Toward a New Institutional Economics Theory of Regulation

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Abstract

The New Institutional Economics (NIE) approach to regulation rejects the notion of optimal regulation. This paper aims to understand and to explain why and how there is no optimal regulation from the perspective of NIE. The paper analyzes and models the institutional design of the regulatory policy-making processes by treating regulation as an outcome of the interaction among the political institutions of regulation. This institutional interaction reveals transaction costs and the credibility of regulatory commitment in the regulatory process and thus, the quality of the institutional design of regulation. The paper discusses the institutional foundations of regulation and introduces a basic model that defines how the institutional structure will be designed for the optimal regulation, if possible. It seeks whether the first-best institutional design of regulation is possible or not and concludes that the first-best institutional design is not possible in the real world with transactions costs. Thus, the paper contributes to understand the institutional design of regulation from the perspective of NIE.

Keywords: Regulation, Institutions, Institutional Design, Transaction Costs, Credible Commitment

Jel Codes: L51, D02, D72

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1 Introduction

In the previous literature, the theories of government regulation such as the Public Interest Theory of Regulation and the Economic Theory of Regulation focused heavily on the demand side for regulation. This literature accepts that regulation is a product like a consumer good and is produced in the political markets. Regulation is demanded by in the regulated industry and is designed for benefit of the industry. Regulators are captured by the interest groups organized in the markets (Stigler 1971; Posner 1974; Peltzman, 1976; Becker, 1983). Differently, the incentive theory of regulation within this tradition studied the mechanism design of regulatory interaction between regulator and the regulated firm (Baron and Myerson, 1982; Baron, 1989; Laffont and Tirole 1993). Whereas the pre-New Institutional Economics (NIE) tradition explains the demand side of regulation, it viewed the supply side of regulation\(^2\) as a black box (Spiller and Tommasi, 2005). In order to open the black box, NIE, particularly Spiller’s studies, has initiated to analyze the supply side of regulation including the institutional fundamentals of regulation (Levy and Spiller, 1994; 1996; Spiller, 1995; Spiller and Tommasi, 2003; 2005; Spiller, 2012). Thus, the NIE approach has introduced a different perspective from other approaches to regulation by analyzing the institutional design of regulation.

From the perspective of NIE, regulation exists as an outcome of the interaction among the political institutions of regulation such as the legislature, the executive and the judiciary\(^3\). The NIE approach has analyzed the interaction among institutions that supply regulation. We can define it as the institutional interaction of regulation. The institutional interaction of regulation determines two principle components of the regulatory process revealing the attribute of regulation. These are transaction costs and regulatory commitment. In a sense, the NIE

\(^2\) In this paper, by the supply side of regulation, we mean the institutional structure of regulation, because the NIE approach to regulation considers it as an institutional design problem (Spiller, 2012).

\(^3\) Levy and Spiller (1994) and Spiller (1995) expresses that the institutional structure of a country consists of five elements including these institutions.
approach deals with to analyze the supply side of regulation from the viewpoints of transaction costs and regulatory commitment. This paper also analyzes the institutional interaction of regulation in terms of transaction costs and regulatory commitment. Interesting in the supply side of regulation, but not the demand side\(^4\), the paper aims to contribute to open the black box of regulation from a perspective of the NIE.

The concepts such as transaction costs and regulatory commitment have been engaged in to analyze regulation within the current literature of NIE (Spiller, 2012; Levy and Spiller, 1996; Spiller, 1995). Similarly, some studies within the literature of NIE examined the roles of legislature, executive and judiciary in the regulatory process (Epstein and O’Halloran, 1997). However, these studies focused on merely the interaction between two of them such as the legislature and the executive, or the legislature and the judiciary (Figueiredo and Tiller, 1996; McNollgast, 1987; 1989; Tiller and Spiller, 1999; Rogers, 2001; Maskin and Tirole, 2004). To our knowledge, there is no study that models regulation by constructing a linkage between the aforementioned institutional interaction and transaction costs and regulatory commitment as the main tools of the NIE approach. For the first time, this paper tries to explain regulation by taking into consideration the interaction between three of these institutions, but not the two, and by combining this interaction with transaction costs and regulatory commitment. We present a basic model that defines and explains the institutional design of regulation from the perspective of NIE. The aim is to combine this desultory literature on the analysis of institutional fundamentals of regulation and to construct a general theory of the NIE approach to regulation.

