate networks. In their insightful review of the treatment of networks in public administration scholarship, Isett, Mergel et al. (2011) highlight three main uses of the term "network" in that body of research: metaphorical, utilitarian, and methodological. Earlier literature uses the word "network" in a utilitarian way, as a tool to understand coordinated public service provision; more recent literature uses the term metaphorically, as an organizing concept of the features of a certain social context[2].

The utilitarian and metaphorical approaches predominate over methodological contributions on network structures. A close reading of the literature, however, reveals the reasons for this shortcoming: on the one hand, gathering data on the actual relations between the regulators that are members of a network is a daunting task, as regulators are reluctant to provide such information; on the other hand, most analysis of networks are actually not focused on networks but on either the political decisions driving their establishment by political principals or their effects on policy convergence or harmonization. Yet, quantitative network analysis offers a rich reservoir of possibilities for the researcher of networks, allowing for the discovery of patterns and drivers of transnational cooperation, a better knowledge of which proves inestimable for this field of research as well as for transnational governance.

[2] In this regard, these authors correctly highlight *"the important and critical issue of whether the actors in an attributed network (meaning a group where the network paradigm is applied) must acknowledge and accept that they operate in a network for it to actually be a network."* (Isett et al 2011, p. i160). This necessity has represented a further strong reason to rely on interviews within the framework of this research: transnational networks of regulators usually do not call themselves networks, but "associations". Therefore, it is important to mention that none of my interviewees has objected to using the term or has even enquired about whether it was the right term to use or has used different words to indicate the subjects of this research.

Why the focus on energy regulators?

The 1980s and 1990s have seen the rapid spread of market reforms in infrastructure sectors, in particular telecommunications and electricity, across the world. The core of these reforms has consisted in the introduction of private capital in infrastructure sectors, followed by liberalization reforms aimed at promoting competition and accompanied by the establishment of regulatory institutions. Socio-economic interdependence (Lazer 2001, Raustiala 2002), membership in international organizations (Rodine Hardy 2008, Cao 2009, Rodine-Hardy 2015), electoral calculus (Murillo and Martínez-Gallardo 2007), coercion by International Financial Institutions (Henisz, Zelner et al. 2005, Dubash and Morgan 2012), emulation of policy choices perceived as legitimate (Meseguer 2004), competition for foreign direct investment (Elkins, Guzman et al. 2006) are only some of the causes adduced by scholars to explain why and how, over the course of two decades, nearly all countries of the world adopted very similar kinds of economic reforms, including in their infrastructure industries.

The infrastructure sector privatization reforms undertaken by the Thatcher government in the late 1970s had enormous impact worldwide. Even though utility regulation had been practiced already for over a century in the USA, it had always had the purpose of replacing, not promoting, competition; the British reforms introduced the notion of regulation promoting competition and markets. The accompanying establishment of independent regulatory authorities was also followed with great interest by practitioners and observers alike. The combination of privatization, re-regulation and introduction of competition has entered the economics but also the public policy literature under the notion of “British model” (Stern 2014).

This influence was primarily felt across the European Union. Before European legislation on the subject was even drafted, several Member States governments looked at the UK as a source of inspiration for the liberalization of their markets and

the creation of regulatory authorities (a point made in the literature – e.g. Kassim and Menon 1996 – and confirmed by my interviews). Moreover, British officials enjoyed substantial influence within the EU as concerned the legal framework, which essentially mandated the steady erosion of state control over the utilities (Hancher 1996). The subsequent uncertainty regarding the modes of sector management after reform eased the emergence of regulatory networking in the EU, as shall be seen in the thesis.

Gilbert and Kahn (1996) scrutinize the specificities of the utilities and describe the regulatory problem as linked to the following characteristics of natural monopolies: capital intensity and minimum economic scale; non-storability with fluctuating demand; locational specificity generating location rents; essentiality for the community; involving direct connection to customers (1996, p. 2). The last two characteristics, which imply large exploitative power by the producer, render regulation politically inevitable. The consumer demand for "fair" regulation of electricity prices makes investors wary that, once they have sunk capital in electricity infrastructure, they will be "unfairly" limited in the prices they can charge. Authors converge on the acknowledgement that, if private investment is to be successfully attracted to and remain into the sector, "*what is critical is that there be some protection against political intervention*" (Gilbert and Kahn, p. 5, see also Levy and Spiller 1994). This is the rationale for regulation of utilities by independent regulatory authorities.

Energy infrastructure has important scale and scope network properties. Simplifying considerably, increasing the size of the interconnected network of electricity grid lines and gas pipelines leads to substantial increases in efficiency. The strategic importance of energy for security and economic purposes, however, has determined the fact that most electricity and gas infrastructure systems have been built in order to ensure national self-sufficiency (Lagendijk 2008). Nevertheless, engineering reasons of network stability and reliability motivated the construction of cross border interconnection lines. In cases of shortages or of overcapacity on either side of an interconnection, national system operators (usually, incumbent vertically integrated

state-owned companies) would agree for the one-off import or export of electricity in order to keep both systems stable.

With the advent of energy markets, each of those lines came to represent a market opportunity. The allocation of the costs of energy trade in its physical realization (i.e. the costs that the nature of energy infrastructure networks imposes on the systems of parties that are not involved in the market transaction) as well as the allocation of the costs and the benefits of new interconnections are deeply controversial political and economic issues. These issues represent the policy rationale for transnational regulatory cooperation. Integrating energy markets should bring considerable benefits (Pérez-Arriaga, 2014): increase efficiency, improve security of supply, and facilitate the integration of renewable energy sources. The challenges, however, are great. They can be summed up in the necessity that countries share reserves and do not discriminate among market players and among consumers, giving priority to their local demand. This presupposes wide-ranging regulatory harmonisation, and, most importantly, an acceptance of the fact that a regional market is aimed at improving global social welfare, which implies it may, even though only temporarily, bring more benefit to some than to others (Pérez-Arriaga 2014).

The literature on transnational regulatory networks and the literature on electricity and gas reforms have, however, only rarely met. Researchers have devoted most of their attention to networks having global scope, such as those involving regulators from the banking and financial services sectors (Verdier 2009, Bach 2010, Bach and Newman 2010a, Bach and Newman 2014). The most visible, and among the most thoroughly investigated, such network is the Basel Committee on Banking Supervision (Zaring 1998, Verdier 2009, Zaring 2009, Zaring 2012, Goldbach 2015, Reisenbichler 2015).

The diffusion of the regulatory authority as institutional form is, indeed, often ascribed to the virtues of the figure of the central banker: expertise, clear objectives, and depoliticized operation (Cukierman, Web et al. 1992, Kapstein 1992, McNamara 2002, Stern and Trillas 2003, Simone Polillo and Mauro F. Guillén 2005, Gilardi 2007). Over time, the growth in the importance and visibility of networks of central bankers

or financial and insurance sector regulators eased the task of investigating them, given the appearance of reliable longitudinal data on their membership, decisions, and meetings. Transnational regulatory networks have been understood as the coordinated regulatory response to the mobility of capital, which would enable regulatory forum shopping and races to the bottom of regulatory standards.

Academic investigation of networks of regulators of infrastructure sectors (i.e. electricity, gas, telecommunications, water, railways) is less widespread and mostly focused on the telecommunications sector (Barendse 2006, Maitland and van Gorp 2009, Jordana 2011, Boeger and Corkin 2012, Mathieu 2016), followed by energy (Vasconcelos 2009, Beecher 2012, Bianculli 2013, Maggetti 2014), as these are the two sectors where the most extensive reforms have taken place in the EU and around the world. A considerable amount of research on European Regulatory Networks displays the same sectoral focus. However, the specificities of these sectors are rarely, if ever, acknowledged. Contrary to financial services, infrastructure sectors are territorially bound natural monopolies. This means that it is anti-economical to build two or more infrastructure systems in any given territorial unit, hence affording a monopoly position to the owner and/or manager of the infrastructure. The conditions at which this monopoly is held are the object of regulation.

Nowadays, the telecommunications sector appears to have nearly lost its natural monopoly characteristics. Technological innovation has rendered Information and Communication Technologies (ICT) markets more and more contestable. Moreover, telecommunications represent the infrastructure sector that is most embedded in international institutional arrangements: the World Trade Organizations (WTO) agreements cover telecommunications services, and stipulate the obligation for countries to establish a separate regulatory agency for the sector; the International Telecommunications Union (ITU) is the long-standing United Nations agency for the ICT sector, involving a multiplicity of stakeholders and providing for technical standards. None of this applies to the electricity and gas sectors. The relevant infrastructures retain very strong natural monopoly characteristics. Liberalization and privatization processes have not matched the levels reached in

telecommunications. The WTO agreements do not contemplate energy services. No single world agency or organization, comparable to the ITU, exists for the energy sector[3].

Most importantly, the main difference between scholarship on financial sector regulatory networks and extant research on networks of infrastructure regulators is that the latter is very informative, if descriptive, thus lacking full appreciation of the politics of this networking activity. In a sector as politically salient as energy, this is an important omission. Differently from the global scope of transnational regulatory networks in banking or securities regulation, transnational networks of energy regulators tend to have regional scope. This is mainly due to the characteristics of the infrastructure: electricity grids and gas pipelines have limits to their extension before they become anti-economical.

Moreover, because the provision of energy service has a very visible, direct and measurable (through the bills and through the outages) impact on the quality of life of the citizenry, it has the characteristic of being at once extremely complex and extremely, immediately political. If the core of the regulatory problem in globalized financial services is taming swift capital mobility, regulators of infrastructure sectors have to tackle the opposite issue: sunk costs. In other words, capital invested in infrastructure is unrecoverable. The assets' long lives and the time span required before revenues cover the cost of the investment make investing in infrastructure risky in absence of regulatory credibility and policy stability (Spiller 1996, Spiller and Tommasi 2005).

The regulatory problem in infrastructure sectors is providing private capital with sufficiently credible commitments and incentives to invest in the infrastructure. The

[3] The International Energy Agency (IEA) finds its origins and is still mostly concerned with the politics of energy sources (in particular oil and gas and their alternatives), particularly insofar as they involve relations between producer and consumer countries, but not regulatory aspects.

rationale for network coordination for regulators of infrastructure sectors is, therefore, qualitatively different from that of regulators of financial services. The latter have to tame capital; the former have to attract it. Hence, the underlying determinants of regulatory networking are sector specific. Moreover, the inescapable territorial dimension of infrastructure renders regulatory authorities constrained not only in their jurisdiction, but also in their autonomy from political principals. For this reason, researching networks of energy regulators presents familiar as well as new challenges and corroborates known results while yielding new ones.

Analysing transnational networks of energy regulators: the questions, the concepts and the hypotheses guiding this research.

The literature on transnational regulatory networks has maintained a rather narrow focus insofar as theoretical frameworks, approaches and methods are concerned. As mentioned, analyses of regulatory networks treat them as if they were "frozen" in time. The assumption that network establishment was driven by some external actor, i.e. a supranational institution such as the European Commission, is omnipresent in the literature. In the few contributions recognize to regulators the paternity of their networks, the process of emergence is usually neglected. The need for regulators to network and exchange information is treated as almost self-evident, plausibly because the policy literature has established that exchange of information among stakeholders is conducive to policy input (König and Bräuninger 1998, Coen 2005) and/or because the new institutional economics approach recognized in asymmetric information between regulators and companies one of the main obstacles to effective regulatory performance (Ogus 2002, Guerriero 2010). Yet, network formation (which is an issue of emergence) may reveal important information on the goals of exchange and on the incentives of the actors involved.

In their contribution on the evolutionary phases of policy networks, Provan and Kenis (2008) distinguish between spontaneous, or member-driven regulatory networks

(that they call non-brokered) versus networks whose establishment is mandated by an external agent (that they call brokered). Within the brokered/non-brokered dichotomy, these authors recognize three network governance modes: self-governed; lead-organization; and externally-governed. In the first mode, members are in the driving seat: they set up the network and exert shared governance over it. In the second mode, one of the network members, usually the one with the greatest interest in the network objectives, takes up the role of lead organization. This member may provide administration for the network and underwrite the relative costs, or seek access to external funding. In the third mode, networks are governed *"by a unique network administrative organization (NAO) which may be either voluntarily established by network members or mandated as part of the network formation process"* (p. 234). Provan and Kenis' framework is parsimonious and includes an element evolution of networks. However, it is very deterministic and relinquishes consideration of the reasons why brokered or non-brokered networks are established.

Given this background, the question guiding the first part of the thesis is:

1. What explains the emergence of transnational/trans-jurisdictional networks of energy regulators?

I rely on the insights of the literature but also let the evidence I gathered through interviews, documentary analysis and archival research speak to the matter. I expect this evidence to point to some of the motivations that have emerged from the literature on regulatory networks but also on regulatory agencies: for instance, I expect regulatory networks to emerge during policy crises or policy change, in line with assessments reached by Bernstein (1955) and Downs (1967). Interdependence is plausibly going to prove pivotal in the acknowledgement of the desirability of transnational regulatory coordination (Haas 1975, Keohane 1982, Keohane 1998, Lazer 2001, Gilardi 2002, Baccini and Dür 2012, Van Boetzelaer and Princen 2012, Farrell and Newman 2014, Farrell and Newman 2015, Saz-Carranza, Salvador Iborra et al. 2016). At the same time, by focusing on the regulators' motives to establish networks, I extract from the research new material that reveals how regulatory

institutions benefit from networking and how networks empower them towards both their domestic interlocutors and supranational ones.

Just like to individual organizations do, networks may, over time, grow (in size and importance) and learn to perform better and routinize their procedures, therefore undergoing a process of consolidation. Transnational regulatory networks usually display some elements of formalization, such as legal registration (usually as not-for-profit entity), a small coordinating secretariat, fixed budgetary contributions and schedules of activities, meetings, roundtables and the like. The moment of passage from completely informal and spontaneous interaction between peers to the kind of "light" formalization described above is invariably overlooked in the literature.

The sociological literature on inter-organizational networks provides useful instruments to understand the developments leading from a phase of network existence to the next. In his study of inter-organizational relationships, Powell (1995) contends that trust, which is necessary for networks to be viable (Uzzi 1997), is actually a product of interaction rather than a precondition for it (a point underpinning the arguments made in Slaughter (2017)). Drawing from game theoretic contributions, Powell affirms that organizations decide to network when they are aware that the probability of future association is high. In his view, trust cannot be calculated or enforced, as much as it is not embedded: rather, it emerges as a by-product of networking. However, cooperation implies vulnerability, from a sociological point of view, or costs, from a public choice perspective; at any rate, it requires the establishment of some governance structures to allow for constant monitoring and consultation, leading to institutionalization.

Therefore, the second research question guiding this research is:

2. What explains the consolidation/formalization of transnational/trans-jurisdictional networks of energy regulators?

The answers that are present in the literature include growth in size and importance, awareness of the prospect of future cooperation, and desire to monitor

counterparts' contributions to the network. These responses are, however, confined to the dimension of the network. They do not appear to consider whether the relationship between network members and their external institutional environment may explain the transition of a network from a looser to a more consolidated state. Yet, this is a plausible hypothesis, given that regulators exist within complex institutional systems or regulatory spaces (Hancher and Moran 1989), populated by a myriad other actors.

One of the main goals of this research is investigating the concrete usage that individual regulatory authorities make of their network ties. In examining the purpose of networking, I deviate from the historical approach and analyse the network ties of the members of a single network at a single point in time. This choice is mainly due to lack of data on regulators' ties at different moments in time. Despite this shortcoming, the analysis fits with the overall approach of the thesis as it relies on a generative model that assumes that the currently observed network configuration is the result of the network evolution over time.

3. What are the main determinants of network ties across a network of energy regulators?

I derive my main hypothesis from one widely acknowledged tendency of members of social networks: individuals tend to associate with similar others. This tendency is captured by the term "homophily". In the case at hand, I expect similarities in market and sector arrangements to influence regulators' choices of their preferred and most frequent network partners, therefore pushing them to establish direct links with those. In order to assess this hypothesis, I rely on the 'Varieties of Capitalism' approach, which has recently been shown to affect the character of regulatory institutions (Guardiancich and Guidi 2016). I use the approach as a heuristic in the case at hand; namely, to categorize the regulators on the basis of the specifics of electricity sector arrangements that are found in their country of origin. Moreover, inspired by the work of Alcañiz (2016), who finds that sudden budgetary cuts prompt nuclear sector regulators and experts in Latin America to rely on networking in order to pool their scarce resources.

I formulate therefore the following core hypotheses:

- Regulators are more likely to network with peers from countries sharing the same Variety of Capitalism as themselves, all else equal.
- Regulators are more likely to network with peers having more resources than themselves, all else equal.

The first two research questions concerned specific key moments in the history of a transnational regulatory network: emergence and consolidation. Once consolidated, how do networks evolve? In particular, I am interested in examining whether and how networks are able to reinvent themselves once their original "regulatory policy function" (to paraphrase Downs) has diminished in importance as a result of changes in their institutional environment.

Historical researchers have made wide use of the notion of path dependence to explain the longevity of institutions. According to this approach, institutions emerge when a path-breaking event (referred to in this literature as a "critical juncture") occurs, "*moving the pressure on the status quo to a new, much higher level – very close to the threshold level for major political change"* (Pierson 2003, p. 213). Outcomes at critical junctures induce path dependent processes, creating *"dynamics of self-reinforcing or positive feedback processes even in the absence of the recurrence of the original event or process"* (2003, p. 214). By implication, institutions, once created, persist unaltered (in a state of "lock-in", Thelen 2003) until another exogenous shock occurs. A key point in the logic of path-dependency is that the factors responsible for the genesis of an institution may be different from those that sustain it over time. Moreover, the configurations emerging from path-breaking events set constraints on subsequent developments, leaving less space for agency and contingency and more for adaptation to institutional incentives and constraints.

In her discussion of the analytical devices that can be used to understand institutional evolution and change, Thelen (2003) argues that path-dependency is ill-suited to this purpose. The path-dependent logic, she argues, is more apt at explaining institutional reproduction, i.e. how institutions persist, than at explaining evolution. Hence, she

introduces the concepts of layering and conversion as analytical constructs that help making sense of evolution and change. She also calls for introducing more structure at the "front end" of institutional emergence and more agency at the "back end" (2003, p. 225). This means, on the one side, considering the role that existing structures played when path-breaking events led to institutional creation, by constraining the range of options available to actors; on the other side, it means investigating the agency of institutional actors within the framework of their existing institutional structures when faced with changes in their environment. The feedback loops reinforcing path-dependent processes are usually conceived as constraints on actors going forward; Thelen (2003) argues that they may also represents opportunities. This approach

> *"…helps understanding why, over time, institutional arrangements may come to serve functions that are quire remote from those originally intended by their designers, how they can affect (rather than just reflect) the prevailing balance of power among societal groups and how they can become resources for (rather than just constraints on) actors engaged in contests over the types of practices that are coded as appropriate or desirable."*
>
> (Thelen 2003, p. 220)

Over time, networks may evolve in response to a changed environment that confronts them with new problems and challenges that they address by using the existing structure to new purposes. They do so via a process of layering, i.e. by either partially renegotiating some elements of their mandate, while leaving others in place; or via conversion, i.e. by redirecting the network to new purposes. These themes emerge in early American literature on "life cycle" models of both state regulatory commissions (Bernstein 1955) and federal regulatory bureaus (Downs 1967).

As summarized in Mitnick (1980), Bernstein (1955) argued that there are four phases in the life cycle of a regulatory commission: gestation, youth, maturity and decline. Gestation is a phase during which the demand for regulation emerges: rising

dissatisfaction, for instance due to business practices perceived as unfair, activates affected groups who begin pressurizing government to protect their interests. Conflict between these groups and the groups to be regulated ensues. Protracted struggle ends when a statute with vague wording is passed and regulatory commissions are created. During its youth, the regulatory commission operates in a conflictual environment and aggressively fulfils its mandate, while accumulating experience. Over time, the policy crisis giving rise to regulation dissipates as the groups that called for it retire and as regulated industry is successful in appeasing regulators. The maturity phase sees the regulatory agency relying on precedent and routine and becoming increasingly parochial; regulators are eventually captured by industry, leading to scandals that set the life cycle back in motion.

Downs' (1967) life cycle of bureaus also seeks to explain the ultimate rigidity and capture of regulatory agencies by the regulated industry. Initially, the bureau emerges from the demand for regulation but must seek external support in order to survive, as the groups supporting it conflicts with other groups. The bureau is vulnerable to termination initially, but overcomes its "survival threshold" and stabilizes once it is able to offer useful services and to routinize relationships with its major clients. The bureau grows because over time it learns to perform better, develops rules and procedures and records its own experience. Competition from other bureaus, or simply the decline of its social function, however, cause the bureau's decline. Bureaus react to decline by acquiring additional functions in order to survive. *"As time passes, bureaus, like firms, tend to diversity to protect themselves from fluctuations in demand"* (Downs 1967, p.20). Hence, established bureaus are unlikely to die, because they will adapt their functions to changes in the environment while also expanding their client base.

Thatcher and Coen (2008) have indeed conceptualized the evolution of the European regulatory space in terms of layering and conversion: once separate national policies gradually evolved to a European one. Thatcher (2011) argued that the creation of European agencies has involved layering and conversion of the pre-existing informal

regulatory networks. At any rate, those networks did not disband with the creation of the agency, leaving open the question of their current rationale.

4. What explains regulatory networks longevity?

Network expansion may entail an expansion of the functions performed by the network, of the issue areas it concerns itself with, or of its membership. Network expansion may also mean establishing connections with new clients for new purposes. Expansion takes place as the networks continues to fulfil some of its original tasks, whose usefulness to network members is still high even though it has diminished for actors outside of the network, from which the network derives its relevance.

Definitions of key concepts

This research revolves around a few important concepts, that it is important to define. In many places in the chapters that follow, I argue that regulators network for *legitimacy*. I also make references to regulators' *credibility* and *reputation* as being enhanced by networking. Further, I show that the *agency* of regulators is a crucial determinant of network structure; and that regulators can be *network entrepreneurs*. The topic of the legitimacy of regulatory decision-making permeates the literature on regulation (Majone 1999, Lodge 2002, Black 2008, Black 2009, Maggetti 2010, Prosser 2010, Keegan, Craufurd-Smith et al. 2013). Nominally, the legitimacy of regulators descends from the act of delegation of regulatory authority from elected representatives (Maggetti 2010) and from their expertise. However, the contested nature of the regulatory process of decision-making and the consequences of regulatory decisions on market and societal interests have often triggered debate on whether the act of delegation sufficiently legitimizes regulatory authorities. Early literature contended that regulatory decision-making would only affect the efficiency of regulated industries, but not have re-distributional consequences (Majone 1997). However, these expectations were not met in reality: regulatory decisions have

profound re-distributional consequences and the regulatory activity is ridden with societal implications (Prosser 2010).

In the context of regulatory governance, "*a statement that a regulator is ''legitimate'' means that it is perceived as having a right to govern both by those it seeks to govern and those on behalf of whom it purports to govern*" (Black 2008, p.144). In other words, a regulator needs to be perceived to be legitimate by those affected by their decision. The legal legitimacy inherent in the statutes of the regulatory authority is not sufficient for market actors to deem the regulator legitimate; if they do not consider the regulator legitimate, affected interests have little incentive to conform to the regulator's decisions. In other words, regulators need to possess legitimacy in order to induce the hoped-for behavioural responses (Black 2008, p.148). Importantly, regulators are not just passive recipients of legitimacy but can actively construct their own legitimacy (Black 2008, p.146), including by forming and maintaining ties to organizations in their institutional environment, which are perceived to be legitimate by those whose legitimacy claims they want to meet (Meyer and Rowan 1977). In the context of multi-level governance, individual regulators need to establish their legitimacy both in the eyes of industry and of domestic and supranational political institutions. By networking across jurisdictions, regulation conquer an intermediary space between levels of governance (Jordana 2017), which they can leverage to increase their legitimacy in both directions.

Furthermore, I contend that regulators network in order to boost their credibility. One of the main rationale for delegation of regulatory authority to independent regulatory bodies at national level has been, indeed, enhancing the credibility of regulatory policy (Majone 1994, Gilardi 2002). The need for credible regulatory policy is heightened in the context of market integration, as uncertainty and differences in legal, economic and institutional traditions impose further costs on industry. As I show in this research, in the context of multi-level governance systems, the regulatory network represents a repository of a great amount of information on individual markets, which it would be very difficult and time-consuming to gather. Supranational regulatory institutions benefit from having a single point of access to

such information. Hence, regulators, via their network, are able to contribute to the supranational policy formulation process. Collaborative relationships across levels of governance in the formulation of policy strengthens the credibility of regulatory commitments at both domestic and supranational level.

The notion of reputation is very closely tied to the mechanism of regulatory networking and the regulators' legitimacy and role in policy formulation. I do not tackle the link between networking and reputation directly. However, interviews suggested that regulators perceived that collaboration within networks had reputation-enhancing effects on them. Arguably, reputation is one of the main assets of regulatory bodies. So important that regulators with lower levels of expertise may even be overly generous with industry in order to prevent industry from exposing their lower competence and ruining their reputation (Leaver 2009). A reputation for impartial, informed, expert decision-making has several positive consequences for regulators: it enhances their legitimacy (Schrefler 2012), it produces desirable behavioural responses in regulated entities (Cambini and Rondi 2011), and it protects the regulators' autonomy (Carpenter 2001) from political interference. Recent literature has argued that regulators' willingness to cooperate with other institutions depends on their calculations of the reputational benefits of the cooperation (Busuioc 2016). Moreover, the position that regulators hold within horizontal network structures of collaboration is a determinant of their reputation (Ingold and Leifeld 2014, Fischer and Sciarini 2015). In sum, reputation is a source of power for regulators (Carpenter 2010). I contend that network collaboration has a reputation-enhancing effect on regulators, as a result of their control on the information that is collected and generated by the network.

The first part of this thesis argues that regulators network for "control". I use this word as meaning, essentially, turf, i.e. a regulatory authority's jurisdiction (Wilson 1980). I also use the words "sphere of authority" to convey the same concept. The reason why I use "control" in the text, rather than "turf", is that "control" is the word used by many of my interviewees. All through the analysis, I often emphasise the importance of regulators' agency in shaping and using their network. The debate

concerning whether agency or structure is more important for explaining behaviour is a crucial one in the institutional theory of organizations (Heugens and Lander 2009). The results of the process-tracing analysis in this thesis suggest that regulatory networks are able to exert agency on their environment by responding to change and pressures in autonomous ways, and that individuals within them are able to exploit the network institutionalization to display policy entrepreneurship (DiMaggio 1988). This becomes particularly evident in the last part of the thesis, where I depict the emergence of the network of Euro-Mediterranean energy regulators (MedReg) as an act of network entrepreneurship.

The historical reconstructions in this thesis show that network emergence always appears to be due to the initiative of specific individuals. However, the case of MedReg is different from all others. The other three regulatory networks studied in this thesis emerged in very similar circumstances: radical reform, uncertainty, governance tensions. Individual initiative, in those cases, sparked a process of collaboration for which a huge window of opportunity had been opened by changes occurring in the institutional environment. In contrast, MedReg emerged in absence of comparable circumstances. Initiative was the determinant of its emergence. Policy entrepreneurs are actors capable of acting as catalysts for action (Carpenter 2001), who possess considerable expertise and enjoy strong reputation (Arnold 2014). Expertise and delegated authority, however, are not sufficient for policy entrepreneurs to further their goals; network ties are also essential (Newman 2008).

The methods of enquiry and case selection.

The interest of comparative historical analysis with embedding causal propositions into historical processes in comparative perspective across a range of cases affords the researcher considerable freedom in terms of methods and considerable leverage in terms of results (Mahoney and Rueschemeyer 2003). This approach combines consideration of objectively changing circumstances and contexts with close-up analysis of the actors involved: the ways in which they understand the situations they

face are not assumed away but integral part of the data collection and analysis (2003, p. 16). For this reason, the method of process tracing is often used in comparative historical research.

The interest of process tracing is reconstructing the mechanisms linking a cause to an outcome within specific cases. As such, it finds its roots and most common application in analyses concerned with the sequencing of events and the role of temporality in leading from the cause to the outcome (Blatter and Haverland, 2014). Suitable starting points for process tracing are often critical junctures (Bennett and Checkel, 2013), as they offer the conditions of uncertainty and contingency ideal for an investigator to reason on alternative explanatory paths. Early notions of process tracing confined themselves to outlining the main thrust of the method, that is, exploring "*the chain of events or the decision-making process by which initial causal conditions are translated into case outcomes*" (Van Evera, 1997, p. 64).

Later scholarly debate sought to strengthen the internal validity of process tracing as instrument to open "the black box of causality" (Beach, 2013). It underlined the invariant nature of the mechanisms the researcher ought to test or to find within the case study, which are not to be confused with the intervening variables between two events (Beach, 2013): they are necessary parts of a mechanism of causation, whose force rests in its uniqueness and certainty. Those, in turn, can be assessed through tests confirming or disconfirming the hypothesised mechanism (Mahoney, 2012). Process tracing can be used not only to test theory, but also to generate it (Van Evera, 1997; Beach and Pedersen, 2012), raising issues of external validity, to be tested through application of the theory generated to other cases.

From the standpoint of historical institutionalism, institutions are characterized by stability or constrained, adaptive change. The concept of path-dependence, as previously mentioned, underlies this view. Any explanation of the regulatory networks considered here must adopt the logic of path-dependence, since they have outlived their initial *raisons d'être*, sometimes quite considerably. The perspective of this school of thought on institutions' formation and change emphasizes the identification of the moment when these occur. The choice of the "when" is essential

to then make the case that the patterns created in that initial moment persisted and exerted long-term influence on the organization (Peters, 2011, p. 76). Contributors have understood major change to happen at "critical junctures", being the starting points for new path-dependent processes (Collier and Collier, 1991; Mahoney, 2001a, 2001b). "Critical junctures" happen in moments of political indeterminism, when multiple courses of action are possible the usual structural constraints on action are relaxed, allowing "wilful actors" to shape circumstances "in a more voluntaristic fashion than normal circumstances permit" (Mahoney, 2001a, p. 7).

Historical institutionalism also emphasizes the role of ideas in shaping the formation of institutions. However, ideas require individuals to be translated into an organization. Hence, agency is crucial in this perspective. This is why I chose to rely on elite interviews with individuals who were directly involved or well-informed about the events retraced in this research. Elite interviews represent the necessary complement to documentary and archival research in this context, as many of the events, the actions, the choices made by actors at the inception of network cooperation have never been recorded, if not in some memo notes buried in these actors' desks. Interviewees were selected according to purposive sampling: my aim was to talk to individuals who were involved in the establishment and/or the management of each of the networks considered as well as to individuals who are (or have been) "simple" network members. I was acquainted with several key actors (including regulators, academics, and consultants) of each of the networks considered thanks to previous work experience. The names that some of them made during the interviews helped selecting further interviewees.

I use Social Network Analysis (SNA) to investigate the drivers of network connections among regulators. SNA is a powerful tool of analysis because it allows for the measurement of physically immaterial relationship structures that constitute the fabric of networked cooperation. Through SNA, one can analyse regulatory networks in relational terms rather than in organizational ones. The interplay between structure and agency that is encountered when analysing networks is also acknowledged by researchers who have made use of the method in historical

research (Padgett and Ansell 1993, Gould 2003). The SNA only concerns the network of European energy regulators.

I gathered complete network data from regulators. I asked the Communication Officers of each member regulatory authority the following question: "*Think of the individuals you (or somebody at your regulatory authority) exchange information with more regularly and frequently. Which regulatory authority do they belong to?*". The questionnaire asked regulators to list the regulatory authorities they are most often in touch with for exchange of opinions and suggestions. It also asked them to name the most active network members in their opinion, and the most competent.

Finally, a few words on the cases selected for investigation. In this thesis, I examine four transnational or trans-jurisdictional networks of energy regulators:

1. The National Association of Regulatory Utility Commissioners (NARUC) comprising 50 state level utility regulators from the United States of America (USA).
2. The Council of European Energy Regulators (CEER) comprising 28 full members from the 28 Member States of the European Union (EU).
3. The Energy Regional Regulatory Association (ERRA) comprising initially 24 members from countries in Central and Eastern Europe and the New Independent States (CEE/NIS).
4. The Association of Mediterranean Energy Regulators (MedReg) comprising 24 members from 21 countries in the EU-defined Euro-Mediterranean region, comprising Southern European Member States, Accession countries to the EU and most of the countries comprised in the European Neighbourhood Policy.

The first two networks are non-brokered networks, born out of the spontaneous initiatives of their members (Provan and Kenis 2008). NARUC and CEER are long standing actors in their respective regulatory space that have had significant influence on the policy process, as the chapters will outline. Chapter 2 and 3 investigate the conditions allowing them this opportunity. The second couple of networks investigated in this thesis are mandated, or brokered networks (Provan and

Kenis 2008). Their inception is inter-related with the developments of the previous two networks. Specifically, the establishment of ERRA was coached by NARUC, which, since 1998, has been cooperating with the US Agency for International Development (USAID) in the delivery of regulatory technical assistance throughout the world. In contrast, MedReg is a transversal case: although CEER was not involved in its establishment directly, MedReg originated from the initiative of a small group of EU energy regulators, who set it up on the basis of their experience within CEER. The analysis of these two cases, which is carried out in the third and final part of the thesis, shows that regulatory networks are considered capable of entrenching policy change.

Comparison of all four cases with each other reveals that NARUC, CEER and ERRA underwent similar evolutionary phases, although at different paces and over time spans of different lengths. All three emerged in the context of radical change in the policy paradigm of the energy sector (Hall 1993). Moreover, the members of NARUC, CEER and ERRA belong to a well-defined polity: the USA, the EU, and initially within ERRA, the countries of Central and Eastern Europe intending to enter the EU. MedReg, in contrast, did not emerge out of a policy crisis or a paradigm change, entailing uncertainty and opportunity structures. Moreover, the so-called "Euro-Mediterranean" region is, at present, more of a denomination concocted by European policy-makers than an actual regional polity with shared institutions, rules, or at least goals. These facts distinguish MedReg from the other cases examined in this work and may explain its lukewarm achievements in terms of policy contribution. At the same time, MedReg may well represent an empirical case of collaborative initiative having mutual trust as its outcome rather than its premise (Powell 1995).

PART ONE - EMERGENCE AND CONSOLIDATION OF NETWORKS OF ENERGY REGULATORS

Part I. Introduction: the spontaneous emergence and consolidation of transnational regulatory networks.

The literature on regulatory networks has often discussed the circumstances of their official establishment, usually tracing it back to the preferences of either political principals or supranational institutions. The spontaneous, bottom-up origins of regulatory networks are sometimes acknowledged in the relevant literature, but rarely investigated. Yet, understanding the rationale of spontaneous regulatory networking across jurisdictions is key to understanding why regulators network, or, more precisely, how they benefit from networking. This is particularly relevant in systems of governance, articulated across multiple levels. In these systems, regulatory authority is distributed across levels to regulatory institutions, whose mission and mandates partially overlap. Regulators at lower levels of governance come to occupy an intermediary position (Jordana 2017) between levels as they fulfil their tasks in compliance with the policy mandates deriving from either level.

Therefore, In this first part of the thesis, I pose, and answer, the following questions:

- what are the conditions leading to the spontaneous emergence of trans-jurisdictional regulatory networks?
- what are the conditions prompting network consolidation from a loose set of informal ties to an entity with some of the properties of organizations?

The findings of the analysis are that regulators begin networking whenever they are facing great uncertainty in the fulfilment of their tasks. Being unique institutions in their jurisdictional context, regulators reach out to peers in other countries who are facing similar uncertainty and are therefore likely to be facing similar challenges. Hence, the answer to the first question is that similar levels of uncertainty drive network formation. Regulators begin networking for expertise, using each other as sources of information and of epistemic legitimacy in order to strengthen their

decision-making domestically. Initially, their collaboration as an exclusively peer-to-peer dimension, confined to their professional community.

Consolidation of their loose set of professional ties happens as a result of the tensions across levels of governance become permanent. Network consolidation, thus, occurs as a result of the interaction between regulators and the institutional environment surrounding them. Regulatory decisions have distributional as well as economic consequences. In other words, their decisions create winners and losers. As a result, regulators face domestic opposition from interests that are damaged by their decision-making. Hence, as government seeks to appease constituencies, regulators face the concrete threat of losing their powers and/or see their autonomy curtailed. Hence, regulatory networks emerge as organizational entities as a result of governance tensions that pose the continuous threat of partially reducing their powers or their authority.

Whenever this threat is common, regulators strengthen their collaboration by consolidating their network into a representative body of all of the regulators in their jurisdictional setting (whereas previously smaller subsets of regulators in the multi-level governance system would gather more frequently) displaying some of the properties of organizations: headquarters, legal personality, set budgetary contributions, etc. Moreover, regulators use their network to seek allies at higher levels of governance, e.g. the supranational level, by exploiting the latter's quest for information on their local markets in order to formulate policy. Partnership, in the form of a symbiotic interdependence (Pfeffer and Salancik 1978), with supranational (federal) institutions wielding supranational regulatory authority represented an enabling factor for network consolidation and participation in the policy process. This opportunity has the effect of increasing the reputation of the regulators and of further strengthening the network.

I focus my analysis on the empirical cases of the National Association of Regulatory Utility Commissioners (NARUC) and the Council of European Energy Regulators (CEER). These gather, respectively, state Public Utility Commissioners (PUCs) of the USA and National energy Regulatory Authorities (NRAs) of the EU. NARUC emerged

in 1884 and was officially established in 1889; CEER emerged in 1997 and was officially established in 2000. Both organizations have risen from being constituted as little more than informal professional associations to becoming key actors in the regulatory policy formulation process in their respective jurisdictions. In the two chapters to follow, I retrace their emergence and consolidation. In doing so, I identify the critical junctures that shaped the network identity and mission. In the conclusions to this part of the thesis, I discuss their stories in comparative perspective.

The USA and the EU are two "regulatory powerhouses" (Drezner 2007). Both have, over time, increasingly relied on regulatory policy, substituting "rowing" the economy with "steering" market actors' behaviour towards socially desirable outcomes (Osborne and Gaebler 1993). Therefore, the USA and the EU represent the embodiments of the notion of the "regulatory state" (Sunstein 1989, Majone 1997, Baldwin, Scott et al. 1998, Moran 2002, Lodge 2010). Whereas in the USA the notion of the regulatory state has been associated with the rise of federal agencies and, more generally, of the federal layer of government, in the European context the rise of the regulatory state has been qualified both as the rise of the European layer of governance at supranational level, and as the move from positive to regulatory governance (Majone 1997) at national level, entailing the retreat of the state from the provision of certain services, e.g. energy services. In both polities, the deepest roots of the regulatory state are found in the regulation of economic sectors, and, in particular, infrastructure (Kanazawa and Noll 1994, Lodge 2008).

For both NARUC and CEER, the moment of official foundation represented little more than a formality, their real identities having formed at different stages in their evolution in response to certain events. In their origins and evolution *"time itself becomes an element of the causal explanation, a factor in the model"* (Büthe 2002, p. 486). Investigating cases over time allows the identification of causal mechanisms and explanatory factors rooted in previous phenomena or events, whose significance informs later events (Farrell and Newman 2010, Farrell and Newman 2014). However, defining the moment or the event triggering the path-dependent sequence of events that leads to the outcome is a delicate task, which researchers in this

tradition are sometimes accused of performing arbitrarily (Capoccia and Kelemen 2007). “Critical junctures” are moments presenting institutional actors with opportunity structures that they may exploit in order to pursue their own preferences.

Capoccia and Kelemen (2007) address a major shortcoming in the existing literature on critical junctures: lack of methodological guidance on how to recognize, define and analyse them. The literature is rich in macro-historical analyses identifying the emergence of critical junctures as a result of broad, structural causes of change, rather than from actions and decisions made during the critical juncture itself. Their model, therefore, aims to provide a solid framework to recognize and analyse critical junctures. The criteria they advance are as follows:

- The critical juncture must be a moment characterized by political indeterminism and uncertainty, when multiple courses of action are possible but only one is chosen thanks to circumstances combined with the agency of wilful actors.
- The length of the critical juncture has to be much shorter than the length of the process it generates: the briefer the juncture relative to the outcome, the more critical it is (they call this measure temporal leverage).
- In order to identify a critical juncture, one should enquire on the counterfactuals (alternative courses of action that might have been chosen, but were not, as much as available information allows).
- The farthest the probability of the outcome being achieved in absence of the juncture is from 1 (they define this measure as probability jump), the higher the likelihood it is a critical juncture.
- The higher the probability of the outcome producing itself post-juncture, the higher the likelihood that the juncture is a critical one.
- Contingency is the key element of critical junctures.

Critical junctures need not be perceived as path-breaking moments as they occur; to the contrary, they could be small, apparently not very meaningful events or decisions whose posterior impact is almost surprisingly strong. In the two chapters that follow,

I inductively build the causal narrative linking critical junctures to network emergence and consolidation through process tracing, by relying on documentary analysis, archival research and elite interview material. A rarely highlighted feature of process tracing concerns its reliance on the testimony of those who were directly involved in the process under study (Van Evera, 1997) to make sense of their decision-making process and of the effect that institutional arrangements and other stimuli had on it (George and McKeown, 1985). Blatter and Haverland (2014) include "confessions" among the elements needed for process tracing, as actors' perceptions, although biased, can shed light on decisions as well as non-decisions, given anticipated consequences. Such emphasis on contingent individual behaviour matches the concerns of analyses of critical junctures, thus bringing the two frames of reference to converge.

The following two chapters are informed by a total of 41 face-to-face semi-structured interviews I carried out with current and former regulators and staff executives from NARUC and CEER. Interviewees have been selected on the basis of their role (past and present) within the network: chairs, vice-chairs, executive directors and staff executives. At the same time, I interviewed as many network members not holding official leadership or coordinating roles in the network as time and resources allowed, in order to grasp their perceptions of the network. Finally, I also interviewed individuals who gravitated around both networks in different capacities, such as private consultants and representatives of academia and international organizations. All interviewees have been guaranteed full anonymity. A complete list of summary interviewee information is provided in Appendix 1.

NARUC and CEER are the by-product of the inner workings of the environment that generated them. Their importance grew, perhaps unexpectedly, for the response they managed to articulate to certain events. In the case of NARUC, regulators were facing the threat of progressive disempowerment because of the rise of the federal level of government; in the case of CEER, regulators enjoyed progressive empowerment, and the network grew in importance, until regulators were mandated to coordinate, because a federal level of government would not arise.

2. The history of the NARUC: defending the turf of the Public Utility Commissions.

The long history of utility regulation in the USA is also the long history of the NARUC. The NARUC membership consists of utility regulators from the 50 states (plus the District of Columbia, Puerto Rico and the Virgin Islands). Hence, it has a homogeneous and horizontal membership structure. Despite its longevity, the NARUC has rarely been object of in-depth study. Paul Rodgers, NARUC's Executive Director from 1965 to 1996 (Beecher, 2012), retraces the history of NARUC from its origins to 1978. The book, published by the NARUC itself, only exists in a few copies[4]. Childs (2001) provides the only thorough historical overview of the NARUC, highlighting the instrumental role it had in defending the PUCs' turf in the federal system. Investigation of NARUC as network is much more recent (Beecher, 2012).

