The Potential of the Network Approach for Analysing Regulations and Regulatory Processes: Empirical Examples from the Egyptian Telecommunication Sector

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Abstract

The widespread utilisation of the network approach in different scientific and social science disciplines raises a basic question about its validity for studying and analysing specific type of policies such as regulation. In other words, the question that this paper attempts to answer is that, can networks be treated as more than a metaphor? If so, what aspects of regulations and the regulatory processes does network analysis illuminate? The answer presented in this paper is yes, the network approach can be a valuable analytical tool for studying and analysing regulations and regulatory processes and it can add some new 'stones to the wall' of regulatory studies. From this perspective, the paper asserts that with few exceptions, the potential of policy networks for studying and analysing regulation policies and regulatory processes have received a little attention. Regulation has been the subject of many scholarly researches, articles, and books. Using different approaches and theoretical frameworks, such studies covered different social, legal, economic, political, and administrative aspects of the topic. These studies are important but not sufficient either to capture the whole picture about the dynamic nature of regulatory processes or to visualise interactions and relationships between actors involved in different regulatory arenas. Based on empirical data collected from 42 interviews with decision-makers, regulated companies, and civil society organisations, and using Social Network Analysis (SNA) techniques, this paper attempts to highlight the structural and relational analytical powers of the network approach. It concludes that combining quantitative and the qualitative aspects of the network approach can lead to a more serious treatment of networks than just a metaphor to capture relationships between state and non-state actors.

Introduction

The experience of the welfare state during the 1960s and the 1970s illustrates that the potential of governments' steering capacities as an individual or sole actor is limited. In order to perform in a more efficient and effective way, governments need to cooperate and to work with (not above) other private, semi-governmental, and nongovernmental actors in different policy fields. Consequently, relationships and interactions between state and non-sate actors have become a focal analytical point for many policy studies. This new model of governance has contributed to the raise of the concept of policy networks. Taking this a starting point, this paper asserts that the policy network approach could be a valuable analytical framework for studying and analysing public policy and policy processes in general as well as regulation and regulatory processes. It can add some new value to the previous research in that field by concentrating on the dynamism of regulatory processes and interactions between actors involved in these processes. It can also present a more realistic picture of how regulation policies are made and implemented in multi-actor settings.

In dealing with regulations and regulatory processes, many scholars have chosen to view actors in different regulatory arenas as autonomous entities motivated by achieving their own goals without considering the goals other actors. This image of atomistic actors is increasingly inadequate in a world wherein such actors are

embedded in networks of social, professional, and exchange relationships with each other. My contention in this paper is that, the conduct of regulatory processes can be more fully understood by examining the networks of relations in which actors in regulatory arenas are embedded. By adopting a relational rather than atomistic approach, our understanding of regulatory processes and interaction between actors involved in such processes can be deepened.

A good starting point for the analysis could be Melville's conclusion that, 'to understand regulation we must discover how particular interests come to be served and we therefore need to understand the structural and behavioural features of the system. These include the structure of power which shape the regulatory arena, membership of or the exclusion from the regulatory process, the rules and resources that define the ability of parties to bargain for advantage, and the process of exchange and interdependence' (Melville,1994: 385). In other words to understand regulation one should analyse 'regulatory networks' and the dynamics of interactions between actors within and between networks.

To fit networks in the larger context, the notion of the "regulatory space" by Hancher and Moran (1989) could be very useful. From this perspective, regulation can be visualized as a process that occurs in a virtual regulatory space. In such space, several actors are exercising different levels of powers, connecting to each others with a relationship of interdependence, and each party plays his role according to structured rules. This view of regulation could be very helpful in understanding the nature of regulatory processes, the main characteristics of regulatory frameworks, and the real role of regulators in these processes. Such a visualisation also indicates how all these issues reflect in the politics of regulation.

Building on the above, this paper argues that, regulation policies are made and implemented mainly in networks of interdependent actors. They represent a final product of a long and complicated process of interactions between different state and non-state actors each with its own objectives, resources, and strategies. This observation has far-reaching consequences for the way that regulatory bodies manage the course of interaction in the regulatory process. One of the major challenges with which regulators are confronted is how to manage their relationships and interactions with other actors? In other words how to steer the regulatory process in a network setting in order to achieve the intended regulatory goals?

To cover such issues, the paper starts first with identifying and discussing the concept of networks and the essence the policy network approach as presented in network management and policy literature. Network definitions, theoretical roots, limitations and strengths are covered under this section. In section two, the analytical strategy of the study is illustrated followed by a discussion of the potential of the network approach for analysing regulatory processes in section three. The discussion in this section is supported by empirical examples from two regulatory arenas (mobile telephony and internet service provision) within the Egyptian telecommunication market. The paper concludes with a brief discussion on the potential of policy networks for studying and analysing regulation and the regulatory process.

1. Networks and Policy Studies

'Network' has become a fashionable catch-word in recent years in many scientific and social science disciplines (Borzel; 1998: 253). Microbiologists, ecologists, computer scientists, in addition to sociologists, economists, business scholars, policy analysts, and political scientists are all using networks and network analysis each from a different perspective. What is common among all these attempts is their concentration on studying and analysing a specific mode of intersections and relationships among various set of actors in a given context.

The concept of networks has started to appear in policy literature during the 1970's as recognition of the fact that, the process of policy formation and policy implementation involves many actors other than the governmental ones. Those actors interact with each other and the final policy outcomes can be regarded as products of this interaction. In this sense, networks are used in the literature, typically to refer to 'multi-organisational arrangements for solving problems that cannot be achieved or achieved easily, by single organizations' (Agranoff, 2001: 296). Interaction between these organizations is a crucial feature of networks. As Salanick noted, networks are constructed when individuals whither organizations or human interact. Such an interaction can be idle and formed by mandates or it may arise because network actors want to achieve, plan, coordinate, or decide, on their individual and collective activities (Salanick, 1995: 346-347).