The paper consists of five sections together with introduction. In section two, we survey the related literature for understanding the lack of the current analysis of regulation. The section includes the survey of alternative approaches to regulation by making a distinction

\(^{4}\) Due to we are not interested in the demand side of regulation, our analysis don’t include the effect of the politics of interest groups on the regulatory policy-making process.
between the pre-NIE regulation literature and the post-NIE literature in order to show the
different of the NIE approach from alternative approaches to regulation. Section three focuses
on the nature of the institutional design of regulation. The section considers the importance of
transaction costs and regulatory commitment as two useful tools of NIE in the institutional
design of regulation. Section four explains the roles of legislature, executive and judiciary as
the political institutions in the separation of powers system, because regulation in the modern
societies is designed in the separation of powers system (Epstein and O’Halloran, 1997;
Estache and Martimort, 1999). Section five constructs a basic model of regulation from the
perspective of NIE by defining the institutional design of regulation. Through this model, the
paper reveals whether the efficient institutional design of regulation is possible or not and
there is the optimal regulation or not. The paper aims to contribute to the literature by
constructing a model that clarifies the supply/institutional side of regulation that has been
treated as the black box by the pre-NIE literature. The paper ends with a conclusion.

2 The Pre- and Post-NIE Literature on Regulation

2.1 The Pre-NIE Literature on Regulation

Until the present, the different approaches have been used to explain regulation and the
different theories of regulation have occurred. The literature of regulatory economics has
provided a giant support for understanding government intervention in the economy. The
public interest theory of regulation justified the necessity of regulation due to market failures
(Joskow and Rose, 1989). This approach had been criticized and rebutted by the empirical
(Stigler, 1971; Posner, 1974) and theoretical studies (Demsetz, 1968; Baumol, 1977; 1982).
Currently, the related literature accepts that the public interest theory does not actually include
market failure phenomena (Hantke-Domas, 2003; Çetin and Ertigit, 2013).
This debate brought about the rise of the economic theory of regulation. This approach is supported by the Chicago school, public choice theory, and relatively Austrian economics. The economic theory of regulation *de facto* began with the seminal paper of George Stigler in 1971. Its most important support to the literature is the analysis of political behavior in the regulatory process. Accordingly, regulators, like the other private agents of economic activity, are presumed to be self-interested maximizers. Special interest groups can manipulate the regulatory outcomes by pressuring to regulators or influencing them (Peltzman et al., 1989). Regulation is carried out by manipulation of the regulated industry, but not a market failure, like natural monopoly. As a rule, state regulation is implemented not because it is needed, but because it is demanded by the regulated industry and is operated primarily to the benefit of the regulated industry (Stigler, 1971; Posner, 1974).

Regulation is a commodity produced in the political market, including voters on the demand side and their representatives on the supply side (Peltzman, 1976). Becker (1983), by going the Peltzman’s analysis forward, emphasized the competition among pressure groups. Politicians and bureaucrats in the political market carry out the political allocation of wealth through the competition among pressure groups (Becker, 1983: 396). The rent-seeking approach of the public choice theory followed the private interest theory of regulation that observes the demand side of regulation. According to the public choice theory, the regulatory process will transform a rent seeking process with the pressure of interest groups and will never ensure the first-best policy on the contrary the foresight of the public interest theory of regulation (Tullock, 1967; Krueger, 1974; Levine and Forrence, 1990). Another contribution to the economic theory of regulation came from Austrian economics, which accepts regulation as a political impetus that reallocates property rights and wealth in the society. Accordingly, regulation occurs in an entrepreneurial and dynamic process in which bureaucrats, regulators, and firms strive to maximize their self-interests (Benson, 1984; 2002, Bootke and Lopez,
2002; Parker, 2002). Consequently, the theories of regulation before the NIE approach have accomplished to demonstrate the failure of regulation, but have treated the institutional structure of regulation as given and have neglected the supply side of regulation. The institutional analysis of regulation was treated as a black box by this literature (Spiller and Tommasi, 2005).

2.2 The Post-NIE Regulation

Because NIE has initiated to open the black box of regulation by analyzing the institutional interaction within the supply side of regulation, the NIE approach differs from other approaches to regulation. The main component that differentiates the NIE approach from alternative approaches to regulation is that it is interested in the determinants of institutional structure and regulatory performance in the regulatory policy-making processes (Spiller, 2012). Institutional determinants refer to the distinctive characteristics of the supply side of regulation and these characteristics mean the nature of the institutional interaction.