In his seminal paper on issue networks, Heclo (1978) remarked how in the USA the politics of public administration usually aroused less interest, and thus scrutiny, than the Presidency and Congress. Childs (2001) echoes this view, noting that study of the politics of regulation in America has overwhelmingly focused on federal agencies. Studying the NARUC is an important step towards addressing both of these concerns.

The emergence of the NARUC: the public demand for regulation of the railroads.

The birth of regulation in the USA is entwined with the appearance of the railroads (Kolko 1965, Kerr 1968, Nice 1987, Himmelberg 1994, Kanazawa and Noll 1994, Dobbin 1995, Dowd and Dobbin 2001). The sequence of events leading from the appearance of railroads to state regulation comprises technological progress, abuse of market dominance, popular discontent, litigation, and eventually political

[4] The NARUC, very kindly, made the book available to me.

intervention establishing a new institution for the resolution of controversies: the Public Utility Commission (PUC).

In the late 1820s, the steam-powered locomotive technology revolutionized transportation across the American states. The railroad increased the speed of transportation across the main centres of commerce, quickly gaining business at the expense of the incumbent water and turnpike transportation companies. Private railroad companies quickly multiplied, each building their own infrastructure. The technological disruption caused a series of abuses: wherever the railroads faced competition from other technologies -- typically, over long distances, where competition from canal and riverboats kept prices low (Law and Long, 2011) -- customers demanded below-cost service; in the short haul, however, railroads had virtually no competitors and exploited their monopoly power.

The ensuing volume of litigation, between companies, shippers, and customers quickly made evident the limits of states legislatures in regulating railroad operations and responding to business and consumer complaints over their practices. The courts lacked the necessary expertise to deal with economic regulation of technical sectors and had a typically passive role, as they would take action upon filing of suits only (Rodgers, 1979). In the early 1870s, the protests of the farmers prompted the legislatures of four Midwest states (Iowa, Illinois, Wisconsin and Minnesota) to pass legislation, imposing regulation of railroad companies by regulatory commission.

As Fainsod and Gordon (1948) note, American regulation was not the product of a farsighted plan, but rather *"a series of empirical adjustments to felt abuses*". Railroad companies felt that regulatory legislation damaged their interests, and challenged its constitutionality in a series of legal cases. In one case, Munn v Illinois (1876)[5], the Supreme Court affirmed that when private property becomes affected with a public interest it can be subject to governmental regulation (Rodgers, 1979). This verdict represented the cornerstone of the legitimacy of state regulation of the railroads. *"The first of these "commissions" appeared in Rhode Island in 1839, New Hampshire*

[5] *Munn v. Illinois*, 94 U.S. 113 (1876)

in 1844, Connecticut in 1853, New York and Vermont in 1855, Maine in 1858, Ohio in 1867, and Massachusetts in 1869" (Rodgers, p. 3).

These early PUCs did not have ratemaking powers; their responsibilities were limited to undertaking an appraisal of the worth of a company's property and enforcing railroad safety standards. They often consisted of only one commissioner. Their recommendations about rates were often plainly ignored by the railroads. Their establishment had been motivated by the willingness to calm public unrest (Kanazawa and Noll 1994).

These early-established PUCs met six times before the creation of NARUC itself. The earliest of these meetings, held in 1874, involved Commissioners from Wisconsin, Illinois and Minnesota (Rodgers, p. 5). Rodgers does not comment extensively on the content of those informal meetings. He mentions a common willingness of the regulators to share experiences, compare and contrast their powers and obligations, and the challenges they were facing in regulating railroads. As more commissions were created in the various states, they also joined these informal meetings. The last recorded meeting was held in 1881.

In 1886, the Supreme Court, in the Wabash vs Illinois[6] case, affirmed the exclusive competence of Congress over interstate commerce, confining the authority of the state commissions to their state. Only a year later, in 1887, Congress created the first federal regulatory agency of the United States: the Interstate Commerce Commission (ICC). The first president of the ICC, Judge Thomas M. Cooley of Michigan, "*recognized that his new agency then lacked the resource to carry out even the modest tasks set for it by Congress"* [7] (Rodgers, p. 9). Therefore, Cooley decided to

[6] *Wabash, St Louis and Pacific Railway Company v. Illinois*, 118 U.S. 557 (1886)

[7] The ICC powers foreseen in the Act were limited and vaguely worded: it had the power to require comprehensive information from carriers, as well as testimony; to deal with complaints, including from PUCs; to request the carrier to modify its behaviour if found contravening to the requirements of the act, but in case of incompliance it had to refer the

call upon the state regulators to provide information on the operations of the railroad and their regulation in the different states. In order to establish such dialogue, Judge Cooley convened the first meeting of the Convention of Railroad Commissioners, which was to become the National Association of Railroad Commissioners, at ICC offices on March 5, 1889 (Rodgers, p. 8). Representatives of 21 PUCs attended the Convention[8]. Judge Cooley became the association's first president. Hence, the ICC and NARUC first chairmen were the same person, representing their cooperative relationship.

The period during which these events unfolded ranges from the early 1890s to World War I (WWI) and is commonly referred to as the Progressive Era. Progressives nurtured the conviction that regulation should and could be depoliticized by entrusting expert regulatory commissions with regulatory powers to be exercised independently of politics and industry (Bernstein, 1977). These ideas concurred in the establishment, in 1907, of the first "modern" state commissions, properly staffed and overseeing several utility markets: New York and Wisconsin, which quickly became models for all other PUCs (Anderson 1980).

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case to a court of law in the state where the carrier held office or where the infraction had taken place. http://www.historycentral.com/documents/Interstatecommerce.html

[8] The intent of the convention to encourage regulatory convergence in the railroad sector emerged since the first meeting: the first reports to the convention concerned "Uniform Railway Statistics" and "Uniformity in Reports from Railroad Companies". A third report concerned "Uniform Classification of Freights". These reports resulted in the promotion of resolutions. One of them, initially recommending the adoption of a uniform freight classification for the roads across the country, was modified into a lesser prescriptive formulation upon a roll call vote. Significantly, Rodgers remarked (p. 10) "only State representatives voted […] and each representative had one vote irrespective of the number of representatives present from a State". Clearly, this kind of voting system, coupled with direct access to federal regulators, represented a strong incentive for state regulators to attend convention meetings in order to make their interests heard.

The Progressive Era-inspired decisions to grant more powers to the ICC, with the Hepburn Act of 1906 and the Mann-Elkins Act of 1910[9], marked the beginning of the conflicted relationship between state and national regulators (Childs, 2001). Eventually, a logic of "pragmatic federalism" (Childs, 2001) prevailed, according to which federal agencies and state regulators cooperated in the interest of preserving their respective regulatory powers. However, the railroads' lobbying, public discontent with the railroads, and some PUCs' discriminatory ratemaking practices resulted in a legal battle, which had lasting consequences for regulatory federalism in the United States.

The Shreveport case and WWI: questioning the legitimacy of state regulation.

The story of how the process whereby NARUC became the single voice of American PUCs centers on the Shreveport case[10]. Both Rodgers (1979) and Childs (2001), identify this case as crucial in the history of PUCs. The Shreveport case represented the beginning of their conflicted relationship with the federal level of regulation, since then perceived to be constantly attempting at depriving them of their powers.

In 1912, the PUC of Louisiana filed a complaint with the ICC against a Texan railroad company. The Louisiana PUC complained that intrastate railroad rates in Texas (established by the Texan PUC) were much lower than interstate rates between Texas and Louisiana (established by the ICC). This resulted in Louisianan shippers paying

[9] The Hepburn Act gave ICC rulings the force of law and empowered it to change a railroad rate to one it considered "just and reasonable," after a full hearing of a complaint. The Mann-Elkins Act placed the burden of proof on the railroads; for the first time, they would have to actively demonstrate that a rate was reasonable. Interstate telegraph, telephone, and cable companies, were declared to be common carriers within the purpose of the Act, and were placed under the regulating authority of the Commission. On impulse of the railroads, the Act also created the Commerce Court to review ICC decisions (Kerr, 1968).

[10] Houston, East and West Texas Railway Company vs United States, 234 US 342, 58 L. Ed. 1341 – the paragraphs on the case are based on Rodgers (1979) and Childs (2001) accounts.

higher prices to reach commercial cities in eastern Texas, close to the border, than Texan shippers did, even though the latter had to cover much longer distances within Texas. The case took the name from the city in Louisiana, which the shippers competed to serve and originated the case: Shreveport.

The initial decision of the ICC was to cap the interstate rates and to order the railroad companies to adjust intrastate rates so as to not be discriminatory when compared to interstate ones. They could do so by either raising intrastate rates to the interstate level, or by lowering the interstate rates. The decision, instead of filling it, seemed to make the institutional and decisional vacuum over the matter more evident, as the railroads seemed to be authorized to make these decisions without the approval of either the relevant PUC, whose authority was entirely bypassed, or the ICC.

This long case culminated in a 1914 Supreme Court decision stating that the power to alter intrastate rates when those discriminated against interstate ones rested in the ICC (Childs, 2001). This was in stark contrast with the provisions of the Act to Regulate Commerce, instituting the ICC, which stated "*the provisions of this act shall not apply to the transportation of persons or property wholly within one state*" (Rodgers, 1979). The court considered, however, that discriminatory intrastate rates would constitute an undue burden on interstate commerce. In effect, the primacy of federal regulation had been established.

This legal battle represented the consolidation of NARUC as the representative body of US PUCs. Through NARUC, PUCs strongly opposed the Supreme Court decision, as it was factually subordinating their jurisdiction to the federal one. A delegation of NARUC representatives even went to see one of the judges deciding the case at their vacation home (Rodgers, p. 28) in order to make their case. The Shreveport Doctrine *de facto* deprived PUCs of their authority over railroads. By this time, PUCs existed in most states and oversaw other utilities as well (i.e. telephone, electricity, gas)[11].

[11] The history of how PUCs came to regulate other sectors, besides the railroads, in interwoven with the history of the electricity utilities in the USA and in particular with the

NARUC drafted resolutions meant to regain the PUCs' lost leverage or at least avoid being further deprived of authority (Childs, 2001). The political response from Congress was to create a *"special joint subcommittee […] to conduct an investigation into government regulation of interstate and foreign transportation and government ownership of all public utilities".* The subcommittee never completed its task because the USA entered WWI.

The consolidation of the NARUC: post-WWI arrangements.

When the USA decided to engage in WWI, it became evident that the railroad system was unable to meet the coordination demands of the war and risked plunging into chaos. This prompted the Council of National Defence to ask railroad companies to halt competitive activities and to coordinate their operations nationally. The companies created the Railroads War Board to that effect. Initially, the ICC tried to preserve the extant system of regulation and to cooperate with the War Board, although rejecting their calls for general rate increases. However, it later agreed to unified operation under the direction of the President (Splawn 1939).

In 1918, President Wilson created the temporary US Railroad Administration (RA), to manage the railroads for the duration of the war. Mr McAdoo, Secretary of Treasury, President's son-in-law and main advisor on the matter, became the RA Director General. He populated the RA with railroad executives, who, empowered with federal executive powers by the Federal Control Act of 1918, set off to improve railroads management. In so doing, however, they disrupted the political balance characterizing the Progressive Era. Swift rate increases were authorized, damaging shippers. The ICC was only called upon for advice, its powers virtually abrogated. Only one NARUC representative sat in one of the RA committees (Kerr, 1968), so that the

figure of Samuel Insull. Insull was a powerful and influential utility executive who was instrumental in the very creation of modern State Public Utility Commissions, as shall be seen later in the chapter. By the 1910s, PUCs regulated all of the utilities.

representativeness of PUCs was reduced to the minimum possible. Recognizing that tension was mounting against the RA and its managers, McAdoo's successor, Walker Hines, who was also a railroad executive, tried to re-gain the shippers' and the NARUC's support by increasing their representation within the RA. He tried to co-opt PUCs by setting up a Public Service Division, headed by the then president of NARUC. These decisions improved the relations between state regulators and the RA; however, state regulators were painfully aware of their considerable loss of control over the practice of industry in their state and concerned about post-war arrangements.

At the end of the war, the entire regulatory and ownership system of the railroads was put under discussion. Hence, a window of opportunity opened for all stakeholders to advance their preferences. More than thirty plans for reform were proposed to Congress (Waterman, 1919). Hines proposed the regionalization of regulation (and of PUCs) within the States under the aegis of the ICC (Kerr, p. 134). The railroad companies called for the elimination of state regulation and centralization of regulatory powers at the federal level (Post, 1918; van Metre, 1918). Part of public opinion was in favour of government ownership (Stonex, 1919). In its 1919 annual report, the ICC recommended continued private ownership and operation under governmental regulation (Eastman, 1919; Splawn, 1939). The ICC wanted its powers expanded and regulation to move beyond rates to involve all aspects of railroad service, ensuring its stability, and efficiency. Shippers wanted a return to the status quo ante (Kerr, 1968).

The NARUC *"urged the elimination of federal control of the railroads […], an ICC-State cooperative mechanism for ratemaking, and the eradication of the Shreveport Doctrine."* (Rodgers, p. 20). *"But the commissioners' most important role in the post-war legislative debate was to communicate, through the National Association of Railway and Utilities Commissioners, with the Interstate Commerce Commission in developing arguments to counter the railroad attack on the regulatory system"* (Kerr, p. 202). The final outcome of the struggle was the Transportation Act of 1920, which strengthened the powers of the ICC, but still enshrined the Shreveport Doctrine.

The attitude of PUCs towards the ICC had become extremely guarded, as exemplified by the following extract from a NARUC record dated December 10, 1920 and consisting of a letter the NARUC sent to the ICC in relation to a pending proceeding brought to the ICC by railroad companies.

> *"In this connection, I call your attention to the provisions of paragraph 17 of Section 1 of the Interstate Commerce Act as amended, which provide that nothing in the Act shall impair or affect the right of a state in the exercise of its powers to require just and reasonable service for intrastate business "except insofar as such requirement is inconsistent with any lawful order of the Commission made under the provisions of this Act". If the commission has power to make, and does make, an order against carriers prescribing the terms of side-track agreements, the effect of it may be to prevent state authorities from making orders controlling the terms upon which side-tracks shall be installed and service provided. These are local matters, concerning which, if the federal commission has power, it is a serious question whether it will desire to act in such a way as to interfere with the jurisdiction of the state authorities."*

A Supreme Court decision in 1922 (Wisconsin Passenger Fare Case) mandated the ICC to be receptive of PUCs instances in those cases when it intervened on intrastate rates. In that year, most ICC members were former NARUC members: 6 of the 11 positions in the ICC board were held by former state regulators, and even the ICC head was a former NARUC President (Childs, 2001). Cooperation between the two organizations resumed and gradually deepened, until NARUC managed to eradicate the Shreveport Doctrine and to prevent its reappearance in the statutes of subsequent federal agencies. According to Childs, state regulators, *"battling attempts to centralize regulatory action in Washington"* (p. 702), managed to work out a role for themselves *"in the emerging modern regulatory state"* (p. 703). Although PUCs eventually lost their powers in railroad regulation following the deregulation reforms of the 1980s (Goldin and Libecap 2008), the experience consolidated NARUC's role as their representative organ towards federal institutions.

Critical junctures in the history of the NARUC: battling attempts to get rid of PUCs.

Critical junctures are events determining change from the *status quo ante* in unexpected ways. There were several definitional moments in the history of NARUC: the foundational moment, in 1889; the Shreveport case in 1912 and ensuing doctrine; the period following WWI, when the allocation of regulatory competence over US railroads was put into question. However, not all moments bear the properties of critical junctures as defined by Capoccia and Kelemen (2007). The first two events lack the necessary contingency and unpredictability: PUCs had been informally meeting since 1874 and it was Judge Cooley to call for their convention, establishing NARUC, not the regulators. As for the Shreveport case, although the Interstate Commerce Act safeguarded PUC's authority within their own states, the practice of cutting a State shipper's costs to bolster their competitiveness was bound to trigger litigation and then stumble upon federal oversight.

The post-WWI and post-RA setting of uncertainty over the future of the railroads, instead, qualify as critical junctures:

1) Uncertainty was high and usual constraints on action were relaxed, so that all parties could advance their own preferences, including calls for public ownership;
2) The counterfactuals were, therefore, many; influential groups (railroads, ICC, politicians) all had a different vision;
3) Indeterminacy was high. A complex puzzle of preferences had emerged: railroads wanted to keep private ownership but to dispose of competition in favour of centralized regulation. The ICC was calling for an expansion of its own powers as well. Therefore, PUCs were seriously at risk of losing their competences over railroads.
4) Eventually, NARUC and PUCs remained and subsequent legislation institutionalized their involvement in ICC decision-making when this touched

upon intrastate rates. This meant cementing PUCs and NARUC into the USA regulatory system, which is the real outcome of the struggle. Hence, the probability of NARUC becoming a stable actor in US utility regulatory policy dramatically increased post-juncture.

5) Contingencies were key in this case. In particular, the attitude of RA executives during the war period brought regulators at both levels to form a coalition and to bring shippers on their side.

Most importantly, the events surrounding the post-WWI struggle for regulatory authority triggered regulators' awareness that conflict over the degree of regulatory control between the state and the federal level had become inherent to the US regulatory federal system. In other words, it was the moment of NARUC consolidation; the occasion that transformed NARUC from a loose set of ties to an institution.

After the war, Congress essentially abode by the pre-war system. Faced with many contrasting pressures from different sides, it shifted the burden to the ICC, whose powers were expanded. However, at that time many ICC members were former NARUC members. Cooperation between the two organizations resumed and gradually deepened, until the NARUC managed to eradicate the Shreveport Doctrine, by preventing its appearance in the statutes of subsequent federal agencies. The weapon PUCs wielded was the NARUC itself: *"once the state commissioners had persuaded national regulators, Congress, and the courts to accept the cooperative approach, they employed the power of their association, NARUC, to solidify their victories with a concerted movement to "professionalize" the business of regulation"* (p. 704). The fact that the outcome of the juncture was continuity should not put in doubt its criticality. As Capoccia and Kelemen (2007) confirm, a critical juncture need not necessarily bring about change.

Electricity: the utilities' demand for regulation of themselves.

Since the early 1900s, the relationships between PUCs and electricity industry executives evolved in parallel to their relationships with the railroad industry. However, they were markedly less confrontational. Whereas railroad executives struggled to eliminate state level regulation of their business, electric utility executives engaged in the opposite battle: they actively sought state regulation and protected it from federal and local encroachment already since 1898, when the Supreme Court case reviewed the method of rate regulation (Anderson 1980, Anderson 1981, Hausman and Neufeld 2011). Anderson's narrative retraces the inception of state regulation of electricity in the simultaneous action, in the early 1900s, of three types of actors: the utilities, civil society and certain reformer governors, sharing a common interest into maintaining regulation at local level and locating it into independent commissions.

The utilities called for state regulation as alternative to state franchises, which were subject to corruption, and municipal ownership. As Hausman and Neufeld (2011) note, *"state rate regulation did not replace open competition among utilities; it replaced regulation by municipalities"* (2011, p. 727). State franchises were contracts whereby municipalities allowed the utilities to provide services by placing their equipment on municipal land. They usually lasted for several decades. The terms of the franchises varied considerably among municipalities and did not foresee constant oversight. Also, utilities were not normally offered monopoly protection beyond the first few years of operation, so that *"entry by competing utilities could and did occur"* (2011, p. 727). However, municipal governments often appropriated the quasi-rents generated by the difference between the revenue needed to cover the utilities' short run operating costs and the revenue needed to maintain economic viability and threatened the utilities with entry and competition unless a bribe was paid (Hausman and Neufeld, 2011). The introduction of state regulation gave those quasi-rents the status of a constitutional right protected by both state and federal courts.

In 1907, National Electric Light Association (NELA) released a report, outlining the utilities' position: some form of public interference in their business appeared

inevitable, judging also from the events regarding the railroads; they would rather have it exerted by a regulatory commission than by municipal governments. The report was extremely timely, as in that same year the first "modern" PUCs (i.e. possessing actual regulatory powers) had been created in New York and Wisconsin. In Wisconsin, a Republican politician who was also vice-President of a local electric utility actively lobbied for electricity to be regulated by PUC. In California, where support for electricity regulation was fuelled by discontent over the railroads, utilities were among its earnest supporters. As Anderson put it, *"the widespread historical impression that the most important leaders of all public utilities were dragged kicking and screaming into a system of state regulation is simply wrong"* (p. 9). At the time, electricity networks did not extend across state boundaries. The typical utility served a small area from a single generating plant in a single state (Hausman and Neufeld, 2011). Hence, PUCs had full jurisdiction over the utilities and regulation effectively guaranteed the utilities protection from competition.

The second actor in Anderson's reconstruction is the National Civic Federation (NCF), a group of "*civic reformers and corporate liberals*" (p. 10). The NCF published a report in 1907 stating "*public utilities are so constituted that it is impossible for them to be regulated by competition […] and the question is whether to regulate or to operate"*. Their reply to this question was state regulation. They feared municipal ownership would have perpetuated the corruption machinery around the granting of franchises. It was the Progressive Era, and dissatisfaction with politics was at its peak. In Wisconsin, the governor asked an NCF member to draft the law extending state regulation to municipal public utilities. Eventually, therefore, the NCF report served as outline for state legislation, in Wisconsin and elsewhere in the USA.

The last actors in Anderson's account are several governors, who used the issue of public control of private enterprise as a springboard to launch their political career at national level. He focuses on the case of Governor C. E. Hughes of New York. Hughes, known as close to private interests, had led an investigation into utilities rates and the insurance industry. Contrarily to expectations, he exposed the abusive practices of the private sector. This made him a national figure. As soon as elected

governor of New York, he created two PUCs whose members he could remove at will: one for New York City, one for the rest of the state. A month later, the Wisconsin legislature followed suit. In the following six years most States created PUCs to regulate electric and other utilities. Importantly, Anderson retrieved most of its data on PUCs relationships from NARUC's archives, and underlines NARUC's role in gathering regulators and providing them with a platform for exchange of experiences and expertise.

During the New Deal, many new federal agencies were created, such as the Federal Power Commission (FPC – created in 1920 to regulate hydroelectric projects, reinforced in 1935 and given jurisdiction over the sale and transportation of electricity and gas) and the Federal Communications Commission (FCC, created in 1934). Both were enlisted in NARUC's membership. NARUC purposefully shaped its relationships with all new federal agencies in a cooperative fashion. As a matter of fact, previous NARUC members were often Board members in these new agencies. NARUC representatives helped drafting these agencies' statutes, careful to prevent the Shreveport doctrine from being enshrined in them (Childs, 2001).

The Federal Motor Carrier Act of 1935 was particularly important as it institutionalized the ICC – NARUC cooperation. The Act negated the application of the Shreveport Doctrine to intrastate rates and provided for the use of State joint boards, nominated by PUCs and appointed by the ICC, to decide motor carrier issues involving not more than three States (Rodgers, p. 31). According to Rodgers, these were NARUC's proposals, which ended up in the law. The Act also provided for NARUC to have office space in or close to the ICC building in Washington.

The tension between federal agencies and state PUCs had become a permanent feature of American regulatory federalism. However, for a relatively long period between the end of the Second World Was and the 1970s, the energy sector enjoyed a relative calm (Hausman and Neufeld, 2011). As Anderson (1980) outlines, the industry was growing and reaping the benefits of economies of scale; increased consumption was rewarded with lower tariffs and rates were perceived as "just and reasonable".

In 1965, Professor Harry Trebing, a former academic turned regulator, established the very first "school of regulation" in the USA and the world: the Institute of Public Utilities (IPU) headquartered at the University of Michigan (Miller and Samuels 2002). Commissioners from all over the USA began receiving their training at the same institution, which enhanced their knowledge of regulation in both theoretical and practical terms, and further strengthened their bond to NARUC as their "natural home" (interview 39). To this day, the IPU is the main provider of regulatory training to US PUCs staff. As shall be detailed in the next chapter, the creation of a "school of regulation" was of primary importance in the development and strengthening of ties and cooperation among European regulators.

Before the 1970s, Anderson writes, the job of being a state Public Utility Commissioner was placid and attracted former politicians looking for an occupation after retirement, with close links to state governors. The whole approach to regulation at state level was premised on a pact of sort between the utilities and the state legislature: utilities would be afforded protection from competition, provided they were subject to public control. Regulation would perform both protection and control functions. Until the 1970s, developments in the sector followed a smooth, predictable linear pattern of growth in consumption and in utility revenue. It is perhaps not by chance that the first critiques of regulation were formulated at this time, and that they focused on the regulation of the electricity sector at state level (Stigler and Friedland 1962, Peltzman 1971) before producing their widely influential contributions on the topic of regulatory capture (Stigler 1971, Peltzman 1976).

This period of calm ended once economies of scale were exploited to the then possible maximum and utilities began facing difficulties in raising capital. The oil embargoes of the 1970s gave a blow to the industry, by making rates soar and pushing several big utilities on the verge of bankruptcy (Anderson, 1980). A sudden and massive increase in rates was deemed inevitable. A conspicuous amount of litigation ensued, with consumers and environmentalists becoming increasingly involved in the regulatory process. Deciding what was "just and reasonable" became a contested process, requiring skilled, timely and informed decision-making. Public

utility commissioners got under the spotlight of the stakeholders, who, in turn, became professionalized in how they defended their interests. The whole regulatory process became much more contested, as did PUCs' relationships with the federal agencies.

The expansion of the federal agencies' jurisdiction.

Since it was conferred authority over the sale and transportation of electricity and gas in 1935, the federal energy agency FERC has seen its jurisdiction constantly expanding, by allowing it increasing policy relevance and control. The introduction of competitive generation through the Public Utility Regulatory Policies Act (PURPA) of 1978 and, in particular, through the Energy Act of 1992 entailed increased competencies for FERC as it was tasked with developing new rules that would open access to utility-owned transmission systems allowing the private independent generators to compete in wholesale markets. The political support for restructuring and deregulating both generation and retail grew unabated across the states during the 1980s and the 1990s; until the California electricity crisis of 2000-2003 reversed the trend (Hausman and Neufeld, 2011). At any rate, over time state regulators' control over the utilities in their state diminished. Most recently, the regulations of the Environmental Protection Agency (EPA) in matters related to the environment and climate change (most notably, President Obama's signature environmental initiative called Clean Power Plan) also have tangible consequences for PUC's powers and for electricity rates.

The route towards centralization of regulatory power is also marked in case law: the PUCs and NARUC' efforts to expunge the Shreveport doctrine in the 1920s have not prevented the emergence of a new doctrine, which PUCs perceive as "*giving control*

to the feds" (interviews 35 and 40), i.e. the so-called Chevron deference doctrine[12] (interview 40). State regulators defended their powers in the telecommunications sector with equal resolve (Wallsten 2006). Events in that sector mirror those in the electricity sector to a great extent. Deregulation and greater network integration in both the telecommunications and electricity and gas sectors determined a diminished role of state regulation, which not even the NARUC could be able to reverse.

It is in this context that the evolution of NARUC took place. I discuss the NARUC's strategy of survival as one of "layering" (Thelen 2003): in the early 1990s, NARUC seized the opportunity to expand the scope of its activities by incorporating a new rationale. Just like at its foundation, that opportunity presented itself in the form of a proposition from a federal agency. As chapter 6 discusses in detail, the next critical juncture in NARUC's history occurred in 1998, when the USAID and the US State Department invited the NARUC to cooperate into a technical assistance programme aimed at establishing regulatory authorities in Central and Eastern Europe. The success of that programme marked the beginning of the continued involvement of the NARUC in regulatory technical assistance provision around the world, which has risen to represent the main source of NARUC's income.

[12] "Chevron deference" principle in administrative law holds that a reasonable interpretation of an ambiguous statute by an agency with subject matter jurisdiction prevails. Chevron U.S.A., Inc. v. Natural Resources Defense Council, Inc., 467 U.S. 837 (1984).

3. The history of CEER: the quest for legitimacy.

The emergence, consolidation, growth and evolution of the CEER has always been entirely driven by national European regulators. This single fact differentiates CEER from all the other cases examined in this thesis. Differently from other networks, which benefited from funding from external sources in their transition from loose communication to consolidated networked organizations, the CEER has always been financed by regulators exclusively. This fact testified to the clear intent of European regulators to maintain their autonomy, as well as to their agency in shaping the role of their collaborative network in the European energy regulatory policy process.

In most of the United States, the creation of PUCs predated the establishment of federal agencies. The same occurred in the EU: after the first regulatory "offices" were created in the UK (Stern 2014), the institutional format of the regulatory authority spread to other European countries. Their establishment was only subsequently mandated by European legislation. The creation of National Regulatory Authorities predates the establishment of European Agencies, which has occurred only very recently.

The key difference between these two cases is in the distribution of regulatory authority across levels of governance. In the USA, which is a federal system, regulatory authority is vertically split between the federal and the state level. The competence of federal agencies is limited to interstate infrastructure and issues. The competence of state level regulators is confined to the boundaries of their state. However, this apparently neat separation of powers does not prevent the emergence of conflicts of authority, because of the inherent interdependent nature of the object of regulation: energy infrastructure is a network industry. Hence, infrastructure placed at state level feeds into interstate infrastructure. The interdependent, networked character of the infrastructure has caused federal agencies' authority to come to impinge on the authority of state regulators.

In contrast, there are no supranational regulatory authorities in the EU. Each national regulatory authority is competent for the infrastructure within the boundaries of

their country. The European Union is not a federal state, but a peculiar political and economic construction. The allocation of power and authority in the realm of infrastructure sectors is not as clear-cut as in the US case. Rather, various institutional entities placed at various levels of governance hold and compete for more regulatory authority on the sector. Regulators have been voluntarily networking for a decade before the European Commission mandated them to coordinate within the European Agency for the Cooperation of Energy Regulators (ACER), which, however, does not have actual regulatory powers. This results from the Member States' reluctance to delegate regulatory powers to the European level, particularly since interconnection issues, and the repartition of the relative costs, are one of the longest standing matters of controversy in the European energy policy (Olmos Camacho and Pérez-Arriaga 2007). Hence, currently regulatory authority resides mostly at national level. However, the ACER is managed by the European Commission. Therefore, the preferences of the European Commission weigh in on ACER's processes; regulators are not alone in the driver's seat.

The literature has analysed CEER empirically: its policy relevance (Vasconcelos 2005, Thatcher and Coen 2008, Vasconcelos 2009); its empowering effects on regulators (Maggetti 2013) and its ability to successfully bargain its gradual absorption (Eberlein and Newman 2008) into the European institutional framework (Lavrijssen and Hancher 2009) by securing a central role for Board of Regulators into the Agency for the Cooperation of Energy Regulators (ACER) (Thatcher 2011). However, there are no detailed analyses on its emergence and the rationale driving it. Investigations of the agency of regulators within it, their motivations to network, and the CEER's evolution are missing from the literature.

Before the Regulatory State: the role of engineers in promoting interconnections and cross border energy trade.

The topic of cross border energy trade has deep roots in European history, as shown by Vincent Lagendijk (2008) in his book on the history of electricity networks in

Europe. Although often linked to the integration efforts of the European Commission and its tendency to self-aggrandizement, energy markets integration across the European continent has been a longstanding concern of (initially) private utilities and, in particular, of the technicians and engineers that worked in the power sector. Langedijk's historical reconstruction underlines the key role engineers played in the electrification of Western Europe and in shaping the debate of the time concerning the desirability of interconnection across European countries.

Engineers maintained a central role in the European power sector also in the aftermath of World War II. The following extended quotations portray the encounter between US and European engineers in the context of the Marshall plan.

> *"In April, 1949, a group of European engineers was welcomed by their American hosts. The visitors from Europe, most of them system operators in their respective countries, flew across the Atlantic to see firsthand the American state-of-the-art in the electricity industry. This Technical Assistance (TECAID) Mission was an integral element of the electricity programs set up within the framework of the European Recovery Program (ERP), also known as the Marshall Plan. The overall intention of the ERP with regard to electricity was to expand generation capacity, by building national and international power plants on the one hand, and making better use of new and existing capacity by creating European power pools on the other. These power pools, should be brought about by building both physical and institutional interconnections between countries."* (p. 107)

> *"As an outcome of these efforts, organizations representing regional power pools eventually became the face of European cooperation. (…) European engineers clearly had differing opinions from American ERP officials, who argued for international – and even supranational – ownership and operation of power plants and networks. The ideas of Western European engineers showed remnants of interwar plan, in stressing the solidarity effects of a European network. At the same time, their proposed way of creating such a network was rather similar to the consensus that emerged in the course of the*

1930s that national and international interconnections should develop side-by-side. To them, a European system should consist of nationally operated networks, working in close coordination." (p. 108-109)

Producer organizations were the main promoters of cross border electricity infrastructure integration in Europe. The UNIPEDE (Union Internationale des Producteurs et Distributeurs d'Énergie Électrique i.e. International Union of the Producers and Distributors of Electric Energy), set up in 1925, was the platform where the ideas of engineers regarding interconnection of European electricity grids were first voiced. The UCPTE (Union pour la Coordination de la Production et du Transport de l'Électricité - the Union for the Coordination of Production and Transportation of Electricity) an informal, regional network of utility representatives from eight Western European countries established in 1951 that set up the first mechanisms of regular communication among utilities[13]. Both organizations were very influential in framing the debate on infrastructure integration across Europe. They evolved into what today are the Eurelectric (the association representing European electric utilities in Brussels) and the ENTSO-E (the association of European system operators).

Lagendijk's historical narrative compellingly attests to the relevance of technical experts to the constitution of a supranational European order, linking in not only with well-established research on the contribution and impact of transnational networks of experts on national and transnational policy-making (Haas 1975, Haas, Williams et al. 1977, Haas 1992, Djelic and Sahlin-Andersson 2006, Ambrus and et al. 2014) but also with contributions from the social and geographical theory underscoring how technological interconnection and integration shaped the conceptualization of

[13] Similar groupings were created over the years, e.g. one gathering Scandinavian utilities, another gathering utilities' representatives from Spain, Portugal and France, another for utilities from Italy, Austria and Yugoslavia. Central and Eastern European countries remained relatively isolated from developments in Western Europe. Gradually, however, they established similar structures of cooperation among their utilities' representatives.

European integration (Barry 1996), and stressing the role of experts, engineers and scientists as physical carriers of policy-impacting knowledge (Larner and Laurie 2010).

Moreover, it outlines the core features of the European energy infrastructure and market integration policy: the tension between national and supranational authority and a preference for expert coordination rather than the creation of fully-fledged supranational institutions. On this background, the emergence and evolution of CEER find their place. I have investigated the history of CEER by way of face-to-face elite interviews with key individuals who were directly involved into its establishment and/or who previously or currently work in its ranks. In the following sections, I retrace the events leading to its emergence, its consolidation, its reproduction over time as influential actor on the European energy regulatory policy, and its ongoing evolutionary path.

The emergence of the CEER: networking for legitimacy.

> *"It is a very, very interesting story… I'll give you an outline of the key stages… from my point of view, of course. I'll tell you my personal history, although I believe it is similar to that of many others".* (interview 1)

In February 1997, representatives of the few then existing energy NRAs (from Italy, Spain, Portugal, Sweden, Norway, and the UK) met for the first time at a conference on electricity market restructuring[14] organized by the European Union and the World Bank. The laws establishing Southern European NRAs had been passed in 1995 (Italy and Portugal) and 1994 (Spain). Their respective governments had followed in the steps of the United Kingdom, which had undertaken the utility privatisation and liberalization process in the 1980s and had established independent energy regulatory authorities in 1989. As for the Scandinavian countries, at the time the

[14] Second World Conference on Restructuring and Regulation of the Electricity Market, 3-5 February 1997, Vasteras (Sweden).

liberalization of electricity markets was well under way, with Norway pioneering the process in 1992. The first comprehensive European legislation on energy markets was released in 1996. The so-called "first Electricity Directive" mandated the end of the energy monopolies and set the goal of achieving the creation of a European Internal Energy Market (IEM). However, it did not mention regulation or regulators at all. The establishment of independent regulatory authorities depended exclusively on national governments' initiative.

The head of the British electricity regulatory authority (called Office of Energy Regulation, or OFFER) was presenting at the conference. At the time, OFFER was perceived as being the paradigmatic NRA. The newly established Southern European regulators were eager to learn from its experience (interviews 1, 2, 3, 4, 13, 14). Scandinavian regulators, also in attendance, had a long-standing history of collaboration already. In those countries, governmental regulatory departments for infrastructure sectors were created in the early 1900s. Differently from their Southern European and British counterparts, which were constituted as Independent Regulatory Authorities (IRAs), Scandinavian regulatory authorities had developed out of former ministerial departments. The newly established Southern European regulators were more interested in learning from the British experience of independent regulation. However, British regulators observed with more interest the massive privatization programmes then ongoing in South America and Australia than the embryonic opening of southern European markets.

United in their quest for benchmarks, and given the strong similarities in their national markets, the three Southern European regulators agreed to start communicating on a regular basis to exchange information about the issues they faced. They started meeting quarterly, once in each country. Their first joint meeting took place a month after the Vasteras conference, in March 1997, in Lisbon. The second meeting was held in San Sebastian (Spain) in June 1997. Their third meeting took place in Milan in December 1997. They established three working groups, each chaired by one of them. They charged their staff with maintaining regular contact with the other two regulators in-between meetings. The first topics they addressed

were the new regulatory framework, in particular the development of incentive regulation, and regulatory independence from government and incumbent energy companies. In this way, the three Southern European regulators lay the foundation of what would become the CEER.

The European Commission co-opts the regulators.

At the time, the Commission was severely under-resourced, especially in sectors for which it did not have well-defined competence, such as energy policy. Therefore, officials in the Directorate General for Energy had only limited knowledge of national energy markets and actors. Their only providers of information at the time were the national energy incumbents, which had clear incentives to provide a biased picture. For these reasons, European Commission officials began reaching out to national regulators.

In the course of 1997, the then Director of the EC Directorate General (DG) on Transport and Energy (TREN, now DG ENER) learnt about the ongoing meetings of the three Southern European regulators. Their developing collaboration inspired him to conceive of a multi-stakeholder Forum, whose task would be to foster dialogue between stakeholders on energy market reforms, and encourage progress towards the creation of the Internal Energy Market (IEM). He envisioned it as a regularly scheduled gathering of *"those actors who, like itself, felt the need for market integration" (interview 3)*, i.e. regulators, operators, and other energy market stakeholders. It was also a mechanism to bring transparency into a sector that, at the time, was impervious to the outside observer.

The European Commission had realized that mandating the abolition of the state-owned utility monopolies, as the 1996 First Electricity Directive had done, was not enough to stimulate cross border energy trade. However, it was too early to begin negotiating a second piece of legislation. As a matter of fact, Member States

representatives were still negotiating the first Gas Directive as these discussions were taking place.

The Director General's idea resonated with sector stakeholders and rapidly materialized into what was called the European Electricity Regulatory Forum. The first meeting of the Forum was held in Florence (Italy) in February 1998. Henceforth it was commonly referred to as "the Florence Forum". Florence appeared as a suitably neutral location because it hosted a European apolitical institution, i.e. the European University Institute (EUI[15]). The following year, the European Gas Regulatory Forum, or "Madrid Forum", was set up, focused on the gas sector. Now a consolidated, taken-for-granted event concerning EU electricity markets and regulatory policy matters, at the time the Florence Forum represented a veritable revolution in the governance of the energy sector and a bold initiative of the Commission. The idea of bringing together regulators[16], operators, utility companies and European Commission officials was literally unheard of. Attendees of the very first meeting of the Florence forum

> *"…included senior representatives of national regulators or ministries responsible for electricity regulation, the EU Director General for Energy, Pablo Benavides, European Commission officials (DGs XVII and IV), representatives of the electricity industry and of major consumers. All EU Member States were represented as well as Unites States, New Zealand and Norway. The main areas addressed by the forum covered transmission pricing methods and cost accounting, (…) non-discrimination and unbundling, and treatment of public service obligations and environmental 'costs' in a pro-competitive environment. (…) Mr Benavides emphasised that the objective is not simply the liberalisation of 15 national systems, but also the establishment*

[15] The EUI is the only European university, whose existence is based on a legal agreement between the EU and 22 Member States, initially signed in 1970s1972, https://www.eui.eu/About/HistoryofEUI.

[16] Because most Member States had not established a regulatory authority yet, their energy Ministers were invited instead.

of an Internal Market in electricity: i.e. not just liberalisation but also "internal marketisation". This means that the imperative of subsidiarity co-exists with the need for a certain degree of homogeneous interpretation on the part of the Member States." (First Florence Forum Meeting 1998 - minutes)

Besides presentations from the European Commission, key Transmission System Operators (TSOs – from the UK, Sweden, Germany, Spain) and European and American consultants, a roundtable of regulators also took place during the meeting. Participants included regulators from Italy, Spain, Portugal, Sweden, Norway, Finland, Denmark, the UK, and the US. All regulators recognized the need to allow for national diversity and to increase transparency. However, clear differences in approach emerged in the discussion. According to the minutes, while the Portuguese regulator made the clearest calls for harmonized regulatory approaches, German industrial consumers expressed satisfaction with the hands-off approach in place in their country and clearly auspicated that *"stronger regulation will not be called for".* The hopes of German industrial consumers stood to be disappointed: at the second meeting of the Forum, which took place six months later, the topic of the regulation of TSO took centre stage together with key aspect of market opening, such as unbundling.

The first meeting of the corresponding gas Forum, held in Madrid for the first time and henceforth renamed "the Madrid Forum" took place in the same year – 1998. The minutes of that first meeting suggest a cautious approach concerning the integration of European gas markets.

"The fundamental objective of the Forum is to develop consensus amongst all the parties involved in this process; governments, regulators and industry, in order to make rapid progress on these highly technical issues. This mechanism acts as a complement to harmonisation measures that may be necessary to achieve the basic goal of an effectively functioning single market."

Similar to its electricity counterpart, the meeting was attended by officials from the European Commission, national regulatory authorities and EU Energy Ministries, as

well as representatives from international organisations, such as the International Energy Agency, and associations representing the gas industry and gas and electricity consumers. While the meetings of the Florence Forum took place every six months, the second meeting of the Madrid Forum took place two years after the first, testifying to the considerable reluctance of Member States to openings of the gas sector. Nevertheless, the minutes from the second meeting show a considerably stronger resolve:

> *"The representatives of the European Commission, the Member States, and the European Council of Energy Regulators, invite the European gas industry to establish, as quickly as possible, a new body or grouping that brings together representatives of all those responsible for the operation of the transmission network for gas in Europe. (…) The objective of this body is to work, inter-alia in the context of the Madrid Forum, together with the Commission, Member States and national regulators, to resolve issues of mutual concern with respect to the development of a competitive internal European gas market, and to provide technical data regarding the transmission systems within Europe at the request of the Commission, national Regulators, and the Member States."*

The second meeting of the Florence Forum in 1999 had similarly put forward the necessity for TSOs to form an association to dialogue with the Commission and the association of the regulators. The Florence and Madrid Fora became important appointments and boosted the working relationship between national regulators and the European Commission.

It is important to note that, at this stage, the CEER did not officially exist yet. Regulators would sign the Memorandum of Understanding officialising their cooperation only in 2000. Under these completely informal and loose arrangements, European regulators emerged from the Florence and Madrid Fora as key players in the formulation of the regulatory framework.