1.1. The Concept and the Theoretical Roots of Policy Networks

A wide variety of definitions of policy networks could be found in the literature. From a very wide perspective, Dowding (1995) sees networks as metaphors characterizing relationships between governments and other societal groups. Kickert, Klijn, and Koppenjan define them as 'patterns of relations between interdependent actors, involved in processes of public policy making' (1997: 6). O'Toole describes networks as 'structures of interdependence involving multiple organizations, where one unit is not just the formal subunit or subordinate of the other in some larger hierarchal arrangement' (1997: 117). Klijn, Koppenjan, and Termeer look at them as 'more or less stable patterns of social relations between mutually dependent actors which form themselves around policy problems or clusters of resources and which are formed, maintained and changed by a series of games'(1995: 439). According to Borzel a network means 'a relatively stable pattern of relationships which are of non-hierarchical and interdependent nature linking a variety of actors who share common interests with regard to a policy and who exchange resources to pursue these shared interests.' (1998: 254).

Comparing the preceding definitions of policy networks, three main features of that concept can be identified (Kickert, Klijn, and Koppenjan; 1997: 31-33): dependency as a precondition for networks; variety of actors and goals; and relation patterns between network actors. At the outset, networks develop and exist because of interdependencies between actors. At the same time, such policy networks consist of a variety of actors each with their own resources, goals, and strategies. No single actor can unilaterally dominate and predetermine strategic actions of the other network members. The relational component of policy networks is of a prime importance for network analysts. Network relations are of more or less lasting nature so that one can

talk about relational patterns. These patterns of relations result from the situation of resource dependency which pushes actors to interact with each other but at the same time such patterns influence the process of interaction between actors.

The variety of definitions of policy networks reflects the fact that there are rich theoretical traditions on which the network approach was founded (Klijn and Koppenjan, 2000). As illustrated in figure 1, these theoretical traditions can be traced back to the developments in three main disciplines: organisational studies, policy studies, and political studies.
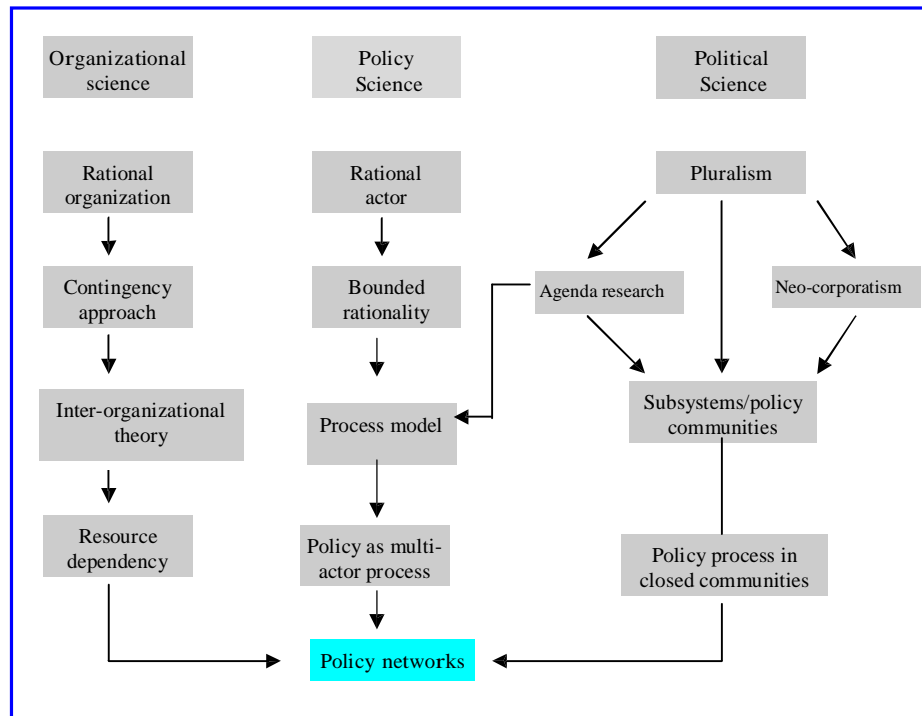

Figure 1; theoretical roots of policy networks
Source; (Kickert, Klijn, and Koppenjan; 1997: 29)

The policy network approach builds on these theoretical branches by focusing attention on relations and interaction processes between interdependent actors and by highlighting the complexity of objectives and strategies which result from this interaction. An important addition for the network approach is that, it gives more attention to the institutional context in which complex interactions take place. In this sense, the policy network approach attempts to connect public policies with their strategic and institutionalised context: the network of public semi-public and private actors participating in certain policy field (ibid: 1).

As it has evolved, the policy network approach has developed its own distinctive theoretical framework. Such a framework assumes that policies are made in complex interaction processes between different actors in policy networks. These actors are mutually dependent so that they need to co-operate in order to realise their goals. This co-operation, however, is by no means simple or spontaneous, and it requires types of network management.

1.2. Strengths and Limitations of the Network Approach

Before discussing the empirical examples from the Egyptian context, it might be useful to shed some light on the debate around the analytical power of the policy network approach. Such a debate is quite important because it illustrates the strengths and the limitations of the network approach as an analytical tool. At the analytical level, several advantages can be achieved when using the policy network approach. One merit of using this approach is that it represents a bridge between macro and micro levels of analysis (see Lazega, 1997: 120-123). As noted by Rhodes (1997) and Marsh (1998) the policy network approach represents a 'meso-level' of analysis between the macro-level and micro-level theories. In this sense, a network perspective may work as a bridge between macro level analytical approaches which are described as being abstract and not applicable to concrete situations because of their little focus on mediating processes, and micro level approaches which tend to ignore the impact of broader structural factors on micro-level settings (Evans, 2001:542). As a result, applying this approach not only helps researchers to connect macro and micro conditions, but, it also helps in identifying the junctions at which policy analysts can focus.

Another point of strength in the policy network approach is that 'policy networks' is a multi-theoretic concept and it can be used in conjunction with a range of theoretical frameworks (Kenis and Schneider 1991). This concept provides theoretical insights and normative starting points for analysing and assessing complex processes in networked settings. It also highlights the role that perceptions, interactions, and institutions play in such complex policy environments. Furthermore, it provides perspectives for improving interactions between parties as well as management strategies for initiating and supporting interactions (Klijn, and Koppenjan; 2004: 9).