The importance of regulation stems from the interaction between the regulatory process and investor. Regulation by this interaction directly affects the economic performance of the country, especially investments in the public utility industries. Due to investments in these industries include high fixed and sunk costs, investors are directly interested in the institutional quality of the regulatory structure. The nature of the institutional interaction of regulation reveals the institutional quality of the regulatory structure. On one hand, while investors expect the regulatory institutional environment with a low transaction costs, on the other hand, they want a credible regulatory commitment on their capital assets by the institutional structure of regulation. The NIE approach builds its framework on the institutional analysis of regulation as per this interaction. It considers regulation as the governance structure of these interactions and focuses on the institutional characteristics of
contractual hazards inherent to these interactions. The hazards could be qualified as governmental and third party opportunism. As they vary across sectors, their intensity varies with the institutional nature of regulation. Thus, the emphasis of the NIE approach on contractual hazards in the institutional design of regulation differentiates it from the aforementioned approaches (Spiller, 1995; Spiller, 2012).

However, this paper differs from the previous literature, including the current NIE approach as well. While the emphasis of the current NIE literature is only on the hazards characterizing the particular government and investor interactions, we focus on the interaction among the political institutions of regulation, but not the interaction between regulator and investor\(^5\). Moreover, we think that, in order to construct a more general theory of the NIE approach to regulation, it is needed to model the institutional determinants of regulatory performance by taking into account transactional hazards characterizing the institutional interaction of regulation and what regulatory commitment means for the success of regulation in terms of institutional design. For that reason, we try to define the efficient of regulation by means of transaction costs and regulatory commitment and to understand what the different institutional structures of regulation mean in terms of the institutional design and performance of regulation.

### 3 The Nature of the Institutional Design of Regulation

In order to elucidate the institutional design of regulation, we have to understand how regulation is determined by the institutions of regulation and what transaction costs and regulatory commitment mean in the regulatory policy-making process from the perspective of NIE. This requires a micro-analytical approach (Spiller, 2012). That is, the political institutions of regulation, the interaction among these institutions, transaction costs and

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\(^5\) Some studies within the current literature clarified the importance of the interaction between regulator and investor in terms of the NIE approach to regulation (Spiller, 1995, Levy and Spiller, 1996).
regulatory commitment occurring in the regulatory policy-making processes, and the maximization of utility principle becomes fundamental for understanding regulation.

By employing this micro-analytical approach, we can define regulation. Figure 1 presents a framework that defines the institutional nature of regulation. As seen in the figure, regulation is determined by the legislature, the executive or independent regulatory agencies (IRAs), and the judiciary as the political institutions of regulation. At the same time, the figure indicates that the interaction among these institutions establishes transaction costs and regulatory commitment in the regulatory policy-making processes in a country. In that case, it is needed to explain what the role of the political institutions of regulation in a regulation game is and what transaction costs and regulatory commitment mean in this game.

*Figure 1 The Institutional Nature of Regulation*[^6]

![Diagram of institutional nature of regulation](image)

3.1 Transaction Costs

As in Spiller (2012) and Spiller and Tommasi (2003), regulation can be explained in the standard transaction costs arguments. If the institutional environment of regulation facilitates

[^6]: This figure and the framework presented here are drawn from Çetin (2007).
political cooperation in the institutional interaction, transaction costs in the regulatory process will relatively be low. In such an environment, it can be expected that relatively efficient and adaptable regulatory policies can be implemented. On the other hand, when the institutional environment of regulation does not facilitate cooperation, regulation will be implemented with transactional hazards. Transaction costs in the regulatory process will be relatively higher than the former case (Spiller and Tommasi, 2003: 287).

It is possible to see a great deal kind of transaction costs existing with different forms in different areas, if we define transaction costs as cost of transacting or exchange in any market like a used-car market or the politics market. It can roughly be mentioned three forms of transaction costs; search costs, bargaining costs, and enforcement costs. Additionally, transaction costs are always positive when there are hostile, many and unfamiliar parties, unique good or service, unreasonable behavior, delayed exchange, numerous contingencies, high costs of monitoring, and costly punishments (Cooter and Ulen, 2004).