The necessity of homogenous interpretation, and implementation of the regulation of energy markets across the Member States has always been the leitmotiv of the European Commission's policy initiatives in this sector. The literature has understood the Commission's insistence on regulatory convergence and harmonization as a self-aggrandizing strategy (Schmidt 1998, Eberlein 2008, Mayer 2008, Diathesopoulos 2010, Torriti 2010, Maltby 2013, Goldthau and Sitter 2014, Herweg 2015): by transferring the formulation of energy regulatory policy to the European level, the European Commission inherently transferred more power to itself. As previously mentioned, the vast majority of scholarly contributions on European regulatory networks stem from consideration of the European Commission's integrationist pushes in energy policy. Early literature on networks, in particular, has assumed that the preferences of the European Commission and the regulators coincided. It has not investigated whether that is, indeed, the case, and why. This section suggests, and following sections confirm, that the regulators, similarly to the Commission, endorsed the policy goal of Europeanizing energy regulation because that would enhance their institutional role.

The consolidation of the CEER: the tensions of multi-level governance.

> "*In the beginning most of the work was national. There was so much to do nationally (…) the CEER was a club, it was interesting to go there because you met colleagues, on a national level you did not have colleagues (…) you had nobody to talk to and find out "Oh this is a usual problem or my issues are totally different from everybody else's? Am I doing something wrong? (…) In the meantime, the CEER continued to develop and we found that as a group we have some influence at EU level, so it's not just exchanging best practices and learning from each other, which is also a component, but we also have an impact on what happens next"* (interview 28).

> *"Let's put it this way, if my goal would be to… implement or to achieve very nationalistic, specific solutions, probably it would not be successful to do it at EU level. But if the goal is to develop solutions that make sense in a general economic way in a European perspective then you're much better off to try to push that at EU level"* (interview 25).

The CEER had begun as informal contacts between a handful of regulators, meeting occasionally in European capitals. With the exceptions of France (that did so in 2003) and Germany (in 2005), all EU-15 Member States established energy NRAs quickly thereafter. The group of regulators expanded in size: newly established authorities did not hesitate to reach out to the forming network of European regulators and to establish ties with it. In order to take stock of the state of energy regulation across the Member States, in 1999, the Italian regulatory authority organized a seminar on "Criteria for electricity tariffs and pricing", held in Rome (Italy). All other European NRAs were invited to take stock of their experiences. Representatives from 18 institutions attended and gave a presentation, including NRAs from Italy, Spain, Portugal, the Netherlands, Finland, Ireland, Belgium, the UK, Northern Ireland, Sweden, Norway, Hungary, Poland, Romania; Ministers from France, Germany and Switzerland, and an observer from the European Commission (AEEGSI, Annual Report 2000, p. 291; CNE database[17]).

The exchanges preceding and following this meeting showed that, in their different national contexts, regulators were facing very similar challenges: primarily, domestic opposition from industry and government as prices increased as a result of cost-reflective tariffs, and government subsidies were phased out. A month after the meeting, in December 1999, during the fourth meeting of the Florence Forum, the three regulators publicly expressed the intention to establish an association of

[17] CNE Online Database http://www.cne.es/cgi-bin/BRSCGI.EXE?CMD=VERDOC&BASE=TODO&DOCR=14&SORT=-FECH&RNG=20&SEPARADOR=&&desc-c=+DISE%D1O+Y+ESTRUCTURA+DE+PRECIOS+Y+TARIFAS

European energy regulators. Just like European Energy Ministers met at the European Council in Brussels, regulators "*would have their own council*" (interview 1), as well. Hence, they decided to call their association the Council of European Energy Regulators (CEER).

Not only had the regulators found that they faced similar challenges; they also had understood that the process of reforming national energy markets and integrating them would take a long time, and that opposition to their decision-making activity would not dissipate: the activity of regulation consists of imposing costs on (and creating benefits for) different market actors as a result of market design. More broadly, just like their US counterparts had experienced a century earlier, European regulators realized that the tensions and contrasts inherent in the distribution of regulatory authority across levels of governance entailed issues of regulatory control. They would always face the threat of having their powers or authority curtailed, whether "from below" (i.e. by national governments) or, as they soon realized, "from above" (e.g. by the European Commission). Therefore, they needed a mechanism of collective representation to address the supra-national level and to refer to at domestic level.

In the early 2000s, the regulators understood that establishing an association would have allowed the "regulatory position" to come across directly to the Commission (interview 4). This opportunity changed the attitude of the UK regulatory authority (OFGEM), which had initially been lukewarm towards the idea of regularly cooperating with their European counterparts. Therefore, in January 2000, the representatives of 10 regulatory authorities met at OFGEM offices in London to discuss the form and the goals of their association. On 7 March 2000, representatives from Belgium, Finland, the UK, Ireland, Northern Ireland, Italy, Norway, the Netherlands, Portugal, Spain and Sweden met in Brussels to sign the Memorandum of Understanding (MoU) establishing the Council of European Energy Regulators (CEER). Several interviewees recalled the endorsement of the CEER by OFGEM as decisive for the establishment of the association. The British model of energy regulation was so influential in the EU and beyond that many felt an association

without the British NRA would have been somehow less credible (interview 3). The MoU was non-binding and merely declared the intention of regulators to coordinate in the interest of achieving the IEM. The formalization of regulators' cooperation occurred three years later, in response to the first attempt of the European Commission to appropriate the space of cooperation that regulators had built for themselves.

ERGEG and the officialised CEER: cherishing the NRAs' self-rule.

In the year 2000, the European Council launched a policy programme called the Lisbon Agenda. Among other things, it encouraged the full liberalization of the national energy markets and the achievement of the IEM. To that end, the Council asked the Commission to prepare legislative proposals. In their turn, the European Commission sought the regulators' views. At this point, CEER members felt that their network could no longer remain an informal association of professionals: the constant interaction with the Commission required resources and updated knowledge of the latest policy proposals. Moreover, providing policy input required closeness to the centre of policy formulation. This was difficult to achieve from national capitals.

Until that point, the financial viability of the CEER had been assured by voluntary contributions: regulators did not have fixed dues; they covered their CEER-related expenses, which mainly consisted in travelling to meetings around Europe, individually and autonomously. The opportunity to contribute to the drafting of the European Commissions' legislative proposals, however, represented a rather more consequential commitment. Regulators decide to provide CEER with structure, as well as headquarters in Brussels, secretariat staff, a work plan, and set budgetary contributions.

At the same time, the European Commission needed to formalize its relationship with the regulators. As one interviewee pointed out, the EC could not continue to explicitly

and extensively rely on a private association of individual professionals to carry out important market reforms (interview 1). “Formalizing” the Commissions’ relationship to the regulators was necessary to ensure transparency and accountability. At the same time, regulators feared that the Commission would have imposed its decisions, should it have the opportunity – they decided to retain their own informal network to retain their independence from both of their principals (Egeberg 2006): the “old” one (i.e. national governments) and the “new” one, i.e. the European Commission.

Hence, the Commission gave leeway to the regulators to propose a model for their coordinated dialogue. The regulators’ proposals were very ambitious. Besides market design rules, in the first draft of what then became the second Energy Package, there was the creation of a European body of regulators with ample regulatory powers, *“on the model of the American FERC* [Federal Energy Regulatory Commission]*; a true European regulator, with real powers, so that you could move from national to European regulatory agency”* (interview 4). Therefore, some regulators envisioned a regulator-only European agency, similar to the USA FERC, and their careers as ascending from the national to the supranational level. The EC Legal Service, however, in application of the Meroni doctrine[18], restrained the scope of the foreseen regulators’ body to no more than consultative powers.

[18] The Meroni doctrine arose from cases C-9/56 and C-10/56 (Meroni v High Authority [1957/1958] ECR 133) and relates to the extent to which EU institutions may delegate their tasks to regulatory agencies. The European Court of Justice rules that it "cannot be excluded" that power might be delegated to bodies whose existence was not contemplated by the Treaties, if doing so appears compatible with the regulatory powers conferred on the institutions (in that case, the High Authority of the Coal and Steel Community). However, such delegation is permissible only when "it involves clearly defined executive powers the exercise of which can, therefore, be subject to strict review in the light of criteria determined by the delegating authority", whereas delegation of "a discretionary power, implying a wide margin of discretion" is to be excluded in all cases. http://www.jeanmonnetprogram.org/archive/papers/02/020201-03.html This is to respect the institutional balance of powers of the European institutions, which is a fundamental

In November 2003, a Commission decision created the European Regulatory Network (ERN) of energy regulators: the European Regulators Group for Electricity and Gas (ERGEG). A few days earlier, the CEER had been registered as a no profit association under Belgian law.

> *"The Commission wanted to consolidate the CEER as advisory organ to itself. It was the regulators who said "Well, we don't want to be part of something that can only be convened by the Commission… we want to be able to convene meetings and talk about our things, for instance training, exchanges of information, of help…. We have a series of things that interest us so we don't dissolve the CEER". And so there were the CEER and the ERGEG."* (interview 1)

As the above suggests, the actual process leading to the establishment of the ERGEG followed a rather informal, under-the-radar path. If the formal aspects of this process may be described as consisting of a "double round of delegation" (Coen and Thatcher 2008), its informal core consisted of regulators' acceptances of closer monitoring by and collaboration with the European Commission, provided the network's advisory role remained essentially the same. Coen and Thatcher (2008) do not focus on the energy regulators' network, because of its weak powers and formal autonomy. This statement reinforces the importance of investigating the informal dimension of regulatory networks, since, like in this case, it may be the dominant one.

The CEER and the ERGEG coexisted under the same roof between 2003 and 2011. These arrangements suited the circumstances – the Commission could barely devolve any resources to the ERGEG; the existing organisational infrastructure of the CEER supported it entirely. The creation of the ERGEG faced regulators with the option of terminating the CEER. Several NRAs were in favour of this solution, on account that it would have reduced the expenses on travelling to Brussels for

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guarantee afforded by the Treaty to European citizens. http://eur-lex.europa.eu/summary/glossary/institutional_balance.html

meetings (interviews 4, 15, 19). Nevertheless, the majority of CEER members voted during their General Assembly in favour of retaining the CEER as the regulators' own association, independent of any other institution. Some regulators feared that the European Commission was *"too ideological"* (interviews 4, 5) and too eager to speed up the pace of market integration, regardless of national circumstances.

The training of regulators: the establishment of the Florence School of Regulation.

Since 1997, European energy regulators had been regularly exchanging information. In the early 2000s, they reckoned that the body of knowledge that they were developing on the field would be useful to current and future European regulators. One of the Spanish Commissioners volunteered to organize a course on electricity tariffs. He had gained considerable experience in providing regulatory training while working as consultant for Latin American governments and NRAs in the mid-1990s. The first training course, attended on a voluntary basis by only a few CEER members, was held in March 2002 in a hotel conference room in Palma de Mallorca. The location was chosen to keep participation costs at a minimum thanks to low season hotel prices, given that most of the participants financed their own participation out of their own pocket (interview 1). The course was not labelled a "CEER training course". Not all members would be ready to endorse such a statement at that point (interview 1). The course was attended by all EU regulators as well as by the head of the Hungarian regulatory authority (interview 3), which had been established in 1994. Hungary was not an EU Member State at that time, but interactions between EU and Eastern European regulators were becoming more frequent in the early 2000s, as will be recalled in chapter 6.

The success of this first training programme prompted European regulators, as their North American counterparts had done in the 1960s, to set up a "school of regulation". They decided to test the idea by locating the future school of European energy regulators within an existing institution. The choice fell upon the European

University Institute (EUI) based in Florence (Italy) – it had hosted the first Florence Forum meetings and still appeared as a suitably neutral location. Supported by a communication to the EUI president from the EC vice-President Loyola de Palacio, regulators arranged for a second training course to be held at the EUI. The course took place in October 2003 and represented the foundational moment for the Florence School of Regulation (FSR), which was officially created in 2004. The head of the Italian NRA, a professor who had created the CEER together with its Spanish and Portuguese counterparts, became its first Director upon finishing his NRA mandate.

The CEER as a policy lever: policy influence and institutional goals.

> *"…A strong unbundling (…) would not have found a majority in parliament (…), even if the ministry of economy had supported that (…) so early on I said it's not worth try to lobby nationally because we will fail but at EU level it's a different story… so we did succeed to get quite a number of those provisions into the 3rd package (…) like it's a separate branding, you know, it would be totally impossible to get this in XXXXX but in Brussels it was not such a big issue because a number of countries had already done it so they felt, yeah, it's a good idea, let's do it, and those countries that were strongly opposed were few, (…), but they did not have the majority in the comitology process therefore we got some rules we would never have gotten on a national level"* (interview 25).

> *"A good example is the third energy package where with luck at that moment in time we were able to influence quite a bit the outcome, so in the third energy package there are many provisions that we have drafted… and at that time we had extremely good cooperation with the Parliament so we were able to bring in many amendments to the Parliament and strengthen the role of regulators, the independence of regulators, strengthen the unbundling*

rules, things that we would not have been able to do on a purely national basis" (interview 15).

Preparatory work for the Third Energy Package represented a key opportunity to further market integration. Regulators used the opportunity to shape the institutional design of their national markets by taking part in the formulation of binding European legislation. The second Energy Package had represented the first occasion for regulators to influence European legislation on energy markets. However, it resulted into much less ambitious legislation than regulators would have preferred. Eventually, it mandated regulatory independence from industry, but not from government, and provided for minimal monitoring and advisory powers.

Furthermore, in the early 2000s the European Commission had realized that market integration was not progressing. In 2004, the European enlargement brought ten new Member States into the EU and ten new NRAs into the CEER and the ERGEG. The scope of the IEM had thus greatly expanded and came to encompass jurisdictions at different stages of institutional and market development. As the policy relevance of the coordination taking place within the CEER/ERGEG kept growing, and the push for market integration and liberalization of retail markets grew stronger, these differences came to be seen as hampering the effectiveness of such coordination. Specifically, some regulators could not make commitments to their counterparts, because very often they either lacked jurisdiction over cross border issues or they shared it with the government. Until the second half of the early 2000s, most regulators still needed government approval of most of their decisions.

However, no entity existed, which could impose its decisions on any of the actors of the EU energy regulatory space. The regulators, together with the Commission, crafted an interim solution by promoting, in 2006, the division of national energy markets into regional blocks, which would integrate their markets first. These blocks, called Regional Initiatives, became the building blocks of the Internal Energy Market (IEM). *"There was no grand scheme behind it. It was more like… what the hell do we do!"* (interview 25). Hence, regulators came to see the establishment of a European

Agency as necessary to force market integration and as an opportunity to enhance their decision-making authority (Thatcher 2011).

> *"I said we need to keep our autonomy from everyone. I cannot gradually lose autonomy as I get closer to Brussels. So I wanted the Agency to be a regulators' agency. Autonomous, independent, that had to be very clear. I wanted it to be financed, like national ones are, through levies. (…) At that time, the Parliament listened to us. They listened to us and eventually that hybrid resulted, with at least a strong board for the regulators"* (interview 4).

The European Commission, however, saw itself in the driving seat of the Agency. This competition led to a hybrid agency, where the regulators retain considerable authority but under the aegis of the Commission. Although falling short of Euro-wide regulatory competences, the ACER gained exclusive authority over the formulation of the rules that would ensure the viability of an integrated EU energy market – the network codes (Jevnaker 2015). The entry into operation of the ACER in 2011 ended the path-dependent progression of the CEER and triggered the third and current phase of its existence: re-invention.

Re-inventing the CEER: layering or conversion?

> *"The CEER has been incredibly successful but its initial role is finished, it's gone, pretty much, it's transferred to ACER. So now CEER is still working but I think it's got a philosophical purpose, which is to preserve the interest of independent energy regulators. (…) It can also lobby, of course… lobby is the wrong word… it can also try to influence the political establishment in Europe in ways which ACER can't, really, because technically ACER is kind of an arm of the EC so it would be wrong for it to lobby for new policy initiatives or lobby publicly in ways which disagree with where the EC is coming from because it would be like the EC arguing*

with itself, but CEER can do these things and that I think is the real example of the independent voice of regulators" (interview 14).

Virtually all interviewees acknowledged that the creation of the Agency has partially deprived the CEER of its institutional and policy relevance. By creating the ACER, the European Commission institutionalized regulatory coordination, rendering the informal space of interaction it previously had with the regulators redundant.

In their discussion of the institutionalization of the network of European civil aviation authorities into a European Agency, Pierre and Peters (2009) conceptualize institutionalization as an outcome determined by the environment surrounding the network.

> *"Institutionalization should be seen as a set of contingent choices made by actors, rather than as some type of natural evolution of organizational life. Institutionalization could in some instances be seen as a process in which actors with an interest in controlling the regulation of a policy sector, or a part thereof, struggle to control the domain or 'space' of the emerging institution (…) To the extent that the environment is populated by powerful actors, and there are technical demands for uniformity, there will be greater demands for institutionalization. For example, public-sector institutions face demands to create legal instruments rather than informal instruments for controlling policy sectors."* (Pierre and Peters 2009, p.342)

The outcome of the struggle for regulatory control over the European energy regulatory policy resulted in a hybrid agency, where the Commission and the regulators share the driver's seat.

However, CEER did not dissolve. Rather, it re-invented itself. On the one hand, it began focusing on policy issues, outside of the official remit of ACER, such as retail markets and consumer issues; on the other hand, it added a new function to its mission by engaging in training provision. Finally, in the past few years CEER has been welcoming regulators from FYROM, Montenegro, Moldova, Bosnia-Herzegovina and

Kosovo as affiliate members, in an effort to revamp its representativeness (interview 32) and potentially representing the European energy policy in the EU neighbourhood (interview 21).

Moreover, regulators emphasise the CEER's twenty-year networking experience, conferring it an advantage over the European Agency in terms of speed and flexibility:

> *"We have more resources. ACER is always limited by the Commission resources (…) today ACER has 60 people and the regulators have about 180 full time equivalents that work for ACER, (…) the regulators as a whole group probably have 3500 people in Europe so we can quickly come up with 5 or 10 people on something, ACER would have to go to the EC, to the administrative service, get a budget increase, has to hire, to follow a procedure, so it takes them almost a year to find another 10 people. We can do this in a week"* (interview 25).

> *"They* [CEER representatives] *really negotiated with the Parliament and there are a lot of things in the Third Package that are actually, even our wording… which the Agency could not have done, I mean it didn't exist, but we couldn't have done that through ERGEG, we could only do it through… and we've still got that"* (interview 15).

Critical junctures in the history of the CEER.

The history of CEER is marked, similarly to NARUC's, by key definitional moments. Four stand out for their significance to CEER developments, as emerging from the interviews: the meeting of the Italian, Spanish and Portuguese regulators at the conference in Sweden in 1997, which set in motion the process; the endorsement of the British NRA; the launch of the Florence and Madrid Fora in 1998; the call on regulators to collaborate with the European Commission to speed up energy market integration following the launch of the Lisbon Agenda (2000), which led to the

creation of ERGEG (the European Regulatory Network) in 2003; and the establishment of the ACER in 2009.

Only one, however, displays the properties of a critical juncture according to the diagnostic guidelines in Capoccia and Kelemen (2007). The fortuitous encounter of the three southern European regulators in Vasteras and their decision to maintain an informal collaboration was absolutely key, in that it represented the emergence of CEER. However, the Florence Forum represented the first occasion where regulators confronted other stakeholder's preferences and interests concerning the future direction of the European regulatory framework and realized that the tensions they experienced in their national context existed across the EU. In other words, they realized that those tensions and divergences would remain a feature of the regulatory system and that, therefore, regulators would benefit from collaborating and constituting a single entity. Moreover:

- The length of the events following the first meeting of the fora in terms of regulators' network relations and interaction with the European Commission greatly exceeded the perceived importance of the event at the time, and its duration.
- After the critical juncture, the likelihood of network participation in the policy process increased exponentially.
- Contingency was paramount, as the initiative had originated from the institutional environment of the regulators…
- … thanks to the proactive agency of a single individual, the Director General for Energy at that time.

One important feature of a critical juncture as per Capoccia and Kelemen (2007) that appears missing from the CEER history is the availability of counterfactuals. In other words, the CEER does not seem to have emerged out of a period of crisis or political uncertainty, when it became the favoured option amongst several alternatives. However, a more thorough reflection shows that this impression is inaccurate. In the early to the mid-1990s, the existing European energy NRAs faced considerable indeterminism: the legal framework at EU level was being established; NRAs had no

guidance as to how to steer the liberalization process; the first Directives had just been released, and only a few Member States had established NRAs. All that NRAs had to guide their decision-making was the White Paper the EC had published in 1995, outlining the objectives of the EU energy policy, and the first liberalization Directive for electricity markets (96/92/EC) where NRAs as such are not even mentioned.

Moreover, as the initial outcome of the Vasteras meeting in 1997 shows, regulators came from national backgrounds that were so widely different that they initially ruled out the possibility of cooperating. The UK regulator was more interested in establishing links with regulatory agencies in overseas countries, where vast scale privatizations were under way. Scandinavian regulators were embedded in a very specific governance settings bearing no comparison to that of Southern European regulators. The initiative of the three Southern European regulators, however, had two effects. Firstly, by exchanging information, regulators setup their network as a rapidly accessible repository of information on different national markets; this attracted more members since the mere existence of these connections reduced the new regulators' uncertainty. This condition led to the expansion of the three-node network formed by the three Southern European regulators. Secondly, by facing stakeholders from different Member States at the Florence forum, regulators realized that they faced common challenges, which were unlikely to vanish. Hence, they would all would benefit from a mechanism of collective action and representation and decided to consolidate the CEER into a network, displaying the properties of an organization and the rules, norms and longevity of an institution.

Part I. Conclusion: networking for control.

Having emerged in different historical epochs and in response to diametrically different institutional and market circumstances, NARUC and CEER have apparently little in common. However, I selected these two networks as case studies because both gather regulatory authorities embedded in a multi-level governance system, that has made the political decision to organize the provision of certain services through independent regulatory bodies with delegated authority. Furthermore, in both the USA and the EU, the establishment of regulatory authorities derived from a radical change in the policy paradigm governing the sector: from competition under municipal franchise in the former case; from state ownership and management in the latter case. In both cases, regulatory networks emerged spontaneously from the coordinated action of small groups of network members (Provan and Kenis 2008). The literature, however, has rarely investigated their reasons, and the interplay between regulators' network initiative and their surrounding environment.

The question guiding the analysis in the foregoing two chapters is, therefore: what are the conditions leading to network emergence? To answer this question, I reconstructed the events and circumstances leading to network emergence in both cases. The origins of NARUC date back to the 1880s; hence, I relied on archival sources and existing literature to reconstruct its emergence. The origins of CEER are much more recent, dating back to the late 1990s; hence, I mostly relied on elite interviews with individuals involved in its emergence. The analysis is based on inductive reasoning based on these information sources, on the background of the findings and insights of the institutional theory of organization but also theories of bureaucratic politics.

Spontaneous regulatory cooperation emerges soon after the establishment of regulatory bodies: regulators are unsure about the boundaries of their role and face domestic opposition. The willingness to learn from the experience of counterparts in their broader institutional environment, constituted by the nascent Regulatory State, undergirds the emergence of both networks. Regulators pursued their peers' expertise with the aim of increasing their domestic legitimacy, from which they

would derive their authority. Although the American process was marked by litigation, while the European process by informal elite networking (John 2012), the inception of the network was the regulators' response to the uncertainty surrounding them. I distinguish this early phase of regulatory networking from its subsequent one, where loose professional ties transform into consolidated, politically consequential collective action.

The findings of the comparative historical analysis are that regulators network for control. Namely, they decide to consolidate their networks as entities, bearing the properties of organizations (e.g. legal personality, physical headquarters, secretarial staff, budgetary contributions, work plans etc), as they realize that the governance tensions inherent in the multi-level governance system will always represent a potential threat to the extent of their autonomy and authority. These tensions originate in the allocation of regulatory authority across levels of governance. Even where this allocation has seemingly very clear boundaries, as in a federal state such as the USA, regulators at different levels of governance collide over the extent of the primacy of their respective decisions within given territorial jurisdictions. In contexts where the allocation of regulatory power across levels of governance is far from having clear boundaries, given the absence of supranational regulatory authorities, such as in the European Union, the issue of regulatory control is even more politically complex, as regulators derive their legal authority from the previous holder of regulatory power: the national government.

Comparative examination of the cases shows that, in the course of their development, NARUC and CEER faced different kinds of opposition. In the case of NARUC, railroad industry representatives long battled to eliminate state regulation; Public Utility Commissioners were only able to retain their regulatory power by allying with the nascent federal agency and the primary customers of the railroads: shippers of goods. Soon after their inception, European national regulators also faced harsh opposition from the energy industry, organized in powerful "national champions" having close ties to government. Consumers, who stood to benefit from regulation, were not vocal supporters of regulation also because the onset of cost-

reflective tariffs and the elimination of subsidies in Europe improved the quality of service but also implied much higher prices. European regulators' only strong ally were supranational institutions and, in particular, the European Commission. Regulators and the European Commission entered into a relationship of symbiotic interdependence (*"the output of one is the input of the other"*, Pfeffer and Salancik 1978, p. 41) because the fulfilment of the latter's policy agenda because necessarily implied the strengthening of the role of the former. As discussed at the end of chapter 3, however, the establishment of a European Agency for the Coordination of Energy Regulators changed the nature of the relationship between the Commission and the CEER, transforming it from one of symbiotic to one of competitive interdependence (*"the outcome achieved by one can only be higher if the outcome achieved by the other is lower"*, p. 41). Arguably, the same mechanism undermined the initially cooperative relationship between state regulators and federal agencies in the USA: as the latter were gradually more empowered by legislation, what had hitherto been a horizontal collaborative relationship became a vertical competitive relationship.

I relied on the concept of critical juncture (Collier and Collier 1991) to capture the shift in the essence of regulatory networking from mere professional interest to a strategy of preservation. I adopted Capoccia and Kelemen's (2007) diagnostic framework to pin down the regulators' realization of the permanency of the governance tensions to specific moments. The moments I identified as representing critical junctures derive from the evidence I gathered to trace the history of these two networks. Their validity may be disputed: although clearly emerging as critical from my data, one might argue that additional data may have pointed to additional moments or events, or that different interviewees may have pointed to different events as critical. This potential critique is well taken, but does not change the validity of the finding: regulators consolidated their networks into entities with organizational and institutional properties as a result of the realization that their turf would be always potentially subject to erosion from competing sources of regulatory authority at different levels of governance.

Thus far, I have discussed networks of regulators as unitary actors (and units of analysis). In reality, however, not all regulators make the same use of the networks they belong to. They are not equally active or equally influential within their network. Interviews clarified that there always is a subset of network members who are more active than the rest: they attend all meetings, contribute material, bring new information into the network, and eventually shape the agenda. These regulators are the engines of network activities. What explains the actual structure of network relationships within a transnational network of regulators? Why are some regulators more active networkers than others? These questions are posed and answered in the next two chapters.

PART TWO – EXPLAINING NETWORK STRUCTURE, NETWORK ACTIVISM AND NETWORK INFLUENCE.

Part II. Introduction: measuring network cooperation.

The literature on transnational networks has often treated networks as organisations within whose framework regulatory officials interact. Various contributors to the literature on regulatory networks, as well as policy practitioners, often use the word "network" metaphorically, to describe a certain kind of informal association of professionals (Isett, Mergel et al. 2011). In social networks, nodes choose which relationships to pursue and maintain. Networks are measurable structures, whose analysis can reveal information about the relationships between the nodes and about the character of those relationships.Recently, inferential social network analysis has made inroads into the social sciences allowing for the modelling of networks. These models afford the researcher considerable explanatory power as concerns the drivers of network ties and the determinants of network structure.

In the context of this research, the social network analysed is the network of European national energy regulators. Using original data collected between late 2015 and early 2017, in this part of the thesis I investigate the explanatory factors of their network structure and the determinants of their ties. I asked regulators to report their most frequent and regular ties as concerns exchange of information, opinions and advice. I gathered data from all 29 European national energy regulators that are members of the CEER (i.e. from all 28 EU Member States plus Norway). Only one regulator did not respond to my question; for that regulator, I considered their ties as reciprocated. In chapter 4, I develop an Exponential Random Graph Model of network structure. In chapter 5, I investigate the determinants of regulators' bilateral ties to each other.

In the model developed in chapter 4, I hypothesise that the ties among European regulators would display a pattern of homophily (McPherson, Smith-Lovin et al. 2001). Homophily is the tendency of individuals to associate and bond with similar others, as in the proverb "birds of a feather flock together". Its presence has been discovered in a vast array of network studies. Specifically, I hypothesise that

European regulators tend to network with peers overseeing markets that have a similar structure to theirs. Since the European regulatory policy for energy markets is premised on liberalization, I further hypothesise that regulators overseeing markets at more advanced stages of liberalization would receive significantly more incoming ties, as their peers seek to learn from them. Furthermore, previous literature points to resources as a powerful motivation for cooperation among experts and regulators (Cengiz 2007, Alcañiz 2010, Alcañiz 2016); therefore, in the chapters I also test the hypothesis that regulators with lower (financial and human) are likely to have more outgoing ties than their peers.

The results of the model show that, indeed, regulators are homophilous in their choices of network partners; in other words, they tend to establish direct ties with regulators, facing similar sector structure and political economy. Furthermore, the UK energy regulatory authority emerges as overall more sought after than their peers, in accordance with the second hypothesis concerning market liberalization. Finally, human, rather than financial, resources appear to be associated with a higher number of outgoing ties. The model also reveals that geographic contiguity and common membership in one of the European Electricity Regions also matter, and that regulators tend to cluster around particularly active networkers.

Chapter 5 further develops analysis on regulators' resources and how they relate to their network tie choices. The models developed in chapter 4 suggests that regulators with intermediate levels of staff resources are more active compared to peers with large resources. In contrast, regulators with very low staff resources are not more likely than resourced peers to be proactively using their networks: this suggests that the link between resources and activism holds as long as regulators are not so resource-constrained as to being unable to devote resources to networking, or so well-resourced as to be able to acquire or generate information in-house. In the chapter, network activism is operationalized as the count of regulators' non-reciprocal ties. Non-reciprocal ties suggest a weaker (i.e. less frequent) relationship than that implicit in mutual ties (Granovetter 1973). This, in turn, suggests different assessments of the strength of the relationship on the part of the involved regulators.

This chapter stems from the notion that regulators with more outgoing non-reciprocated ties are information seekers, and understands them as proactively using network ties to compensate for lacking resources.

The hypothesis underlying chapter 5 is that lower resources correspond to higher counts of non-reciprocated ties. The results of the analysis lend support to the hypothesis, but only for staff resources. Budget resources are measured by a categorical variable resulting from the categorization of budgetary data referring to 2013); exploration of the data reveals a linear relationship, which, however, fails to achieve significance. However, this data is older than staff data and therefore may suffer from measurement error.

The combined findings of chapters 4 and 5 are that regulators are homophilous in their tie choices according to market structure; that regulators from markets at an advanced stage of development are more sought after; that better resourced regulators are more sought after while less resourced regulators are the most proactive, exception made for regulatory authorities having extremely small resources, for whom, plausibly, regulatory networking represents too high a cost. Arguably, the interdependence engendered by the process of European integration underpins this mechanism of resource compensation by creating the opportunity for regulators' interaction. The patterns emerging from analysis suggest that regulatory networking may have improved (national) governance more than national resources alone would have allowed. This conclusion is noteworthy for the literature on transnational regulatory networks, which overwhelmingly focused on the potential for networks to improve global governance. Arguably, this analysis calls for reflection and, given further hypothesis development and testing, acknowledgment that the feedback effects of transnational networking on national governance have been consistently improving national regulatory practice.

4. The drivers of transnational regulatory networking: Varieties of Capitalism between homophily and convergence.

Introduction

The literature on transnational regulatory networks has literally boomed since the early 2000s (Raustiala 2002, Eberlein and Grande 2005, Slaughter and Zaring 2006, Tarrant and Kelemen 2007, Berg and Horrall 2008, Coen and Thatcher 2008, Verdier 2009, Zaring 2009, Ahdieh 2010, Maggetti and Gilardi 2011, Yesilkagit 2011, Jordana and Levi-Faur 2012, Maggetti 2013, Newman and Zaring 2013). The combination of their pervasiveness and their relative mysteriousness has fuelled academic and policy curiosity about their inner dynamics. What are the criteria according to which regulators choose whom to network with? In other words, what are the drivers of regulatory networking? This chapter answers this question by analysing network ties among National Energy Regulatory Authorities from EU Member States.

The governance literature has converged on the overarching understanding that transnational (or trans-governmental) networks are meant to improve the governance of economic sectors or phenomena, whose reach extends beyond any single country. Within networks, regulators have the opportunity to exchange information and to coordinate their regulatory practice in order to facilitate cross border trade and investment. These conclusions resonate with the stances of the liberal school of international relations (Keohane and Nye 1974, Keohane 1998), which has emphasised how increased interdependence motivates transnational cooperation and coordination, leading to the creation of international regimes (Haas 1980, Keohane 1982). In this view, regulators network transnationally in order to tackle the challenges of interdependence while reaping the opportunities.

Beyond interdependence, the drivers of regulatory networking have rarely been investigated. More recent explanations have pointed to the importance of autonomy and resources in prompting regulators to network transnationally (Reisenbichler 2015, Vestlund 2015, Bach, De Francesco et al. 2016). Overall, in existing literature the word "network" usually constitutes a useful descriptive metaphor, rather than a relational structure (Isett, Mergel et al. 2011). Yet, the real thrust of networks resides in the connections between the nodes forming them. Regulators maintain informal network ties with peers from other countries because they find it worthwhile. Even when semi-formalized networked organizations (such as European networks) exist, individual regulators are unlikely to maintain regular informal ties with each and every one of their peers; more plausibly, they sustain bilateral frequent and stable ties to a subset of them, reaching out to others more sporadically.

In this article, I investigate the drivers of regulatory networking by analysing the directed network of connections between the 28 National Energy Regulatory Authorities of EU Member States, plus Norway. I develop an Exponential Random Graph Model (ERGM) premised on hypotheses aimed at testing whether the Varieties of Capitalism (VoC) framework (Hall and Soskice 2001, Hancké, Rhodes et al. 2007) holds relevance for explaining network structure. The results show that regulators are homophilous in their tie choices, which means that they tend to establish ties with counterparts that are similar to them; namely, this study finds that similarity in the structure of the energy sector across countries – operationalized through the VoC framework – is a powerful determinant of network ties for some clusters of regulators. Moreover, the British regulator emerges as considerably more active and influential than its peers, and a divide is observable between regulators from EU-15 and others. Contrary to expectations, the results of the model indicate that higher, not lower resources are associated with more active regulators, suggesting that more resourceful regulators are both more sought after and more active networkers.

Overall, these results lend support to contributions underlining the importance of expertise-driven policy learning as the driving force of transnational regulatory networking. The paper confirms the relevance of the VoC framework to understand network industries and regulatory institutions and demonstrates its usefulness to also explain the transnational networking choices they make. Although co-membership in EU policy frameworks and transnational flows of electricity and/or gas also partially explain network structure, VoC-related factors are associated with much higher odds of tie existence.

The homophily effect is strongest for some newer Member States, suggesting they form a rather detached clique from the core of the network. If placed in the context of European energy market integration, this result suggests that the establishment of a European Agency for the Cooperation of Energy Regulators (ACER) was probably necessary to compel all EU energy regulators to coordinate with and learn from counterparts regulating very differently organized markets, as well as to spur convergence across the whole EU.

The determinants of network ties: literature review and hypotheses.

The structures of interconnection or interaction among a set of nodes can be measured, explained, and predicted using Social Network Analysis (SNA). The usage of SNA for transnational or national networks of civil servants or other regulatory official has recently made inroads into the social sciences, as shown by the growing number of contributions employing the technique (Alcañiz 2010, Cranmer and Desmarais 2011, Ingold, Varone et al. 2013, Maggetti, Ingold et al. 2013, Alcañiz 2016, Boehmke, Chyzh et al. 2016, Cranmer, Leifeld et al. 2017, Lazega, Quintane et al. 2017). Patterns of regulatory interactions have often been operationalized using co-affiliations, such as co-membership in certain policy fora or platforms, or

perceived influence and resources (Cranmer, Leifeld et al. 2017). Further, the fact that nodes prefer to connect to nodes that they perceive as being similar to themselves in some theoretically or empirically relevant respect (a pattern called "homophily") has often emerged as having considerable explanatory power (McPherson, Smith-Lovin et al. 2001, Lee, Lee et al. 2012, Maoz 2012, Barberá 2015, Alcañiz 2016).

Scholars have conceptualized transnational regulatory networks as the functional response to interdependence. Indeed, networks have been shown to affect rule adoption across countries (Maggetti and Gilardi 2011, Maggetti and Gilardi 2014) via a process of regulatory coordination at supranational level leading to the creation of soft rules to be implemented at national level. In a sociological perspective, networks have been depicted as arenas where regulators can exchange information, opinions and experiences and therefore learn from each other (Majone 1997, Humphreys and Simpson 2008, Sabel and Zeitlin 2008, Bianculli 2013). In a policy learning perspective, networked cooperation that is sustained over time enables regulators to experiment with the outcomes of their collaboration, to conceive new approaches to old and new problems (Sabel and Zeitlin 2012).

More recently, the literature has complemented these understandings with perspectives emphasising domestic circumstances and challenges as motivations for transnational networking. In particular, contributors have highlighted the strategic use that regulators make of their networks to achieve more independence and autonomy (Danielsen and Yesilkagit 2014, Ruffing 2015) from government by exploiting the informational advantages deriving from transnational networking (Eberlein and Grande 2005, Jordana 2017). Additionally, regulators appear to pool resources through networking, thereby compensating for those they lack (Alcañiz 2010, Vestlund 2015).

However, both sides of the literature have thus far overlooked the rationales explaining regulators' choices regarding their network connections. Regulators

maintain informal, bilateral network ties beyond the official policy framework, because they find it worthwhile. They are unlikely to devote an equal amount of effort to networking with each of their network counterparts; more plausibly, they choose their strong ties. Analyses of the motivations for these choices are, however, lacking. Filling this gap requires close-up observation and analysis of the ties that each regulator has within a network, as this would allow for a clearer grasp of the aims of regulatory networking and the formulation of generalizable statements about transnational regulatory networks.

In this article, I use original network data gathered through email and phone inquiries from all 28 energy regulatory authorities of EU Member States, plus Norway[19]. Their self-reported bilateral ties constitute a network structure. The model developed in this chapter is aimed at explaining that structure. The literature on European Regulatory Networks (key contributions include Coen and Thatcher 2008, Eberlein and Newman 2008, Thatcher and Coen 2008, Kelemen and Tarrant 2011, Levi-Faur 2011, Maggetti and Gilardi 2011) and more generally on networks of regulators of infrastructure sectors has, thus far, scarcely relied on the richness of insight that network theory and network analysis could afford it. In other words, the literature has often used the term "network" without using the methods pertaining to the quantitative analysis of networks.

There are notable exceptions: several contributions have used measurements derived from network analysis in order to quantify influence and reputation of

[19] I have included the energy regulatory authority of Norway in this analysis because the regulatory authority is a member of the Council of European Energy Regulators (CEER), the voluntary network of European energy regulators, and the country has an obligation to comply with the provisions of the EU energy law. I have not included the NRA of Iceland because it is not compelled to adopt the EU legal framework in energy.

different bureaucratic and political actors in the Swiss telecommunication sector (Ingold, Varone et al. 2013) or the independence and accountability of different regulatory authorities (Maggetti, Ingold et al. 2013). Few contributions, however, have investigated the explanatory factors of the relational structure connecting the members of a network. Alcañiz (2010, 2016) is a rare exception: her model of network structure finds that common geographical origins and lack of resources drive the frequency of regulatory cooperation among nuclear experts. At any rate, the mere existence of semi-formalized frameworks of cooperation, such as European Regulatory Networks, offers no insight onto the drivers of informal bilateral ties among regulators. Yet, the importance of trans-governmental networking for the shaping of EU energy policy in particular can hardly be overlooked (Eberlein 2008, Kaiser 2009).

Recent scholarly contributions have shown that the characteristics of network industries and national regulatory authorities are associated with the "Variety of Capitalism (VoC)" of the country (Thatcher 2007, Guardiancich and Guidi 2016). The VoC framework subdivides OECD countries according to "*the way in which firms resolve the coordination problems they face*" (Hall and Soskice, 2001, p. 7) in the country where they operate. The main watershed is between Coordinated and Liberal Market Economies (CMEs and LMEs). In LMEs, firms predominantly coordinate their activities via markets; transparency is, therefore, essential and regulatory authorities and policy are tasked with ensuring it. In CMEs, firms rely more heavily on relational modes of coordination with other actors in the political economy than on market signals. In Continental Europe, CMEs are the majority. The only LMEs are found to be the United Kingdom and Ireland (Hall and Gingerich 2009). CMEs can be further differentiated: Scandinavian countries appear to have a specific type of social-democracy, different from the coordinated economies of Germany (the only pure CME), Austria, Belgium, and the Netherlands. Moreover, Southern European countries (France, Italy, Spain and Portugal) have been defined as "mixed"

(or “Mediterranean”) economies (or MMEs), where coordination (or lack thereof) co-exists with an interventionist and compensating state.

Thatcher (2007) studies the interplay between the VoC framework and regulatory institutions in network industries. He examines the cases of the UK, France and Germany and states that, while the 1980s UK privatization and liberalization reforms of network industries occurred largely independently from EU developments, the EU regulatory framework for network industries dovetails the LME paradigm, being premised on the effort to bring about competition through the unbundling of the sector, the introduction of private capital, cost-reflective pricing, market transparency, and cross-border energy trade. The EU choice, according to Thatcher (2007), forced all other Member States to converge towards the LME model of regulation of network industries. Indeed, before the EU began legislating on network industries, France and Germany displayed very different approaches to those sectors: in France, the state owned or controlled most of the sectoral firms and steered technological and sector development; in Germany, industrial associations performed self-regulatory functions and the state accepted to keep itself at a distance, while retaining a monitoring role.

After long resistances, France and Germany, as all other Member States, eventually complied with the requirements of European legislation in formal respects, *inter alia* by setting up regulatory authorities. Upon closer examination, however, it becomes evident that both retained the key features of their distinctive mode of coordination in the *informal* networks undergirding the sector (Thatcher, 2007). Thus, in France the state preserves a key steering role, while in Germany industry continues leading sector development, even though both at least formally converged to an LME-type sector organization.

The VoC of the country also affects the characteristics of regulatory institutions: in both France and Germany, lack of political support prevented regulatory authorities from enjoying the wide-ranging independence that is characteristic of an LME

approach and, therefore, of UK regulators. His stances echo Coen (2005), who found regulators in Germany to be less independent than in the UK. Guardiancich and Guidi's (2016) analysis confirms these patterns: in the UK, where market signals shape market players' interactions, the independence of the regulatory authority from both government and industry is crucial to ensure the credibility of the regulatory system; in CMEs, strategic coordination among firms precludes regulatory detachment from market actors and government; in MMEs, the highly discretionary role of the state leaves little room for regulators' autonomy. Indeed, institutional complementarities play a role in this regard, as market players and government demand of regulators to perform the role best suited to the extant mode of coordination. These contributions show that the original classification by Hall and Soskice (2001), by and large, is able to explain variation in national regulatory arrangements. Moreover, these studies show that VoC is an inherently relational framework.