Mentioning these advantages is not to say that the network approach is problem free. Similar to any other research method, network analysis has it own limitations (see John and Cole, 1998). One of these limitations is that in some cases relationships and interaction between policy actors reflect symbolic rather than real exchanges that influence policy decisions. As such, it would not be easy for network analysts to decide which set of relations should become the focal point of the analysis[1]. Another issue with network analysis is that the boundaries of analysed networks are not always clear. Because core policy actors are involved in many policy networks in different policy arenas, network boundaries overlap[2].

Identifying the nature of network actors is another matter of concern to network analysts. Unlike sociological accounts where individuals represent network actors, in policy science, organisations are considered the building blocks in the structure of policy networks. The problem with considering organisations and not individuals as

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[1] In order to avoid this shortcoming, the researcher explained to the interviewees what exactly he meant by the regulatory network in each of the two studied policy arenas. This explanation helped the respondents to focus on those actors with whom they have important links and to exclude those with unimportant relationships.

[2] To handle this problem, the researcher started by identifying the core policy actors. Then the interviewees from these institutions were asked to name other actors they have connections with. By following this snowballing technique the boundaries of the two studied networks became clearer.

core components in network structures is that organisational relationships are complex, multitude, and ambiguous[3]. Added to the above mentioned limitations, network analysis can only reflect a snapshot of the relationships and interaction of policy actors in a given moment. Relationships and interaction in policy arenas are flexible by nature. Actors join networks and withdraw from others all the time. This situation affects the structure and the composition of the network[4].

2. The Analytical Strategy of the Study

With the advantages and limitations of the network approach thus identified, the discussion now turns to the analytical strategy of the study. The study's analytical strategy encompasses two stages. The first stage focuses on the identification of the main network actors in each of the two specified arenas in order to give a vivid depiction of each network before more precise analysis of the nature of relationships and interaction between the actors involved. For the second stage of the analysis, the relational part that includes the interplay dynamics between actors becomes the focal point.

In this context, the network concept is used in its basic form to denote the patterns of interaction and relationships between different state and non-state actors. The core assumption is that state actors are not unilaterally authoritative as they depend on the actions and the reactions of the other actors to formulate and deliver the intended regulatory policy goals. The network in this regard represents a system of actors that interact on certain regulatory issues (see Bressers and O'Toole; 1998). Such a conceptualisation of networks reflects networked relationships between the involved actors in addition to the details of the networked interdependence between state and non-state actors.

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[3] In order to reduce such ambiguity, in choosing the interviewees the researcher focused on those who have organisational affiliations. By doing this, the researcher considered the two studied networks as the property of individuals as reflected in their organisational roles.

[4] Despite the fact that the flexibility of network relations cannot be denied, a good follow-up of the developments in the studied policy arenas was the strategy followed by the researcher in this study to find out about any fundamental changes that can affect the structure of the two studied networks.

3. The Potential of the Network Approach as an Analytical Tool

Applying network techniques can be helpful on different grounds. In the following section, two of these grounds will be explored: the potential of the network approach for mapping out and visualising core policy actor, and for measuring network properties.

3.1. Mapping Out and Visualising Core Policy Actors

Mapping is a quite familiar technique in policy studies. Different scholars use this technique to map different things[5]. Despite the familiarity of the mapping technique for policy scholars, each of them uses it in a different way and depends in the mapping process on different resources. Some of the scholars depend mainly on their experience and expertise in their respective fields to map actors involved in certain policy arenas. Other analysts complement such experience and expertise with other sources of data and information such as interviews, databases, surveys, and content analysis of written documents. These sources of information are used in an attempt to bring into sharper focus a group of actors with their relationships and interaction, and sometimes to present a visual representation of such interplay dynamics.

In the context of this study, the mapping process started with a review of a wide range of written materials and documents (reports, presentations, studies, press articles). These background materials helped the researcher in identifying the potential actors participating in regulatory networks in the telecommunication sector in Egypt. Many actors have been identified in each of the studied regulatory arenas. Not all involved actors participate at the same level or have the same influence on regulatory issues in these arenas. Therefore, only those who are influential and important to the process of making, amending, and implementing regulations will be the subject of the analysis in the following pages. By 'influence' I mean the power which an actor has over a regulatory issue: in other terms, the extent to which actors in regulatory networks are able to persuade or coerce others into making decisions, and following certain courses of action. 'Importance' underlines those actors whose problems, needs and interests are the priority of the regulator. If these important actors are not assisted effectively then the regulatory process cannot be deemed a success.

Using influence and importance criteria, the researcher listed a number of key actors in each regulatory arena. This list was amended in the light of the interview data analysis. In the first section of each interview, respondents were asked to identify the key actors in their respective arena and among those key ones to name the most influential and important actor(s)for the regulatory process. The resulting list from the interview data analysis was checked against the list generated from the analysis of the

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[5] At a macro level, Doern (1998) applies the mapping technique to map the interplay among regulatory regimes in the United Kingdom, the United States and Canada. At a more specific analytical level, Turnpenny et al. (2005) use the same technique for mapping the involved actors in climate change policy networks within the U.K. Based on the analysis of existing research and knowledge on networks, Besussi (2006) has mapped the geography of the European Research Area (ERA). Process mapping is also a common tradition in policy literature in which mapping involved actors in such processes represents only one analytical step (see Acioly; 2004). Power, concept and influence mapping are also parts of policy analysis scholarship (see Mayers; 2005, Trochim; 2005).

written documents and actors who were mentioned in the two lists were chosen to be the focus of the analysis (see table1)[6].