We interest in transaction costs occurring in the regulatory process. They mean the cost of operating a regulatory process and the cost of reaching and enforcing regulatory contract. That is, transaction costs in the regulatory policy-making are concerned in the contractual nature of regulation. Regulatory contracts are incomplete due to the institutional weaknesses of regulatory policy-making (Laffont, 2005). The level of transaction costs in the regulatory process that depends upon the institutional design and institutions of regulation in a country are among the foremost factors that shape the design (Menard and Shirley, 2005). Because transaction costs in contractual interactions have implications to ensure the optimal design of regulation, transaction costs in all contracts are unavoidably positive in the real world. As a result, incompleteness in the regulatory contract refers to the institutional weakness or failure of regulation (Estache and Wren-Lewis, 2009). It is clear that the institutional interaction of
regulation includes transaction costs and its institutional design affects the magnitude of transaction costs (Levy and Spiller, 1996).

### 3.2 Regulatory Commitment

The second concept used in the analysis of the institutional foundations of regulation is regulatory commitment. The institutional design of regulation can influence the performance of regulation by also determining regulatory commitment such as transaction costs. As expressed by Estache and Wren-Lewis (2009), an institutional failure or weakness affecting regulation can lead to limited credibility. When the limited regulatory credibility injures the success of institutional design, this will negatively influence the decisions of investors.

Credibility of the institutional design of regulation in public utility regulation is specifically a crucial factor in the realization of investments requiring high fixed and sunk costs. The success or failure of regulation in the case of public utilities depends on whether there is a credible commitment on investments. Governments can manipulate the process of pricing policy in the public utility industries and expropriate the firm’s assets with sunk cost by altering regulations (Levy and Spiller, 1996; McChesney, 1987). However, firms expect to gain a fair rate of return on their investment costs. They will not be able to invest now and hereinafter if this return is not committed or if their assets are expropriated through regulation. It should be expected that governments use this discretion where costs of the institutional manipulation of the regulatory process are so low and the expected utility of such arbitrary discretion is too large (Levy and Spiller, 1996). The ill-designed institutional structure of regulation gives rise to such an environment. The problem of regulatory commitment in public utility regulation is a consequence of the very nature of the regulatory policy-making.

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7 In the previous literature on regulation, among others, Laffont (2005) explains the problems of limited credibility through the interaction between regulator and the regulated firm that play a role in the regulatory contract. Differently, this paper focuses on the problems occurring during the institutional interaction of regulation.
processes (Majone, 2001). Simply, if there is no a credible regulatory commitment on the capital assets of investor, firms cannot realize the long-termed and sunk-cost investments (Baron, 1995). This means that regulatory commitment is a meaningful tool for understanding institutional design that determines the performance of regulation.

Accordingly, a major task of the institutional design of regulation is to ensure a credible regulatory commitment. Without a credible commitment, the expectation of a future regulatory policy reversal may become a self-fulfilling prophecy, defeating the purpose of regulation. Such a credibility problem is more important than in the worldwide movement towards reform in the public utility sectors. Because investments with high fixed and sunk cost in the public utility sectors are very long-lived, the institutional design of regulation that fails to commit credibility on sustainability of these investments cannot trigger long-term investments. Institutional weakness in the regulatory process would easily turn into political backlash against the regulatory process in the related country (Spiller, 1995).

Regulatory commitment has two sources. These are institutional environment and regulatory governance. As a component of regulatory design, regulatory governance composes of the regulatory structures like the separation of powers that a country employs to limit regulatory discretion and to solve conflicts in the institutional design of regulation with a highly centralized government. Unless the political institutions of regulation ensure the isolation of arbitrariness from the regulatory process, regulation may not attract the high levels of investments and welfare expected from private sector participation. On the other hand, there is reciprocity in this interaction. The institutional design of regulation can restrain regulatory governance (Spiller, 1995; Levy and Spiller, 1994). For those reasons, a well-designed institutional environment in the regulatory policy making-processes is needed to maximize credible commitment and to minimize transaction costs. As a result, we have to use

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8 However, Spiller (1995) expresses that they may provide substantial incentives for investment, although some countries might have regulatory regimes that restrict regulatory commitment.
transaction costs and regulatory commitment for understanding the effect of the political institutions of regulation on the outcome of regulation.

*4 The Role of Institutions in Regulation Game*

Traditionally, a major cause of high transaction costs and incredible commitment in the regulatory process is the presence of unified state. The tradition of unified state includes governmental and third party opportunism. By contrast, the explicit separation of powers within the institutional design of regulation can lower transaction costs and ensure a credible regulatory commitment. The separation of powers can limit to governmental opportunism and provide more assurances to investors than a highly centralized government or unified state. The executive, by exercising its control over the legislature, can limit to the opportunistic use of legislative powers. An independent judiciary, by reviewing the decisions of the legislature, can impede governmental and third party opportunism (Spiller, 2012). It is accepted that the separation of powers can minimize transaction costs and ensure a credible regulatory commitment.