How does this translate on the transnational arena of regulatory networking? Does the VoC of their country affect regulators' networking choices? I argue that it does, possibly through more than one mechanism: on the one hand, regulators may gain more value from communication with peers dealing with a similar sector structure, as these are more likely to face similar challenges as themselves; on the other hand, regulators from certain VoC may enjoy more influence than others, prompting their peers to seek them out as frequent interlocutors. Since the EU energy legislation conforms to the LME variety, one should expect regulators from LMEs to receive more incoming ties as all other VoC slowly converge (or adapt their extant mode of coordination in network industries) to the LME mode of coordination.

In a recent contribution on the European network of broadcasting regulators, Papadopoulos (2017) emphasises that regulators learn from peers they hold in high esteem and/or who are facing problems perceived as similar, but does not explore this pattern any further. In their study of the European network of patent judges,

Lazega, Quintane et al. (2017) find that "*It is clear that judges do sort each other in social networks based on their belonging to blocks of countries with similar types of capitalism*." (p. 19). The vague explanation they provide is that judges from similar VoC probably refer to similar bodies of law. Both studies also note that, within networks, certain regulators are much more influential than others and perceived as models by their peers, who seek access to their experience and suggestions.

The reason why regulators belonging to countries with similar modes of coordination in the political economy are more likely to choose each other as network partners is that they are likely to encounter the same bottlenecks in the formulation and implementation of regulatory policy. The energy sector is well suited to illustrate this argument: EU energy legislation mandates the unbundling (or separation) of the network infrastructure, consisting of the separation of high voltage/capacity (transmission) and low voltage/capacity (distribution) grids from the potentially competitive segments of the electricity and gas sectors, i.e. generation/production and supply. Previously, production and investment decisions were made within a single vertically integrated, usually state-owned energy company. The unbundling of generation of electricity (and gas production) from transmission, distribution and supply is meant to ensure that coordination between energy demand, supply and construction of infrastructure happens through market signals (as per the LME model)[20].

[20] The EU legislation has mandated full separation (i.e. functional, accounting and legal); the so-called Ownership Unbundling (OU). Under OU, the Transmission network is owned and/or managed by a separate company (so-called Transmission System Operator - TSO), having no but a minority interest in generation or retail activities. Alternative models deemed admissible include the Independent System Operator (ISO) model, which foresees that the

The economics literature has recognized that national regulators need to make informal "regulatory contracts" (Stern and Trillas 2003, Helm 2009, Stern 2012) in their national markets, with government, infrastructure managers, equipment manufacturers and suppliers. These contracts concern the regulatory approach, the objectives of the regulatory policy and the boundaries set to firms operating in the sector. The stability and credibility of regulatory contracts are pivotal to regulators' legitimacy and, therefore, authority. Regulators have to conclude regulatory contracts that are acceptable to all parties, hence corresponding to the prevalent mode of coordination, while also fulfilling the objectives of the EU legislation, which is clearly LME-inspired. Therefore, I argue that European regulators seek out counterparts from similar national modes of coordination, as these are best suited to respond to their requests with replies, grounded in the knowledge of the structure of interaction the regulator faces at home. At the same time, however, regulators use networks to access the experience and expertise of other counterparts, particularly influential ones.

My first hypothesis is, therefore, that European energy regulators' connections are governed by a pattern of homophily (Cranmer and Desmarais 2011) driven by similar VoC as exemplified in the energy sector structure.

H1: Regulators network more with regulators from their same Variety of Capitalism.

network is owned by the vertically-integrated company and leased to a separate company. The third model, the Independent Transmission Operator (ITO), implies that the transmission network is owned by the vertically-integrated company and managed by a department within it, walled by strict independence requirements in its operations. The three models co-exist across EU Member States, although the OU is the most common.

My second hypothesis is that the UK regulator should be highly sought after by its peers, given that all EU Member States have had to converge, at least partially, towards an LME type of energy sector organization.

H2: Regulators from Liberal Market Economies have significantly more incoming ties than their peers from other Varieties of Capitalism.

One of the main criticisms levelled at the VoC framework is its stationarity. Indeed, the VoC of a country is virtually time-invariant. Studying connections between regulators as depending on the VoC of their country implies considering them as rather stationary. The data underlying this analysis, indeed, concerns regulators' frequent, regular connections. Yet, the flexibility of informal social networks is one of their key attributes: participants can add or sever links as opportunity and need require. However, the reasons for tie formation and elimination may be highly idiosyncratic, and last for limited time periods. There are, however, time-variant factors, which may consistently affect the likelihood of tie formation: resources (Glachant, Khalfallah et al. 2013). Alcañiz (2010, 2016) finds that the sudden budgetary cuts, especially in developing countries, represent a strong incentive for nuclear experts to collaborate with their peers in transnational joint projects. They compensate for the sudden decrease in their resources by pooling their competences with those of their peers in neighbouring countries in order to accomplish their ongoing technical activities. Less resourceful regulators, therefore, should use informal networking to compensate for their lacking resources. These considerations lead me to formulate the third hypothesis.

H3: Regulatory authorities with lower (budgetary and human) resources are more active networkers (i.e. have significantly more outgoing ties than their peers).

This analysis comprises the full sample of European energy regulatory authorities, including Eastern European Member States. However, the original VoC classification by Hall and Soskice (2001) only includes OECD countries, which then excluded

Eastern European countries. Scholars of VoC have investigated the usefulness of the framework for understanding the political economy of newer EU Member States. There is some degree of consensus about the Baltic countries being closest to the LME model, and Slovenia to the CME model (Feldmann, 2006). While acknowledging these definitional efforts, Hancké, Rhodes et al. (2007) underline that new Member States should be considered as transitioning towards models of capitalism, and cluster them as Emerging Market Economies (EMEs). Nölke and Vliegenthart (2009) rely on a specific trait (i.e. provision of capital through foreign direct investment) found in the Czech Republic, Hungary, Poland, and the Slovak Republic to label them Dependent Market Economies (DMEs).

I categorize the VoC of EU Member States with respect to the market structure of their energy sector. The resulting categorization differs from the "traditional" breakdown in some respects; principally, in not considering Ireland as an LME, as done in Hall and Gingerich (2009), given that its energy sector is almost entirely under government control. I find a neat distinction between countries where the transmission and distribution segments are owned and operated by different companies, and are separate from generation and retail (only the UK) and countries where companies active in distribution are also active in retail and sometimes in generation, too (as in most CMEs). In MMEs, the dominance of formerly state-owned incumbents has been restrained through regulation (as in France), mandatory divestment (as in Italy and Greece) or privatizations (as in Portugal and Spain); still, these former incumbents have the largest market shares. Scandinavian Market Economies have a good level of competition in both generation and retail, even though state-controlled incumbents are also active in those segments, and are characterised by locally-owned distribution systems and state-owned transmission systems. The penetration of foreign capital (mostly from Western European national companies) in the generation, distribution and retail segments of the electricity sector in several Eastern European countries resonates with their classification as Dependent Market Economies (DMEs). Finally, a prevalence of direct state

ownership and control in all segments of the market is evident in other Eastern European countries, Cyprus, Malta and Ireland (details in Appendix). The resulting classification used in this chapter is as follows:

- LMEs: only the UK;
- CMEs: Germany (the only pure CME), Austria, Belgium and the Netherlands;
- "Government-owned": Ireland, Croatia, Cyprus, Estonia, Latvia, Lithuania, Malta and Slovenia;
- Dependent Market Economies (DMEs): Czech Republic, Hungary, Poland, Slovak Republic, Bulgaria and Romania;
- MMEs: Italy, France, Greece, Portugal and Spain;
- Scandinavian Market Economies: Finland, Sweden, Norway and Denmark.

The tie choices of regulators of network industries, however, may hardly be choices at all: geography plays such a dominant role in energy infrastructure as to potentially overcome or obscure any other rationale for informal cooperation, as regulators are bound to communicate often with regulators from neighbouring (or, more precisely, interconnected) countries. Regular communication with neighbours, in turn, may engender stable patterns of exchange of information. In order to assess this effect, rather than geographic contiguity, one should consider the actual direction of the flows of electricity and gas that are transmitted across borders and seas within the EU. Consequently, I include electricity and gas flows, both across land and sea, in the analysis, as their directionality may be strongly determining regulatory interactions and potentially obscuring any other explanatory factor.

Furthermore, within the context of the EU, exchange of information is, beyond beneficial, actually made compulsory by the presence of a shared policy framework that national regulators have to implement at national level. The declared aim of the EU energy policy is achieving a fully integrated Internal Energy Market (IEM). As an interim step towards the achievement of the IEM, the European Commission has launched the so-called Regional Energy Initiatives for Electricity and Gas. The

Regional Initiatives group regulators into eight regions for electricity and three for gas with the intent of achieving integrated regional markets for both. Frequent interaction in the framework of the Regional Initiatives may have engendered socialization dynamics leading to trust and thus to the maintenance of ties beyond the official policy framework. I therefore include co-membership into the Regional Initiatives as a suitable control and proxy for the relevance of European policy requirements to explain regulators' informal ties.

Data and method: an Exponential Random Graphs Model of strong ties among European regulators.

The literature on transnational regulatory networks, both European and global, has scarcely exploited the power of quantitative network analysis to explain patterns of transnational networking. This is plausibly due to lack of data on the connections that individual regulators maintain. Those contributions that use the tools of network analysis usually concern multi-level and multi-actor networks of experts around specific issue areas, such as the environment, and usually rely on data concerning co-membership in cooperation initiatives and/or co-attendance of certain events. The assumed link between co-membership and collaboration, however, is not self-evident, as actors may be members of the same initiative but not collaborate regularly. Very recent contributions in the policy studies literature have resorted to asking network members about their regular and frequent ties to other network members (Fischer, Ingold et al. 2017, Hamilton and Lubell 2017) in order to attempt to capture the essence of coordination. This analysis adopts a similar approach in studying the empirical case of a homogenous network (i.e. comprising one type of actor) of transnational scope: the network of ties linking European energy regulators, as reported by regulators themselves.

I gathered the data used in this chapter between the second half of 2015 and late 2016. Specifically, I wrote to the Heads of International Affairs departments and to Communication Officers. Not all European energy regulatory authorities have dedicated International Affairs offices, but all have staff dedicated to international affairs, such as Communication Officers. I asked these respondents to reply to the following question[21]: "*Think of the individuals you (or somebody at your NRA) exchange information with more often. Which NRAs do they belong to?*". Network analysis is very sensitive to missing data; it is important to possess information on the whole network in order to make accurate analyses. Therefore, I chose to rely on a single question in order to maximize my chances of receiving a reply from all network members. Indeed, I have obtained replies from all European national energy regulatory authorities, bar one. For that missing respondent, I have just considered the nominations of other regulators as reciprocated.

Being aware that the notion of "most frequent" may mean different things to different people, and that regular exchanges of information may include mostly routine exchanges due to shared borders and interconnected infrastructure rather than be occasions for learning, I added to my requests explanatory text specifying to respondents that they should name the peers they get in touch with when they seek advice or an exchange of opinions or suggestions, not just routine exchanges of information. Moreover, I complemented the question with a request to name the regulatory authorities with which they are in contact above and beyond European policy requirements (including participation into the European Agency for the Coordination of Energy Regulators). I guaranteed anonymity to all respondents.

[21] In half of the cases I obtained regulators' replies over the phone. Because the question asked during phone conversations was identical to those in the email messages, there is no need to account for whether regulators responded to the email or were contacted by phone in the models.

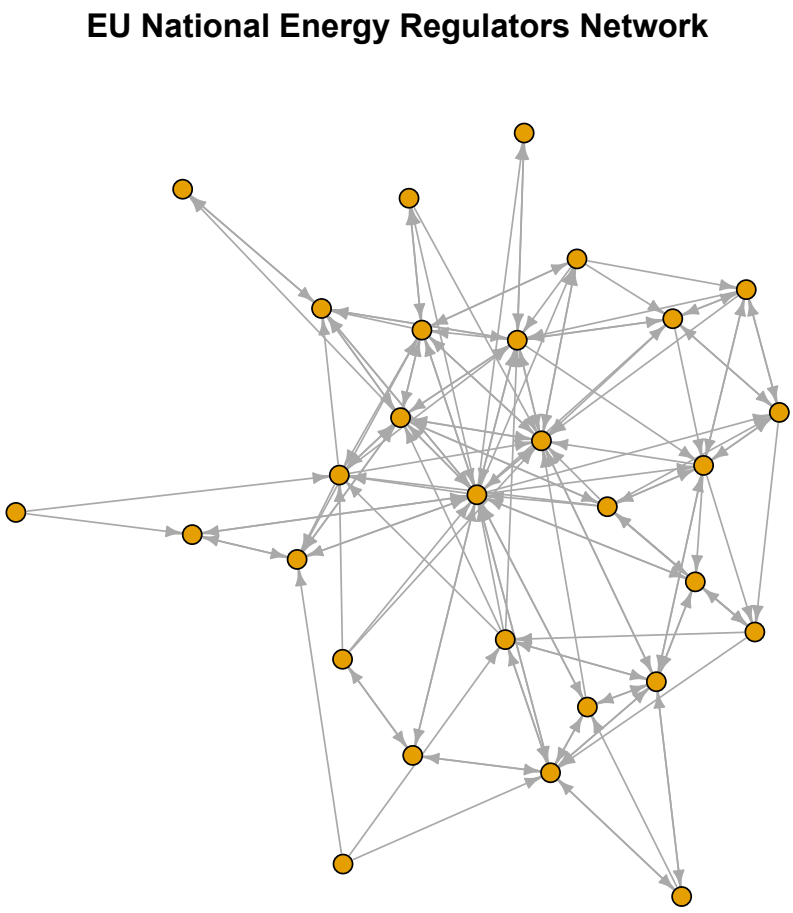
The resulting network is a “thinned” network (Cranmer and Desmarais, 2011), i.e. a network consisting of only the strong relationships between the nodes. If the ties across European regulators were a valued network (with ties having different weights depending on their importance), the network studied in this chapter is the one of highly valued ties. I chose to focus on strong ties because energy regulatory cooperation in the EU has a long history, dating back since the late 1990s (Vasconcelos 2005). Moreover, European energy legislation imposes an obligation on European regulators to cooperate within the European Agency for the Cooperation of Energy Regulators (ACER). Therefore, every European energy regulator is connected to all others. I was specifically interested, however, in the informal bilateral ties that regulators maintain more regularly and frequently.

I set up an Exponential Random Graph Model (ERGM) of the network of relations among European energy regulators. ERGM are generative models: the underlying assumption is that the observed network structure has emerged from an evolutionary process of tie formation over time, explained by a series of predictive factors (Robins, Lewis et al. 2012). The researcher selects the relevant factors, which could be attributes of individual nodes or attributes of dyadic ties, on theoretical and knowledge bases; the analysis reveals the probability that the observed network is drawn from the distribution of the network structures that are plausible, given the number of nodes and the network density, and the factors. The coefficients of the model are to be interpreted as log odds, as in a logit model. ERGMs also allow the modelling of the interdependencies existing within networks, and represent a technique for inferential network analysis where the outcome of interest is a set of relationships (i.e. the ties among the nodes of the network) (Cranmer, Leifeld et al. 2017).

The graph in Figure 1 reports the structure of the relations among European energy regulators. The network appears characterized by a small number of highly connected nodes, a small number of peripheral nodes, and a majority of nodes

having an intermediate number of connections. Figure 1 shows that two nodes have not been nominated by any of their colleagues as their most frequent contacts (hence have an in-degree of zero). Figure 1 also shows that most of the ties are reciprocal, which validates the data, considering that I did not set a minimum or a maximum number of nominations for regulators. The promise of anonymity concerning respondents' identities and their replies prevents me from assigning labels to the nodes in the graph.

Figure 4-1 - Visualization of the network.



As mentioned, I expect the ties in this network to depend on both exogenous and endogenous factors. As for the exogenous factors, the hypotheses I developed in the previous section point to homophily, activism and influence according to VoC, controlling for EU policy requirements, interconnection and flows across borders. I also include in the model several endogenous dependencies to account for likely patterns of social interaction that may have contributed to determine the network structure: the density of the network; the reciprocity of ties; and the transitivity of ties, whereby if node *i* is connected to *j* and *j* is connected to *k*, there is a higher probability that *i* and *k* are also connected. I also include dependencies to account for the centralization of the network, i.e. to verify whether the network is more centralized around particularly active (i.e. many outgoing ties) or particularly influential (i.e. many incoming ties) nodes than would be expected by chance.

Therefore, the predictors employed in the model include electricity[22] and gas[23] flows, over land and sea, across EU Member States (plus Norway); co-membership in the European Regional Initiatives for Electricity and for Gas[24]; data on each regulatory

[22] A matrix reporting electricity flows in both directions across EU Member States in GWh in 2015. Data from ENTSO-E website, https://www.entsoe.eu/publications/statistics/electricity-in-europe/Pages/default.aspx (last accessed 3 November 2017).

[23] A matrix reporting gas flows in both directions across EU Member States in cubic meters of gas in 2015. Data from UK government website https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/579632/Physical_gas_flows_across_Europe_in_2015.pdf (last accessed 3 November 2017).

[24] An affiliation matrix of the Regional initiatives in Electricity and Gas. Data from ACER website, http://www.acer.europa.eu/en/electricity/regional_initiatives/pages/default.aspx

authority's budget and staff numbers[25]; and the VoC categorisation. As previously outlined, the VoC categories derive from my assessment regarding similarity of electricity and gas sector structure across EU Member States, as indicated essentially by the number and the identity of firms active in different market segments and the extent of public ownership (details in the Appendix). The quantitative data has been standardized before proceeding to the analysis by subtracting the mean and dividing by the standard deviation.

Results of the model.

For the sake of clarity, let me recall the hypotheses I formulated together with the variables describing them and the corresponding mechanisms in the ERGM, as well as the factors I am using as controls for the effect of interconnection and co-participation in EU Regional Initiatives.

and http://www.acer.europa.eu/en/gas/regional_%20intiatives/pages/gas-regional-iniciatives.aspx (last accessed 3 November 2017).

[25] The budget and staff numbers of each the regulatory authority in 2012 (for lack of more recent data). Data from the European Commission DG Energy website https://ec.europa.eu/energy/en/topics/markets-and-consumers/single-market-progress-report Country reports 2014, last accessed on 3 November 2017, complemented with regulatory authorities' annual reports in some cases.

Table 4-1 – Hypotheses, Variables and Mechanisms

	HYPOTHESES	VARIABLE	MECHANISM
1	Regulators network more with regulators from countries belonging to the same Variety of Capitalism as themselves.	VoC	Homophily
2	Regulators from Liberal Market Economies have significantly more incoming than their peers from other Varieties of Capitalism.	VoC	More incoming ties
3	Regulatory authorities with lower (budgetary and human) resources are more active networkers (i.e. have significantly more outgoing ties than their peers).	Budget Staff units	More outgoing ties
Control 1	The structure of the network of relationships existing among European energy regulators mirrors the paths of electricity and gas flows across EU Member States.	Electricity flows and gas flows	Matrix of network ties mirrors matrix of electricity and gas flows

Control 2	The structure of the network of relationships existing among European energy regulators mirrors the subdivision operated through the Regional Initiatives for Electricity and Gas, respectively.	Regional Initiative (electricity) and Regional Initiative (gas)	Matrix of network ties mirrors matrix of co-participation in EU Regional Electricity and/or Gas Initiative

The results of the ERG models are reported in Table 2. I performed the analysis using R package "ergm" (Handcock, Hunter et al. 2017). The coefficient are log odds, that is, after exponentiation, they indicate the probability that an edge exists between two nodes, all else equal, i.e. conditional on the rest of the graph being fixed. Positive and high coefficients indicate higher odds, while negative and high coefficients indicate lower odds of a tie existing between two regulators on the basis of the given parameter. Each explanatory factor was fed into the model according to its expected effect[26] on the odds of tie existence.

[26] The syntax of ERG Models comprises a wealth of terms. The ones used in this model are outlined here below:

- "edgecov" : the input is a matrix of covariates; a positive coefficient indicates the probability that two nodes sharing the same characteristic are also ties (e.g. are part to the same Regional grouping);

- "nodeicov" : it tests whether a certain attribute of the node affects its in-degree (e.g. more resources are associated with significantly higher odds of incoming ties);

Table 4-2 - ERG Models of the network of European energy regulators

	(1)	(2)	(3)	(4)	(5)
Network density	-4.865***	-5.494***	-5.477***	-6.015***	-5.135***
	(0.376)	(0.496)	(0.519)	(0.576)	(0.451)
Homophily according to Variety of Capitalism					
Coordinated Market Economies	1.252***	1.178**	1.167**	1.143*	1.177**
	(0.484)	(0.569)	(0.593)	(0.564)	(0.553)
Dependent Market Economies	0.744**	1.670***	1.836***	2.250***	1.168***
	(0.319)	(0.514)	(0.577)	(0.605)	(0.440)
Government ownership	0.577**	0.800**	0.841*	0.928*	0.536
	(0.257)	(0.402)	(0.444)	(0.479)	(0.360)
Mixed Market Economies	0.586	0.416	0.397	0.452	0.911*
	(0.394)	(0.507)	(0.512)	(0.560)	(0.470)
Nordic Market Economies	1.494*	1.508	1.583*	1.625	1.448*
	(0.801)	(0.918)	(0.917)	(0.949)	(0.843)

- “nodeocov” : same as nodeicov, but for out-degree;

- “nodeifactor” : same as nodeicov, but for categorical variables;

- “nodeofactor” : same as nodeocov, but for categorical variables;

- “nodematch” : it tests for homophily, i.e. the probability that two nodes that match on the given characteristic (e.g. two regulators who are both from Western European countries) share a tie;

- “absdiff” : similar to nodematch but for continuous covariates.

Varieties of Capitalism and incoming ties			
Coordinated Market Economies	0.980**	0.977**	1.106**
	(0.462)	(0.483)	(0.502)
Dependent Market Economies	Reference category	Reference category	Reference category
Government ownership	0.654	0.635	0.667
	(0.475)	(0.498)	(0.518)
Liberal Market Economies	1.989***	1.871***	1.863***
	(0.517)	(0.610)	(0.615)
Mixed Market Economies	0.993**	0.958*	0.974**
	(0.460)	(0.492)	(0.494)
Nordic Market Economies	0.895*	0.883*	0.942*
	(0.492)	(0.510)	(0.523)
Effect of resources on outgoing ties			
Staff (2012)		-0.144	
		(0.188)	
Budget (2012)		0.197	0.261*
		(0.172)	(0.143)
Staff size (Full time equivalents, 2016):			
Large (>170)			Reference category
Medium (90-140)			0.978***
			(0.353)
Medium-small (50-75)			-0.173
			(0.506)

Small (12-50)				0.750	
				(0.473)	
Micro (>12)				-0.173	
				(0.690)	
Varieties of Capitalism and outgoing ties					
Coordinated Market Economies					0.522
					(0.415)
Dependent Market Economies					Reference category
Government ownership					0.465
					(0.434)
Liberal Market Economies					1.416***
					(0.492)
Mixed Market Economies					0.059
					(0.458)
Nordic Market Economies					0.464
					(0.469)
Controls					
Co-membership in Regional Initiatives for Electricity	0.361**	0.550***	0.578***	0.685***	0.501***
	(0.172)	(0.196)	(0.204)	(0.219)	(0.192)
Co-membership in Regional Initiatives for Gas	0.154	0.130	0.101	-0.092	0.106
	(0.238)	(0.246)	(0.251)	(0.276)	(0.247)
Cross border electricity flows	0.627***	0.576***	0.580***	0.580***	0.588***
	(0.191)	(0.188)	(0.197)	(0.181)	(0.171)
Cross border gas flows	0.052	0.016	0.013	0.085	0.035

	(0.097)	(0.096)	(0.095)	(0.102)	(0.105)
Endogenous dependencies					
Reciprocity	1.967***	1.956***	1.899***	1.801***	1.905***
	(0.394)	(0.383)	(0.393)	(0.396)	(0.383)
Activity	3.022**	2.263	2.360	4.099*	2.800*
	(1.487)	(1.468)	(1.451)	(2.126)	(1.623)
Popularity	-0.187	-0.158	-0.209	-0.418	-0.336
	(0.830)	(0.914)	(0.886)	(0.928)	(0.866)
Shared partners	0.051	0.061*	0.067*	0.077**	0.053*
	(0.031)	(0.036)	(0.037)	(0.036)	(0.028)
Transitivity	1.073***	0.932***	0.908***	0.880***	1.008***
	(0.218)	(0.223)	(0.232)	(0.235)	(0.234)
Akaike Inf. Crit.	494.559	489.868	492.298	483.653	496.646
Bayesian Inf. Crit.	565.052	583.858	595.687	601.840	590.636
Note:	*p<0.1; **p<0.05; ***p<0.01				

Table 2 offers two main takeaways: first, regulators do display a tendency to maintain close relationships with peers from their same VoC, all else equal, and this pattern is strongest and most consistent across specifications for regulators from Dependent Market Economies and from Coordinated Market Economies; second, the UK regulator is not only more likely to be at the receiving end of a tie than its peers, but also much more active than them, all else equal. Hypothesis one and two, therefore, are confirmed. The homophily pattern could not be tested in the case of the LME because it is unique in the dataset, hence cannot form homophilous ties. Overall, all regulators are significantly more likely to receive ties than regulators from DMEs (the

reference category in the models), bar regulators from countries where the electricity and gas sectors are mostly under public ownership and control.

In model 3, budgetary and staff resources are operationalized via a continuous predictor and refer to the year 2012, and appear to not significantly affect the odds of tie existence. To shed more light on the matter, in model 4 I use more recent, categorical data on staff figures released by European Agency for the Cooperation of Energy Regulators (ACER)[27]. All else equal, regulators with medium staff numbers (i.e. 90 to 140 full time equivalent employees) are more likely to be active networkers compared to regulators with large resources. Higher budgetary figures are also associated with higher odds of outgoing ties, but the effect is rather weak. These results do not fully confirm hypothesis three, which expected regulators with low staff numbers to send significantly more outgoing ties than regulators with higher staff numbers. In model 5, I examine whether VoC is associated with a higher likelihood of being active networkers. Once again, the British regulator appears, all else equal, more likely to have more outgoing ties than its peers.

Furthermore, the results for endogenous dependencies show that ties are very likely to be reciprocated. The coefficient on the dependency called "shared partners" should be read in conjunction with transitivity. Shared partners indicate the tendency for the nodes in the network to have connections in common, whether they are related or not. Transitivity indicates whether two regulators that share a strong tie

[27] Categorical data on staff figures by regulatory authorities referring to 2016 on the ACER website, http://www.acer.europa.eu/official_documents/other%20documents/acer%20taking%20stock%20of%20the%20regulators'%20human%20resources%20summary%20of%20findings.pdf I combined the "Large" and "Medium Large" categories, as the latter only contained two regulatory authorities (last accessed 3 November 2017).

are also more likely to have shared partners than would be expected by chance. Hence, in this network there is a weak tendency to have connections in common, which becomes significantly higher when two regulators are connected. In other words, if two regulators have a connection in common, they have higher odds to be connected by a strong tie, as well. Finally, there are signs that the network is centralized on nodes having high out-degree, i.e. having many outgoing ties, while the parameter for centralization of the network around highly influential nodes, although positive, fails to achieve significance. This suggests that regulators cluster around active nodes, but not around influential ones. Plausibly, regulators use active nodes to increase their access to information, including their access to influential nodes.

As for the other predictors, the models show that regulators that are members to the same Regional Initiative for Electricity are more likely to be connected, and that the direction of the electricity flows across the EU mirrors the directionality of ties across regulators. Gas Regional Initiatives and gas flows never achieve significance. Nevertheless, these effects do not suffice to explain the network structure, which appears even more strongly determined, judging by the parameters in the models, by VoC-related variables. The coefficients of the ERGM should be interpreted as log odds of the probability of a tie existing, given the feature investigated. In the network described by model 2, the probability of a tie existing (equivalent to the intercept in a regression) is 0.4%. It there is a mutual tie, the probability becomes 17%. If two nodes are both from Coordinated Market Economies, the probability jumps to 40%.

In order to check the robustness of the results, I run other models (not shown here but available on request) testing for homophily with respect to the extent of market liberalization as operationalized by the market share of the largest generator in each

country[28]. Moreover, I used the same variable to check for whether regulators from more liberalized markets have higher odds of receiving incoming or outgoing ties. The variable did not prove significant, however. Additionally, I used OECD data on network industries regulation (Koske, Wanner et al. 2015) concerning the extent of government ownership in the largest firm active in each of the segments of both the electricity and gas sectors: generation (production or import for gas), transmission, distribution, and supply. The models detected homophily between regulators with lower government ownership percentages in electricity generation and distribution (no significance for gas). Finally, when re-running the models using a different VoC categorisation, where Ireland appears as LME (as per Hall and Gingerich 2009) and Member States that entered the EU in 2004[29], 2007[30] and 2013 (Croatia) are clustered as a single "Other" category, the results are virtually unchanged.

Model fit.

The ERGM defines a probability distribution across all networks of the size of the network in the model. If the model is a good fit to the observed data, then networks drawn from this distribution are likely to resemble the observed data. As mentioned, ERGMs are generative models. They represent the process of tie formation from a local perspective: the perspective of the factors that are used to predict tie probability in the ERGM itself. These locally generated processes eventually produce network properties, even if those are not specified in the model. One way to assess

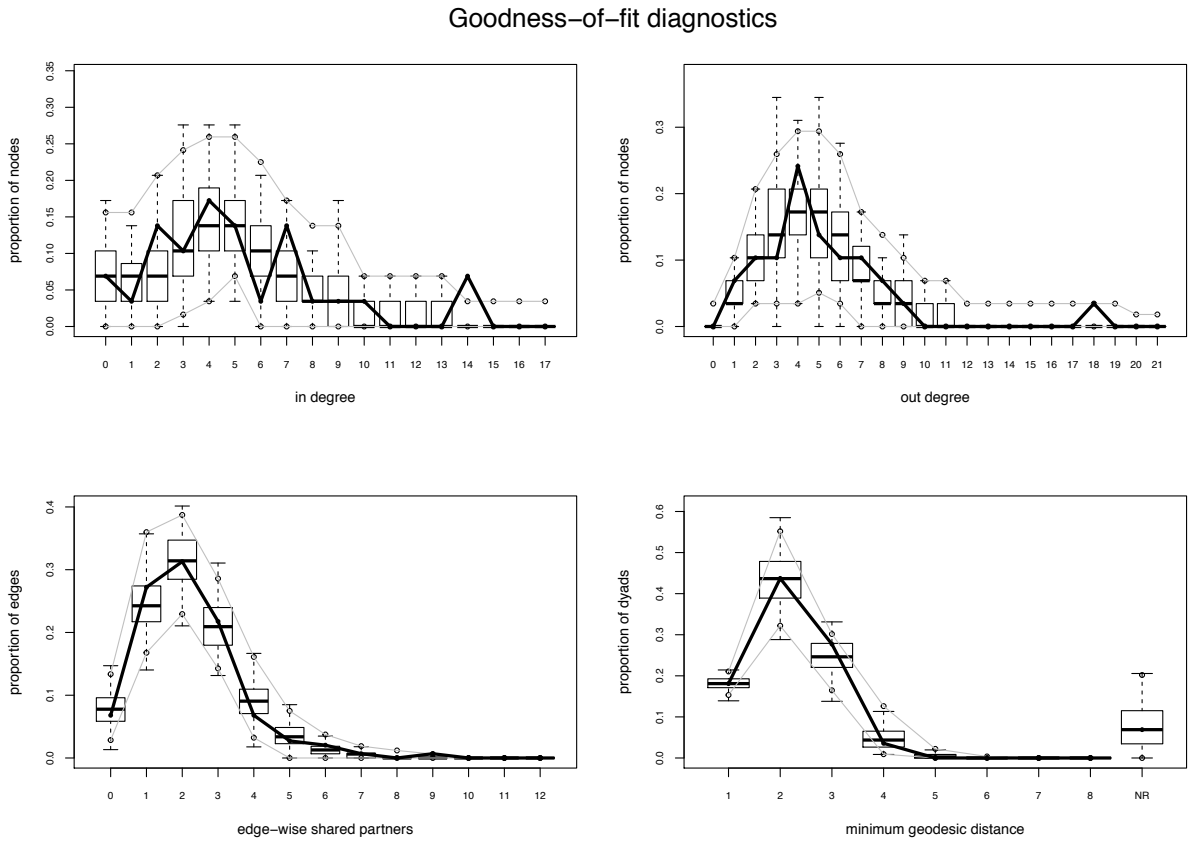
[28] Eurostat energy statistics http://ec.europa.eu/eurostat/web/energy/data/main-tables (last accessed 3 November 2017)

[29] Cyprus, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia, and Slovenia.

[30] Bulgaria and Romania.

the fit of a model, then, is to examine how well it reproduces network properties that are not in it. One obtains an assessment of model fit by comparing the value of a network statistic of choice between the original network and the simulated networks. I calculated goodness of fit over a series of network characteristics: edgewise shared partner distribution, minimum geodesic distance, in-degree, and out-degree. The four plots emerging from the simulation from Model 2 (the preferred model) are reported in figure 2. Model 2 appears able to capture network structure considerably well, given its parsimonious setup and clarity. The dark lines, corresponding to observed values, fall in the boxplots (simulated values) for nearly all configurations.

Figure 4-2 - Goodness of Fit of Model 2: indegree, outdegree, edge-wise shared partners, minimum geodesic distance



Discussion of the results.

Two main findings emerge from this analysis. Firstly, regulators appear more likely to maintain connections with regulators from their same Variety of Capitalism; this is particularly the case for regulators from Coordinated, Nordic and Dependent market economies. Secondly and simultaneously, the regulator from the only LME in the dataset (the UK) has much higher odds of receiving ties, given its peripheral geographic location, than its peers. Given that the whole EU energy regulatory framework and relevant legislation are based on a LME-type mode of coordination, this finding can cautiously be interpreted as a manifestation of regulatory convergence. The combination of these two patterns appears to support Thatcher's (2007) analysis, which diagnosed convergence of other VoC towards the LME model, at least in network industries, but at the same time noted the persistence of extant modes of coordination. Regulators from Mixed Market Economies are the least likely to be significantly homophilous in their tie choices; this suggests that the variety of a regulators' connections is as important as their actual number.

Although coefficients are higher for regulators from CMEs and LMEs, all regulators appear significantly more likely to receive incoming ties than regulators in the reference category (DMEs), bar regulators from countries where government ownership and control across the whole energy sector is prevalent. These two categories of regulators, for the most part, belong to newer Member States, which entered the EU after 2004. In short, as far as transnational energy regulatory networking is concerned, there appears to be a divide between regulators from EU-15 and regulators from newer Member States.

Overall, the analysis of this network structure appears to tell a story of policy learning driven by expertise as well as by commonality in sector structure and therefore, as per my hypotheses, common challenges. The approach I adopted in developing the

model is very conservative: I included several endogenous dependencies to account for ties that exist because of structural properties of the network, rather than homophily; I also included common membership in European Regional Initiatives and electricity and gas cross border flows in order to test the strength of regulators' associations against a powerful constraint for network industries, as geography. Furthermore, coordination and collaboration between European energy regulators has a long history, dating from the late 1990s, and is embedded in a very developed and well-formed supranational legislative and regulatory framework. These features show in the network structure, which is overall dense and comprises a single component. Indeed, that any effect is visible beyond those controls is telling of the strength of the national political economy of the sector as a driver of regulatory networking.

As regulators are placed at the interface between their national markets and market players and the European dimension, they build their informal bilateral ties according to both homophily and, arguably, convergence. Interestingly, the British regulator also emerges as significantly more active than its peers in model 5, all else equal. This finding resonates with Thatcher's (2007) remark that British politicians have often complained of the slow progress of liberalization reforms in other Member States. In truth, the British regulatory authority has repeatedly expressed concern over the effect that the lower extent of liberalization in other European markets may have on British consumers, and underlined its leading role in the network of European regulators in virtually all of its annual reports to the European Commission, released since 2007[31].

Model 2 is preferred for its parsimony. Indeed, evidence regarding the importance of resources for explaining network ties is not conclusive, even though suggestive of

[31] Annual Reports of National Regulatory Authorities can be downloaded at https://www.ceer.eu/eer_publications/national_reports (last accessed 3 November 2017).

interesting patterns. Using categorical instead of continuous data for staff figures, which splits regulators into groups according to the number of their full time equivalent staff, avoids the collinearity driven by the very high numbers of staff of the British regulatory authority. Results show that regulators with intermediate numbers of staff are most likely to be active networkers. Regulators with small numbers of staff appear less unable to cultivate an extended network. I run other models which indicate homophily among regulators with large numbers of staff (i.e. > 170), i.e. regulators with large numbers of staff tend to network with each other. It bears pointing out that, perhaps surprisingly, regulatory authorities with large numbers of staff are not necessarily those from bigger Member States; that subgroup comprises regulators from the UK and Germany, but also from Hungary and the Czech Republic. The energy regulatory authority of a large country like France has between 40 and 90 full time equivalent staff units, ending up in the medium group. In short, the impact of resources on the likelihood of tie existence is difficult to discern clearly. I further explore the link between resources and activism in the next chapter.

The coefficients for endogenous dependencies indicate that transitivity is a property of this network, as is relatively common in information exchange networks (Fischer, Ingold et al. 2017). Moreover, the model shows that some regulators are more active than others, hence have more outgoing ties, causing the network to be centralized on out-degree, even though the coefficient is not always significant across models. These active nodes are plausibly bridging across the network, which would otherwise comprise some isolated nodes or disconnected communities.

The literature has found that very often policy networks display a core-periphery pattern (Knoke 1990, Knoke 1996, Carpenter, Esterling et al. 2003), whereby there is a cohesive core of densely connected nodes and a periphery whose members are poorly connected both to the core and among themselves. The intuitive conception of core-periphery structures entails a dense, cohesive core and a sparse,

unconnected periphery. Core-periphery structures have been investigated in the literature on networks (Borgatti and Everett 2000) as well as in the literature on the European Union (Magone, Laffan et al. 2016). In the context of the EU, the same concept has been applied to frame relations between “old” and “new” Member States (Bohle and Greskovits 2012).

Finally, the irrelevance of gas in explaining the patterns of European energy regulators’ networking is a puzzling results of the analysis. Neither gas flows, nor gas regional initiatives appear to have statistical or substantive significance with regard to this network. This may be due to the lower control regulators have on the gas sector and the development of gas markets compared to electricity.

Conclusions

The main question this chapter sought to answer concerned the drivers of informal regulatory networking at transnational level. Specifically, the empirical case examined in this chapter is that of European National Energy Regulatory Authorities, tasked with regulating the electricity and gas sectors within their national borders and simultaneously asked to coordinate in order to bring about regulatory harmonization and foster market integration across the EU. Far from being straightforward, this task is ridden with difficulties and setbacks as, as the literature on these matters has often discussed, Member States have different administrative, legal and institutional traditions. Differences in their political economy are likely, and have been shown to be equally important not only in affecting the design of regulatory institutions but also their networking practices, as they seek to fulfil the tasks bestowed upon them.

I hypothesised that regulators would tend to choose counterparts embedded in a similar political economy as their most frequent and stable network partners. I

operationalized this concept through the Varieties of Capitalism framework, slightly modified to take account of the specific characteristics and structure of the electricity and gas sectors in the countries considered. I also hypothesised that regulators from LMEs would receive significantly more ties, since the European energy regulatory policy and legislation are shaped according to that mode of coordination. Finally, I expected resources to also matter for regulators' networking choices, as less resourceful seek to fill their informational gaps by linking to more resourceful ones.

The results show that the VoC framework is well suited to investigate and explain transnational regulatory networking, and able to make sense of the interplay between transnational interdependence and national circumstances. The hypothesis concerning homophily is confirmed for most categories of regulators. The hypothesis concerning the influence of LME is also confirmed, and can be interpreted as a sign of ongoing convergence, on the background, however, of persisting dynamics of coordination typical of national political economies, as found in Thatcher (2007). The hypothesised link between lower resources and higher network activism failed to emerge from analysis: rather, medium sized regulatory authorities appear as more likely to be active compared to their more or less endowed counterparts. Moreover, higher budgets are associated with more outgoing ties, suggesting that more resourced regulators have more resources to devote to networking.

The endogenous network dependencies indicate that ties in this network tend to be reciprocal; the effect for this dependency is very strong, representing an important validation of the data as I did not specify a minimum or a maximum numbers of nominations to the respondents. Moreover, regulators tend to close triangles, particularly when two nodes are already connected; this testifies to the importance of information exchange relationships in fostering trust among the actors involved. The observed network structure features a handful of regulators having considerably more outgoing ties than their peers; to account for this, I included in the model

dependencies accounting for network centralization around active networkers. The effect is strong, but not consistently significant.

Overall, regulators from newer EU Member States (i.e. those who entered from 2004 onwards) appear less integrated into the network structure, suggesting a core-periphery pattern. Regulators from Dependent Market Economies appear as the most strongly homophilous and the least likely to receive incoming ties. Regulators from countries where government ownership and control across all sector segments predominate also emerge as less likely to receive ties than their peers. The presence of scarcely connected nodes in this dense network of regulators suggest that forms of structured cooperation, such as the European Agency for the Cooperation of Energy Regulators, are probably necessary in order to achieve energy market integration in the EU. Structured cooperation impedes the formation of cliques or disconnected communities of regulatory authorities, and encourages learning and exchange also across widely different institutional contexts.

Concluding, this chapter carries out an analysis of the global structure of the network connections considered; exceptions are notable across all categories of regulators. For instance, the regulators of Hungary and Latvia are much more active networkers than some of their EU-15 counterparts. The purpose of the analysis was grasping the invisible and undocumented drivers of transnational networking; this entails the important limitation of the impossibility of triangulating data with other sources of information. This concern is assuaged by the practitioner knowledge of the persons who kindly agreed, under promise of anonymity, to respond to my inquiry. Further research may seek to study network evolution over time by relying on longitudinal data, as this may help capturing the engines of phenomena, only cautiously alluded to here, such as convergence (or lack thereof).

5. Networking for resources: how regulators use networks to compensate for lacking resources.

Introduction

This chapter unpacks the relationship between regulators' resources and ties in more detail. The analysis in the previous chapter was not conclusive on this point. The hypothesis concerning regulators' resources expected regulators with lower resources to be more active networkers, in the sense of possessing significantly more outgoing ties than their peers. The analysis included continuous data on staff and budgetary figures (dating back from 2013) and a categorical measure of staff resources (dating from 2016). The latter measure is thought to be more accurate since the data collection on regulators' ties was carried out in 2015/2016. The results of the Exponential Random Graph Models (ERGMs) showed no significance for the continuous measurements. As for categorical data, the results showed that regulators with medium resources are more likely to be active compared to regulators with large resources. Regulators with medium small, small or micro-resources were not significantly more active than their peers with large resources.