State Actors	
• The Ministry Of Communication and Information Technology (MCIT) • The National Telecommunication Regulatory Authority (NTRA) • Telecom Egypt (T.E)	
Non-State Actors	
1- The Mobile Telephony Arena	
• Mobinile • Vodafone Egypt • Etisalate Misr	
2- The Internet Service Provision Arena	
ISPs Class (A)	ISPs Class (B)
• EgyNET • LINKdotNET • TEData • Nileonline	* Equant * Noor * Raya telecom * Yalla * Internet Egypt * Menanet * Soficom * Batelco

Table1: State and Non-State Network Actors in the Internet and Mobile Regulatory Arenas

Identifying the core policy actors can be an important step to reveal many secrets about the structure of the studied network and the interplay dynamics between its policy actors. For instance, in the internet service provision arena, a distinction can be made between the early phase of the liberalisation process (1993-1999) and the recent phase (1999-2008). The network structure of these two phases can be depicted in figure2 and 3.
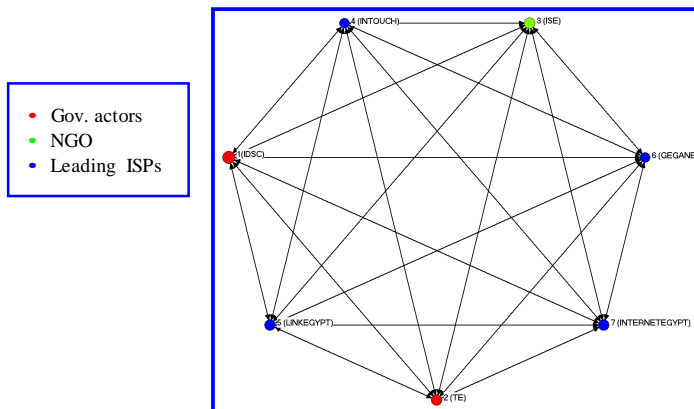

Figure 2: Network of Actors Active
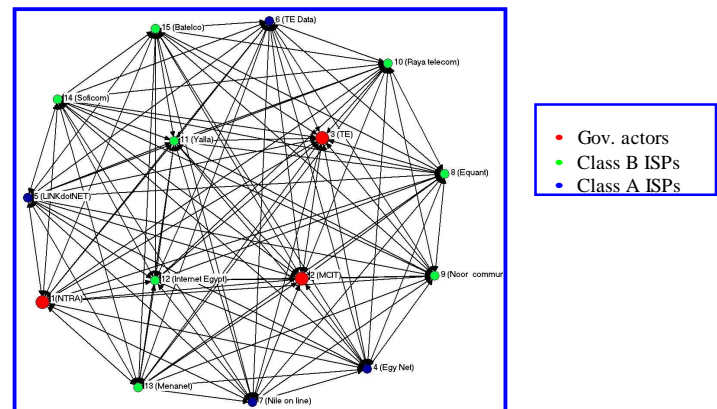in the Internet Regulatory Arena
Phase One 1993-1999

Figure 3: Network of actors active
in the Internet Regulatory Arena
Phase Two 1999-2008

Comparing the network structure in the two diagrams can improve the knowledge available in different areas including: who the main policy actors are and what are their affiliations; how changes at the level of state strategies are reflected in the changes at the level of network structure; how regulatory networks respond to state interventions; and how changes in network structures complicate of facilitate regulatory processes. As the sociogram in figure 2 illustrates, seven actors were

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[6] A summery of these actors' characteristics is provided in appendix 1.

actively engaged in managing and regulating the internet arena during the first phase of its liberalisation. Starting from the year 1999 the internet arena has witnessed many changes. As the graph in figure 3 indicates, the structure of the regulatory network has changed to reflect a more complex configuration. The number of actors has increased and the overall structure of the regulatory arena has become denser. Added to this, at the level of state actors, new actors have emerged and became major players in the internet regulatory arena (e.g. the NTRA and the MCIT). The role of some other actors has declined in regulating and managing the sectors such as the ISE.

3.2. Measuring the Network Properties

The literature on social network analysis is full of methods that can be utilised to measure every single aspect of social interactions between network actors. Some of these methods seem to be useful for highlighting the major relational features of the studied regulatory networks.

3.2.1. Frequency of Interaction and Ties Strength

Frequency of interaction between actors involved in regulatory processes can be a good indicator for ties strength among them[7]. Figure – shows the frequency of interaction between actors involved in the internet Arena.
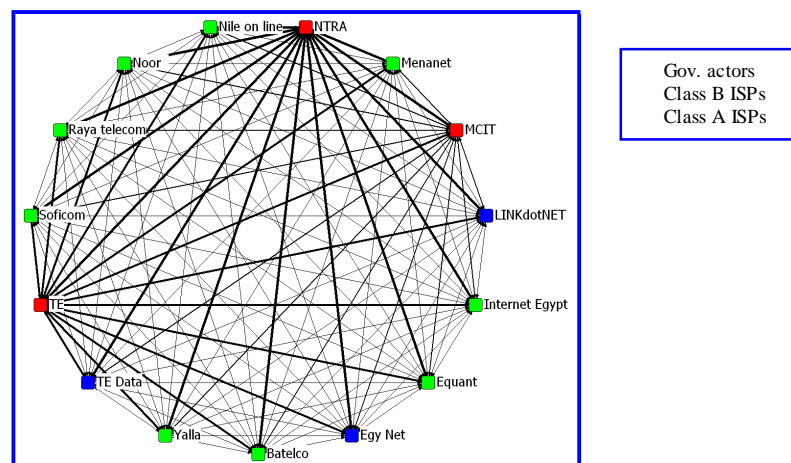

Figure 4: Frequency of Interaction between Actors
Involved in the Internet Arena

An arrow between two actors indicates the occurrence of interaction between them on a frequent basis. Most of the arrows in the graph are two-way arrows, which mean that, these interactions were reciprocated by the other network actors. Thick arrows represent actors who communicate most frequently with others in the network. Such a visualisation of the frequency of interaction between network actors may shed lights

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[7] During the interviews, informants were asked how often they usually interact with the other actors including NTRA, MCIT, TE, and other ISPs and Mobile operators. The form of interaction has intentionally been widened to cover different shapes such as personal interaction, or interaction by phone, e-mail, instant messaging, or by any other means. The responses were scored on a five degrees scale that included (daily interaction, several times a week, once a week, once every other week and once a month). The generated data were used to build a matrix of actors' frequency of interaction. The interaction matrix has then been used to visualise this relationship in the studied policy arena.

on different aspects of the network dynamics. In this respect, important questions can find its way to answer such as who the most active actors are? Why some actors interact with each other on a more frequent basis? Where the higher and the lower levels of interactions exist within the network? And how this may reflect in the ability of actors to coordinate and cooperate in order to solve the problem at stake?