I investigate the relationship between staff and budgetary resources and network ties by testing the same hypothesis of linear relationship between resources and activism, but by operationalizing network activism differently. I introduce a refined notion of network activism that draws on the sociological literature on social networks and outlines network activism as the possession of higher numbers of weak ties (Granovetter 1973).

I posit that regulators conceive of their informal ties as resources, in a very practical sense: their peers are repositories of information and experience which they can easily access. I then consider that the regulators who most need to rely on network

resources are those possessing lower in-house resources to fulfil their information requirements. These regulators are likely to reach out to their peers more frequently than their peers are likely to reach out to them, particularly if the latter have higher resources. This implies that active, or proactive networkers have higher numbers of non-reciprocated ties.

Non-reciprocated ties indicate an overall weaker relationship than reciprocated ones. In the context of exchange of information within networks, they suggest that senders are information-seekers, who have perhaps less information to exchange than within a reciprocal relationship. Stemming from this reasoning, I use the count of European energy regulators' weak ties to operationalize network activism. I use both continuous and categorical measurements of staff and budgets as predictors. I carry out linear regression analyses to test the significance of the correlation between resources and activism. I then include indicators of independence and market liberalization in the regression. Thereafter, I run ERG models with a new specification of resources, while still including terms related to homophily based on common Variety of Capitalism, as emerged in the previous chapter.

The results of the analysis lend support to the hypothesis: overall, lower resources are significantly associated with higher network activism. The significance of the association is different, however, for different categories of budgetary and staff resources: medium and small levels of staff resources and small, but not medium, budgets are associated with higher activism. Overall, however, the relationship between staff resources and activism is the only one of the two that is consistently significant.

Recent literature has featured calls (Mastenbroek and Martinsen 2018) and attempts (Maggetti 2014, Ruffing 2014, Boeger and Corkin 2017) to shift scholarly attention from debating the rationale of European regulators' collaboration according to the preferences of either the European Commission or the Member States to studying the ways in which regulators concretely use their informal networks. Several recent

contributions have begun exploring these aspects and found that network participation increases bureaucratic autonomy (Danielsen and Yesilkagit 2014), thanks to the information exchange occurring within regulatory networks. Other contributions showed that participation into networks correlates with increased powers for the regulatory authority (Maggetti 2014), and facilitates the sharing of existing resources and the creation of new ones as outputs of network collaboration (Vestlund 2015).

The topic of regulators' resources has often surfaced in the relevant literature, but has rarely been tackled in its own merit. Yet, resource constraints significantly affect regulatory performance, pushing regulators to optimize the resources they have in the face of increasing sector complexity (Glachant, Khalfallah et al. 2013). However, higher staff numbers are associated with higher quality regulation (Koop and Hanretty 2017). Hence, whereas well-resourced regulators are likely to possess sufficient expertise and means to acquire the information they need, less well-resourced regulators may struggle to accomplish their tasks while also staying ahead of the information curve.

Although the resources available to a regulatory authority positively correlate to country and market size (suggesting that regulators from smaller countries need lower resources to begin with), all regulatory authorities have a set range of expert tasks to be fulfilled, whatever their size (Pollitt and Stern 2009, Glachant, Khalfallah et al. 2013). Therefore, less resourced regulatory authorities may recur to the extra resources they have available, such as their peers, to compensate.

To understand whether networks can improve governance, it is important to study how regulators use them and the benefits they derive from them. This analysis suggests that regulators use their bilateral network ties to compensate for their lacking resources. Arguably, European energy regulators' common embeddedness in the European Union and its single legal and regulatory framework are important structural premises for the exchange of information and expertise to occur. Absent

that interdependence, the onset of a mechanism whereby less resourced regulators can attempt to compensate for their lacking resources via networking with more resourced peers appears less plausible, since the assessment of the worth of a non-reciprocal tie is, by definition, unequal between the two nodes. Finally, the results of this analysis suggest that, if European regulatory networks may have had uneven influence on regulatory convergence, they probably have a consistent impact on improving regulatory practice at national level.

Networking for resources: literature review and hypothesis.

One of the key questions in the literature on regulatory networks concerns the extent to which they are able to improve governance (Coen and Thatcher 2008, Kelemen and Tarrant 2011, Levi-Faur 2011, Maggetti and Gilardi 2011, Thatcher 2011, Van Boetzelaer and Princen 2012, Maggetti and Gilardi 2014, Bianculli, Jordana et al. 2015, Blauberger and Rittberger 2015). Assessments of network effectiveness have often tried to capture their impact on regulatory convergence, which has proven hard to discern (Bach, De Francesco et al. 2016). The literature has often maintained that regulatory networks may improve governance by improving regulators' practice and strengthening their professional ethos by affording them access to high quality information and expertise held by their peers (Bianculli, Jordana et al. 2015, Jordana 2017, Papadopoulos 2017).

In the context of the European Union, the literature has considered the necessity of collaboration and exchanges of information between national regulatory authorities as almost obvious, given the exigencies of regulatory convergence to compensate for the necessary vagueness of the European Directives, which bound Member States to goals but not to means (Dehousse 1997, Nicolaides 2004, Eberlein and Grande 2005). Until recently, this focus has been predominant in the literature on European Regulatory Networks. Contributions on transnational regulatory networks steeped in

the international relations literature, however, have flagged the issue that mere participation into networks reveals nothing of how individual regulators use their networks (Bach and Newman 2014, Ahdieh 2015). Network membership need not imply activism.

In agreement with that statement, this paper does not study networking among European energy regulators in terms, functional to the achievement of European integration goals; rather, this chapter studies the informal, voluntary, bilateral ties that regulators entertain with each other besides the context or the requirements of the EU. I am interested in "pick-up-the-phone" relationships, i.e. those informal collaboration ties that regulators maintain besides the meetings, schedules, and requirements of European coordination, with the precise intent of consulting each other on matters of their daily, national regulatory practice. The interest of this research is exploring the inner workings of actual network relationships between national regulators, which is a prominent gap in this literature (Mastenbroek and Martinsen 2018).

Recently, the literature has begun filling this gap by exploring the benefits that regulators obtain by networking with their European peers. The relevant contributions have mostly focused on independence and autonomy (Thatcher 2011, Yesilkagit 2011, Danielsen and Yesilkagit 2014, Maggetti and Verhoest 2014, Ruffing 2014). Several contributions have mentioned the importance of adequate resources for regulatory authorities to be able to perform their tasks (Coen and Thatcher 2008, Maggetti and Gilardi 2014) but did not connect them to networking. Maggetti (2014) investigated the hypothesis that participation in European Regulatory Networks correlated with an increase in the budgetary resources made available to national regulators. He found no support for this hypothesis. Vestlund (2015) explores the connection between networks and resources, but in a different take than the one adopted in this paper: in that contribution, networks are producer of resources, i.e. the outputs of regulatory networking, such as reports, meetings and work plans. In

contrast, this contribution, focuses on financial and human resources, i.e. those resources that the regulatory authority needs in order to perform its duties, and whether they can be thought to affect the pattern of regulators' networking.

To assess the relationship between networking and resources, as in the previous chapter, I consider the empirical case of the network of energy regulators from EU Member States (plus Norway). The data consists of regulators' self-reported information on their most frequent and regular bilateral relationships with their European peers in response to a questionnaire I submitted to them between 2015 and 2016. The data gathering process aimed specifically at investigating the regulators' perceptions of their most frequent, regular collaborators among their European colleagues, i.e. the colleagues they would call upon for suggestions, exchanges of opinions, advice, and experiences.

Thus far, the few contributions relying on network data have linked the possession of many ties to network influence (Maggetti and Gilardi 2011, Maggetti 2013), in line with the key tenets of network theory. Hence, several contributions have concluded that regulators having high degree (i.e. a higher number of ties) compared to their peers are influential. Examples include Ingold, Varone et al (2013), who measure reputation across the various bureaucratic and political actors involved in the Swiss telecommunication sector; Maggetti, Ingold et al (2013), who examine the independence and accountability of different regulatory authorities in Switzerland; and Alexander, Lewis et al. (2011), who explain the networking strategies of politicians and bureaucrats across multiple municipal governments in the state of Victoria in Australia. These contributions have examined ties as undirected.

Yet, the directionality of ties is as informative as their number: being at the receiving end of many ties may indicate influence, while sending many outward ties may indicate activism (Desmarais and Cranmer 2012). The two analytically distinct concepts of influence and activism have often been conflated under the assumption that influential regulators are also active networkers (Maggetti 2014). This

contribution assesses activism not in terms of the absolute number of ties, but in terms of the number of outgoing ties that exceed regulators' strongest (i.e. mutual) relationships, as this indicates additional effort to gather information from the network.

In his seminal contribution on the strength of so-called "weak" ties, Granovetter (1973) showed that the vast majority of his interviewees had found their job thanks to information received from the friends of their friends, with whom they had only infrequent contact. In that article and in the conspicuous literature it spawned, "weak ties" bridging across cliques of strong ties (e.g. close friends) have thus been shown to play a crucial role in information diffusion across networks (Djelic 2004). By obtaining novel, non-redundant information, network nodes with weak ties are able to bridge across cliques (Berardo and Scholz 2010) and to make better decisions and innovate more effectively (Aral 2016). In Granovetter's research, respondents reached out to their infrequent ties in the pursuit of (in that case, job-related) information. Information is the main asset regulators pursue; given resource scarcity, they may pursue it via other means. Networking with their more resourced peers appears a particularly suitable and relatively inexpensive one.

In social surveys, respondents are typically asked to nominate their contacts according to the frequency of their interactions. The absence of reciprocity suggests a weaker relation than would be inferred from reciprocal nominations. In the context of this inquiry, the absence of reciprocity between two regulators indicates different assessments of the frequency of their relationship. Activism is conceptualized as the active pursuit of information from peers, given one's resources. More resourced regulators are likely, in absolute numbers, to have more ties to their peers, precisely as a result of having more resources to spend on networking. The interest of this paper, however, is investigating network activism relatively to resources. To do so, I operationalize network activism as the difference between a regulator's outgoing and incoming ties or, in other words, their non-reciprocal ties.

A count of non-reciprocal ties equal to zero suggests that the regulator sticks to their strongest ties. A negative count suggests influence (i.e. the fact of being sought by others in the network more than one seeks them). In contrast, the fact that a regulatory authority has a positive number of non-reciprocal relationships suggests that they consider relatively weaker ties as, still, important resources of information and advice. Hence, I understand the presence of non-reciprocal ties as indicating an effort, on the part of the sender of the tie, to peruse its environment for more information than the one available within the clique of their strong ties. I thus contend that regulators reporting non-reciprocal outgoing ties have a stronger incentive than others to seek information from peers. Given the importance of resources to any organization, I formulate the hypothesis that this incentive derives from lack of sufficient resources to carry out their regulatory tasks. Therefore, the main hypothesis underlying this analysis is:

H1: The lower the resources of the regulatory authority, the higher its network activism.

The topic of regulatory independence has been very widely discussed and analysed in the public policy and public administration literatures, including in relation to regulatory networks (Danielsen and Yesilkagit 2014, Monti 2014, Ruffing 2014). In that regard, several contributions have shown that networks empower regulators by providing them with information, not available to their domestic political principals. By virtue of their intermediary position between levels of governance, the information collected via networking expands regulators' autonomy in the transnational policy space (Bach and Ruffing 2013, Ruffing 2014). Arguably, the effect of networking on independence may push less independent regulators to be more active networkers. Therefore, I include a measure of regulatory independence in the analysis, to assess whether it matters to explain activism along with (or instead of) resources. The indicator refers to regulators' statutory, or *de jure* independence,

which may differ from actual independence (Maggetti 2007) but still has been found to be positively correlated to it (Hanretty 2010).

Furthermore, the extent of market liberalization in a given regulator's country may also affect its networking behaviour. Indeed, the European energy market model is premised on liberalization and the introduction of private capital in infrastructure sectors (Jamasb and Pollitt 2005, Thatcher 2007). Hence, regulators overseeing less liberalized markets may seek interaction with peers overseeing more liberalized markets as they attempt to foster liberalization in their own national settings. For this reason, I also include in the analysis indicators of market liberalization. However, these are likely to correlate with the size of the market, which, in turn, correlates with the resources available to a national regulatory authority.

Data and Methods

In order to gather data on regulators' network ties, I emailed the energy regulatory authorities from all EU Member States, plus Norway. All respondents are informed people at their regulatory authority, who have excellent knowledge of its external cooperation patterns either because they are in charge of supervising it or because they occupy senior positions. I asked regulators to name the regulatory authorities they are most often in touch with as concerns exchange of information within the EU. I specified that they should mention their most frequent informal contacts, beyond routine interaction and scheduled network meetings or EU-related policy events.

Under promise of anonymity of the respondents' identity as well as of their replies, I obtained replies from all 29 regulatory authorities, bar one. For that one, I considered their incoming ties, as resulting from other regulators' nominations, as reciprocated. I did not specify an upper or lower limits on the number of network partners that

regulators could name as their most frequent contacts, in order to capture the different extents of individual regulators' networks. Moreover, I also left the precise frequency of contact unspecified. Regulators were asked to report on their "most frequent" contacts. Clearly, the word "frequent" may mean different things to different respondents. Also, different regulators may engage more or less often with peers from other countries based on a variety of factors. Then, reciprocity is a first good indicator of the strength of two regulators' relationship. Lack of reciprocity, instead, suggests imbalance in the two regulators' assessment of the frequency of the relationship and, thus, a weaker one.

Yet, the sender of a non-reciprocal tie, by the very fact of mentioning the tie in response to my question, indicates that they assess that relationship as important. Possession of non-reciprocated outgoing ties, then, is a proxy of a more pronounced network activism compared to regulators who only engage in mutual relationships (an activism of zero according to my operationalization) or display negative values, suggesting that information is sought from them more than they seek information from others. A regulatory authority can be, of course, very active and have many mutual ties. This would imply a high investment in network collaboration. However, it would also imply possession of sufficient resources to support a broad portfolio of regular contacts. The interest of this analysis is capturing whether regulators with lower resources are more active than their resources would lead to expect, as this would suggest they use networks to compensate for their resources.

While I gathered original data on European national energy regulators' ties, I rely on two main sources of secondary data for staff and budgets: for staff, I use categorical data, as per the report on National Regulatory Authorities resources released by the European Agency for the Cooperation of Energy Regulators (ACER) in 2016[32]; for

[32] ACER Taking stock of the regulators' human resources - Summary of findings (2016), https://bit.ly/2GQnzFP (last accessed 9 April 2018)

budgets, I rely on figures published in the country reports released by the European Commission in 2014[33], for lack of more recent data.

The ACER document categorising regulators' staff levels comprises six categories: "large" (over 220 Full Time Equivalents); "medium-large" (between 170 and 175 FTE); "medium" (between 90 and 140 FTE); "medium-small" (between 50 and 75 FTE); "small" (between 12 and 50 FTE) and "micro" (fewer than 12 FTE). As shown in the regression model in Table 4 in the Appendix, category "large" is not significantly different from "medium-large". Since the whole dataset only comprises 29 observations, and since the category "medium-large" only comprises two national regulatory authorities (from Italy and Spain), I merge this category into "large" in order to save degrees of freedom. Moreover, I split regulators in the "medium-small" category between group "medium" and group "small" on the basis of their staff figures in 2013 (derived from the European Commission country reports). Hence, the categorization of staff figures used in the analysis section comprises four categories: "large" (the reference, with 9 observations), "medium" (with 9 observations), "small" (with 7 observations) and "micro" (with 4 observations). In further re-categorizations, I maintained category "medium-small" separate or merged category "micro" into "small", thus reducing the number of categories to three: "large", "medium" and "small"; the results of the analysis do not change.

Although budgetary figures may have changed since 2013, they are unlikely to have changed very considerably. Initially, I categorized budget figures in a variable with five levels, ranging from "large" (over 20 million euros; only 3 observations) to

[33] European Commission, (2014), "EU Energy Markets in 2014", https://ec.europa.eu/energy/sites/ener/files/documents/2014_energy_market_en_0.pdf (last accessed 9 April 2018)

"micro" (less than 2 million euros; 5 observations)[34]. This categorization, however, resulted in over-fitting; all regulators are much more likely to be active networkers than the three "richest" authorities in budgetary terms. In additional categorizations, I created a single "large" category merging "large" and "medium-large" budgets (thus comprising regulators with budgets higher than 10 million euros); I also reduced the number of categories to three ("large", "medium" and "small"): the results change very slightly and concur in showing that regulators with small (but not medium) budgets are more likely to be active.

As for the covariates, I derive data concerning regulators' independence from the OECD Sector Regulation indicators, released in 2015 but referring to the year 2013[35]. The independence indicator is the average of three indicators: one referring to the regulator's accountability, one to their regulatory power, and one to the extent to which they have to take instructions from the executive in their regulatory practice. The OECD data features two separate indicators for independence; one for electricity regulation and one for gas regulation. Although all of the European regulatory authorities that regulate gas also regulate electricity, their scores for electricity and gas regulation may differ[36]. For this reason, I include each indicator in separate models. Further, I include a measure of market liberalization (from the mentioned OECD Sector Regulation indicators) to account for the possibility that it may drive activism, as well.

[34] Other categories are: "medium-large" (between 20 and 10 million euros; 7 observations); "medium" (between 10 and 5 million euros; 10 observations); and "small" (between 5 and 2 million euros; 4 observations).

[35] OECD, (2015), Indicators of Sectoral Regulation, http://www.oecd.org/gov/regulatory-policy/indicators-sectoral-regulation.htm (last accessed 9 April 2018).

[36] Indeed, the Pearson's correlation coefficient between the independence gas and electricity indicators is 50% and their Spearman's correlation coefficient is only slightly higher.

To test the association between resources and network activism, I carry out an Analysis of Variance (ANOVA) whereby I regress, firstly, staff levels and then budget levels on network activism. Secondly, I run Ordinary Least Squared models including the mentioned covariates (concerning independence, liberalization and infrastructure links). Before running regressions, however, it is useful to provide plots describing the relationship between the variables of interest.

Analysis

Figure 1 and Figure 2, depicting, respectively, the relationship between staff levels and activism and budget levels and activism. Figure 1 shows that regulators with intermediate levels of resources are more likely to be active networkers compared to their counterparts with large or very small resources. The upper part of figure 2 is based on a categorization setting aside regulatory authorities with very high budgets from their peers: all other categories show much higher levels of activism. Since the group with much higher resources than the rest of European regulators only comprises three countries, I rely on a different categorization in the lower part of figure 2, which reveals a linear relationship whereby as budgets decrease, activism increases.

Figure 5-1 – Relationship between staff levels and network activism

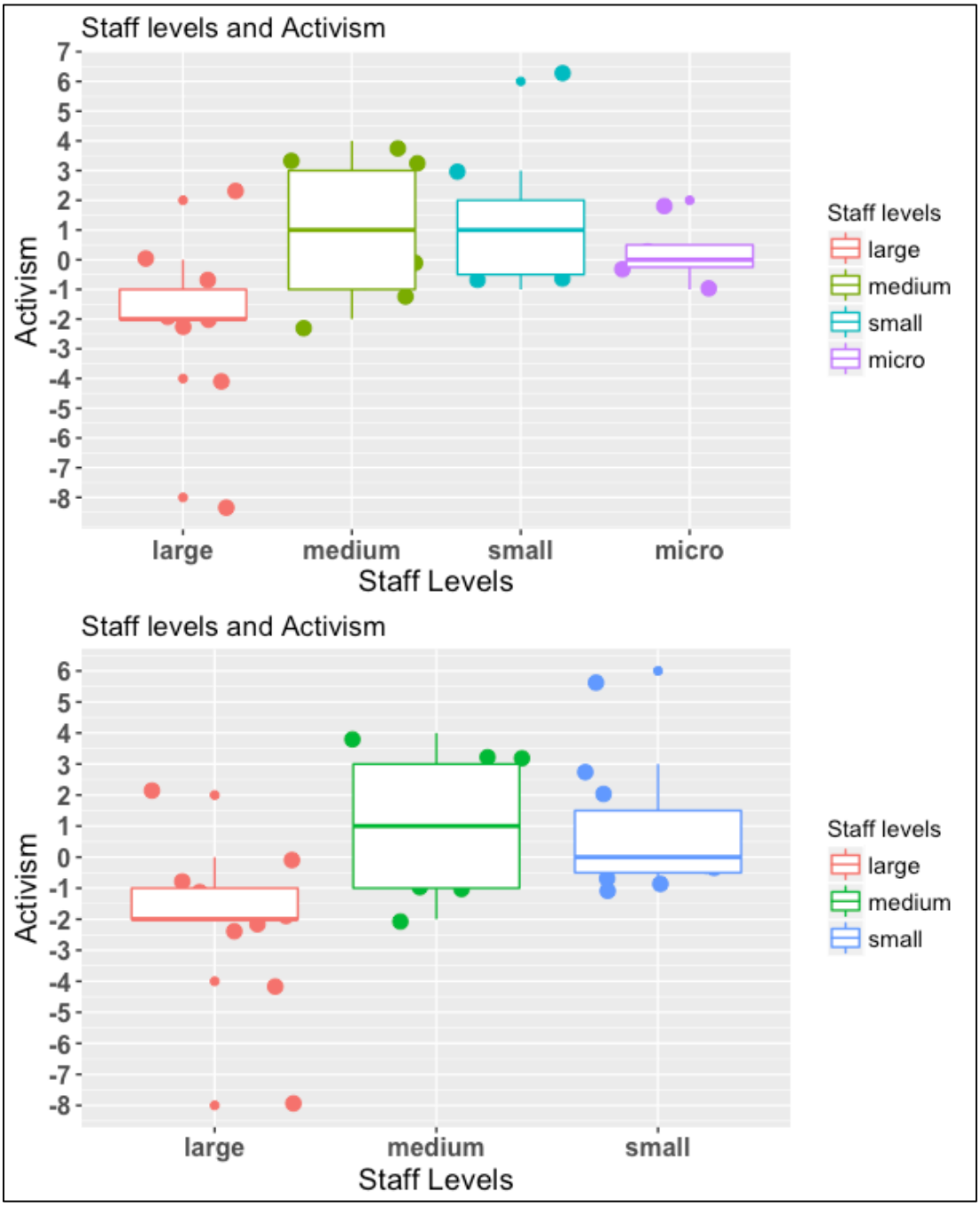
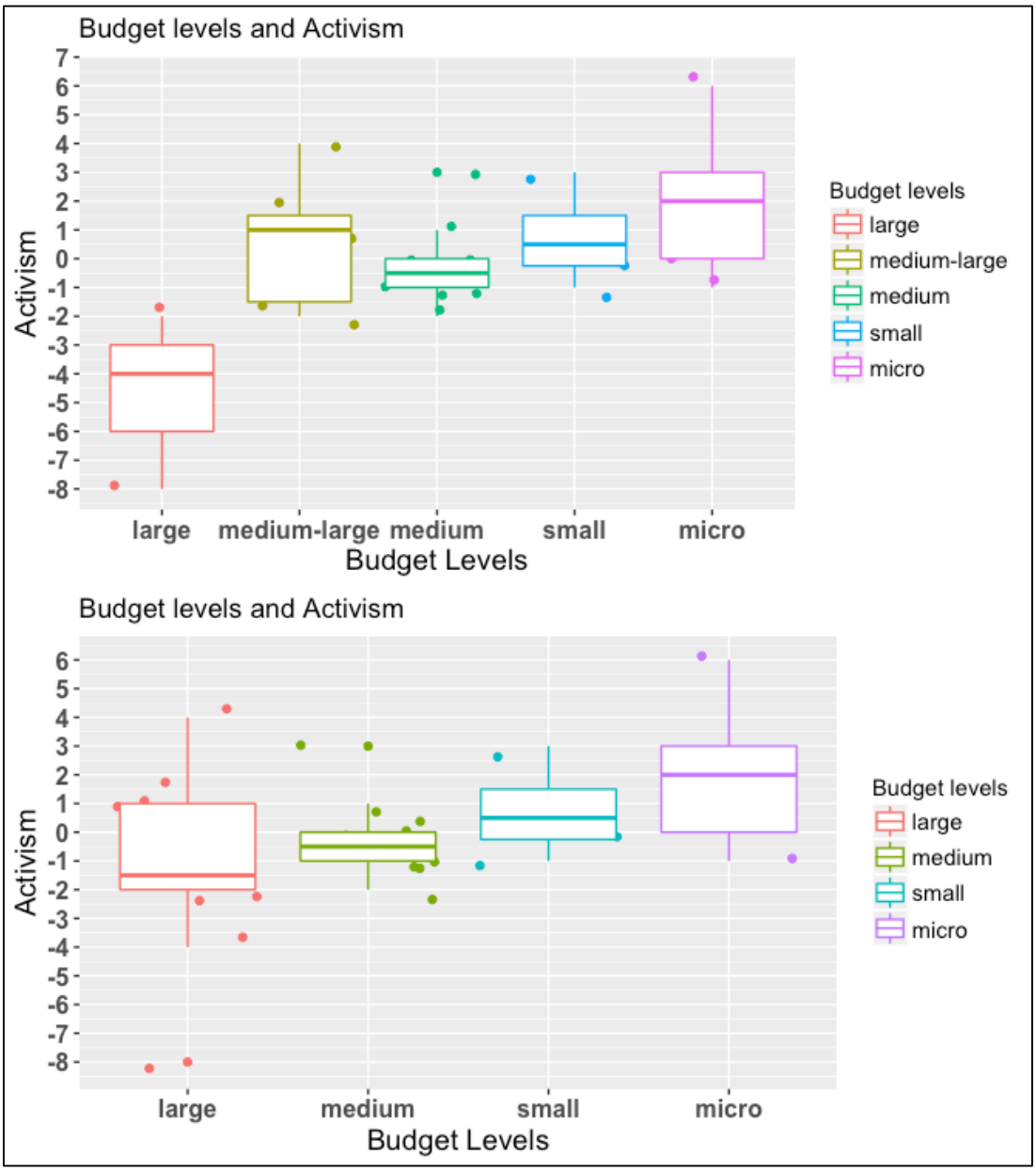


Figure 5-2 – Relationship between budget levels and network activism



Before assessing the significance of the differences between levels of activism for regulators with different levels of budgets and staff, I test for the significance of both factor variables, as a whole, in explaining the dependent variable. To do so, I carry out an analysis of variance (ANOVA). The results of the Levene's tests on the relationship between, respectively, staff levels and budget levels on network activism are not significant. This means that the assumption of homogeneity of the means, necessary to carry out analysis of variance (ANOVA), is not violated. Hence, I carry out ANOVAs for both independent categorical variables. The results show that the variable related to staff levels, whatever the categorization used, is statistically significant (i.e. p-values are lower than 0.05). In contrast, the variable related to budgetary figure is not statistically significant.

Table 1 and Table 2[37] report the results of Ordinary Least Squared models having network activism as dependent variable and, respectively, staff and budget levels as the main predictor in the first model. Subsequent models include, one by one, the covariates selected for analysis.

Table 5-1 - Association between regulators' network activism (dependent variable), staff levels and covariates

	Model 1	***Model 2***	***Model 3***	***Model 4***	***Model 5***
(Intercept)	-2.00*	-1.82*	-1.76*	-1.35	-1.67
	(0.79)	(0.77)	(0.81)	(0.91)	(0.81)
Staff category					
large	reference				

[37] The results of the regression analyses were carried out in R and exported using package "texreg" (Leifeld 2013).

medium	2.89*	2.65*	2.63*	2.37	2.42*
	(1.11)	(1.09)	(1.13)	(1.16)	(1.15)
small	3.29*	3.18*	2.91*	2.39	2.68*
	(1.19)	(1.15)	(1.22)	(1.34)	(1.25)
micro	2.25	1.70	1.79	0.28	1.69
	(1.42)	(1.41)	(1.46)	(2.02)	(1.85)
Independence (electricity)		-0.73			
		(0.45)			
Independence (gas)			-0.55		
			(0.47)		
Liberalization (electricity)				-0.87	
				(0.64)	
Liberalization (gas)					-0.74
					(0.49)
R^2	0.28	0.35	0.32	0.33	0.36
Adj. R^2	0.20	0.25	0.21	0.22	0.24
Num. obs.	29	29	29	29	27
RMSE	2.36	2.28	2.34	2.32	2.35

The indicators for independence, while not significant in table 1, are statistically significant in conjunction with budget levels and show that regulators with lower independence are more active. Lack of significance on the staff coefficients when regressed together with the extent of electricity market liberalization is due to collinearity: regulators with smaller staff resources tend to be from smaller countries and have smaller markets, which, in turn, tend to be less liberalized. I run the same regressions using different categorizations of staff levels, and the results are

remarkably consistently showing that intermediate levels of staff are associated with higher activism.

Table 5-2 - Relationship between network activism (dependent variable), budget levels and covariates

	Model 1	***Model 2***	***Model 3***	***Model 4***	***Model 5***
(Intercept)	-1.10	3.61	4.65	0.54	2.39
	(0.80)	(2.21)	(2.87)	(2.90)	(2.48)
Budget levels					
large			reference		
medium	0.90	0.44	0.22	0.80	0.04
	(1.13)	(1.07)	(1.11)	(1.16)	(1.25)
small	1.85	3.00	2.20	1.48	1.27
	(1.49)	(1.47)	(1.41)	(1.64)	(1.51)
micro	3.10*	2.77*	2.81*	2.28	2.82
	(1.38)	(1.29)	(1.31)	(1.98)	(1.84)
Independence (electricity)		-1.57*			
		(0.69)			
Independence (gas)			-1.89*		
			(0.91)		
Liberalization (electricity)				-0.39	
				(0.66)	
Liberalization (gas)					-0.82
					(0.56)
R^2	0.18	0.32	0.30	0.19	0.29
Adj. R^2	0.08	0.21	0.19	0.06	0.16
Num. obs.	29	29	29	29	27
RMSE	2.52	2.34	2.37	2.56	2.47

$^{***}p < 0.001$, $^{**}p < 0.01$, $^{*}p < 0.05$

It bears noting that, since I am using network data, linear models may be unreliable because they assume the independence of the errors. Typically, network data features interdependencies. Methods such as Exponential Random Graphs Models (ERGMs) have been devised specifically to deal with those interdependencies. The ERGMs run in the previous chapter showed that regulators with medium staff resources appeared to have significantly more outgoing ties than regulators with large resources. No other category reported significant differences. I run further ERGM models, which included the variables that proved significant in the previous chapter (i.e. homophily for Variety of Capitalism, an effect for incoming ties depending on Variety of Capitalism, electricity flows, electricity Regional Initiatives, and dependencies for high outdegree, reciprocity, shared partners and transitivity) and staff levels as originally presented in the ACER document they are drawn from. Next, I run the same model including my re-categorization of staff levels that comprised four instead of five categories. In both cases, results are nearly identical and show that, all else equal, regulators with medium and small staff levels are significantly more likely to have more outgoing ties than their peers, thus largely confirming the results of the statistical analysis as well as the results in the previous chapter. By the same token, regulators with large staff resources are significantly more likely to receive more incoming ties than their peers. In contrast, ERG models including the categorical variable for budget levels do not result in significant statistical coefficients.

Discussion of the results.

The research interest motivating this analysis is investigating the determinants of ties between regulators within regulatory networks. Regulatory networks are the protagonist of a rich literature which, however, has rarely investigated the incentives driving ties across network members. Contributions on networks of European regulators usually focus on their potential or actual influence on regulatory

convergence, or, alternatively, on establishing links between network membership and outcomes such as increased independence. This contribution, instead, attempts to assess the quality of network membership and the concrete usage that regulators make of their informal collaborative ties to their peers.

The results of the analysis suggest that resource imbalances across European national energy regulators matter for their network behaviour. The clear result is that regulators with large resources, both in staff and budgetary levels, are less proactive than their counterparts and tend to be at the receiving end of their outgoing ties. Well-resourced regulators have resources that are several times larger than those of some of their counterparts. The small size of the data does not allow for a high-powered analysis. Yet, the relationship between numbers of staff dedicated to energy regulation (i.e. the ACER categorical data) and network activism is consistent and substantive (with an eta square above 0.50) and, in the categorization including category "micro" (i.e. regulators with less than 12 FTE dedicated to energy regulation) shows a quadratic trend.

This suggests that lower resources correspond to higher activism up to a point: regulators with extremely small resources are not significantly more proactive than their peers with large resources. This suggests that these regulators are so resource-constrained that the opportunity cost of networking is too high in terms of staff time. Regulators with intermediate staff resources, instead, may not have all the resources they need but still they have enough for networking to be a cost-effective compensatory strategy. Additional models considering the additive effects of budget and staff resources yield no significance for budget levels. There are too few observations to test whether staff levels matter differently at different budget levels (and vice-versa) or, in other words, to test for interaction effects. At any rate, budgetary and staff levels are very highly correlated (Spearman's correlation coefficient of 0.62). Yet, only staff levels are consistently significant; after all, a regulatory network is a social network of individuals. Their number seems to affect

the extent to which a regulatory authority can strive to compensate for lacking resources by relying on their peers.

These results lead to infer that one of the main virtues of regulatory networks may well be their impact on governance at national level. As a matter of fact, the scope of European national regulators' authority is confined to the borders of their country. Steeped in very different market contexts, national regulators need to set the right incentives for the regulated industry to achieve efficiencies and re-invest its profit, monitor their conduct, while preventing abuses, ensuring consumer protection and empowerment, while remaining accountable to government and the general public. These are tremendous tasks; in their fulfilment, regulators face great information asymmetries with the regulated industry (Pérez-Arriaga 2014). At the same time, regulators need to preserve their legitimacy and credibility as adequately accomplishing their tasks; otherwise, they face government intervention and, potentially, the curtailment of their powers. Faced with low resources, regulators tackled the demands of their profession by relying on a further resource: their peers.

Therefore, the understanding of transnational regulatory networks' potential for improving governance should be extended beyond transnational or global governance to encompass governance improvements at national level. In other words, transnational regulatory networking may have important feedback effects at national level, which need not necessarily push in the direction of convergence. Access to informed and resourced peers may improve the problem-solving and analytical capacities of regulatory authorities (Lodge and Wegrich 2014) at national level, even though barriers remain to transnational regulatory convergence, which may depend on factors beyond the control of the regulatory authority itself. In the European context, the results of this analysis suggest that the interdependence created by designing the single market (including the internal energy market) may have improved regulatory practice at national level beyond what would have been achievable based on national resources alone.

Conclusions: networking for resources.

The literature has claimed that membership is a regulatory network does not automatically guarantee regular involvement (Bach and Newman 2014). Although agreeing on the importance of networks for information exchange among regulators, fostering their learning and even increasing their de facto independence from their principals, the literature failed to specify the mechanism whereby regulators network for expertise. This paper makes a step in the direction of tackling this issue using original data on European energy regulators' ties to each other (gathered under promise of anonymity) and rare data on their budgetary and staff resources.

The analysis tests the relationships between the difference between regulators' outgoing and incoming ties, or, in other words, the number of regulators' non-reciprocal ties, and the extent of their resources. Non-reciprocal ties are understood as indicating the active pursuit of information beyond one's strongest ties (i.e. reciprocated ties). The higher numbers of non-reciprocated ties, the more active the regulatory authority. Possession of non-reciprocal ties suggests that the regulatory authority branches out beyond their closest contacts in the pursuit of information, much like job-seekers contacted the friends of their friends in the seminal Granovetter's article on the strength of weak ties for information diffusion (Granovetter 1973).

Information is the main resource regulators need in order to fulfil their tasks. Resource-constrained regulators are less able to set the right incentives for the regulated industries (Glachant, Khalfallah et al. 2013) and therefore less able to recognize and punish their wrongdoings. Moreover, staff levels have been found to correlate with higher quality regulation (Koop and Hanretty 2017). The hypothesis guiding this analysis is that some regulators are more active networkers because they use their informal networks to compensate for their scarce resources in terms of budget and staff. The results lend support to the hypothesis. Indeed, regulators possessing high resources tend to have negative activism, i.e. negative difference

between incoming and outgoing ties, pointing to their influence and popularity among their peers.

Although the interdependence created by the common membership in the European Union is plausibly at the root of these informal collaboration patterns, the mechanism whereby regulators use networks as substitutes for their lacking resources has already been identified elsewhere in the literature (see Alcañiz 2016 on the case of nuclear experts in Latin America). This analysis suggests that the benefits of transnational collaboration do not only improve European regulatory governance but also spill over to national regulatory policy, providing for more informed regulators than it would have been possible to achieve on the sole basis of domestic resources.

Although lacking empirical data confirming the argument, this chapter contributes to theory development regarding how regulators use their networks. Hence, this analysis can spawn further analyses assessing hypotheses concerning the effect of networks on regulatory decision-making. For instance, a case study analysis focusing on a relatively less resourced regulatory authority and testing the causal chain leading from network exchanges to actual decision-making against empirical evidence would represent a suitable follow up to this analysis.

A final word concerning the availability of data on national regulatory authority's resources: gathering this data is exceedingly difficult, as no central platform appears to collect it on a regular basis and make it publicly available. National reports often do not contain this information and often are not drafted in other languages than the national one. As a result, research using this data has to rely on imprecise or slightly outdated data. Making this type of information more readily available to the academic and scientific community would not only improve research, but probably also corroborate claims for adequate resources to be provided to national regulatory authorities.

Part II. Conclusion: the rationale for regulatory networking.

This second part of the thesis shifted the focus of analysis in two ways: it moved from the historical narrative to the present and from networks as organizations to networks as structures resulting from regulators' voluntary connections to one another. This shift enabled analysis of the determinants of regulatory network collaboration. The explanatory model of network structure reveal that a strong pattern of homophily drives regulators' connections. Moreover, the model shows that regulators overseeing more liberalized markets receive more incoming ties, but also have significantly more outgoing ones. Finally, the analysis in chapter 5 showed that energy regulators with higher resources are more likely to receive more incoming ties, and that regulators with lower staff resources are more likely to be proactively using networks to compensate for their lacking resources.

The policy implications to be derived from the joint considerations of these results are several. On the one hand, the strong homophily pattern determining network ties suggests that some form of structured cooperation (such as a European Agency or a more formalized network) is probably necessary to foster cooperation among regulators, where the overall goal is market integration. Otherwise, network interactions may result in disconnected or weakly connected communities. This not only would slow down the flow of information across the network, but it would also confer remarkable leverage to bridging nodes. On the other hand, the relationship between resources and activism emerging from chapter 5 shows that regulators are strategic in their usage of networks; moreover, it suggests that regulatory cooperation in the European Union has probably had the effect of improving governance at national level more than national resources alone would have allowed. Discerning the net effect of network collaboration on policy outcomes is exceedingly difficult, and I do not have data to empirically confirm the pattern emerging from that analysis. However, the chapter strives to contribute to theory

development concerning the reasons why regulators network and to the formulation of hypotheses for future research concerning how information retrieved via informal collaboration helped regulatory decision-making.

The significance of time as a key factor in explaining the origins and the effects of transnational regulatory cooperation underlies this whole thesis. These two chapters utilize data gathered at a precise time and therefore providing a snapshot of the network of European energy regulators. Yet, Exponential Random Graph Models such as the one developed in chapter 4 are generative models, which means that they assume that the observed network is the result of an evolutionary process. Some of the mechanisms visibly at play in the foregoing two chapters may be idiosyncratic for individual regulators; for instance, a given regulatory authority may have been particularly proactive in the time frame of the research, and not be the following year. Yet, the mechanisms driving tie choices, such as homophily and a compensatory strategy for lacking resources, are likely to be relatively stable opportunities that networks offer to regulators.

In the next part of the thesis, I revert to historical analysis and to the comparative perspective by examining the phase of network expansion for both European and American energy regulators. Although following entirely different evolutionary paths, both sets of cooperation structures replicated themselves by generating new networks in other areas of the world. I will show how, faced with the relative decline of its main function, the NARUC resorted to a layering strategy by taking on the additional mission of exporting US utility regulation to the four corners of the world. This contrasts with the conversion strategy adopted by the CEER as the establishment of the European Agency deprived it of much of its policy worth; the CEER found new topics (e.g. consumers and retail markets) and functions (e.g. in-house training) to keep its viability. The conditions leading to either strategy are also discussed in the next part.

PART THREE – EXPORTING NETWORKS: THE ROLE OF AMERICAN AND EUROPEAN REGULATORS IN FOSTERING REGULATORY NETWORKS ABROAD.

Part III. Introduction: exporting networks.

This third and final part of the thesis consists of two chapters focusing on what I define the "export of networks". Exporting networks, in this context, refers to the attempt to foster regulatory collaboration in a given governance context by reproducing the informal network structure embedding successful regulatory collaboration in another governance context. To be specific, in this part I investigate the reasons why the US Agency for International Development (USAID) and the European Commission through its European Neighbourhood Policy programme decided to invest on fostering regulatory networked collaboration in foreign jurisdictions as part of, in the former case, a foreign policy agenda and, in the latter case, what the literature defines as "external governance" (Manners 2002).

Tackling this question across the two chapters brought to the fore two other important themes: the theme of regulatory network evolution and the theme of network entrepreneurship. The next two chapters focus on the emergence of two networks, which are the progeny of, respectively, NARUC and CEER; these are the Energy Regional Regulatory Association (ERRA) and the Association of Mediterranean Energy Regulators (MedReg). The analysis shows that, although via different processes, the NARUC and CEER were essentially exported to other regions, in the explicit attempt to replicate their success formula.

Investigations of the rationale of such network export yielded important research findings as concerns the dynamics of network evolution, the interdependencies between networks emerged in different areas of the world, and the ways in which entrepreneurial regulators can leverage their embeddedness in the multi-level governance system to further collaboration initiatives with strategically crucial foreign jurisdictions. The following two chapters show that donors (in this case, the US government and the European Commission) purposefully chose networks as an

instrument of “soft” foreign policy. This finding partially echoes some earlier contributions, such as Raustiala (2002), who argues that networks can be synergistic with more formal policy programmes in implementing regulatory transfer of best practices from more developed to less developed markets. Raustiala (2002), however, was concerned with regulatory compliance and more effective regulatory enforcement. In this setting, instead, the policy goals are primarily political. In pointing explicitly to foreign policy motivations, I exclude alternative explanations that, although plausible, are unlikely to be the main driver of network establishment in the cases of ERRA and MedReg. The main competing argument to the foreign policy one is that the creation of ERRA and MedReg (the former located in Central and Eastern Europe, the latter in an area defined as the Euro-Mediterranean region) happened as a result of a process of diffusion.

The key argument of the (voluminous) diffusion literature is that when certain policy or institutional solutions become accepted wisdom they diffuse across the world. This diffusion process can result from different mechanisms. The four main mechanisms identified in the (rational-choice-inspired) literature are coercion, competition, learning and emulation (or mimicry). In other words, countries and governments replicate policies or establish organizations imitating other countries because they compete with them for capital and trade (Elkins, Guzman et al. 2006), because said policies have proven to deliver superior outcomes (Shipan and Volden 2014), because they want to be seen as “modern” or competent (Meseguer 2004), or, finally, because external agents, such as international organizations, force them to do so (Henisz, Zelner et al. 2005). A more constructivist explanation of policy diffusion relies on the insights of sociology and on the concept of institutional isomorphism (Powell and DiMaggio 1983) and emphasises the symbolic properties of the adoption of a policy that is generally thought to be effective and efficient (McNamara 2002).

The fact that transnational (or trans-jurisdictional) networks of energy regulators have sprung up nearly in every region of the world (Berg and Horrall 2008), often with the support of international financial institutions, appears to lend support to the diffusion hypothesis, particularly the coercion and mimicry versions. However, the concept of policy diffusion applies to policy solutions; informal networks of regulators, *per se*, are not a policy solution. Networks are platforms for discussion and exchange about policy solutions, not policy solutions in themselves. Regulators may choose to leverage their network to obtain collective and individual benefits, as outlined in the first part of this thesis, but the mere existence of a network, e.g. of an acronym and a meeting schedule, does not imply any actual policy implementation or change. Moreover, policies diffuse, or are diffused, because they are perceived to be generally superior and efficient.

By contrast, the arguments of foreign policy have a distinct security flavour. Foreign policy is aimed at achieving specific political goals in countries that are perceived as a security threat to the donor. As the next chapter shows, this was the thinking underlying the USAID efforts to shift the governance paradigm of the energy sector in Central and Eastern Europe in the aftermath of the collapse of the Soviet Union. This included the establishment of regulatory authorities, according to a well-established "recipe" of infrastructure sector governance that international organizations worldwide espoused in those years (Henisz, Zelner et al. 2005). Fostering regulatory networking, however, was not part of that recipe. The USAID decided to foster the formation of a network of energy regulators in the area autonomously, and for two reasons: the experience of NARUC had shown that regulatory networks can foster learning across members, and, in the context of technical assistance, they were a cost-effective alternative to schooling regulators individually on the economics of energy markets; also, a direct link to regulators in different countries of the area allowed monitoring the reform progress and accompanied their transition to a market economy under the aegis of the European Union. In its own turn, NARUC utilized the USAID partnership to revamp itself and its

image. The programme was so successful that USAID decided to replicate its formula in other regions of the world where it was operating, in partnership with NARUC, ever since.

The following chapter, chapter 7, reconstructs the formation of the network of energy regulators from countries facing the Mediterranean Sea (i.e. MedReg). The events surrounding MedReg were completely different from those leading to ERRA. The establishment of MedReg did not take place within the framework of a broader foreign policy programme; as a matter of fact, it was not even the initiative of the European Commission. MedReg was the result of a bold display of policy entrepreneurialism by a small group of European regulators, in the wake of the European eastward enlargement of 2004 and, most importantly, its signature of the Energy Community Treaty in 2005. The Treaty, signed with South Eastern European governments, obliged those governments to reform their energy markets in compliance with European legislation as an interim step towards their full accession as Member States of the EU. Contextually, it encased regulatory cooperation in the rather formalized setting of a Board with advisory functions to a Board of Ministers. At the time, European regulators disagreed with the Commissions' formalization of the regulatory collaborative relationships. Determined to prevent the replication of the Energy Community approach to the Southern neighbourhood of the EU, in 2006 the Italian regulator and a few Southern European colleagues took the lead in the establishment of a regulatory network encompassing regulators from all countries facing the Mediterranean, thus including regulators from countries in the Middle East and North Africa region: MedReg.

The analysis in the following chapters is based on the insights gained from 41 semi-structured interviews (some of which also informed the writing of chapters 2 and 3; the table in Appendix 4 reports the corresponding interview numbers). As a matter of fact, very little written public information in available on the events recounted. The information gained through interviews was triangulated across different types

of interviewees (international organizations, regulators, consultants) and cross checked with other sources (reports, newsletters, and electronic articles – quoted in the text and referenced in the list of references at the end of the thesis).

These chapters also contribute to the literature on transnational regulatory technical assistance programmes. In a recent contribution, Broome and Seabrooke (2015) show that international financial institutions (IFIs - in particular, the International Monetary Fund and the World Bank) use technical assistance programmes to foster the emergence of "sympathetic interlocutors" in recipient countries by socializing national officials through transnational policy training. In this way, these authors argue, international organizations increase the number of domestic reformers who are sympathetic to their prescriptions for policy change. Indeed, a stronger emphasis on socialization followed the IFIs' acknowledgement that lending conditionality, by itself, was not achieving the desired results (World Bank 2006). The key importance of socialization with peers from more advanced economies as well as hands-on cooperation over concrete policy issues has been proven to determine the success of technical assistance programmes (Freyburg 2015).

Some of the findings emerged elsewhere in this thesis are confirmed in the cases of ERRA and MedReg: primarily, that uncertainty drives regulators to seek each other out to establish informal collaborative relationships to corroborate their decision-making and reduce the uncertainty they are exposed to; that symbiotic interdependence drives collaboration between different levels of governance, as in the case of USAID and ERRA, when the fulfilment of one's agenda entails the strengthening of the other. Moreover, it shows that the evolutionary phase of one network can represent the emergence of another, as in the case of NARUC and ERRA, and that experience of network collaboration is a valuable asset in regulators' relationships to their political principals. Finally, chapter 7 shows how well-established regulatory networks may function as templates for policy entrepreneurialism of any network member.

6. The establishment of the network of energy regulators of Central and Eastern Europe *or* Foreign policy via networks.

In chapter 2, I identified in the post-World War I crisis of regulatory credibility and legitimacy the critical juncture prompting regulators to consolidate NARUC as their collective home. Much later in time, another event had a transformative impact on NARUC, representing a second critical juncture (Collier and Collier 1991, Capoccia and Kelemen 2007). In 1998, the US bilateral aid agency (USAID) proposed to NARUC a cooperative agreement to deliver the goals of their mission in Eastern Europe. The cooperative agreement was a manifestation of the new, post-Cold War guiding paradigm of USAID's work around the world: from strategically motivated aid to "transformative development" (Natsios 2006). During the Cold War, USAID gave aid to countries irrespective of their human rights or governance records, provided that they became or remained their allies against the Soviet Union; after the Cold War, the rationale for USAID aid provision changed radically and re-oriented its focus towards institutions.

Until USAID's request, the international exposure of US state utility regulators individually and of NARUC as a whole was virtually non-existent, except for sporadic interaction with Canadian counterparts. After the ERRA programme, USAID partnered with NARUC for regulatory cooperation programmes in other areas of the world, including Asia and Africa. The federal grants that NARUC receives for its national and international work represent now over half of its annual budget. The consequences of USAID's request were therefore far-reaching and long-lasting. In its absence, it is highly unlikely that NARUC would have mustered the resources, the political support and the internal cohesion to develop these activities independently.

This chapter retraces the history of ERRA to unveil the under-investigated link between technical assistance and networks; it also represents the concrete route taken by NARUC to re-invent itself and evolve by acquiring new clients (Downs 1967). The establishment of ERRA is a case of brokered network fostered by an external agent (see Provan and Kenis 2008). In the context of the case, USAID plays a similar role to the European Commission towards the embryonic CEER: it was a policy partner placed at a higher level of governance, pursuing an agenda whose fulfilment was dependent on the regulators and entailed the strengthening of their policy relevance.

The emergence of ERRA is inscribed in the history of NARUC and unfolds in parallel with that of CEER. Hence, the three cases are nested within each other. The commonalities in their development are striking: all three emerged in a context of radical policy overhaul; all three stemmed from loose, irregular professional ties; all three found in the symbiotic interdependence with political actors the key to their growth in size and importance. However, the ERRA differs from CEER and NARUC in one respect: ERRA members are regulators from separate countries, which do not form a single policy entity. As the European enlargement englobed seven Central and Eastern European countries and their energy regulators became members of CEER, the task ERRA was created for was accomplished and the multi-level structure of governance, comprising the USAID and national governments (as well as International Financial Institutions and the European Union) underpinning it vanished. The ERRA that provided input to policy formulation for the region vanished as well. Still, the network did not disband. Regulators kept finding value in the familiarity of the network and its focus on issues that mattered for that region. Hence, the ERRA underwent a process of conversion and transformed into a different organization, bearing the same name: primarily a training provider and platform of regulatory interactions with, declaredly, no intention of contributing to policy or of espousing a specific policy agenda. This new identity enabled ERRA to expand and to

welcome any new member: indeed, ERRA members nowadays comprise regulators from countries all over the world.

Bilateral aid and transnational regulatory cooperation: stranger literatures.

The intervention of USAID in Central and Eastern Europe in the 1990s, following the demise of the Soviet Union, was part of a bilateral aid programme financed by the US government. The determinants of recipient selection by aid providers is a key topic in the literature on foreign aid provision (Alesina and Dollar 2000, Berthélemy and Tichit 2004, Neumayer 2005, Bermeo 2008, Younas 2008, Bearce and Tirone 2010, Winters 2010, Bermeo 2011, Reinsberg 2015, Eichenauer and Reinsberg 2017, Findley, Milner et al. 2017). This literature has converged on several founding claims. One of them concerns the higher politicization of bilateral aid compared to aid provided by multilateral institutions such as the World Bank and the Regional Development Banks. Bilateral aid agencies are financed by individual governments, which have biases and preferences concerning their aid recipients. The most important bilateral donors include the USA, the UK, Japan, France, Germany and other European countries (Neumayer 2005). Of these, the USA provides the largest sums in absolute terms.

During the Cold War, strategic and foreign policy considerations dominated the allocation of aid (Berthélemy and Tichit 2004, Natsios 2006), bringing USAID to provide aid to countries with dubious or weak human rights and governance records. After the Cold War, however, all Western donors began to explicitly condition aid on the quality of governance in recipient countries (Dollar and Levin 2006, Bermeo 2008). Even though strategic foreign policy goals remain relevant to explain bilateral aid allocation (Milner and Tingley 2010), economic performance and institutional quality are at least as important (Alesina and Dollar 2000). In his assessment of the

role that good governance indicators play in aid recipient selection in the post-Cold War period, Neumayer (2005) finds that the only consistent pattern across the major world donors is the level of the regulatory burden imposed on the private sector. Respect for human rights and the rule of law do not emerge as equally important.

The quality of the governance structure of a country is recognized as an important determinant of the effectiveness of aid (Neumayer 2002, Dollar and Levin 2006, Dietrich 2013). Donors have always used soft power techniques in order to elicit compliance with their desiderata concerning their aid provision: Neumayer (2005) lists persuasion, capacity building, policy conditionality and selectivity as the four main strategies of donor soft power. Particularly after the Cold War, the donor community, and the USA in particular, have shifted the targets of their soft power efforts: not only governments, but also institutional actors. The USAID has been found to provide less aid to poorly governed countries (Bermeo 2008) or countries with weak governance structures (Eichenauer and Reinsberg 2017), unless it could bypass government and target aid at non-state actors in order to increase the likelihood that it will achieve its intended outcome (Dietrich 2013). This is true, more generally, of bilateral donors from countries whose political economy places a premium on market efficiency, such as the USA, rather than on state intervention into the economy (Dietrich 2015).

In other words, after the Cold War bilateral donors and the USA in particular have started responding to good governance as a signal of the recipient's capacity to use aid effectively. Hence, recipient countries are rewarded when they show signs of increased governance quality (Neumayer 2003). Since the quality of institutions matters (Booth 2011), development aid has become increasingly targeted at improving it, in particular through capacity building and technical assistance programmes (Vandeveer and Dabelko 2001, International Competition Network 2003, Adams and Tirpak 2008, Urpelainen 2010, Marcoux and Urpelainen 2012, Broome and Seabrooke 2015).

Both bilateral and multilateral donors have routinely used policy conditionality to mandate certain economic reforms in recipient countries. However, besides being blind to governance indicators, during the Cold War aid was also ineffective because donor governments could not credibly enforce their conditionality (Bearce and Tirone 2010). Afterwards, the threat of conditionality became much more credible and therefore triggered actual reforms. Over time, however, donors fully realized the importance of a sympathetic institutional environment for correct reform implementation (World Bank 2006). Therefore, they began investing resources into strengthening the capacity of institutions in order to build local coalitions that are supportive of donor-promoted reforms (Broome and Seabrooke 2015). As former USAID director Natsios (2006) explicitly advocates: *"As development professionals, we should be trying to institutionalize pressures within a given political system that are consistent with one another and that work to favour reformers and put the status quo protectionists at a disadvantage."* (2006, p. 137).

The notion of "transformational development", elaborated by the USAID in the early 2000s (Essex 2013) is eminently focused on institutions and their potential for entrenching policy change in the direction of economic neoliberalism. The idea of transformative development encapsulates the stated goal of transforming countries by transforming their institutional setup through, in particular, capacity building and partnership with donors. The launch of this approach to development by the USAID predates the State Department's subsequent emphasis on "transformational diplomacy" and a joint 2007 USAID/State Department strategic plan including both concepts (Essex 2013). In a speech given at Georgetown University (DC) in 2006, the then US Secretary of State Condoleeza Rice remarked:

> *"It was always assumed that every state could control and direct the threats emerging from its territory. It was also assumed that weak and poorly governed states were merely a burden to their people, or at most, an international humanitarian concern but never a true security threat. Today,*

however, these old assumptions no longer hold. Technology is collapsing the distance that once clearly separated right here from over there. (…) So, I would define the objective of transformational diplomacy this way: to work with our many partners around the world, to build and sustain democratic, well-governed states that will respond to the needs of their people and conduct themselves responsibly in the international system. "[38]

These words echo the stances of Slaughter (2017) but also Slaughter (2004), Slaughter (2004b) and even Slaughter (1997) with their emphasis on trans-national cooperation and networks of institutional actors as a promising avenue for fulfilling the goals of American diplomacy. As shall be seen, the partnership programmes implemented by the USAID since the mid-1990s already bear the characteristics of a transformational development approach, testifying to the entrepreneurialism of the organization (Essex 2013).

The literature, however, lacks investigation of bilateral aid agencies' involvement in the field of regulatory reform. Most importantly for the purposes of this research, the literature has overlooked the significance of networks in the field of technical development assistance and therefore the role that regulators may play in the delivery of capacity building and technical assistance programmes. Although many articles on regulatory networks quote Slaughter's (2004c) contribution, they lack the foreign policy/diplomacy rationale that informs it.

Raustiala (2002) represents a notable exception. He suggests that trans-governmental cooperation of experts and regulators via networks is synergistic with government cooperation via international organizations. This author adds that networks promote "regulatory export": the export of regulatory rules and practices from major powers to weaker states. This process, by facilitating regulatory

[38] https://2001-2009.state.gov/secretary/rm/2006/59306.htm (last accessed 12 August 2017)

convergence and by building bureaucratic capacity, can improve domestic regulation and thereby enhance regulatory enforcement across the world. More recently, Ahdieh (2015) has remarked the opportunities that coordination via networks offers for leveraging a regulators' own preferences as well as to signal the extent of their commitment. These contributions, however, focus on the legal and the enforcement side of regulatory cooperation, not on the eminently political aims that can be pursued through networks. This chapter compensates for this lack of empirical analysis.

"*Consultants were not enough*": how the NARUC became involved in the USAID mission in Central and Eastern Europe.

> *"Let me set the context, that's the right question. The context was back to 1990, 1992… and Central Europe and the former Soviet Union. The broader reforms, what we called the transition from a centralized economy, centralized communist government to decentralized market economy and decentralized government required very fundamental reforms. In terms of the economy it meant breaking up centralized monopolies, decentralization, in the electricity sector unbundling was the term that was used, politically it meant breaking up or destroying a lot of institutions, procedures, processes… and… creating new institutions and radically revising existing institutions"* (interview 29).

The USAID and the World Bank played an enormous role in accompanying the transition of Central and Eastern European economies from the communist to the capitalist economy. Privatization programmes were a very visible feature of the transition (World Bank 1995, World Bank 2002), whose essential thrust, however, resided in institutional reform. In all sectors of the economy, including infrastructure, reforming or creating institutions quickly became a key policy goal: on the one hand,

new bodies – e.g. regulatory authorities – had to be created and staffed; on the other hand, the reform effort consisted in introducing new mind-sets of economic and social organization.

Indeed, energy utilities across Central and Eastern European countries were not used to conceive of utilities as businesses, whose commercial viability needed to be ensured. Many interviewees concurred in affirming that engineering and technical competences abounded among the professionals in the area; the main obstacle was that they "*had no idea how much a kilowatt hour actually cost to produce, no idea how much… installed capacity cost…. depreciation was an alien concept, why should you ever allow an earned return, if you need more money you'll get it from somewhere."* (interview 15).

It is important to note that an assessment of the success of electricity sector or regulatory reform in CEE/NIS countries is beyond the scope of this chapter. In actual fact, the achievements of the reform period in the electricity sector were judged unsatisfactory for most of the countries in the area insofar as competition is concerned (von Hirschhausen and Opitz 2001, Krishnaswamy and Stuggins 2003), even though privatizations have improved the quality of service (Vagliasindi 2004). The accession to the European Union improved investment levels in Eastern Europe (Vagliasindi and Izaguirre 2007). The countries of South East Europe have been struggling with electricity sector reform for longer; the establishment of the Energy Community (Deitz, Stirton et al. 2009, Hooper and Medvedev 2009, Pollitt 2009), a precondition to these countries' accession to the EU (Cambini and Franzi 2013), improved sector performance but progress has been uneven and donors are still very much involved in the area (interview 31).

The utility and regulatory partnerships.

In the context of post-Soviet Central and Eastern Europe, identifying what Broome and Seabrooke (2015) define sympathetic interlocutors was one of the primary concerns. These are actors in key positions at various level of governance who are willing and able to collaborate with the donors in order to carry out the reforms.

> "*Over time, USAID identified progressive change agents within the Ministries that championed sector reform and led the Ministry's transition from operating utility to the policy setting and data collection functions. Once they were identified, USAID provided these individuals with legal and regulatory technical assistance to draft new energy laws and shepherd their passage through the parliamentary process"* (interview 31).

The USAID organization comprises different regional Bureaus. Responsibility for Central and Eastern Europe fell under the remit of the Bureau for Europe and Eurasia. The Energy and Infrastructure Division was in charge of carrying out the reform programme in the energy infrastructure sector (US Congress, 1993, p. 96). In order to fulfil its mission, the Division adopted an innovative approach, that later went under the name of "transformational development": investing non-state (or para-state) actors with political support in order to carry out the desired reforms. The scope of the USAID mission in the area is clearly outlined in a 2007 Special Report focused on its work in Central and Eastern Europe since the collapse of the Soviet Union in 1990.

> *"In this issue, we focus on a region where USAID has deployed a transformational approach to development for the past 15 years: Europe and Eurasia (E&E). The fall of the Wall in 1989 and the collapse of the Soviet Union in 1991 was followed by a US Government decision to provide assistance through USAID to assist with the transition to democracy and free-market capitalism. (…) USAID focused most of its energy sector efforts on*

> *transforming the economic and institutional foundations of the sector, particularly the independent regulation and commercial operation of the electricity sector. (…) The E&E region presented several features that USAID had not encountered in other regions: virtually everyone in the region had access to modern forms of energy, and the workforce was highly literate with impressive technical and scientific knowledge. (…) However, these services were provided on a heavily-subsidized and non-commercial basis by essentially self-regulating government departments. (…) With the end of Soviet subsidies, service provision became increasingly unreliable and limited, in effect leaving citizens in the dark"* (USAID 2007).

This Report makes explicit the linkage between energy infrastructure and security as well as between energy infrastructure and politics. The connection between electricity and politics was particularly poignant in formerly communist countries; Lenin himself had made the electrification of the Soviet Union and the universal provision of electricity one of the pillars of his political message.

> *"The importance of power sector reform for sustainable economic growth is widely accepted. What is not often acknowledged are the accompanying political benefits. In the E&E region power sector reform is essential for successful political reform as well. Power systems were central tools of former Communist governments. (…) Power sector reform and politics are interwoven. Lenin's aphorism about socialism plus electricity equaling Communism reflected electricity's central role"* (USAID 2007).

Given the direct link between electricity and communism, it was crucial for USAID to decouple the provision of energy services from the state. The first major step USAID undertook in this direction consisted in establishing the so-called "utility partnerships". Initially, these involved only four countries: Hungary, Poland, the Czech Republic and Slovakia. In its report on the progress of the US intervention in the CEE/NIS countries, the US Congress remarked:

> *"Under this project, AID has also entered into a cooperative agreement with USEA* [United States Energy Association, a philanthropic organization funded by electricity and gas utility executives] *to form the U.S.-Eastern European Utility Partnership Program (UPP). Begun in October 1991, UPP brings together electric utilities in the United States and Central and Eastern Europe for activities focused largely on management issues but including also art annual regulatory systems seminar and dissemination of information and software resources. The Program has received wide support from the U.S. utility industry, including the Edison Electric Institute, Electric Power Research Institute, and the North American Reliability Council. U.S. utilities will share the costs of the program, contributing $1 million, or one-fifth of the program's budget. The first partnership was formed between New England Electric Systems and a Hungarian power company in April 1992, and others are being developed between Commonwealth Edison and the Polish Power Grid, Houston Lighting and Power and the Czech Power Co. (CEZ), Southern Co. and the Slovak Power Utility (SEP), and Central Maine Power and the Bulgarian National Electric Co. Further partnerships are planned with the Baltics and Romania. AID also reports that over 20 companies have expressed interest in joining the partnership program"* (US Congress 1993, p. 100).

"*Electrically known as CENTREL*" (interview 31), the utilities of Hungary, the Czech Republic, Slovakia and Poland were the target of the concerted USAID – USEA effort to improve their commercial viability, compromised by under-investment, scarce revenue collection and therefore inability to invest in infrastructure maintenance. The programme also had a strong symbolic importance: the US government wanted to physically separate the electricity grids of these countries from the integrated Soviet grid and connect them to the Western European electrical network (interview 31). By the mid-1990s, the CENTREL achieved the goal, meeting a major post-Cold War policy objective (interview 31).

USAID's strategy to foster cooperation and learning between US and Central and Eastern European utility executives was based on a two-pronged approach: on the one hand, USAID provided "traditional" technical assistance by hiring experienced contractors to work with aid recipients over a number of years, coupled with short term technical assistance on selected topics; the other prong of the strategy consisted of the innovative twinning element of the utility partnerships.

> *"What that did was give the decentralized utilities that were trying to sort out all kinds of issues direct contact and interaction for 3 or 4 years with a US commercial utility so that they could have a dialogue in terms of specific issues, see how they operated, and this involved about 4 exchanges a year; at the first meeting the utilities were paired together, talk about their issues and develop a plan to meet the needs of that unbundling utility and then they would visit the US for a week, go to certain specific issues, the next quarter the US utility would send people over based upon what they wanted to talk about so it was decentralized in the sense of being very much defined by the utility, what they needed, but really focused…"* (interview 29).

The decision to extend the partnership concept to the regulatory authorities emerged relatively soon afterwards. "*The USAID led efforts in the region to establish independent regulatory agencies as a countermeasure to potential backsliding by the ministries*" (interview 31) in order to remove political interference from the operation of the electric power sector. As per the relevant literature, creating regulatory authorities was deemed necessary to restrain the monopoly power of the newly privatized utilities as well as to enhance the predictability and the credibility of the countries' commitment to reform (Majone, 1997). The first energy regulatory authorities in the region were established in 1994 in Hungary and Ukraine. Others quickly followed suit.

> *"Now, in the development of those organizations we were really focused on 3 or 4 characteristics, we even put it down on a piece of paper, the AAAA:*

Autonomy, Authority, Accountability and then as time went on, Ability, four As, autonomy, separation from the utility, separation from the government; authority to make decisions, set tariffs, approve licenses, and accountability through open public procedures, removal for cause only, and then the ability, the training, capacity building skills and political skills" (interview 29).

USAID central managerial unit of the Europe and Eurasia Bureau convinced the decentralized USAID offices in each country to closely cooperate in order to achieve a consistent approach and for the new institutions to develop at the same time and learn from each other. The success of the utility partnerships encouraged the Bureau to replicate the same scheme with regulatory authorities, hoping to accelerate their learning process given the speed of the reform process.

"So we began again a two-pronged assistance approach. First the advisors located in the country, working with the regulator, for passage of the law, establishment of the organization, internal operations, development of licenses, thorough methodologies, very extensive work on that, and consultants are very useful but we found that… regulators… were hearing different things from different consultants and they highly valued the concept and approach of the energy regulatory partnership so we started doing that, partnering the regulators in central and eastern Europe with the US regulators. In order to do that we did a cooperative agreement, it was called, with NARUC, who then did manage, identify and establish the partnerships. What did a partnership do? Again there was 3 or 4 visits a year to start, the regulators would get together, hear about each other, define their work plan and then have a series of exchanges (…) so we did that for 3, 4 or 5 years, that built a confidence, a comfort and a trust that allowed a lot of interaction between the European regulators and the American regulators" (interview 29).

U.S. state regulators were partnered with their newly established counterparts based on technical similarities in their respective energy sectors, their common interests in

energy sector restructuring or simply on the basis of a shared ethnicity (interview 31). Initially, the regulatory partnerships focused on improving the institutional capacity to manage regulatory institutions, focusing initially on the appointment process for commissioners, ensuring independence from political interference, developing organizational charts, uniform system of accounts and the public hearing processes. As agencies matured, the partnerships became focused on introducing fundamental concepts of energy regulation, e.g. cost of service regulation, wholesale electricity markets, renewable energy integration, cross border electricity trade and market monitoring functions (interview 32).

The partnership format was greatly successful: continuity of interaction ensured not only the gradual familiarization of Central and Eastern European utility executives and regulators with the new organization of the sector, but it also helped USAID to identify the progressive agents of change that could be trusted to endorse the reform aims in their work practice: *"there was a degree of trust and credibility that we had with people in the countries and that we trusted them and knew who you could… trust to… to do the reforms"* (interview 29).

NARUC: the obvious intermediary.

Following the decision to implement regulatory partnerships, USAID needed to decide whether to manage organizational aspects itself or whether to rely on an external body. NARUC quickly appeared as the obvious partner in this endeavour, for three main reasons: the value of the practical experience of the American regulators involved (their cognitive authority); the cost effectiveness of the solution (as American regulators were only reimbursed for their travels, but not paid for their services); and the coordinating advantage that NARUC had as single point of contact for the whole ensemble of US state level utility regulators.

"I asked them [USAID] not to send advisors who are focusing on theory "only", who are not familiar with our region and not familiar with the daily regulatory practice or the daily utility practice, just have elegant advice on it, on the economic basic or… and they [USAID] followed our wish and they found partners on the utilities side and each utility in the region had a partner with a US utility, and we just copied this model when we wanted to learn the US regulatory practice it was evident that they should use the NARUC as a facilitator of knowledge transfer/exchange" (interview 25).

"I believe that… the basic concept there was that, since the utility executives, or utility managers, were already on salary, and because the commissioners were already on salary, basically the US government reimbursed for… out of pocket expenses, travel, hotels, any equipment you had to buy, as well as a moderate management fee for the sponsoring organizations, NARUC and USEA. In retrospect I think it was an innovative, creative, largely effective and pretty cost-efficient model for that region" (interview 15).

"The obvious managers of this process was NARUC, they are the association of the 50 state regulators, they had credibility, they knew the regulators, they could help regulators explain why this was in the US interest, in the interest of the regulators themselves as well as helping countries in central and eastern Europe make the transition so they were an obvious choice to carry this out" (interview 29).

"In the Eurasia region, there were 6 countries where their public hearing regulations and procedures were adapted from US commission counterparts. Countries do not need to start from a blank piece of paper; it is easier to look at a "good practice" and modify it to fit the local context and needs." (interview 39).

USAID selected NARUC primarily for its access to reliable information across US states. NARUC was again called upon to serve as a provider of information on the circumstances of each state, this time to export their learnt lessons to foreign countries. NARUC's networked structure of cooperation was thus put to a different, perhaps unexpected use many decades after its establishment. This re-orientation of purpose testifies to the analytical leverage to be gained by studying and analysing networks along their evolutionary trajectory, rather than restricting the focus of analysis to their stated aims at the moment of their creation.

There was one further way in which NARUC could serve the purposes of the mission: by teaching regulators how to network. Donors had noticed that regulators were, each in their own country, facing the same kinds of issues. Moreover, just like their EU counterparts in those very same years, they were politically isolated and struggled to establish their legitimacy. NARUC held long-standing experience of defending the regulators' institutional turf. Its further contribution to USAID mission, then, became schooling CEE/NIS regulators about how to deal with their domestic interlocutors.

> *"There we are with regulators in 15, 16 countries. What I get to see by working in many of them was similar issues, same questions, same frustrations, these were organizations with no predecessor, no history, in terms of how to do things beyond the consultant's advice and looking at the US program. (…) For example, the Ukrainian regulators, wanted to visit the Georgian regulators who were doing the exact same thing as they were, they jumped at the chance so we sent 3 or 4 of them to Tbilisi for 3 or 4 days to talk to them. We did the same with the Moldovans, and then I think the Moldovans to Romania, and we began to do these ad hoc one off visits and they greatly valued it. Then I could see where this was heading, the value of that exchange, and began thinking about how to bring them together more so we had a workshop in Budapest where we got 11 or 12 countries together and had them each over their experiences and presentations, discussions, and they we set up two technical working groups*

(…) on tariffs and licenses (…). So that began on an ad hoc basis, the technical connection, but at that workshop 4 or 5 of the chairmen stood up and said we would like to propose and support the establishment of a regional organization (…) So that was 1997, I think, that really crystalized the establishment of the regional network or what became ERRA" (interview 29).

The establishment of the Energy Regional Regulatory Association (ERRA).

"One of the, now in retrospective, obvious observation was that there was no peer group, so you have Hungary setting up the Hungarian Energy Office, you have Bulgaria (…) with what was the State Energy Regulatory Commission, you have the ERG in Poland etcetera, and these were… were obviously very committed, well-intended people, economists, lots of engineers, some lawyers, but no peer group… and the… the EU model that was emerging… of associations of regulators as well as the existing NARUC model in the US, where you could have peer to peer exchange, you could look at best practices, regionally, nationally, globally, you could facilitate dialogue. That model helped shape the idea that there should be a regulatory association for non-EU member states that were going through this transition, for aspirational EU member states and to drive an ability to tackle common issues together" (interview 15).

By supporting the establishment of ERRA, the USAID rendered the creation of an informal cooperation network of energy regulators an essential part of its operationalization of the policy goal of fostering market institutions in the post-Soviet space. The key reason for the involvement of US regulators in the mission owed more to their experience of network cooperation than to their regulatory expertise *per se*. In other words, consultants could and did provide ample advice on

various regulatory models; but they could not coach regulators on how to cooperate with each other. NARUC's comparative advantage resided in its network expertise.

> *"As the number of regulatory bodies in the region increased, USAID supported networking among the national regulators to exchange experiences and information. This led to a strong bottom up demand for an ongoing institutional arrangement that allows regulatory bodies to continue their exchanges. As a result, the Energy Regulators Regional Association (ERRA) was established in Budapest, Hungary with USAID support. The regulators anticipated the evolution of the reform process toward regional electricity market arrangements that required cross-border regulatory communication and cooperation. To support the establishment and development of ERRA, USAID formed a Cooperative Agreement with the U.S. National Association of Regulatory Utility Commissioners (NARUC), an association of 50 state regulators. NARUC has provided a valuable link for the E&E regulators to U.S. regulatory experience and practices. An indication of the relevance and effectiveness of the regulatory work is the fact that 14 E&E Missions have bought into the NARUC Agreement to complement Mission bilateral regulatory development efforts"* (USAID 2007).

Before the partnership with USAID in Central and Eastern Europe, NARUC had virtually no international exposure. US regulators had occasional meetings with regulators from neighbouring Canada and Mexico (interview 9). Besides these, American state level utility regulators were confined to their state, and NARUC had a predominantly inward character and focus on the relationship with federal agencies. In particular since the de-regulation period of the 1970s and 1980 (Derthick and Quirk 1985), federal agencies had seen their authority expanded: a series of pronunciations of the Supreme Court greatly expanded the scope of federal regulators' discretion over that of state level regulators. Therefore, when USAID

proposed to NARUC to undersign a cooperative agreement for market reforms in Central and Eastern Europe, it found a receptive ear:

> *"I think USAID realized they needed… they could get hands-on, very active regulators that are actually in office providing those services so they came to us to see if that would be something we could be interested in and we were, and we are, that's why we went forward. (…) Our charge from USAID was really at least two-fold: first was to establish a regional association that would be modelled after the NARUC model (…) the other task was to help the commissions of individual countries, establish independent missions in their… to their…. legislators or governments and the like, so we had a lot of bilateral, we call them partnerships, between an individual state regulatory body here in the US with a partner"* (interview 9).

The founding members of ERRA were the energy regulators of Albania, Armenia, Bulgaria, Estonia, Georgia, Hungary, Kazakhstan, Kyrgyz Republic, Latvia, Lithuania, Moldova, Poland, Romania, the Russian Federation and Ukraine. Several interviewees recalled that the idea of a network of Central and Eastern European regulators was aired primarily by the regulators themselves. Nevertheless, laying the foundation for cooperation was not an entirely smooth process. As emerged in interviews concerning the early days of CEER, regulators were suspicious of each other, unused to share information and to cooperate with peers, and insecure about their own national role.

> *"It was not easy, because when you were sitting on a meeting many of the participating commissions did not speak English at all and not even Russian, they were not used to stand up and speaking their opinion, perhaps they were afraid of the Americans… this is something else than cooperation, I guess there was suspicion towards this whole exercise… and the energy sector was always a very sensitive one also in that region so information sharing was something very new and suspicious for those people… they were motivated to come*

because they really wanted to learn and get the experience but in the beginning it was much… it was a difficult start…" (interview 27).

Despite these hesitations, sustained cooperation quickly ensued from the first ad hoc meetings. The network registered as a regional association of energy regulators with legal headquarters in Budapest in 2001. In that year, the regulators of Slovakia, the Czech Republic and Mongolia also officially joined. They were followed by the regulators of Croatia and Turkey in 2002 and a few years later by the regulators of South East Europe. The choice of casting the network in a regional framework reflects the enthusiasm of the time with the re-launch of the EU Single Market Programme in the mid-80s, completed in 1992 with the Maastricht Treaty. The US aspiration was that former communist countries would gradually and finally be englobed in the EU and therefore in the Euro-Atlantic sphere of influence (interview 29).

Practical considerations also played a role in the decision to foster the ERRA network; not least, the budgetary constraints faced by regulatory authorities in small countries. By convening in a single platform, regulators were able to access state of the art knowledge at contained costs. The additional advantage of being able to talk to peers in the region in an informal context considerably strengthened the case for the network to be established.

"It was frankly an effective and efficient way of bringing expertise that would be probably economically unfeasible on a regulator by regulator basis, the X regulator I suspect would have great difficulty marshalling enough budget to bring in leading economists, licensing experts, financing parties, to talk to them and work with them in workshops in their capital city about how X should be looking at the future to evolve to a diversified, competitive, sustainable power system that it would like, but if X is one of… 24 members, and you can send your tariff experts to the annual tariff workshop, and your licensing expert to the annual licensing workshop, and your commissioners to the annual investors

conference, you've really gotten this ability and access to extraordinarily knowledgeable people at, quite frankly, 1/24th of the price" (interview 15).

"In that time, the major driving force for ERRA members was to learn what does it mean energy restructuring and how to involve private capital into the energy industry. The members wanted to learn from practicing regulators outside of ERRA but some subject was already prepared and developed in ERRA member countries. For example the Hungarian regulator has already been established and functioning and the country went through the privatization and restructuring so some of the knowledge transfer was not only from US or from Europe but among the ERRA member countries and it was very… there was a real appetite from the countries in the region, because step by step every year another regulator was established or another licensing department was set up; they had to issue license conditions, to set tariffs, and they did not know how to do it. That is why the meetings were full of real life discussion, like; hey guys, what to put into the license conditions?" (interview 25).

It is important to bear in mind that CEER and ERRA were evolving in parallel. Closer analysis reveals that they were also making use of similar opportunity structures. In the late 1990s – early 2000s, EU-15 energy regulators began cooperating in order to build their own legitimacy under the political support of the European Commission; meanwhile, Central and Eastern European regulators were achieving the same goal, under the aegis and with the support of USAID and NARUC. Although circumstances were different, both groups of regulators consisted of newly established institutions having to assert themselves on their national scene and to overcome national governments' and constituencies' resistances.

"Especially when you are… yeah… being part of… those networks… really provides you with a very strong professional background and community… many times regulators deal with international companies operating in the countries, having very strong global networks and very well paid lawyers, I

mean, tremendous resources, now, you have to regulate these companies, you have to hurt them, essentially, because without regulation they would behave otherwise and you have to say no, you can do this but not that, and then when you do this you get into a conflict and you have to argue and defend your decisions, and I think these associations what they mostly help for their members is that they… they also provide that sort of… international network… that the regulated companies also have… you get closer into a similar position that just knowing how they behave in other countries, what solutions other colleagues found all around, it's very important…" (interview 27).

" The real driving force was the discussion, the knowledge transfer, and giving a strong background for the members who can use it when they are arguing home they can say that…hey guys, 10 ERRA members are following the same way, then my position should be good - this strong basis was important, because there were no booklets, no theory for regulation in that region, so that's why it was a real technical support for the regulators who started from scratch regulating the industry" (interview 25).

Like CEER represented the channel of regulators' influence on the configuration of the nascent Internal Energy Market, ERRA helped the regulators of Central and Eastern Europe to play a role in influencing the content and the direction of reform in the face of lukewarm governments' commitment to change. In both the EU-15 and Eastern Europe, the realization of the necessity that the electricity and gas sectors had to be reformed clashed with the political implications that reforms would have had in terms of hurting consolidated incumbents' assets and market shares as well as affecting the income of energy consumers, big and small.

"At that time we had the feeling that the governments in South and Eastern Europe… we realized that the governments, they didn't follow the international tendencies, they were not interested in restructuring, so that the ERRA and the regulators in the region they were there facilitators of the changes, they

convinced the governments why to restructure, what is the reason for it, why is it useful, so that's why… in most cases there was no political wish to… to have a… stable regulatory framework…

But why do you create a regulator if you are not interested in reform?

It was fashionable, it was a wish from different international organizations and lending institutions, there were EU requirements, and the governments realized that all the neighbours do it, there should be a reason behind it, and because later on they realized they would like to restructure, they would like to attract private capital so they need this regulatory framework. The details were prepared by the regulators; in most of the cases the regulators forced the governments to restructure, to prepare, to draft bills and to amend the market structure. For us it was evident that when we learn from each other and from the rest of the world regarding the best regulatory practice then we could be on the good way. (…) It was not just because of ERRA, there was a need of the national markets to change and they had no guidance how to change, the governments could not give them any advice, there was no literature to learn it and it was evident for them that… when several other ERRA members are going into one direction, why not to do the same… it was a very good moment, during the restructuring and establishing the regulation, learning from other ERRA members" (interview 25).

Funded by the magnitude of the foreign policy goals of the US government, the programme enjoyed a rare opportunity for bilateral aid provision: continuity and coordination. Very often, donors are criticized for the short lengths of their mandates and for the lack of inter-donor coordination (Klein and Harford 2005). The length of the programme and the approach adopted made for an actual partnership between donors and local elites and for an articulated approach to reform.

"The approach became three-pronged: two prongs was technical assistance, secondly the partnerships that were national in scope and then the third prong of assistance was the regional network, so from the perspective of an energy regulator sitting in Moldova, you've had a technical advisor who can help you on the tariff methodology, you had access to the US pricing tariff process through the partnership and then you could go sit down with your neighbours and hear a tariff committee and see what they were doing, what problems they had etc. so three points of test before they make decisions, I think that gave them enough confidence and capability to try to pursue what they could in difficult political environments… We found that consultants only were not enough. That's the bottom line" (interview 29).

The near-simultaneity of events in the EU-15 and in Eastern Europe might explain the conspicuous absence of the EU in the processes outlined in this chapter: while ERRA was being created, the CEER did not officially exist yet, and its members were grappling with the same issues as their Eastern European counterparts. As one interviewee recalled:

"We did have some personal contacts, you know… but the CEER was too slow, we were not ready. We got there when everything had already been done, so we did not really play a role back then. (…) They were very forward-looking, they understood something that the European Commission made its own only later on: we prevent future wars if we create many levels of cooperation; not only at head of state level but also among the governance structures. (…) They understood you had to do institution-building in countries that you want to be democratic: you cannot just go there and tell them you have to hold free elections otherwise you are not democratic, under conditionality threats; you have to do something more, like encouraging learning and cooperation among the intermediate levels of the establishment" (interview 3).

The end of ERRA as a regulatory network and the beginning of ERRA as training provider.

A few years into their cooperation, ERRA regulators realized that their accumulated experience would be helpful training material for future staff of their regulatory authorities. They envisaged the ERRA to continue into the future and the socialization mechanism triggered by common regulatory training to sustain network cooperation, as it had been for NARUC and CEER. In February 2003, ERRA and CEER joined efforts to organize the first ERRA course – introduction to energy regulation – addressed to electricity regulators from EU accession countries. In the summer of the 2003, this introductory course was held again, organized in conjunction with the Central European University (CEU), and offered to all ERRA members. After the European enlargement, ERRA developed a comprehensive package of training courses that comprise both face to face and online tuition and that, today, represents its main source of income.

The expansion of ERRA began soon after the European eastward enlargement in 2004, which involved seven countries, whose energy regulators had been founding members of ERRA: Estonia, Latvia and Lithuania and four former satellites of the USSR (Poland, the Czech Republic, Hungary and Slovakia). A subsequent enlargement took place in 2007, when Bulgaria and Romania became EU Member States. The corresponding energy regulators joined the CEER almost by default. The integration of Eastern European countries was finally underway, and their energy regulators would be obliged to comply with and implement EU energy legislation; would the ERRA fall apart?

With the enlargement, ERRA's initial mandate was finished. In order to remain viable, the networked organization had to re-invent itself. It decided to convert its main mission from politically loaded role of accompanying the transition of Central and Eastern European energy sectors to market principles to the less consequential role of regulatory training provider, with a specific focus on regulators from countries

where the energy sector is still wholly or mostly under full governmental control. Initially, it expanded its membership to include regulators from South East European countries between 2002 and 2006 (i.e. except Albania, who was among the founders, Croatia, Serbia, Bosnia-Herzegovina, Montenegro, UNM in Kosovo, FYR of Macedonia).

Later on, ERRA began promoting itself worldwide as a point of reference for energy regulatory training, with the support of USAID and NARUC. Since the early 2010s, energy regulatory authorities from an impressive range of countries, from Pakistan to Saudi Arabia to Nigeria, have joined the ERRA as affiliate or associate members, thereby obtaining discounts on training and event attendance. International donors fuel this expansion by referring to ERRA as the regulatory training provider for emerging markets. Nowadays, ERRA explicitly refrains from being perceived as providing policy recommendations or from aspiring to do so. This shift can be understood as aimed at gathering as ample a membership as possible, including regulators that are not independent and whose mandate is to oversee state-owned vertically integrated companies rather than attempting to achieve competitive markets.

Network expansion and foreign policy goals.

In examining the case of financial services regulators, Macey (2003) argues that national regulators become involved into coordination and cooperation with peers from other countries (what he termed “regulatory globalization”) in response to three phenomena: their potential irrelevance due to the opportunity for companies to engage in regulatory arbitrage; the impossibility of achieving their domestic mandate because of the regulatory practices in other countries (which trigger the export of their regulatory standards to other countries - what Macey calls “regulatory imperialism” – thereby gaining them considerable domestic prestige); or the

regulatory agency' pursuit of its own policy preferences when faced with domestic opposition from affected constituencies.