As can be seen from the indicated sociogarme, some actors interact with each other on a more frequent basis than others. All network actors interact with the NTRA on a daily basis. An equally important frequency of interaction occurs with TE (the owner of the telecom network). A high level of interaction exists between the NTRA and the MCIT as they need to coordinate issues related to market regulation and to correct any malpractices from private ISPs. Compared to other ISPs TEdata has a higher level of interaction with TE as it represents the data wing of the previous incumbent. The lowest level of interaction exists between private ISPs. One possible explanation for this is competitive nature of the market.

The frequency of interaction between network actors is reflected in the strength of the ties that connect them. Some actors have stronger connections and relationships than others (see figure 5).
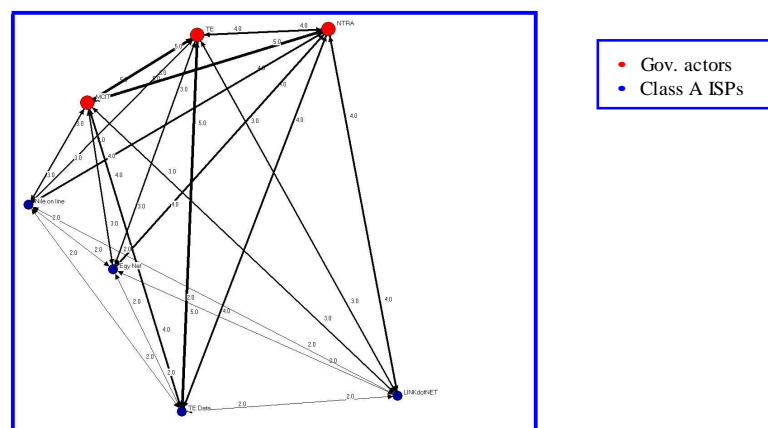

Figure 5: Ties Strength between Network
Actors in the Internet Arena

The graph in figure 5 indicates that, a considerably strong tie, and a very special relationship exist between the NTRA and the MCIT. Other strong relationships exist between the MCIT and TE[8] and between the latter and its data wing TEdata[9]. As for the relationship between the NTRA and the regulated companies, the graph shows equally strong ties connect all ISPs and the NTRA.

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[8] The reason behind this is that 80% of TE still owned by the government.

[9] From the industry point of view, such strong relationship between TE and TEdata reflects in the way that the former treats the latter. 'TEData is the favourite son of TE.' (interview with a senior staff in an ISP). This preferential treatment can be seen in different areas. For example, TEdata is given priority in locating its equipment in TE centrals. Also, before taking any decision that might affect the Internet market, TE consults with TEdata first and then with the other ISPs (interview with an ISP).

3.2.2. Network Ties and the Nature of Relationships

Ties between actors in regulatory networks can represent different forms of relationships. Focusing on cooperation-competition relationships in the mobile telephony network the following figure shows of what nature relationships between actors involved in the regulatory process are.
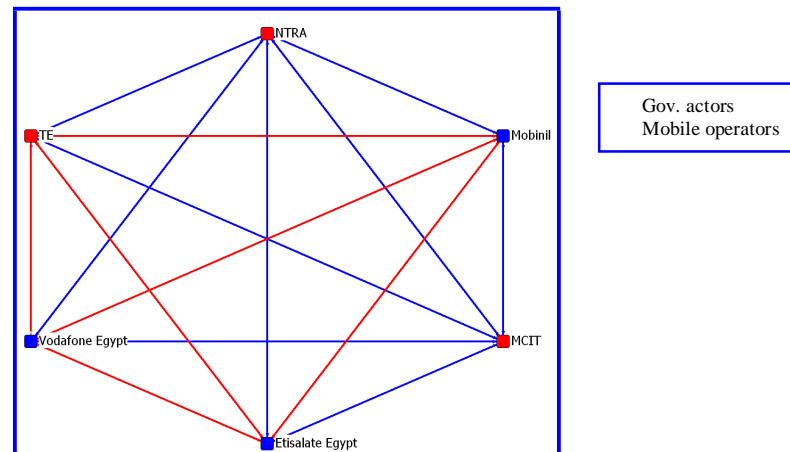

Figure 6: Cooperation-Competition Relationships in the
Mobile Telephony Arena

Figure 6 represents a network composed of both types of relations; cooperation and competitions. In this sociogram, the links between network actors have different colourings based on their content. The blue lines show cooperative relationships while red lines illustrate competition relationships. The study of this figure indicates that relationships between the Mobile telephony operators and the regulatory agency are reciprocally cooperative. In contrast, relationships between private regulated companies are characterised by competition especially when it comes to the strategic issues that affect companies' market share and positions. Focusing on the nature of relationships between network actors can help understanding different issues including: why actors act in a specific way in certain situations; what strategies they may peruse in response to other actors' moves and decisions; how regulatory interventions can be tailored to influence relationships in networks; and under what conditions actors are inclined to cooperate or not with each other.

3.2.3. Resources Distribution

When it comes to resources, interdependence appears to be an important characteristic of regulatory networks. In the first place, actors come to work together, because they need each other's resources. Actors' positions in the network are determined according to the value of the resources they hold. Actors with valuable resources are expected to occupy distinguished positions within networks. Following on from this, in regulatory networks, actors are not equally powerful. The power that actors possess, and their ability to influence other actors' courses of action depends largely on the resources they have at their disposal.

In this context, the discussion of actors' positions in regulatory networks and their power relationships is a prerequisite for finding out who is responsible for doing what and in what way. Put another way, the allocation of discretionary powers between network actors determines who has the right to take decisions and the nature of such decisions. As such, the allocation of discretionary powers determines the roles and mutual obligations of each actor in the network[10]. To understand the nature and the implications of power relations in regulatory networks, two main questions need to be answered. The first is, considering the importance of resources and resources dependency in regulatory networks, what kind of resources network actors might possess? The second is, in a network that comprises governmental and private actors, who occupies the central positions?