The first phenomenon is unlikely to find strong application in the world of infrastructure investment: regulatory stability and predictability, rather than the laxity of regulatory provisions, are among the main determinants of foreign investment in infrastructure (Spiller and Tommasi 2005). Therefore, the phenomenon of regulatory arbitrage is unlikely to apply to this context. The second motivation that Macey (2003) adduces to explain transnational regulatory cooperation points to interdependence. Whenever a regulatory agency is prevented from fully accomplishing its mandate as a result of its enforcement interdependence with a regulator from another country, it will invest political capital into persuading the regulators from that country to adopt common rules. Yet, there is hardly any interdependence between the energy sectors or utility businesses of the USA and the Central and Eastern Europe.

The third of Macey's hypotheses resonates more clearly with the context of the establishment of ERRA (and of all comparable regulatory networks): periods of radical policy change, in particular in sectors with direct and visible distributional consequences, such as the utilities, create winners and losers. The losers oppose reform. Eastern European regulators, exactly like their EU counterparts in the same years, faced opposition from all sides who stood to lose from reform. The endorsement of USAID and NARUC as well as the collective leverage of ERRA represented an important source of legitimacy.

"Sometimes, however, we observe the government expending significant political capital to affect international practice in order to impose its will on the international community, even when such regulatory globalization will not affect domestic policy or practice at all" (Macey 2003, p. 1369). This statement captures the rationale of the US government's support to the mission: the desire to eradicate the remnants of communism from Eastern Europe represented a potent motivation to devote

resources to the programme even though it had no real impact on domestic policy. Rather, it was part of a broader foreign policy strategy aimed at preventing the backsliding of the democratization of Central and Eastern European countries and their transformation into liberal market economies.

USAID chose networks over other options as instruments of professional socialization able to foster sympathetic interlocutors/change agents in recipient countries. In turn, NARUC exploited this opportunity to add a layer to its functions and increase the breadth of the organization. By informing the recent history of NARUC and juxtaposing itself to that of CEER, the case of ERRA provides a useful comparative case within a case. CEER and ERRA developed in parallel and never came in contact as they were emerging. Yet, regulators from both networks faced similar challenges, e.g. uncertainty and domestic opposition, and picked similar strategies, e.g. use their peers as a source of epistemic knowledge and legitimacy, and exploiting their symbiotic interdependence with actors at higher levels of governance to obtain access to policy formulation.

Moreover, the comparison of these cases suggests that the precise timing of each phase and/or the length of time each of the phases identified in this analysis lasts varies across networks. Whereas in the case of NARUC and ERRA formalization occurred relatively soon, CEER became legally registered six years after its inception. These differences do not, however, change the substance and the significance of the evolutionary phases each of these networks went through. This is an acknowledged fact in comparative historical studies (Mahoney and Rueschemeyer 2003), which are agnostic as to the precise length of the spans between phases but convinced of the occurrence and the relevance of the phases themselves.

7. Networks as “first best”? The establishment of the network of Euro-Mediterranean energy regulators.

If the study of European networks has been continuously growing and deepening during the past two decades, the study of the European external governance has remained rather more confined to its formal manifestations. Moreover, the potential or actual relationships between European regulators and regulators from countries neighbouring the EU have been overlooked in the literature. This chapter fills this gap. It provides an empirical case of what I term “network entrepreneurship”: the furtherance of network emergence by policy entrepreneurs.

Moreover, it reveals an important, neglected aspect of regulators’ preferences. The literature considers informal networks a fall-back option when formal arrangements cannot be achieved; a “second-best” solution (Sutherland 1992, Hancher 1996, Dehousse 1997). This chapter shows that, from the point of view of regulators, networks are a “first-best” option for regulatory collaboration. More precisely, regulators think that formal arrangements should always follow, never precede, informal collaboration. Collaboration between previously disconnected, stranger regulators needs to start informally, or it will be unworkable. Regulators consider that prolonged informal collaboration, not legally binding arrangements, can breed trust. This finding is important, because regulators are the subjects of regulatory collaboration within networks. The policy-maker wishing to foster regulatory collaboration should care about which format of collaboration that can be expected to achieve the desired result, and which doesn’t. The findings of this chapter should motivate further study in the informal dynamics of European external governance (Lavenex 2004, 2008, 2009) and foreign policy in energy matters (Youngs 2014 and Judge and Maltby 2017).

The narrative focuses on the establishment of the Association of Mediterranean Energy Regulators (MedReg). MedReg differs from the other three cases examined so far in several respects. Firstly, MedReg emerged due to the initiative of an agent (the Italian energy regulatory authority) who played the role of lead organization (Provan and Kenis, 2008) by providing for network establishment. Hence, MedReg differs from CEER, which emerged due to the collective initiative of a small group of regulators, and from NARUC and ERRA, which emerged from a combination of regulators' initiative and an external agent's support (ICC and USAID). Frustrated with the standstill of energy cooperation between the EU and the countries in the Euro-Mediterranean region, a small subset of European regulators from Southern Member States invited their foreign counterparts to join efforts to create a new informal network focused on the region. Crucially for this research, they led this initiative on the basis of their own experience of informal network cooperation within the CEER and from observation of the success of ERRA in socializing and uniting regulators in Eastern Europe.

Secondly, MedReg does not involve all EU energy regulators, but only the subset from Southern Member States. Therefore, MedReg gathers a mix of energy regulators from EU and non-EU countries, drawn from an EU-defined "Euro-Mediterranean region" whose boundaries comprise a broad range of very diverse countries, from Eastern Europe to North Africa.

Thirdly, as this chapter shows, MedReg was established in the wake of a bold policy initiative (the establishment of the Energy Community of South East Europe) but in absence of a strong momentum for policy change (as it occurred in the EU and in Central and Eastern Europe beginning in the late 1990s) or during a policy crisis (as it happened in 19th century USA with the discontent towards the railroads). Fourthly, the regulators in MedReg have no symbiotic interdependence with a supranational policy actors furthering a specific agenda. Ten years after its establishment, MedReg is not perceived as an influential player in the energy policy of the countries

concerned or of the region as a whole (Cambini and Franzi 2013). Recently, however, the European Commission has endorsed MedReg and committed to keep supporting the network for the fourth cycle of its operations.

The EU's external energy regulatory governance: top-down and legalistic.

Relations between the EU and the countries to its southern border have a long history. The first attempts to forge an external EU policy towards these countries date back to the 1970s, when the Global Mediterranean Policy was put forward by the then European Community, in the wake of the oil crisis (Cardwell, 2011). However, it was only with the Maastricht Treaty and the stated objective of increasing the EU presence abroad that a structured policy was planned for the Mediterranean (Cavatorta and Rivetti 2014). It took the form of the so-called Barcelona Process, initiated with the Barcelona conference of 1995 and bearing the official name of Euro-Mediterranean Partnership (EMP or EuroMed). The EMP was a broad policy programme, covering items from democracy to trade. However, the centrality of energy issues was acknowledged in the only EC Communication entirely dedicated to energy cooperation in the so-called "Euro-Mediterranean region"(European Commission 1996). The EMP energy vector was characterized by a two-fold regional approach: political dialogue between Energy Ministers from both shores in the Inter-Ministerial Conferences and expert dialogue between representatives of the partner countries and the EC in the Euro-Mediterranean

Energy Forum. Both the Conferences and the Forum began convening soon after the Barcelona Conference, but fell short of regular meetings thereafter[39].

In 2004, the EU accomplished three major policy efforts: it carried out the European eastward enlargement; the launch of the European Neighbourhood Policy (ENP); and the establishment of the Energy Community of South East Europe (officially in force since 2006, but prepared in the preceding years). The enlargement brought ten new Member States into the EU. The European Neighbourhood Policy (ENP) was an umbrella programme grouping the various cooperation programmes linking the EU and its Southern and Eastern neighbourhood. The ENP marked the boundaries of the EU, separating Members and Accession countries from countries without a membership perspective (Smith 2005, Cardwell 2011). Moreover, the ENP combined regional aspects with a pronounced bilateral dimension: the Commission proposes bilateral Action Plans to each of its "neighbours", framing cooperation around a series of mutually agreed issues. The Action Plans specify the extent of regulatory convergence that each country is willing to undertake in different economic sectors (Escribano 2010). Energy is an important topic in these bilateral relations, which revolve also around the harmonization or adoption of the European energy regulatory framework. Inasmuch as network governance is a characterising feature of the EU (Boeger and Corkin 2017), the external dimension of its regulatory

[39] The Inter-Ministerial conferences convened for the first time in Trieste in 1996. Other meetings followed in Rome and Athens in 2003. They were then discontinued until 2007 (meeting in Limassol, Cyprus) and 2014 (meeting in Rome, Italy). The Euro-Mediterranean Energy Forum convened for the first time in Brussels in 1997, then in Granada in 2000. It proved extremely difficult to retrace the chronology of Forum meetings thereafter. The Athens meeting of 2003 appears to mix the Forum and the Inter-Ministerial Conferences together. Following the Athens meeting, the Energy Forum as conceived within the EMP seems to have been discontinued.

governance is, instead, highly formalized and premised on the extension of the European *acquis* (Bicchi 2006).

At the very beginning of the 2000s, the EU and the USA crossed roads in Eastern Europe. This resulted in the creation of the Energy Community of South East Europe (ECSEE) in 2005. The ECSEE is a Treaty-based organization, originally comprising the countries that were deemed unprepared to join the EU as Member States immediately, yet maintained Accession status: namely, SEE countries and Turkey (that only joined as associate, not as full member). The premise of this essentially political initiative was to extend the EU energy legislation to the countries in its neighbourhood, as a preparatory step to full accession (Deitz, Stirton et al. 2009, Karova 2009, Padgett 2012, Schulze 2015). The European Commission, CEER, USAID and ERRA, as well as the World Bank and other international donors were all involved in the setting up of the ECSEE.

> *"We had very very common interest with the EU in terms of the integration of the Balkans into the Euro-Atlantic community and integration into Western Europe, the EU… it was a very very staunch support, (…) within the AID but also within the state department they understood the importance of that"* (interview 29).

The political rationale for the establishment of the ECSEE was two-fold: the EU wanted to expand to reach of its market framework to foster investments in the infrastructure that would allow it to diversify its energy imports (Karova 2009, Padgett 2012); moreover, the integration of South Eastern European networks would end the electrical isolation of Greece. The Treaty binds its signatories to implement relevant pieces of the EU energy legislation. The significant costs of adaptation for SEE countries would be rewarded by EU membership (Karova, 2009). The ECT has also been understood as a sign of the EU's "enlargement fatigue" (Renner 2009), driving it to postpone full Accession while still increasing political stability in its neighbourhood. Both the enlargement and the Energy Community were perceived

as important political achievements for the EU: they portrayed its success at exerting and exporting its normative (Manners 2015) and market (Damro 2015) power to third countries. Meanwhile, the Euro-Mediterranean Partnership was embedded into the ENP.

The Energy Community Treaty foresaw the adoption of EU energy legislation *tout court* in the countries of South East Europe via a formalized procedure typical of accession processes (Schimmelfennig 2012). After 2004, the EU policy message concerning regional energy cooperation became centred on the extension of the "Energy Community approach" to the Euro-Mediterranean (Tholens 2014). External energy governance became premised on the notion of extending "*the EU's internal market, through expansion of the Energy Community Treaty to include relevant ENP countries*." (Joint Paper 2006, p. 6), whereas a decade earlier the European Commission affirmed that regional energy cooperation with the Mediterranean should aim "*to develop energy planning tools based on the highly complementary nature of the Northern and Southern Mediterranean markets and supply networks*" (European Commission 1996, p. 4) and left room for co-ownership of the legal and regulatory aspect of energy cooperation ("*An appropriate legal framework should be devised to encourage and promote regional and transregional trade*", p. 6).

In the following years, however, slow progress in the achievement of the Internal Energy Market and deterioration of energy relations with Russia increased the perception of threat to the EU's energy security. The gas disruption episodes involving Russia and Ukraine in 2006 and 2009 prompted renewed European Commission's interest in the Mediterranean. This took the form of bilateral strategic

partnerships with ENP countries (such as Algeria, Morocco, Egypt), as well as the re-launch of regional cooperation in both gas and electricity[40].

Soon afterwards, in 2008, the then President of France, Nicolas Sarkozy, announced the establishment of the Union for the Mediterranean, foreseeing closer cooperation in economic issues between the two borders of the Mediterranean. The initiative should have concerned only EU members bordering the Mediterranean. The European Commission, however, opposed the initiative, pointing out that an economic cooperation programme that excluded most EU Member states was inacceptable. The idea was therefore repackaged as another re-launch of the EuroMed Partnership/Barcelona Process; its full name became the "Barcelona Process: Union for the Mediterranean". The revamp of the Partnership, however, was not accompanied by substantial change in the European approach towards its Southern neighbours (Darbouche 2011). Importantly, none of the European policy initiatives included a regulatory cooperation or regulatory partnership component, nor a capacity building aspect.

Even after the revamp of Euro-Mediterranean energy cooperation following the gas crises in Eastern Europe, the Commission's stance did not change: in March 2011, a Joint Communication of the Commission and the High Representative of the EU in reaction to the "Arab spring" encouraged the extension of the Energy Community approach to the Southern Mediterranean (Joint Communication 2011a, p. 10). The idea was reiterated in the May 2011 Review of the ENP: "*a form of EU-Southern Mediterranean Energy Community. Extending the Energy Community Treaty with the Union's Eastern and South-Eastern neighbours, or building on its experience, this*

[40] At the fifth EuroMed Energy Ministers conference, held in Limassol (Cyprus) in 2007. On that occasion, the European Council jointly with the European Commission launched a renewed Euro-Mediterranean Energy Partnership. An Action Plan for the region was also launched on that occasion, covering the 2008 – 2013 time span. On that occasion, the MedReg was publicly praised for its efforts at bringing about regulatory harmonization.

community should cover relevant parts of the EU's energy legislation with a view to promoting a real and reliable convergence of South Mediterranean partners' energy policies with EU policy." (Joint Communication 2011b, p. 15).

The European Commission's approach stands in contrast to the assessments of regulators, system operators and other technical experts involved in Euro-Mediterranean energy cooperation: according to recent research, these are convinced that the idea of extending the Energy Community is unworkable in that context and should not be used to frame the cooperation, lest jeopardizing its progress (Tholens 2014).

The establishment of the MedReg: networks as "first-best".

> *"There was the enlargement… The EU was ambitious and it started to look around itself. Inevitably they saw that both South East Europe and the Mediterranean were crucial for energy issues, but they focused first on South East Europe. The Commission, grabbing space as usual, imagined this "Energy Community". I immediately tried to get involved because I thought we needed to, as the closest European countries… but then we kind of lost the handle of this and the countries ended up being represented by the EU. (…) On the basis of that experience, I thought, well, I'll take a shortcut and be pro-active, I'll try to anticipate the Commission… We will invent the community of the Mediterranean… and so I created MedReg"* (interview 4).

The only occasion when CEER collaborated with the European Commission to deliver foreign policy goals presented itself with the processes leading to the official signature of the Energy Community Treaty (interviews 2, 7, 8 and 42). In those years, the role of CEER was, in cooperation with the then Directorate General for Transport and Energy of the European Commission, as well as USAID and other international

donors, to facilitate the setup of the Energy Community Regulatory Board (ECRB) – a board of energy regulators with advisory powers that would represent integral part of the Energy Community organizational structure (interview 7, 42). CEER set up an ad hoc working group and hosted joint trainings and meetings with ERRA as well as the regulators from the ECSEE. After that period, however, CEER was never involved again in the delivery of European external energy policy objectives[41], which are led by the European Commission.

The quotation opening this section naturally leads to asking a rather straightforward question: why would EU national regulators care what approach the European Commission does or does not take as concerns energy cooperation with neighbouring countries? Limitations on space do not allow an exhaustive response to this question, since a full account would need to discuss the institutional boundaries of national regulatory institutions and the ways in which they understand their role in domestic and European politics. For the purposes of this research, a few details concerning the energy sector of the countries, whose regulators led the initiative, may shed light on their reasons.

The initiative to set up MedReg came from a small group of EU regulators, in particular the Italian Regulatory authority, in 2006. Italy is the country with the highest electricity prices in the European Union[42] and depends on fossil fuel imports (particularly from Russia and Algeria) for its supply. Moreover, the energy strategy developed by the Italian government foresees transforming the country into an

[41] The CEER's International Strategy working group coordinates the network's informal relations with similar networks, such as the NARUC, and the CEER participation in international events on energy regulation, but does not remotely resemble the structure, the scope or the resources of the NARUC International Affairs division.

[42] Eurostat, http://ec.europa.eu/eurostat/statistics-explained/index.php/Energy_price_statistics (last accessed 13 August 2017)

energy hub for the transit of gas and electricity generated through renewable energy sources to the rest of Europe[43].

Spain also depends on Algerian gas and is interconnected with Morocco, which has, in turn, been heavily investing in renewable energy generation in order to reduce its import dependence from fossil fuels and trade electricity with the EU[44]. France is a former colonial master in North Africa and was unlikely to remain indifferent to the creation of a network of regulators including French-speaking countries in the MENA (interview 6). By the same token, a country like Greece is notably interested in the progress of electricity market integration in South East Europe, whose regulators are also members of MedReg as well as of the Energy Community. Italy, Spain and Greece are important transit countries for the electricity and gas that would be generated in the region and exported to Northern Europe (Escribano and Jordán 1999, Escribano 2010, Escribano 2011, Escribano and San Martín González 2014). In turn, countries like Egypt and Tunisia, but also Turkey and Algeria are interested in leveraging their resources and/or their geographical position to improve their energy use and engage in energy trade with the EU.

Despite the clear rationale for energy trade and, in the longer term, market integration across the Euro-Mediterranean region, the myriad dedicated initiatives have lacked noticeable progress. Intergovernmental initiatives invariably collapsed, EU policy programmes covered many issues besides energy, and Mediterranean countries are unwilling to undertake privatization and/or liberalization reforms.

[43] Italian Government Energy Strategy http://www.sviluppoeconomico.gov.it/images/stories/documenti/SEN_EN_marzo2013.pdf (last accessed 15 August 2017)

[44] Quartz Africa, https://qz.com/533187/tired-of-importing-almost-all-its-energy-morocco-has-built-africas-biggest-solar-farm/ (last accessed 15 August 2017)

Moreover, there is hardly such a thing as a Mediterranean region: ancient conflicts and divisions permeate the Middle East and North Africa (MENA) (interview 3, 11).

In the wake of the establishment of the Energy Community, the Commission began leveraging that policy success towards the countries in the Southern neighbourhood. Fearing this would further hamper progress in the direction of energy trade and/or market integration with the Southern neighbours (both options are technically already possible, but political and regulatory obstacles persist, see Khalfallah (2015)), regulators, in a display of extraordinary policy initiative, made the first move.

> *"I sent the first invites, we had two or three meetings, and then you know how these things go… you have the meetings then you begin thinking well we should maybe jot down some rules, then you draft a statute, then you go to the notary and in the space of a year… there we were. It was impressive because sometimes when you begin these things you can face some lukewarm reactions but no, everyone responded to the invite, also the representative of Ministries where regulators did not yet exist. Everyone was eager to understand their own mandate and profession, it was, you know, the same mechanism at the time* [of the CEER]*, you seek a table to sit at where you can dialogue with peers in order to help each other grow, stand on our feet, and everyone was very enthusiastic"* (interview 4).

The association of Mediterranean electricity and gas regulators (MedReg) was established as the Mediterranean Working Group on Electricity and Natural Gas Regulation in May 2006 within the framework of the Euro-Med Partnership[45]. In

[45] MEDREG, today a Regional Regulatory Association, brings together Energy Regulators for Electricity and Gas of the following countries: Albania, Algeria, the Palestinian Authority, Bosnia-Herzegovina, Cyprus, Croatia, Egypt, France, Jordan, Greece, Israel, Italy, Lybia, Malta, Morocco, Montenegro, Portugal, Slovenia, Spain, Tunisia and Turkey. All member regulators of MedReg are also regulators of countries that are part of the Energy Community.

2007, MedReg was legally registered under Italian Law. Hence, the time between network emergence and consolidation was remarkably short. Soon after legal registration, regulators addressed the European Commission for support in ensuring the viability of the network. *"They were happy about it, because we had done all the work. We provided them with a ready-made framework for cooperation."* (interview 4). MedReg is, since then, supported by European Neighbourhood Policy funds[46].

MedReg's "Concept and Strategy Paper"[47] highlights the parallel between the Energy Community itself. It also stresses the possible involvement of Mediterranean countries into an energy cooperation relationship on the basis of market integration, but with a different approach: *"Considering the strategic energy challenges of the Mediterranean region, Mediterranean Energy Regulators consider as their duty* [my emphasis] *to constitute a strong institutional basis promoting a "bottom up" approach (…) to guarantee greater harmonization of the energy markets and legislations and to seek progressive market integration in the Euro-Mediterranean region"*.

[46] It is useful in this regard to re-use a quotation from an interview that I used in chapter 3 when discussing the growth of the CEER, for it aptly frames the context of MedReg establishment and the regulators' success in securing funds from the European Commission: *"Let's put it this way, if my goal would be to… implement or to achieve very nationalistic, specific solutions, probably it would not be successful to do it at EU level. But if the goal is to develop solutions that make sense in a general economic way in a European perspective then you're much better off to try to push that at EU level".* (interview 25)

[47] MeReg Concept and Strategy Paper http://www.europarl.europa.eu/meetdocs/2004_2009/documents/dv/200/200903/20090316Medreg_concept_EN.pdf (last accessed 12 August 2017)

Replicating the CEER experience.

MedReg would probably not exist, had it not been for the initiative of the regulators. The regulators would probably not have taken the initiative, had it not been for their experience of cooperation within CEER, which they considered successful because it allowed them to feed into European energy policy-making.

> *"The CEER was a bottom-up association born to preserve the regulators' autonomy from the Commission, as well… MedReg was created on the same basis, well actually all institutions that have been created in the area are kind of replicating things that "worked" in the EU. Of course, this does not mean they would immediately "work" in the Euro-Med. The CEER helped the European harmonization process immensely. With time, it showed its obvious limits and therefore it has been necessary to create the Agency. But for many many years it has been a crucial forum for discussion (…) So MedReg could be considered as mirroring the CEER but the thing is that they have representativeness problems; even on very technical topics of regulation you immediately encounter institutional and geopolitical obstacles"* (interview 5).

> *"Yes, absolutely, the MedReg was set up like a photocopy of the CEER. There are two main differences. One is that regulators have less incentives to cooperate within the MedReg, because the MedReg has less impact on what happens at national level. The CEER has always been voluntary but what they say counts, both for the European energy policy and at domestic level. The second difference is the Secretariat. The MedReg Secretariat would need more resources in order to coordinate the working groups more effectively. It being financed by the European Commission, there is not much scope concerning how to allocate resources differently. The CEER was always self-financed so the regulators organized it as they saw fit"* (interview 14).

> *"Well, you know, the founding members of the MedReg all had the CEER experience in their background, as well as the Florence School, so they were used to starting and carrying forward this type of conversations, of cooperation"* (interview 10).

The mechanism leading from CEER to MedReg is similar to the one leading from NARUC to ERRA: in both cases, a previous successful experience of regulatory cooperation inspired its replication in a different context. However, there are profound differences between the two cases. The establishment of MedReg did not derive from a coordinated European foreign policy strategy, but from the initiative of national regulatory institutions. These institutions purposefully chose the informal, networked approach not only because it was the one they knew best, but also because it allowed them to bypass the rigidities of the system of governance of the EU. As mentioned above, Sarkozy's initiative to launch a French-led Union for the Mediterranean was immediately blocked by the Commission and transformed into a European policy. According to testimony from interviews conducted for this thesis, however, the energy policy preferences of the various Member States are too different; some of them are simply not interested in the Euro-Mediterranean region (interview 4, 5, 6). Moreover, Commission-led policy programmes are premised on, once again, compliance with EU legislation. Informal networks, instead, can gather as many or as few European regulators as needed.

> *"I think it is important to cooperate voluntarily, because if you impose legislation top-down it has to be able to bring about solutions. Otherwise it becomes an obstacle to cooperation, rather than an enabling factor. This is the fundamental difference; the origins of the CEER were the opposite* [of the Energy Community]*. There, you had new institutions that were faced with a radically new context and decided to cooperate on concrete things. MedReg was inspired by the same logic. I mean, there have been initiatives in the Euro-Med where you had agreements signed by governments and yet they were*

never implemented. So the idea was let's do it starting from the institutions that are directly involved in these processes, let's see if we can work… and it was immediately successful because everyone needs to understand how things work in order to make progress. The Mediterranean is a natural market, you are basically condemned, and I say this in a very positive sense, condemned to work together" (interview 5).

The words in the previous quotation confirm the relevance of CEER in inspiring the establishment of MedReg while also hinting at the main difference between the two networks. MedReg was an attempt to replicate the process of influential transnational regulatory cooperation that unfolded in CEER in absence, however, of sweeping policy change. To the contrary, the rationale for creating MedReg was the frustration with the protracted standstill in energy cooperation in the Euro-Mediterranean. More precisely, regulators appear to have conceived of MedReg as an initiative that would be able to bypass the political deadlocks in the Euro-Mediterranean cooperation by focusing on concrete, win-win, solutions. After MedReg was established, regulators pushed for the creation of electricity and gas system operators, on the model of the European ones (called ENTSO-E and ENTSO-G). From their point of view, no political institution was needed in order for regulators to identify barriers to integration and agree on solutions to lift them.

"We did MedTso and [have proposed] *MedTso for Gas, they were born in kind of the same way, so you have the symmetry with the CEER, the ENTSO-E and the ENTSO-G and you really don't need anything else"* (interview 4).

In other words, the establishment of MedReg was based on the conviction that cooperation between technical experts (regulators and operators) could suffice to deliver investment in energy infrastructure and eventually markets and market integration. This conviction seems to have been based on the assuredness that this was what had happened in the case of CEER: the obvious benefits of market

integration had overcome domestic reluctance to energy sector reform as precursor to an integrated European energy market.

As chapter 3 shows, however, the desirability of energy market integration and the capability of CEER to propose concrete regulatory solutions to achieve it were only part of the story. The other part concerns specific political circumstances: most importantly, the opening of a window of opportunity caused by the enormous uncertainty surrounding energy sector reform across European Member States, and the parallel formation of a European energy policy framework that entwined the European Commission and the CEER into a symbiotic dependence on one another. The latter provided information and an impartial, technical input into the policy process while the former backed the regulators' cooperation politically. Moreover, the Commission and other European institutions (particularly the European Parliament) supported regulators and could muster the authority to pressure all different Member States into compliance with the legislation. In a completely different setting, USAID could exert its clout over the countries of Central and Eastern Europe that received its aid. The creation of these partnership relations with actors, external to the domestic political setting of individual regulatory authorities, was in itself a necessary condition for network influence.

If European MedReg members appear overly optimistic on the potential of regulatory network cooperation to impact on policy outcomes, the members of MedReg from the Southern neighbourhood appear more aware of the limits of the network's impact on domestic contexts in absence of political commitment to reform. The quotation below presents a different perspective on the rationale and the usefulness of MedReg, that conceives of network cooperation as laying suitable ground for reform, so that when reform occurs, no time shall be wasted on working out the details of regulatory framework implementation.

> *"Strategic decision is not being taken by regulators, it's taken by government, we have a challenge for example in the X project, which is a market for energy,*

it's quite clear that this poses of lot of blocks because the relations between Y and Z countries are not that smooth. MedReg played a role in this project first in providing capacity building, secondly, we decided to resolve technical challenges, so whenever there is a political opening in the process, it will not be halted because there is a lack of technical knowledge. (…) Waiting for a political decision and then start working from that time will take much longer, so MedReg in capacity building, in converging ideas, in making people in the same way of thinking, all of this is very much important" (interview 21).

The limits and the potential of MedReg for Euro-Mediterranean energy cooperation.

The establishment of the Energy Community of South East Europe was perceived as an outstanding policy success of the European Union in exporting its energy governance framework (Lavenex and Schimmelfennig 2009). In the wake of that experience, there was momentum for the idea of a pan-European Energy Community encompassing the whole of the so-called European neighbourhood. Seizing the momentum first, a small group of energy regulatory authorities took a bold policy initiative and set up an informal network gathering regulators from countries as close to the borders of the EU geographically as they are distant from its market model politically.

MedReg is an ambitious attempt to have informal regulatory coordination succeed where many other formal policy frameworks have failed: building infrastructure around the EU borders (the so-called "energy corridors", see Ahner and Glachant (2014) as well as Escribano (2010), Escribano (2011), Abbasov (2014)) that would achieve many important objectives at once: increase its security of supply by diversifying its supply, represent new markets for its energy companies, greening its energy production and consumption and eventually lowering its energy prices.

The experience of CEER had shown the remarkable influence that informal transnational regulatory cooperation could have on regulatory policy and even on EU legislation as such; regulators wished to replicate that experience in the context of the Euro-Mediterranean energy cooperation. The experience of ERRA had shown that hands-on cooperation between regulators from advanced and emerging markets could not only quickly familiarize the latter with the principles of energy markets but also transform them into "agents of change" in their domestic setting.

Therefore, EU regulators saw the establishment of a network of regulators as a "first-best" strategy to foster energy market integration, rather than a second-best option to obviate to the lack of willingness of Southern neighbours to comply with the EU regulatory framework. Interviewees explicitly argued that informal networked cooperation would be more effective than top-down imposition of uniform rules on wildly different economies. Three cited ERRA as an example the initiative to set up MedReg was inspired to. One added that, however, MedReg is much more ambitious in that its aim is to contribute to the realization of market integration across the shores of the Mediterranean, not just transforming into a training providing organization (interview 3).

Yet, the MedReg thus far does not appear to be able to exert a real impact on regulatory policy concerning the region (Cambini and Franzi 2013). Several interviewees from within and without the MedReg have expressed scepticism concerning its ability to influence policy in the near future. They have argued that differences between the two shores of the Mediterranean are still too significant.

> *"For now, the MedReg is diffusing knowledge, best practices, you know. It does not have any influence on legislation, however, not even an advisory function. It's not like MedReg makes proposals that are then discussed… It is succeeding in providing capacity building, in creating a shared body of knowledge also by sharing the progress made in the various countries on*

different topics, for instance, Italy and Spain can share their experience with renewables etc." (interview 5).

Indeed, the evolutionary trajectory of MedReg differs from that of the networks previously examined. Virtually no time has elapsed from the beginning of dialogue to semi-formalization. In the other three cases, regulators transformed the accumulated output of their cooperation into training courses and repository material for future staff at their regulatory authorities; this does not seem to be the case for MedReg. Most importantly, the sort of radical policy overhaul that characterized the cases previously considered seems missing. Therefore, most national regulatory authorities in the Southern neighbourhood (as shown by the missing links and nodes in chapter 5) appear mostly confined to their national boundaries. There is no interdependence motivating continuous and growing interaction.

Although falling short of the ambitious goals its founders had set for it, MedReg has managed, in the past ten years, to positively affect its members via the socialization mechanisms that many contributors (Ikenberry and Kupchan 1990, Sabatier 1991, Checkel 2005, Beecher 2012, Bianculli 2013, Bianculli, Jordana et al. 2015, Freyburg 2015) and this thesis have recognized to policy networks generally and to regulatory networks in particular:

"MedReg has enabled a regional vision (…). Cooperating between regulators without any kind of commitment from the government is very important to create mutual understanding. (…) Second, it created what we can call a MedReg community, we know each other now, we are an association (…) I just pick the telephone, I call somebody, I know them in person, ask what you do, I get normally an appropriate response because they also understand they respond to a person who knows them and expects them to respond, so this has created a kind of cooperation even on a bilateral… which was very much important for exchanging experience. Third one is exchanging experience,

which is basically either from success story or failed story, both are of the same value. Fourth one is capacity building programmes (…). The fifth one which is very much important is working jointly in the working groups, actually they represent a forum, or a think tank for regulators to stick together, to come up, actually we don't have any agenda imposed on us by somebody else, we created our agenda and work plan, this has helped in developing the knowledge of each other, through developing these reports, and I believe the reports MedReg is producing are high quality and address many of the problems in a way that makes them clearly understood" (interview 21).

However, certain circumstances must be present for informal transnational networks of energy regulators to actually affect transnational policy formulation: the presence of common goals, sufficient uncertainty to open opportunity structures, network entrepreneurs willing and able to shape and implement the network's agenda, and partnership with a supra-national source of political authority. These conditions were, and still are lacking in the case of MedReg. The Parliamentary Assembly of the Mediterranean (PAM)[48] could be a suitable interlocutor, but lacks the necessary cohesion and legitimacy (interview 3, 4).

At any rate, the case of MedReg has broader implications for our understanding of the dynamics that play out in the external dimension of European governance and the role of individual policy entrepreneurs navigating them. The existing literature on these topics is, once again, overwhelmingly focused on the European Commission's initiatives and stances. The Commission is described as overly prescriptive and rigid in its approach to the countries surrounding the current borders of the EU (Bicchi 2006) and overall unable to deal with countries whose will to comply with the European legislative and regulatory framework cannot be shaped by membership conditionality (Schimmelfennig 2012). Responses to these statements, which may include consideration of the kind of institution the European Commission is and the

[48] PAM website http://www.pam.int/?m=news&id=575 (last accessed 15 August 2017)

well-defined limits to its discretion in devising tailored policy solutions to its diverse neighbourhood, are beyond the scope of this chapter.

The chapter showed that informal networks can be conceived as “first-best” solution to thorny political and economic issues. However incomplete in terms of necessary conditions for success, the regulators’ perception that informal cooperation can succeed in influencing regulatory policy in order for market integration and trade to take place was based on the reality of their lived experience and in observation of developments in other areas of the world. This fact alone testifies to the appropriateness of investigating transnational expert cooperation using methods that stem from acknowledgement of interdependencies between policy decisions and outcomes.

Finally, the cases of CEER and MedReg embed a common call for the study of policy entrepreneurship in the EU as resulting from the ability of individual actors, be they placed at national level or in any of the *loci* of policy pressure, to further their policy goals by dovetailing them to the policy priorities of the EU.

Part III. Conclusion: networks from networks.

Recent contributions (e.g. Slaughter, 2017) strongly advocated for more reliance on social networks in the context of foreign policy. The bulk of the literature on transnational regulatory networks concerns regulators from economically advanced countries. In this literature, the issue of network establishment is usually tackled in either functional or intergovernmental terms, depending on whether emphasis is placed on the advantages of coordination or on the incentives that powerful countries have to set global standards close to their own. A smaller set of contributions focuses on networks of regulators from developing countries; these contributions are usually descriptive and rarely emphasise network establishment. Some mention, in passing, the support of international organisations or financial institutions. To my best knowledge, the literature does not, as yet, feature contributions highlighting and investigating the link between regulatory networks and foreign policy.

The narratives developed in the foregoing chapters provide some insight concerning how concretely network fit foreign policy agendas. The chapters show that, in both cases, informal regulatory networks were relied upon to foster experts' collaboration in creating the conditions for policy change to occur. In the first chapter, I retrace the process of establishment of the network of energy regulators of Central and Eastern Europe, which emerged in 1998 and has, since then, benefited from the unwavering support of the US Agency for International Development (USAID) and NARUC. In the second chapter, I retrace the processes leading to the establishment of the network of Euro-Mediterranean energy regulators; a unique case of strong institutional entrepreneurship of European national regulators to establish and consolidate expert collaboration with energy regulators in the European neighbourhood.

The reconstruction of their respective histories shows that the establishment of regulatory networks, particularly in emerging markets, may not just follow policy change, but rather accompany or underpin it. Moreover, the chapters show that the emergence of ERRA and MedReg should not be understood exclusively as the consequence of international institutions' coercive pressures, with little or no agency on the part of regulators. To the contrary, in both settings, regulators took an active stance in advocating for support to their collaborative activities from international institutions. The interview data informing both chapters juxtaposes the regulatory and the donor perspective, and demonstrates the co-ownership of the process of network establishment. Hence, in these two cases, network formation involved a dialogic process between donors and recipients.

Seizing the window of opportunity created by the European enlargement, Southern European pre-emptied the European Commission's typically institutionalized approach to external governance by espousing and promoting the concept of bottom up cooperation and the benefit of peer-to-peer interaction. Thereafter, leveraging the access that, arguably, a decade of within-CEER collaboration had afforded them to the European Commission, they were able to brand their initiative as promoting the goals of the European external governance and obtain funding for it. Twelve years later, MedReg is at its fourth funding renewal and expanding both its staff and the scope of its initiatives.

As one MedReg regulator (from the Southern neighbourhood) put it, MedReg is a success story in terms of promoting the benefits of regulation *per se* in emerging markets:

> *"Spreading regulatory culture is very important but most important is to prove that regulators can bring added value to the system because many countries feel like, we have electricity, we are a running system, we don't have a shortage, why do we need a regulator? It's important to prove from a kind of success story that this is very much important, there is a conflict of interest in*

the system if the supplier is a planner, if the supplier is a decision-maker, if the supplier sets the tariffs, or the government sets the tariffs. This is a kind of a culture which needs to be proved so as we build a success story I believe this would be a good export to others" (interview 21).

The initial aim of ERRA was socializing regulators with each other and with the principles of the market economy, in preparation for their transition to liberal democracy and their entrance into the European Union. Once European accession occurred, ERRA lost its initial function and had to reinvent itself in order to maintain its viability. ERRA operated a strategy of conversion, whereby it substituted its previous main rationale with a new one. In contrast, MedReg has not yet reached the point when its initial goal (promoting infrastructure investments and regulatory alignment in order to foster energy markets integration across the shores of the Mediterranean Sea) is exhausted. While the existing distance between the EU and its neighbours' institutions and market models is still very wide, the long road ahead may also imply that MedReg will be needed for the years to come.

8. Conclusions

The findings and strengths of this research.

Since the early 2000s, the literature on transnational regulatory networks has literally boomed. Numerous contributions on regulatory networks in the European Union and elsewhere have debated the rationale of their establishment, their composition, their stated aims, and their functioning. The literature has rarely, if ever, empirically investigated the evolution of regulatory networks over time, thereby portraying a static image of regulatory cooperation. Importantly, existing literature has overwhelmingly focused on the formal attributes of networks: statutes, meetings, work plans, membership lists etc., overlooking the informal dimension of regulatory networking which, arguably, underlies and sustain their very existence. Further, existing literature looks at networks from the outside. It rarely examines the inner workings of regulatory networked collaboration, the drivers of the choices that regulators make concerning how to use their informal ties to each other. This research has addressed these important gaps in the literature on regulatory networks by examining four empirical cases of transnational (or trans-jurisdictional) networks of energy regulators (in the USA, in the EU, in Central and Eastern Europe and in the Euro-Mediterranean area) in comparative perspective.

In other words, existing literature has overlooked a great extent of the policy and the politics of regulatory networking. In addition, many empirical puzzles concerning networks have, to the best of my knowledge, never been addressed. For instance, if the impact of networks on regulatory convergence and/or global governance is scarcely discernible, as extant literature concluded, why do they still exist and keep being established around the world? The literature agrees that networks are instruments for the exchange of information and experiences and experiences, but rarely endeavoured to study how exactly this exchange takes place, which incentives

drive regulators to choose their closest network partners and how concretely do regulators benefit from networks. Moreover, the literature seems to implicitly assume that regulatory networks remain confined to the jurisdiction of their members (like organisations do). This research shows this assumption to be incorrect, thereby opening a promisingly wide avenue for future research on the export of regulatory networks to other jurisdictions and the underlying rationale. In point of fact, this research uncovers the role played by informal networks in linking very distant (geographically and politically) areas of the world virtually seamlessly.

This thesis tackles these open questions by means of a research design that focused on four inter-related stories of regulatory network establishment and evolution, as well as quantitative network analysis of regulators' interactions within networks and their motives. I situated the four networks analysed in this thesis in their institutional environment and underlined the opportunities and constraints it posed to them at different moments, as well as the incentives motivating their interaction as they co-evolve (Trein 2017) with their external environment and with the priorities of their main institutional interlocutors.

The preceding six empirical chapters are divided in three parts. In part 1, I investigate the spontaneous emergence of regulatory networking, its consolidation and its persistence over time. In part 2, I investigate how regulators choose their closest network interlocutors; I find that similarity in the political economy, expertise and resources drive network ties. In part 3, I investigate how networks foster the establishment of other networks, as part of their political principals' foreign policy agendas, in order to re-invent themselves or as a result of institutional entrepreneurship. The narratives of the four networks I examine inter-relate over time; they are all interconnected and, arguably, none would have existed as it is without the others.

In part 1, I carry out a comparative historical analysis of the emergence, consolidation and evolution of spontaneous regulatory networking in the empirical cases of the

National Association of Regulatory Utility Commissioners (NARUC) of the USA and of the Council of European Energy Regulators (CEER) of the EU. The former gathers the 50 Public Utility Commissions (PUCs) of the USA; the latter, the 29 National Regulatory Authorities (NRAs) of the EU. I rely on inductive reasoning to identify the conditions for spontaneous regulatory cooperation to emerge, to consolidate into a semi-formal networked organization (this is the point of departure of existing literature), and to evolve as their initial rationale declines in importance. The historical narrative shows that networks emerge as regulatory authorities do. In both the USA and the EU, the establishment of regulatory authorities at national/state level represented a radical overhaul of the governance of the energy sector. Appointed regulators have to contend with many conflicting interests and learn the ropes of a completely new profession. Being uniquely responsible for the regulation of the sector in their territorial jurisdiction, they have no counterparts and no precedent to refer to. Hence, they start reaching out to one another to compare and contrast the challenges they face and the possible solutions. At this stage, regulatory networking has no structure; regulators keep in contact occasionally.

The nature of the ties linking regulators changes and becomes more politically consequential as regulators face the prospect of losing their powers or of seeing the scope of their authority greatly restricted. The fact of facing a common threat cements their collaboration into an institutional structure with a name, headquarters, a budget, working groups and a work plan; in other words, with the intention of lasting. As federal agencies were established in the nascent American Regulatory State, they faced the same informational gap as their state level counterparts a few decades earlier: a new profession, consequential tasks, and very little information or guidance on how to carry them out. Hence, they sought the collaboration of their state level counterparts and used part of their federal funds to provide for a structured dialogue with them in the form of an association (NARUC) headquartered in Washington DC, close to federal agencies offices. Hence, federal agencies provided the seed funding for NARUC. As time went by, however, legislation

increasingly empowered federal agencies, effectively establishing their primacy over state regulation. As a consequence, state level regulators witnessed the federal agencies' progressive empowerment at the expense of their own control over utilities within the boundaries of their state. As it became evident that the tension between state and federal level regulatory agencies would become a trait of American regulatory federalism, the foundations for NARUC to last as PUCs' collective representation towards federal regulators and government were laid.