Starting with the first question, the network literature provides an inventory on the types of resources that actors might bring to networks. For the purposes of this study, the classification presented by Rhodes (1988) can be very useful. Rhodes has distinguished between five types of resources (authority, legitimacy, information, finance, and organisation). By authority, Rhodes means obligatory rights determined in legal rules that give an actor the right to perform certain functions. Legitimacy refers to the actors' rights to access the decision-making arena and to build support for their cases. Information is a valuable resource, as the quality of regulations depends largely on the quality of information used to make them. Added to this, finance and other organisational resources are equally important, as they determine the degree of actors' dependency in regulatory networks.

Considering the case of the internet and the mobile telephony regulatory networks in Egypt, these types of resources are available to the network actors in different degrees. Starting with authority, the discretionary powers of each actor have been identified generally in the telecommunication law 10/2003. More precise mandatory powers have been mentioned in other legal documents. For the NTRA, these powers are determined by its legal mandate, as reflected in law 10/2003 besides Ministerial decrees that followed the issuance of the law[11]. Regarding the ISPs, the prime source of their discretionary powers can be found in their licenses[12].

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[10] For a detailed discussion of power and authority in the network see Sauvée (2002)

[11] The discretionary powers of the NTRA cover different areas, including the following: encouraging national and foreign investment; guaranteeing the provision of telecommunication services to all regions including remote areas; protecting national security and the state top interests; guaranteeing the optimum usage of the frequency spectrum and increasing its returns and guaranteeing the compliance of the effective international agreements and resolutions, and monitoring the realization of the technical and economical efficiency programs for different telecommunication (Law 10: 2003).

[12] In this regard, a distinction can be made between two types of licenses, class (A) and class (B). Class (A) licensees have the right to provide connectivity services with Internet, excluding voice phone call services. They also have the right to own infrastructure, such as equipments, networks, and ports. In addition to this, class (A) licensees have exclusive contracts with TE for international long-distance getaway access. They are also authorised to lease their infrastructure and their international long distance getaways to other class (A) and (B) ISPs, and to sell their Internet services directly to end users (Abdel-Hafez and Wahba 2004). Class (B) licensees have been granted less discretionary powers in such operational areas, as they have to have their interconnection to the public Internet established by class (A) ISPs. It is worth mentioning that this licensing system is under reconsideration from NTRA, and a new system might be in place in the near future as the differences between these two types of licenses have increasingly diminished (interview with NTRA staff).

With respect to legitimacy, it can be noticed that all actors have the right to access the decision-making arena and to participate in the regulation-making process but in different roles. The decision-making mechanism highlights two types of relationships between actors involved in the two investigated regulatory networks; these relationships are consultation and decision-taking (see figure 7).
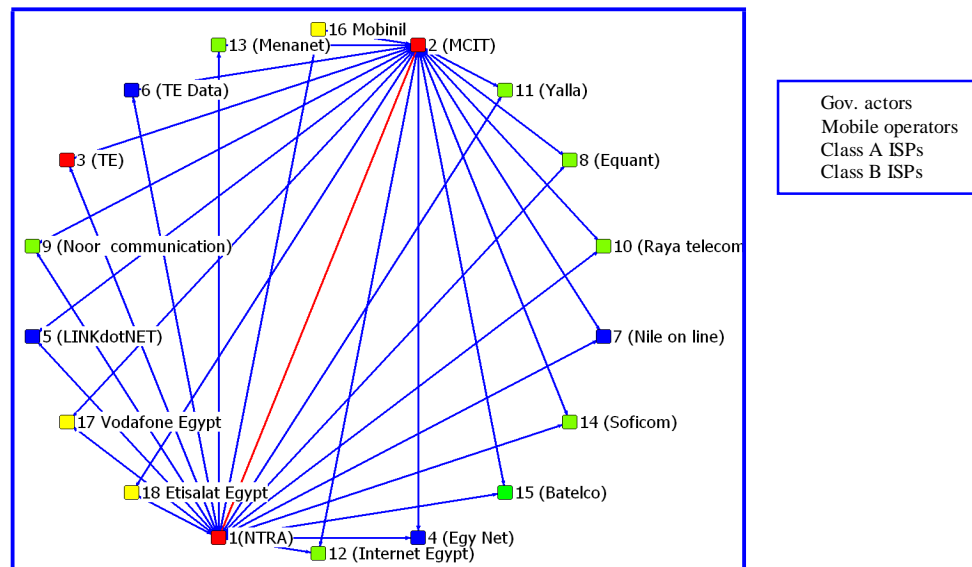

Figure--: The Decision-Making Network in the
Internet and Mobile Telephony Arenas

The sociogram in figure 7 illustrates consultation and decision-taking relationships in a decision-making network which encompasses both the internet and the mobile telephony arenas. The blue lines indicate consultation relationships and red lines indicate both consultation and decision-taking relationships. As can be noticed, blue lines connect the NTRA and the MCIT with all regulated companies in both the internet and the mobile telephony arenas. That means, both bodies tend to consult other network actors before taking policy or regulatory decisions that may affect them. When it comes to decision-taking stage it up to the MCIT and the NTRA based on the consultation they made to take whatever decisions they see in the best interest of the whole sectors.

As one of the network resources, Information can be regarded as a double-edged weapon. The NTRA has the right to ask for information, and the ISPs and mobile operators have an obligation to fulfil its demands in this regard. All ISPs and mobile operators report to the NTRA on regular bases (see figure 8). At the same time, the NTRA is required to report to the MCIT. Some ISPs such as TEData are required to report to the parent organisation (TE). With such extensive channels of communication and information exchange in place, such information becomes a valuable resource. The regulator needs information for making responsive regulations, and from this angle, he is dependent on the regulated industry to provide him with the information he needs.
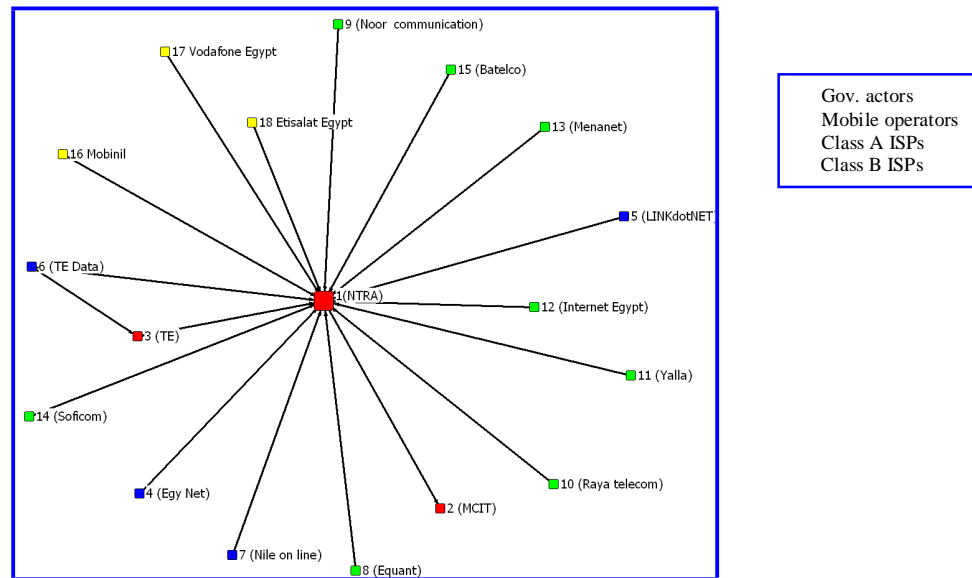
Figure 8: Reporting Network in the Internet and Mobile
Telephony Arena

Ironically, despite such a dependency relationship, many ISPs do not see information as a valuable source to pressure the NTRA. As stated by a manger of one of the ISPs 'we are the ones who have our hands in. We have important information about the market that might not be available to the regulator. But so what; all we can do is to pass this information to the regulator and then he picks up what he considers important'.

Financial and organisational resources are also considered as determining factors in actors' power relations. Despite being a newly established institution, the NTRA has succeeded in building up his capacities in different areas. Compared to the regulated companies the NTRA might appear as lacking organisational resources especially if one considers the recent trend of consolidation and integration between mobile and data companies. However, all ISPs have emphasised that, despite its short existence, the NTRA has succeeded in proving its competence as a regulator of the market. At the financial level, the NTRA has an independent budget that is determined in accordance with its internal rules[13]. The NTRA also has its own rules and administrative procedures that regulate its personnel with respect to their hiring, salaries, allowances, remunerations, promotions, penalties, dismissal and other personnel matters.

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[13] The main financial resources consist of the following: funds assigned for the NTRA in the general budget of the State; annual fees for licenses and permits granted; charges for works, burdens and services in connection with the licensee or other parties whether locally or internationally; the percentage allocated by the cabinet for the NTRA from concession fees devolving to the public treasury when granting certain types of licenses; the yield from investing the NTRA funds; fines and compensations imposed on non-compliant(s); loans, grants, donations and subsidies accepted by the board of directors of the NTRA (Law10/2003, Art 8).

3.2.4. Dependency Relationships

Resources distribution among the network actors is reflected in the way in which dependency relationships are shaped. As noted by Emerson (1962) in a relationship between two actors (A) and (B), actor (A) is regarded as dependent upon actor (B) if he aspires to goals or gratifications whose achievement is facilitated by appropriate actions on B's part. Following on from this conceptualisation of dependency relations, it can be concluded that, in network settings, dependency relationships between actors are functions of two factors: firstly, an actor's motivational investment in goals mediated by other actors; secondly, the availability of those goals outside the relationships between such an actor and the other network actors[14].

The graph in figure 9 shows dependency relationships between the mobile telephony network actors. Actors' dependencies on each other are represented with double headed arrows. The score shown at the end of each arrow reflects the level of dependency from one actor to the other.
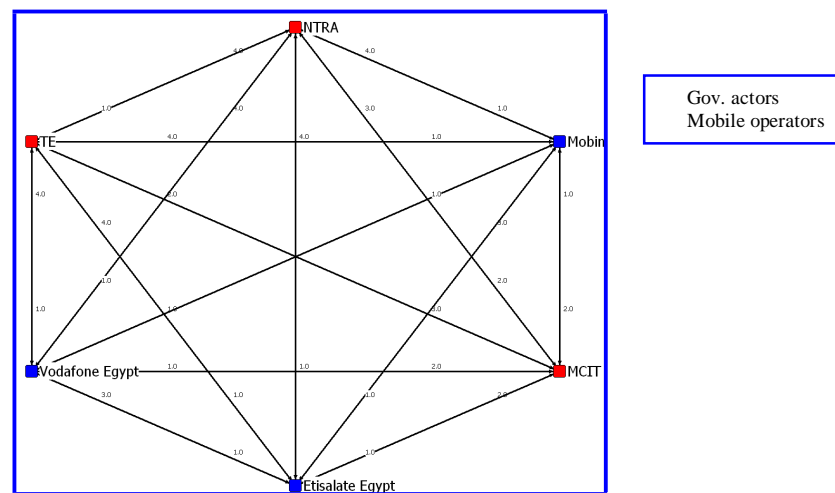

Figure 9: Dependency Relations in the Mobile telephony Arena

Examining the graph, four patterns of dependency relationships between the network actors can be observed: firstly, the three mobile operators are highly dependent on the NTRA as the manager and controller of the whole sector. In this regard all operators have confirmed that the NTRA has at his disposal 'strategic' resources on which they are heavily dependent in order to operate, compete, and expand in the market. Among these resources, mobile operators named frequency distribution and numbering; secondly, another strong dependency relationship exists between the mobile operators and TE. Owning the infrastructure facilities gives TE an advantage in its relationship

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[14] Departing from these theoretical insights regarding dependency relationships, such relationships were measured in the two studied networks by asking the interviewees, which of the following best describes your dependency on the following actors (NTRA, MCIT, TE, and Other ISPs)? The respondents were given four options: A. very high, B. high, C. moderate, and D. weak. The collected data has been used to establish a combined matrix of actors' dependency relationships. Actors with very high level of dependency (other actors are highly dependent on them) were given score 4. Actors with high level of dependency were given score 3. The moderate level of dependency was given score 2. And finally, the low level of dependency was given score 1. The data in the combined data matrix were transformed into a graphical output using Netdraw.

with mobile operators in particular and with other telecommunication providers in general; thirdly, TE as a company owned in its majority by the government is dependent on the MCIT as the latter represents the body responsible for the whole sector; finally, the pattern of dependency between the three mobile operators is relatively low basically because no one of them possesses a scarce resource upon which other operators are dependent. They all are powerful and well known names in the world of mobile service provision.