At first sight, European regulators had no supra-national contenders to their authority, as Member States always opposed the creation of supranational Euro-regulators. For European regulators, the main threat to their autonomy and authority was their national governments. As the UK infrastructure sector reforms introduced private capital and competition into the, thus far, monopolistic energy sector, they set the example for several other European Member States and, most importantly, for the European Commission. As European legislation mandated the liberal market model in the energy sector across all of the EU, Member States had to create independent regulatory institutions. A century later than their US counterparts, European regulators were tasked with immensely consequential market reforms, for which they had to design the rules. They started reaching out to each other, and meeting occasionally and informally in various European capitals.

As the market reforms envisaged by European legislation triggered societal and business backlash, governments across Member States sought to intervene in regulatory decisions and to restrict the scope of the regulatory powers they had delegated. As it became evident that the tension between government interference and regulatory autonomous decision-making would remain a trait of the European system of multi-level governance, European regulators decided to consolidate their informal network ties into an institutional structure with a name, headquarters in Brussels, i.e. close to the EU decision-making, budgetary contributions, etc. Transforming their collaborative ties into the CEER provided them with a solid

platform of resistance to government's intervention and of influence into the European policy process. Differently from their US counterparts, European regulators self-financed their networked collaboration from the very start. The CEER has always been a completely independent network.

Hence, whereas the emergence of a higher layer of authority constrained US PUCs' powers, as those were subject to the federal agencies', it partially freed European regulators from government interference. In both cases, however, the glue of regulatory networking for their joint pursuit of control, and authority. The quest for preserving, if not expanding, the scope of their authority was the benefit that outweighed the costs of cooperation and the partial sharing of authority that is implied in regulatory collaboration and coordination (Macey 2003). This is the first key empirical finding of this thesis and, arguably, one of its main theoretical contributions.

If control was the ideational rationale underlying the consolidation of occasional ties into a semi-formal organisational arrangement with a name, a budget, and headquarters close to the centre of policy and power in their respective jurisdiction, information and expertise are the assets that regulators aimed at maximizing via their collaboration. In chapters 4 and 5 I analyse the structure of the CEER network as a typical case of regulatory network with a long history of intense cooperation and, therefore, one single component and no isolated members. Via the network structure of their collaborative ties, regulators can reach any of their peers in a small number of steps. However, regulators are unlikely to be regularly in contact with all of their counterparts in their network. More plausibly, individual regulators will maintain regular, frequent bilateral ties with a subset of their peers. The motivations driving the choice of that subset are the dependent variables of the quantitative network analysis carried out in chapters 4 and 5. A model of the determinants of network structure showed that regulators choose partners who oversee similarly structured markets as theirs, as those are the peers who are most likely to have come

across similar challenges as theirs. However, all tend to pursue regular relationships with regulators overseeing more advanced markets, as they are likely to have accumulated more expertise as concerns designing functioning energy markets. In chapter 5, I investigate the link between resources and network activism (already emerged in chapter 4) in detail. The findings are that network activism is determined by scarce resources, and indicates that regulators use informal ties to compensate for their lacking resources. Staff numbers are more relevant than budgets. Moreover, the relationship between resources and activism appears to follow a quadratic, rather than linear, trend: active regulators are those with intermediate to small resources, while regulators with large or very small resources are not significantly different. This shows rationality in the usage of networks and points to the categories of regulators for which it may be most useful; for very resource-constrained regulators, informal networking becomes prohibitively costly.

Ultimately, both chapters concur in showing that the literature's emphasis on global governance when discussing the worth of regulatory networks is not misplaced, but it is seriously incomplete. Regulators possess statutory powers over a specific territorial jurisdiction; they have no official powers beyond it. Hence, they use their networks to improve their regulatory practice in their own jurisdiction, alongside attempting to coordinate to achieve more regulatory convergence across jurisdictions. This is the second key empirical finding and theoretical contribution of this thesis. Regulators need information in order to produce quality regulation. Quality regulation is the only asset they hold and can wield to protect their authority. In order to regulate effectively and to build their credibility and legitimacy, regulators need resources. Wherever they lack sufficient resources to carry out their tasks, they resort to their network to compensate.

The third and final part of the thesis tackles the issue of network export: namely, the conscious decision to export networks (their formal and informal structures) from economically advanced jurisdictions to emerging markets jurisdictions. I tackle this

issue in chapters 6 and 7, by reconstructing the emergence of two networks, which can be considered the progeny of, respectively, the NARUC and the CEER: the Energy Regional Regulatory Association (ERRA) and the Association of Mediterranean Energy Regulators (MedReg). The US government, through its development agency, stood behind the establishment of ERRA and supported it for its first ten years of existence. In turn, the European Commission stands behind the existence of the MedReg, and has been supporting it since its establishment 11 years ago. The primary aim of these chapters is, therefore, to inductively identify the reasons why the US government and the European Commission financed the establishment of regulatory networks modelled on their own in other parts of the globe, and why they supported them for a very long time. In other words, the aim of these chapters is discovering why informal regulatory networks have been deemed capable of entrenching policy change.

As the analysis unfolded, however, two very important additional themes emerged from the data. The first one, emerged in chapter 6 (dedicated to ERRA), is the theme of network survival and, specifically, of network evolution over time as a survival strategy. As the main rationale of network existence declines in political salience, network managers and members seek to re-invent their network to prevent its decay. In the case of NARUC, the unexpected opportunity to contribute in the effort of facilitating the transition of Central and Eastern European countries to the market economy represented a layering strategy, adding to the baseline functions of NARUC an international prong, which quickly rose to being its main source of income. The other one, emerged in chapter 7 (dedicated to MedReg), is the theme of institutional – or, in this case, network – entrepreneurship. In this case, I define network entrepreneurship as the decision, on the part of an individual regulator or a small set of individual regulators, to further regulatory coordination purposes by autonomously initiating informal networks, thereby pre-empting political principals from pursuing those same objectives through top-down initiatives, such as setting up of formal organizations. In other words, network entrepreneurs anticipate formal

institutional action by their political principals and decide to short-circuit them by initiating informal networks. In addition, they manage to present their initiative as legitimate and proactive and to successfully advocate for financial support of their efforts.

Chapter 6 narrates of how NARUC became the face of energy regulation worldwide. In the aftermath of the collapse of the Soviet Union, the USAID undertook an institution building programme in Central and Eastern Europe, with the ultimate aim to plant the seeds of the liberal market economy and foster the accession of Eastern European countries to the EU. Regulatory institutions for the energy markets-to-be were created in the first recipient countries with the aid of external consultants. Soon, the mechanisms identified in chapters 2 and 3 started operating: newly established regulators in Central and Eastern Europe realized the magnitude of their task and started informally reaching out to each other to compare their experiences and challenges. The USAID staff monitoring the process proactively decided to foster that spontaneous collaborative incentive; they contracted NARUC to provide their expert support to the emerging regulatory cooperation. NARUC accepted the task: by working with USAID in Eastern Europe, it gained a new, politically crucial role; moreover, its members obtained the possibility to travel internationally and diffusing the principles of long-standing American regulators to the formerly communist world. Collaboration within ERRA quickly gained pace and regulators grew more secure in their role and in their decision-making authority. As regulators on both sides of the European continent (the liberal and the communist) matured, the European big eastward enlargement of 2004 brought seven ERRA members into the CEER. The task underpinning the creation of ERRA was accomplished.

Two events in the early 2000s created huge political momentum for what was named the “external governance” dimension of the European Union. On the one hand, the 2004 eastward enlargement convinced many of the ability of the EU to export prosperity; on the other hand, the 2005 signature of the Energy Community Treaty

represented a first step towards the future accession of the countries of ex-Yugoslavia, then renamed as South East Europe, which were deemed unfit to enter the EU in 2004. The Treaty mandated the integration of the energy markets of South East Europe with the EU's through a highly formalized set of rules and institutional structures. According to European regulators (primarily, the Italian, French and Spanish), the establishment of the Energy Community as an international legal treaty had put a straightjacket on regulatory cooperation by stifling regulators' initiative and tying their collaboration to Ministerial decision-making.

Hence, they decided to prevent the extension of the "Energy Community formula" to the other side of the European neighbourhood: the Southern neighbourhood, comprising countries from the Middle East and North Africa (MENA). By exploiting their existing informal contacts with regulators in the area and their own experience of collaborative governance within the CEER, European regulators joined forces with their MENA counterparts and created MedReg in a very short time. Contrarily to the literature on European integration, which saw networks as "second-best" instruments of convergence (Dehousse 1997), European regulators proclaimed networks as a "first-best" option for framing transnational regulatory collaboration, offering regulators freedom from political interference, confidentiality and open discussion. However, this chapter also confirms the findings of chapters 2 and 3, as well as chapter 6, as concerns the importance of uncertainty and windows of opportunity for regulators to leverage their network to influence policy, by showing their absence in the case of MedReg.

This thesis shows that informal regulatory networks are levers. Regulators use networks as levers that raise their domestic legitimacy and help them fend off attacks to their authority; they shape their networks according to the information and the resources they need most; they leverage their networks to continue networking and retaining a precious, cost-effective, resilient instrument of regulatory governance. Collectively, the findings of this research show that networks are neither rationally

designed by policy-makers, nor do they functionally descend from specific policy targets, as most of the literature maintains. There is no external "mastermind" to the inception of cooperation: rather, regulatory networks are the outcome of a very spontaneous aggregation process driven by the regulators' quest for information, resources, and control.

This research also makes a statement concerning the research approach. The questions guiding the research (What explains network emergence? Why do networks last? How can they influence policy? What is the agency of regulators within networks?) need to be answered by relying on a combination of methods. Comparative historical analysis helps identifying the critical junctures setting in motion emergent processes of network formation and appreciating the evolutionary trajectory of networks, pointing to the lasting importance of sequencing and feedback effects for determining which options of network evolution are available at any given time. Understanding regulatory networks as interdependent sets of relationships, rather than as independent observations resulting from political or administrative functional calculation, allows the identification of the interdependencies linking regulators and networks across time and space; quantitative network analysis allows explaining network structure parsimoniously.

The limits of this research.

There are many issues in the literature on networks that lie outside the scope of this thesis. I did not investigate policy outcomes that are conducible to network influence either at supranational (federal) or at national (state) level. Two main mechanisms of interaction across levels of governance emerged from the analysis: the mechanism whereby the coordination within networks and the resulting policy recommendations or positions influence supra-national (federal) policy, which is also the most studied in the literature; and the mechanism whereby information

gathered from the network affects the regulators' ability to achieve policy outcomes at home. Such a focus would undoubtedly enrich the existing conspicuous literature on policy diffusion across networks (Mintrom and Vergari 1998, Cao 2009, Cao 2010, Cho 2013, Desmarais, Harden et al. 2015, Boehmke, Rury et al. 2016). There are two reasons why I did not engage in analysis of these two immensely important mechanisms of network impact on policy: my main interest lied in identifying the reasons why regulators network, the benefits they obtain from networks that they could not achieve otherwise; setting out to ascertaining the impact of networking on policy requires detailed data, a completely different research design, and, in short, another PhD thesis.

A second limitation of this research is its focus: it is very regulator-centric. I do not investigate how and why regulators network (individually or collectively) with other stakeholders. Nor do I research interactions between regulators' and stakeholders' networks, which is another important, but under-investigated topic (Kalaitzake 2017) that cropped up in several of my interviews. A number of interviewees reported that regulators network in response to industry networks. As a matter of fact, the establishment of networks of regulators always follows the establishment business or industry networks: business organises earlier, faster, and in a more concerted way from the start, given their common goal of ensuring their own profit. This political economic angle on regulatory networking ties in with extant literature on the importance of business' advocacy for market integration in the EU (Mattli 1999) and integrates my explanation of regulatory networking on the basis of regulators' self-interests well. Once again, however, this important topic would need to be addressed on its own and would require a dedicated data gathering process and research design, or, in other words, a separate PhD thesis. The topic of stakeholders' networks links with the recent emphasis placed on epistemic capture (Sebenius 1992, Dunlop 2009) and the growing interest in the frames through which regulatory policy is made. Epistemic capture means that, by interacting with regulated interests,

regulators increasingly see the sector and the policy issues through the frames of the regulatees (Sunstein 2014).

Finally, a third important topic that is missing from this research is the topic of accountability. Slaughter (2000a) affirms that regulators' accountability duties at national level suffice to lessen the problem of the opacity of network collaboration. Helleiner and Porter (2010) and Papadopoulos (2007), however, would disagree and propose various mechanisms of control by democratic institutions over the design, the composition and the output of these networks. This research shows that regulators cherish the confidentiality and privacy of their network communication above all. This is perhaps particularly the case for European regulators; the only ones, of the cases examined in this thesis, to have self-financed their cooperative activities from the start with the explicit aim of preserving their independence. Placing network under political control may weaken the mechanisms of productive network collaboration, while not necessarily submitting networks to public scrutiny; this is what prompted Southern European regulators to establish MedReg: avoiding the straightjacket of formalized cooperation overseen by politicians. These are normative issues of extreme importance, which deserve separate consideration and could not find space in the context of this research.

General implications of this research and future research agenda.

The implications of the findings of this research are wide-ranging, and concern both academic investigation and policy-making. From an academic point of view, the findings of the research testify to the necessity of taking a broader perspective when investigating networks of regulators. Functional explanations of network establishment and rationale only examine the surface of regulatory interactions. Focusing attention on the incentives and interests of political principals with regard

to networks only tells a part of the whole story, and not necessarily the bigger portion.

Regulators network for information, resources, and control. Once created, regulatory institutions can be expected to strive to remain by re-inventing the purposes of their cooperation as needed. Regulators are homophilous in their tie choices, which implies that spontaneous interaction may lead to cliques and disconnected communities or isolated nodes. This fact encourages the creation of some form of structured cooperation in the form of agencies, as was the case in ACER, particularly if regulatory coordination has to be functional to the achievement of common goals. Moreover, the creation of agencies paralleling networks may assuage worries concerning network accountability, yet avoid the temptation of setting external constraints on informal networking, lest potentially hampering its advantages. Networks are structures where entrepreneurial regulators can thrive and potentially propose policy solutions to pressing policy problems. At the same time, the findings of this research point to the importance of time and repeated interaction for the emergence of mutual trust. Particularly in the context of emerging markets, withdrawing donor support too early may risk network disbandment. For the policy-maker intending to foster networks, it is important to understand the importance of nurturing but not piloting networks.

The ongoing technological overhaul in energy systems may provide the next big opportunity windows for networks of energy regulators to pool their resources and contribute to policy-making, in the economically advanced as well as the developing world. Indeed, the world of energy production, transportation and consumption is already experiencing the so-called “energy transition”. The shift away from fossil fuels will cause major reshuffles of winners and losers, and is already proving a polarizing factor politically, with governments dividing between “green” and “brown” and nurturing corresponding constituencies (Aklin and Urpelainen 2013).

The importance of regulation in this context is hardly ever mentioned in the relevant policy debates. This is surprising, given that the energy transition is already technically possible; one of the main reasons why it is not yet accomplished is the absence of regulatory frameworks able to take simultaneously into account technological novelty, the stranded costs of extant infrastructure, the framework for investments, the allocation of costs and benefits across multiple actors, and the myriad other issues that characterize the sector. Indeed, modes of governance are an important part of the relationship between technology and institutions (Künneke, Groenewegen et al. 2010). The pursuit of coherence between the two should be one of main objectives of infrastructure policy (Finger, Groenewegen et al. 2005).

The reason why regulatory networks are plausibly going to be crucial actors in the implementation of the energy transition is the uncertainty it entails. Making decisions under uncertainty is difficult and, as shown in this thesis, creates opportunity structures for shaping the emerging new regime. In this perspective, regulation is not just a set of rules designed exogenously and regulatory authorities are not just organizations tasked with enforcing them. Rather, regulation is an emergent property of a complex system (Vazquez and Hallack 2017). Regulatory networks also are. As regulators learn from the outcomes of the technology and from the outcomes of political decision-making, they adapt and they shape the regulatory environment (and therefore, the regulation) at the same time (Künneke 2008). The regulatory framework of the future will need to keep displaying the attributes of credibility, commitment, and sustainability in a radically changed technological landscape and an uncertain political environment (e.g. the recent withdrawal of the USA from the Paris Agreement).

Upcoming transformations such as electricity decentralization (where, in short, every consumer can be a “prosumer”, or a producer of electricity) and the integration of Information and Communication Technologies (ICT) and electricity grids are likely to multiply the scales at which regulation is needed from the very local to the European

(or regional) to the international. Decentralization is likely to expand the scale of regulatory monitoring by demanding much closer oversight of Distribution System Operators (grid operators in charge of low voltage electricity grids) than performed at present. In a decentralized future, the low voltage grid will be under a much higher stress than it currently is, given that the number of consumers who are also producers (i.e. people with sufficient installed solar power to be able to feed into the grid) is set to increase thousand-fold. Digitalisation will enable the full control of one's electrical consumption from remote – engendering significant privacy concerns. In other words, the world of energy regulation is set to change in ways, unpredictable at the outset. The accumulated network expertise of energy regulators may turn providential in managing the new set of relationships that are likely to arise across level of governance and dealing with uncertainty. The scope for interdependence is all but enlarging, as all infrastructure sectors have to respond to the challenges of climate change mitigation and, increasingly, start developing legal and economic frameworks for financing adaptation. Regulators at all levels are likely to stand to exploit the structural properties of networks (reachability, flexibility, interdependencies) as well as their relational properties (trust, routinized communication, rapid access to information) to face upcoming challenges and contribute to new policy.

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APPENDICES

Appendix 1 – Interviews informing Chapter 2 and 3

Interview number	*Currently or formerly involved?*	*Role*	*Topic of interview*
1	Current	Regulator	CEER
2	Current	Regulator	CEER
3	Former	Regulator	CEER
4	Former	Regulator	CEER
5	Current	Academic	CEER
6	Former	Consultant	CEER
7	Former	Regulator	CEER
8	Former	Executive	CEER
9	Former	Executive	CEER
10	Current	Executive	CEER
11	Current	Regulator	CEER
12	Former	Regulator	CEER
13	Current	Regulator	CEER
14	Former	Consultant	CEER
15	Current	Regulator	CEER
16	Former	Executive	NARUC
17	Current	Regulator	CEER
18	Current	Consultant	CEER
19	Former	Regulator	CEER
20	Current	Regulator	CEER
21	Current	Consultant	NARUC
22	Current	Regulator	CEER
23	Former	Regulator	NARUC
24	Current	Academic	CEER
25	Current	Regulator	NARUC
26	Current	Executive	NARUC

27	Current	Regulator	NARUC
28	Former	Executive	NARUC
29	Former	Regulator	CEER
30	Former	Regulator	CEER
31	Current	Executive	NARUC
32	Current	Regulator	CEER
33	Current	Executive	NARUC
34	Current	Academic	NARUC
35	Current	Regulator	NARUC
36	Current	Regulator	NARUC
37	Former	Executive	NARUC
38	Current	Regulator	CEER
39	Current	Academic	NARUC
40	Current	Executive	NARUC
41	Current	Executive	NARUC

Appendix 2 – Data used in Chapter 4 - Electricity sector structure in EU countries

Country	Electricity sector structure	Main companies operating in			
		Generation	**Transmission**	**Distribution**	**Retail**
Austria	The Republic of Austria owns 51% of Verbund's share capital. The federal province Lower Austria holds (through a holding company) 51% of the share capital of EVN. The main Austrian TSO is Austrian Power Grid AG owning 94% of the Austrian high voltage electricity grid. Verbund AG holds 100% of the shares in Austrian Power Grid AG. There are 14 DSOs and distribution areas in Austria. Wien Energie, Linz Strom, Salzburg Netz and Kelag are the main participants in this sector. Of the roughly 130 retailers, many operate only at local or regional level. The three largest suppliers are Verbund, EVN and Wien Energie.	Verbund; EVN	Verbund; EVN	Verbund; EVN; provinces	Verbund, EVN, Wien Energie
Belgium	Traditional suppliers, notably GDF Suez and its subsidiary Electrabel, continue to hold dominant positions for both generation and supply. Other key generating companies operating in Belgium include EDF and E.ON. In the supply sector, in addition to Electrabel, some of the large players include EDF, Eni and Lampiris. In Belgium, DSOs are mainly	Electrabel; EDF; E.ON	Elia	regional	Electrabel; EDF; ENI; Lampiris

	grouped together in organisations like ORES in Wallonia and Eandis in Flanders. For example, Eandis is comprised of seven Flemish electricity and gas distribution system operators, which are also its shareholders. Elia, the TSO, has a legal monopoly as Belgium's sole electricity TSO.				
Bulgaria	The 100% state-owned company, BEH is the parent company of most generating companies and owns the TSO. Electricity distribution companies were fully privatised in 2012. Thus EVN (Austria) and Energo-Pro (E.On now Czech ENergoPro) own 100% of the shares of the respective subsidiary companies and CEZ (Sofia and Western Bulgaria) owns over 90%. Captive customers and those who have not decided to change their supplier buy their electricity from NEK (if they are connected to a high voltage grid) or the distribution companies (if they are connected to a medium or low voltage grid).	BEH	BEH	Private: EVN (Austria); Energo-Pro (CEZ); CEZ	Private: EVN (Austria); Energo-Pro (CEZ); CEZ; NEK
Croatia	The state-owned holding company HEP d.d. is the owner of the infrastructure, which is managed by its subsidiaries (e.g. HEP-DSO, HEP Generation). The transmission grid is operated by the state-owned TSO HOPS. There are 28 companies active in the generation sector. The majority of these are privately owned. Their market share is dwarfed by	HEP	HOPS	HEP-DSO	HEP-Opskrba d.o.o. (part of the HEP group)

	the generation capacities of state-owned companies. There are 18 companies covering the supply business. Three of these companies are state-owned and hold the majority of the market share. The privately owned supply companies with the highest market share in 2014 were: GEN-I (approximately 6.07%), RWE Energy (former Energija 2 Sustavi with approximately 4.52%) and Proenergy (approximately 2.32%).				
Cyprus	The incumbent Electricity Authority of Cyprus (EAC) owns both the transmission and the distribution system. The TSO is legally but not functionally unbundled from EAC, since all its staff is seconded from EAC. The obligation of ownership unbundling of the TSO does not apply, since Cyprus has obtained a derogation from Article 9 of the 2009/72/EC Directive. The DSO is responsible for managing, operating and developing the network, safeguarding access to the distribution network and equal treatment for all users. EAC has unbundled the accounts of the DSO. No wholesale market is currently operating. EAC is the sole electricity supplier.	EAC	EAC	EAC	EAC

Czech republic	A large part of the generation, distribution and supply segments are integrated businesses owned by CEZ, a.s. and its subsidiaries (CEZ Group). CEPS is the sole owner and operator of the transmission grid, which is fully owned by the Czech state. The distribution system is predominantly owned and operated by: EZ Distribuce a.s., E.ON Distribuce a.s. and PREdistribuce a.s. (DSOs). The Czech Republic has retained a controlling shareholding of approximately 48% of each of the distribution companies. In 2014, the 3 largest Czech electricity suppliers were EZ Prodej s.r.o., E.ON Energie a.s and Praskö energetika a.s.	CEZ	CEZ	EZ Distribuce; E.ON Distribuce; PREdistribuce	CEZ; E.ON Energie
Denmark	Two companies, DONG and Vattenfall, share 70% of market's capacity. Both grids are managed by Energinet.dk, an independent public enterprise owned by the Danish State under the Ministry of Climate and Energy. DONG Energy covers a leading position holding a 21% of market shares, followed by Energiden (10% circa), Energi Fyn, SEAS-NVE and Natur-Energi. The largest DSO DONG Energy Distribution has more than a million customers which is more than 20 % of the Danish population while the smallest DSOs only have a couple of thousand customers.	DONG; Vattenfall	Energinet.dk	DONG Energy Distribution	DONG Energy

Estonia	In Estonia the TSO Elering AS and the main electricity producer and seller AS Eesti Energia along with its subsidiary, the distribution network operator Elektrilevi OU, belong 100% to the State. Electricity production in Estonia is dominated by the state-owned company, Eesti Energia. In 2011, its share of the wholesale electricity market was 90%, while its share of the retail market was 76%. Transmission was unbundled from production in 2010. The state-owned company, Elering, provides the transmission networking service, but also acts as the single transmission system operator. There are 38 distribution networks, the largest of which is owned by Eesti Energia, with 86% share of the distribution market.	Eesti Energia	Elering AS	Electrilevi OU	Eesti Energia
Finland	The electricity market is dominated by Fortum, whose market share in Finland's electricity market is close to 27 percent. Fortum Oyj is a publicly listed energy company, in which the state holds 50.8% of shares. Pohjolan Voima Oy (PVO) is the second biggest Finnish energy company. The Finnish transmission grid is owned by Fingrid, another state-owned company. Distribution companies are owned by municipalities or private companies. The DSOs with largest	Fortum; PVO	Fingrid	Fortum; Vattenfall; municipalities	Fortum

	market share are Fortum with a market share of 19 % and Vattenfall with a market share of 12 %.				
France	In November 2004, the two incumbent monopoly companies, Electricité de France (EDF) and Gaz de France (GDF), both of which were 100% state-owned, became limited companies with a board of directors. The next year, minority stakes in the two companies were sold to private investors. As of December 2014, the state retains an 84.5% stake in EDF, which dominates the sector - 90% of generation; 100% of RTE (the TSO); 100% of ERDF (DSO, 95% of the market); 91% of retail. The remaining 5% of the distribution network are managed by local authorities (collectivités territoriales), who also own the entire network.	EDF	RTE	ERDF	EDF

Germany	The German energy industry has traditionally been privately owned, though there are still a large number of small electricity and gas distribution companies that are either wholly or partially owned by municipalities. Despite reforms, the incumbent operators in the wholesale and retail markets have retained large market shares. E.ON and RWE have been among the dominant players in both the natural-gas and the electricity markets. EnBW (Baden-Wuttenberg), E.On, RWE, Vattenfall leading in generation, distribution and supply. There are four TSOs: Transnet (EnBW); Tennet (Holland govt); Amprion (Commerzbank, RWE); 50Hertz (Elia and IFM)	E.On, RWE, EnBW (Baden-Wuttenberg)	Transnet (EnBW); Tennet (Holland govt); Amprion (Commerzbank, RWE); 50Hertz (Elia and IFM)	E.On, RWE, EnBW (Baden-Wuttenberg); municipalities	E.On, RWE, EnBW (Baden-Wuttenberg)
Greece	The electricity sector remains dominated by the state-controlled Public Power Corporation (PPC) and its subsidiaries. The PPC's generation market share has declined from 98.6% in 2003 to 65% in 2013. The company continues to control almost all electricity supply on the non-interconnected islands. In the electricity transmission sector, the PPC owns all transmission lines and holds a 49% share of assets in the transmission system and wholesale market operator (HTSO) with the rest owned by the Greek state.	PPC	PPC	PPC	PPC

Hungary	The state-owned MVM is the biggest player in the market, controlling a considerable part of Hungary's generation capacity. MAVIR, a subsidiary of the state-owned MVM, owns and operates the transmission system. The distribution networks are owned and operated by six privately owned DSOs (ÛDSZ (100% E.ON); DÛDSZ (100% E.ON); TITSZ (100% E.ON); DÛMSZ (100% EDF); ÛMSZ (54.3% RWE; 25% EnBW; 12% MVM; 18.7% others(; ELM (55.3% RWE; 25% EnBW; 15.6% MVM; 4.1% others). Outside the universal service sector (DSOs), there currently are more than 50 licensed traders selling electricity to end users at market based prices.	MVM	MVM	ÛDSZ; DÛDSZ; TITSZ; DÛMSZ; ÛMSZ; ELM	ÛDSZ; DÛDSZ; TITSZ; DÛMSZ; ÛMSZ; ELM.
Ireland	State-owned companies dominate the electricity and natural-gas sectors. The Electricity Supply Board (ESB) holds two-thirds of generating capacity, though its share has been falling as new power producers have entered the market. It also owns the transmission system, the operation of which is the responsibility of another state-owned body, EirGrid, as well as the distribution network. Bord Gais Eireann (BGE) owns the gas transmission and distribution network, operating the transmission system through a subsidiary	ESB	EirGrid	BGE	BGE

	company. Retail competition has developed to only a relatively small degree.				
Italy	The major player in the electricity generation market is Enel. Enel is controlled by the Italian government. Edison, ENI and E.ON are also key market players. Enel Distribuzione is the main distribution network operator (DNO), with 86% of the distributed electricity volumes. Other DNOs, significant by market shares, are: A2A (3.9%), Acea Distribuzione (3.2%) and Aem Torino Distribuzione (1.4%). Enel is the primary supplier with about 37% of the overall sales of electricity. The other major suppliers by market share are: Edison group, with a market share of 8.2%, followed by Acea, with a share of 4.6%, and Eni, with a market share of almost 4.3%.	Enel, Edison, ENI, E.ON	Terna	Enel Distribuzione; ACEA; A2A	Enel; Edison; ACEA; Eni
Latvia	Latvenergo enjoys a monopoly position as the largest producer of electricity in Latvia and controls all of the country's public electricity distribution networks. The Ministry of Economy, via Latvenergo, is also the ultimate beneficiary shareholder of Latvenergo subsidiaries. The Ministry of Finance owns 100% of the shares in the	Latvenergo	Augstspriegum a tikli	Latvenergo	Latvenergo

	electricity transmission company, Augstsprieguma tīkli. The company is a former Latvenergo subsidiary that was spun off in 2012 in order to comply with Directive 2009/72/EC of the European Parliament and of the Council of 13 July 2009 concerning common rules for the internal market in electricity.				
Lithuania	The Ministry of Energy exercises state ownership rights in UAB EPSO-G which has two listed subsidiaries: AB Litgrid and AB Amber Grid, which operate respectively the electricity and the natural gas transmission grid. State ownership rights in Lithuanian Energy were previously exercised by the Ministry of Energy but were transferred to the Ministry of Economy and then to the Ministry of Finance in 2012-13 in implementation of the 2009 Third Energy Package of the European Parliament, which required that the ownership of energy generation and sale be separate from the ownership of energy transmission networks.	Lietuvos Energia	AB Litgrid	AB Lesto	AB Lesto
Luxembourg	Creos Luxembourg S.A. (formerly SOTEG) owns and operates the transmission system, and it supplies the majority of the market. Most of Creos's shares are owned by various private utilities, though the State maintains minority ownership. Creos also operates one of the two	Enovos International	Creos	Municipalities	Creos

	main electricity-transmission systems in the country. The other main electricity grid operator is the Societe de Transport de l'Electricite (SOTEL). Most of the electricity-distribution companies are owned by municipalities.				
Malta	There are no transmission systems or transmission system operators in Malta. The distribution system covering the whole country remains under the responsibility of one distribution system operator which forms part of a vertically integrated company, Enemalta plc. Unbundling is required at internal management accounts level only. The electricity generation market is open to competition and generators may produce electricity for their own consumption and/or sell to Enemalta plc. The retail of electricity is not open to competition.	Enemalta	n/a	Enemalta	Enemalta
Netherlands	Most electricity is generated by Essent (owned by RWE), Nuon (owned by Vattenfall), Eneco, E.ON, Delta and Electabel. The electricity distribution and transmission networks are publicly managed and owned. The Netherlands has one electricity transmission system operator (TSO), TenneT, which is owned by the state. Since the liberalisation, a number of new supply companies have	Essent (RWE); Nuon (Vattenfall); Eneco, E.ON.	TenneT	Municipalities	Nuon (Vattenfall); Essent (RWE); Eneco; Delta

	joined the market including Doug Energy and E.ON The four largest energy companies - Nuon (acquired by Vattenfall), Essent (acquired by RWE), Eneco and DELTA - still have the largest share of the retail market.				
Norway	The Norwegian power sector comprises a large number of mostly publicly owned participants. Around 90% of generating capacity is in public ownership, with local municipalities and county authorities alone owning just over half. The state-owned utility, Statkraft, is the largest generator. There are more than 160 small distribution system operators (DSOs) in Norway, most of them publicly owned. The dominant supplier within a network area is most often a vertically integrated supplier or a supplier within the same corporation as the DSO.	Statkraft	Statnett	regional and local companies	regional and local companies
Poland	State-owned entities have been organised into four vertically integrated groups and partially privatised. These groups are PGE Polska Grupa Energetyczna S.A. (PGE), TAURON Polska Energia S.A. (TAURON), ENEA S.A. (ENEA) and ENERGA S.A. (ENERGA). All of these companies combine generation, distribution and trading (including supply) activities. In 2012 PGE, TAURON and EDF had the largest market share in the generation sector. The sole TSO,	PGE; TAURON; EDF	PSE	PGE Dystrybucja; TAURON Dystrybucja; ENERGA Operator; ENEA Operator	PGE; TAURON; ENERG; ENEA

	Polskie Sieci Elektroenergetyczne S.A. (PSE), is a fully state-owned joint stock company and owner of all the transmission assets.				
Portugal	During the first quarter of 2012, the Portuguese energy sector saw the privatisation of a significant part of the transmission operator's share capital (Redes Energeticas Nacionais - REN) and of the incumbent's share capital (Energias de Portugal - EDP), a former vertically integrated company, which now develops, through its subsidiaries, generation, distribution and supply activities. Electricity suppliers entail not only Portuguese companies (EDP Comercial and Galp Power) but also several Spanish companies (such as Endesa, Iberdrola, Uniãn Fenosa, EGL Energêa Iberia and Nexus Energêa).	EDP; Galp	REN	Private	EDP Comercial; Galp Power; Endesa; Iberdorla

Romania	In Romania, 89% of the national electricity output is generated by state-owned generators. The Romanian state owns the majority of the shares in the TSO (Transelectrica SA). Five of the eight distribution operators are privatised: CEZ Distribute SA; ENEL Distributie Banat SA; ENEL Distributie Dobrogea SA; E.ON Moldova Distributie SA; ENEL Distributie Muntenia SUD SA; FDEE Electrica Distributie Muntenia Nord SA; FDEE Electrica Distributie Transilvania Sud SA; and FDEE Electrica Distributie Transilvania Nord SA. Electrica SA (owner of the three companies (vi) to (viii) above) holds the largest market share (39.27%) and was majority state owned by the Ministry of Economy.	Hidroelectrica SA; SN Nuclearelectrica SA; Complexul Energetic Oltenia SA; Termoelectrica Deva SA	Transelectrica SA	Private: 6 DSOs	Electrica Furnizare; Enel Energie; Enel Energie Muntenia; E.ON Energie Romania; CEZ Vanzare
Slovak Republic	The main player in the Slovak electricity generation market is Slovensk elektrórne, a.s. (SE), a joint stock company of which 66% is owned by Enel - the Italian based multinational group, with the other 34% owned by the Slovak state. The entire electricity transmission network is owned by SEPS, a wholly state-owned company. Three are regional Distribution System Operators (DSO), co-owned by the state (51%) and a private investor (49% and management control). E.ON indirectly holds 49% of the shares in ZSE Distribucia a.s.; EDF holds 49% of the shares in SSE -	SE	SEPS	ZSE (E.ON); SSE (EDF); RWE	ZSE (E.ON); SSE (EDF); RWE

	Distribucia a.s.; and RWE Energy AG holds 49% of the shares in Vchodoslovenskö distribunö a.s.				
Slovenia	The key companies operating in the Slovenian electricity market are: Elektro-Slovenija, d.o.o. (ELES), the Transmission System Operator (TSO); SODO d.o.o. (SODO), the Distribution System Operator (DSO); 6 distribution companies; Holding Slovenske Elektrarne d.o.o. (HSE), a generation company and GEN energija d.o.o. (GEN), a generation company. All the generators, distributors and suppliers, as well as the TSO, are predominantly or wholly state-owned and no international investment is present. Due to the level of state ownership, the whole electricity sector is arguably fully vertically integrated.	HSE; GEN	ELES	SODO	GEN-I
Spain	Three-quarters of electricity is generated by three companies: Iberdrola, Endesa (almost 100% owned by the Italian utility firm ENEL) and Union Fenosa (owned by Gas Natural). Iberdrola and Endesa alone account for the bulk of retail sales. REE (Red Electrica de Espana), in which the state holds a 20% stake, serves as the transmission system; it owns almost the entire 400 kV grid and two-thirds of the 220 kV grid. Iberdrola, Endesa and Union Fenosa are the	Endesa (100% ENEL); Iberdrola; Union Fenosa	REE	Private: Iberdrola, Endesa, Union Fenosa	Iberdrola, Endesa

	largest distributors, although there are more than 300 small local distributors.				
Sweden	The state-owned company Vattenfall is one of the major players in the Swedish electricity market. Most of the small local electricity distribution companies are owned by municipalities. Three companies - Vattenfall, Fortum (majority-owned by the Finnish government), and E.ON Sverige - generate the bulk of power in Sweden, own most of the distribution assets and account for around half of retail sales. The E.ON and Vattenfall groups have several DSO areas. The market share for the three dominant companies is 51,4 % (E.ON 19,0 %, Fortum and Vattenfall 16,2 % each). The state owned utility Svenska Kraftnät is the Transmission System Operator (TSO) for the electricity market.	Vattenfall; Fortum; E.ON Sverige	Svenska Kraftnät	Municipalities; Vattenfall; Fortum; E.ON Sverige	Vattenfall; Fortum; E.ON Sverige

United Kingdom	The National Grid owns and operates the England and Wales transmission system; the Scottish transmission system is owned by Scottish Power and Scottish and Southern Energy, and the Northern Ireland network by Northern Ireland Electricity. Licences for 14 distribution areas in Great Britain are currently held by six different companies (Electricity North West Limited, Northern Powergrid, SSE, ScottishPower Energy Networks, UK Power Networks, and Western Power Distribution). Retail supply, which is unbundled from distribution, is dominated by six large companies (EDF Energy, E.ON, RWE, Iberdrola/ScottishPower, Centrica and SSE) which supply virtually all consumers.	EDF Energy; E.ON; RWE; Iberdrola/Scottish Power; Centrica; SSE	4 TSOs	Private: 14 DNOs are owned by six different groups.	EDF Energy; E.ON; RWE; Iberdrola/ScottishPower; Centrica; SSE
Compiled by the author from various sources, primarily OECD Factsheets (2015) and CMS Law e-guides (data from 2013/2014)					

Government ownership across different segments of electricity sector in EU countries

Country	Percentage of government ownership of the largest company active in electricity…			
	Generation	**Transmission**	**Distribution**	**Retail**
Austria	51	51	51	51
Belgium	0	45.4	79	0
Germany	0	0	0	0
Luxembourg	7.5	57.3	57.3	25.4
Netherlands	0	100	100	33
Bulgaria	60	100	0	0
Czech Republic	69.8	100	69.8	69.8
Hungary	99.9	100	0	0
Poland	61.9	100	40.5	40.5
Romania	80	74	0	0
Slovak Republic	34	100	51	51
Croatia	100	100	100	100
Cyprus	100	100	100	100
Estonia	100	100	100	100
Ireland	95	100	95	95
Latvia	100	100	100	100
Lithuania	96.1	97.5	82.6	82.6
Malta	100	100	100	100
Slovenia	100	100	100	50
United Kingdom	0	0	0	0

France	84.4	84.4	84.4	84.4
Greece	51	51	51	51
Italy	31.2	29.9	31.2	31.2
Portugal	0	10.3	0	0
Spain	0	20	0	0
Denmark	80	100	80	80
Finland	50.8	53.1	50.8	50.8
Norway	100	100	0	100
Sweden	100	100	100	100
OECD Product Market Regulation Indicators - http://www.oecd.org/eco/growth/indicatorsofproductmarketregulationhomepage.htm#indicators				

Appendix 3 – Additional models for Chapter 5

Association between staff categories (ACER 2016) and population figures (dependent variable, Eurostat 2016)

	Model 1
(Intercept)	17.79***
	(0.52)
large	-0.90
	(0.59)
medium-large	reference
medium	-1.33*
	(0.60)
medium-small	-2.08**
	(0.62)
small	-2.79***
	(0.62)
micro	-4.28***
	(0.64)
R^2	0.78
Adj. R^2	0.73
RMSE	0.74
Num. obs.	29

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$

Relationship between network activism (dependent variable) staff levels (different categorization) and covariates

	Model 1	***Model 2***	***Model 3***	***Model 4***	***Model 5***
(Intercept)	-2.00*	0.97	0.77	1.30	0.60
	(0.79)	(2.12)	(3.00)	(2.76)	(2.19)
Staff levels					
large	reference				
medium	3.33*	2.99*	3.02*	2.69	2.83*
	(1.25)	(1.24)	(1.29)	(1.33)	(1.32)
medium-small	2.20	2.19	2.16	1.74	2.06
	(1.32)	(1.28)	(1.32)	(1.36)	(1.34)
small	3.60*	3.48*	3.17*	2.84	2.83

	(1.32)	(1.29)	(1.39)	(1.44)	(1.46)
micro	2.25	1.73	1.86	0.45	1.72
	(1.42)	(1.43)	(1.48)	(2.02)	(1.88)
Independence (electricity)		-0.95			
		(0.63)			
Independence (gas)			-0.88		
			(0.92)		
Liberalization (electricity)				-0.75	
				(0.60)	
Liberalization (gas)					-0.64
					(0.51)
R^2	0.31	0.37	0.34	0.35	0.36
Adj. R^2	0.19	0.23	0.19	0.21	0.21
Num. obs.	29	29	29	29	27
RMSE	2.36	2.30	2.37	2.34	2.39

$^{***}p < 0.001$, $^{**}p < 0.01$, $^{*}p < 0.05$

Appendix 4 – Interviews informing Chapter 6 and 7

Interview number	*Previous interview number*	*Currently or formerly involved?*	*Role*	*Topic of interview*
1	1	Current	Regulator	MEDREG
2	2	Current	Regulator	MEDREG
3	3	Former	Regulator	MEDREG/ERRA
4	4	Former	Regulator	MEDREG
5	5	Current	Academic	MEDREG/ERRA
6	6	Former	Consultant	MEDREG/ERRA
7	7	Former	Regulator	MEDREG/ERRA
8	8	Former	Executive	ERRA
9	16	Former	Executive	NARUC/ERRA
10		Current	Executive	MEDREG
11	17	Current	Regulator	MEDREG/Energy Community
12	18	Current	Consultant	MEDREG/ERRA
13		Current	Executive	MEDREG
14		Current	Executive	MEDREG
15	21	Current	Consultant	ERRA
16	23	Former	Regulator	ERRA
17		Current	Executive	ERRA
18		Former	Regulator	ERRA
19		Current	Regulator	ERRA
20	25	Current	Regulator	ERRA
21		Current	Regulator	MEDREG
22		Current	Regulator	ERRA
23	26	Current	Executive	ERRA
24		Current	Regulator	ERRA

25		Current	Executive	ERRA
26		Former	Regulator	ERRA
27		Former	Regulator	ERRA
28		Former	Regulator	ERRA
29	28	Former	Executive	ERRA
30		Current	Executive	Energy Community
31	31	Current	Executive	ERRA/Energy Community
32	33	Current	Executive	ERRA/Energy Community
33		Current	Regulator	Energy Community
34	35	Current	Regulator	ERRA
35	34	Current	Academic	ERRA
36	37	Former	Executive	ERRA
37	38	Current	Regulator	ERRA
38	39	Current	Academic	ERRA
39	41	Current	Executive	ERRA
40		Current	Regulator	MEDREG
41		Current	Regulator	ERRA
42	19	Former	Regulator	Energy Community