3.2.5. Power Structures

Having illustrated the patterns of dependency relationships between actors involved in the studied regulatory networks, the question now becomes how resources distribution and in turn dependency relationships affects actors' perceptions regarding the relative power of other network actors? In other words, how actors in the internet and mobile telephony regulatory networks in Egypt perceive each other's powers? To answer this question, a network measurement of the different actors' reputation of influence can be helpful (see figure 10).
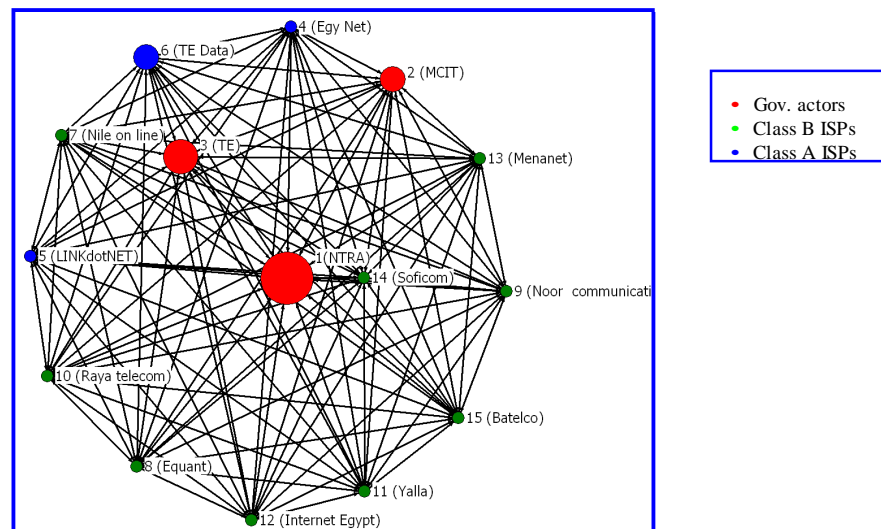

Figure 10: Actors' Reputation of Influence
in the Internet Arena

In this socigrames, the size of the actor reflects it influence and in turn its power in relation to other network actors. As the graph illustrates, the network actors in the internet arena perceive the NTRA as being the most powerful and influential actor in the network[15]. The second most influential actor in the network is TE. Because of their dependence on TE's network, most ISPs perceived TE as a very powerful and influential player. The MCIT has been perceived as the third most influential and

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[15] The likely explanation for this is that most of the prerogatives and authorities for regulating and managing the sector have been gathered from other actors such as MCIT and TE and been delegated to the NTRA. Consequently, the NTRA became the centre of the universe with regard to interactions and exchanges that occur in the network. All ISPs and Mobile operators confirmed that, when it comes to regulatory issues that affect the day-to-day activities of the Internet and Mobile telephony sectors, the NTRA has the upper hand.

powerful actor in the network[16]. Focusing on the regulated industry, there was almost absolute unanimity that TEdata is the most powerful and influential ISP. Such a perceptual status of TEdata stems from its close relationship with TE.

Concluding Remarks: The Network Approach and the Study of Regulation

This paper has had a methodological aim to indicate how the network approach in general and the SNA in particular contribute to regulation research. The lessons learned from the empirical examples given in this paper have demonstrated several advantages of using SNA. Taking into account the previously mentioned limitations of this approach and its analytical tools the following advantages can be listed:

Firstly, using the network approach as an analytical framework and applying SNA techniques enable the investigation and the examination of abstract concepts that are frequently referred to in regulation studies, but not measured empirically as often. As can be seen from the examples, concepts such as frequency of interaction, resources distribution, power relations, dependency relationships and many others that often are difficult to express can be operationalised and measured quantitatively.

Secondly, applying SNA contributes to a better understanding of the way in which regulations are made and enforced. Focusing on the relational qualities of regulatory network actors brings new and different angles since it facilitates an integrated analysis of both individual actors and structural data. The examples provided reveal crucial information about both the overall network structure and the relational properties possessed by particular actors (e.g. the NTRA, the MCIT, and TE). This kind of information is hard to be obtained through the use of other theoretical atomistic approach.

Thirdly, the adoption of the network approach can also help in answering different questions which come at the heart of the regulatory process. For instance, by analysing concepts such as actors' 'power', 'positions' and 'influence' from a relational perspective many secrets related to the politics of regulation and regulatory processes can be exposed. The discussed examples demonstrated that some actors have a stronger bonds and closer relationships than others (e.g. TE and TEdata). Such a close relationship affects the way in which these actors interact with each other and in turn their ability to cooperate and coordinate in order to influence other actors' strategic choices and finally the outcomes of the regulatory process.

Fourthly, considering the abovementioned advantages of the network approach, it can be safely claimed that 'networks' are not jus metaphors or descriptive tools. Networks are no doubt, powerful descriptive tools; however, combining the qualitative and the quantitative aspects of network analysis together with the ability of the SNA to visualise interrelationships and interactions among regulatory network actors could definitely enhance the process of analysis.

In conclusion, the network approach and the SNA present a different picture of regulations and regulatory processes. This picture is more complicated but more

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[16] A possible explanation of this is that, following the regulatory reform and the separation of policy-making, regulatory, and operational functions, the role of MCIT has changed to one of establishing broad guidelines for other actors and following up their implementation. In other words, MCIT does not have its hands directly in the daily affairs of the Internet sector, as it needs to have a panoramic view of the development of the whole sector.

realistic. It can help us to see the whole forest instead of concentring only on the trees. It acknowledges the intrinsic nature of regulatory processes as being interactive phenomena. It also gives us some indications for the role of regulators in regulatory processes, the limitations of this role, the margin for manoeuvring, and ways for intervention to influence interactions. Therefore, by measuring the unmeasured properties of regulatory processes, the network approach can go one step further and add some value to the study of regulation.

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