For that reason, in the modern societies, regulation is rarely implemented directly by the politicians themselves. It is heavily determined by the actual and anticipated interactions among the multiple institutional players of regulation. Generally, politicians share the regulatory power with regulatory agencies, departments, or the courts (Spiller, 1990; Epstein and O’Halloran, 1997). Because the institutional structure of regulation is designed as per the separation of powers, the separation of powers is naturally important and fundamental in the regulatory process. The political institutions of a country that determine the supply of regulation are composed of the legislature, the executive and the judiciary⁹. These institutions

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⁹ In the modern separation of powers system, there are two alternative methods for specifying the details of regulatory policy. If regulation is performed through legislation, this refers to legislative policy making. On the other hand, if regulation is carried out by executive agencies, this system means the regulatory policy making (Epstein and O’Halloran, 1997).
are the political institutions of regulation and the interaction among institutions means the institutional interaction of regulation. The political institutions of regulation are the main players that play a crucial role in the regulatory policy-making. Government regulation is an outcome of the institutional interaction among these players (Tomain and Shapiro, 1997).

The form and interaction of these institutions influences the regulatory policy and the nature of regulatory issues. The context of rules surrounding the regulatory policy and structures governing the institutional interaction of regulation determines the performance and quality of regulation. The NIE approach to regulation is therefore interested in the separation of powers as providing the institutional environment in which various institutional players have to operate to achieve their individual and institutional goals (Peabody and Nugend, 2003). Since the different individual preferences and institutional goals mean the high transaction costs and incredible commitment in the regulatory policy-making game. For that reason, from the perspective of NIE as a modern approach, the separation of powers is also not enough fully to minimize transaction costs and to ensure credible commitment in the regulatory process. Even under the separation of powers system, transaction costs are always positive. For example, interest groups can capture bureaucracy and legislation. Likewise, the judicial process can be shaped by the personal opinions and ideologies of the judges (Gely and Spiller, 1990).

In sum, from the perspective of NIE, the separation of powers is needed to limit governmental and third party opportunism in the regulation game, but is not sufficient for zero transaction costs and the highest level of credible commitment. The regulatory structure has to be shaped in this connection. For the best regulatory policy, the institutional structure of regulation has to be designed optimally by the institutions of regulation. In doing so, the regulatory institutional structure of the government and investor interaction that is threatened by governmental and third party opportunism can efficiently be designed. The regulatory
performance is depended on the regulatory institutional structure’s ability to provide a credible commitment against governmental opportunism and the potential threats from third party opportunism (Spiller, 2012). Likewise, the institutions of regulation can play a crucial role in reducing transaction costs as well (North, 1991). For this aim, the powers and functions of the political institutions of regulation have to be established well.

4.1 The Legislature

The political processes refer to an ambiguity world (Schwartz et al., 1994). Because transaction costs in political markets are high more than in the economic sphere, political markets are far more prone to inefficiency (North, 1990). Politicians can manipulate regulation for their political ends and regulation is highly able to be politicized (Williamson, 1999). When politicians expropriate the capital assets of investors and violate property rights through regulation, they can cause the regulatory processes with high transactions costs and incredible commitment in terms of economic players. For that reason, the most important responsibility in the regulatory process belongs to the legislature. The aim of the legislature is to ensure a credible regulatory commitment and to minimize transactions costs of regulation.

Firstly, because the legislature is the principal player of regulation, it decides the general regulatory outlook and agenda. The legislature decides whether public utilities will be privatized or not. Secondly, the legislature has to establish a regulatory institutional structure that constitutionally defines and protects property rights and contracts. The ill-defined property rights and incomplete contracts refer to an incredible regulatory environment. In such an environment, transacting will be costly. The strength of constitutional rules that define and protect property rights and contracts against governmental opportunism does not only minimize transaction costs, but can also establish a credible commitment by preventing the political attraction of rent-extraction strategies on returns to private capital (McChesney,
1987). Lastly, the legislature has not to be the only regulatory policy-maker in the regulatory process. Instead, the regulatory policy-making discretion has to be shared with more credible institutions. In particular, in the regulatory environments with an independently elected executive such as IRAs, the task of secondary legislation concerning regulation is assigned to IRAs.

4.2 The Executive

In the modern societies, the regulatory policy-making power or political property rights are delegated to the executive or IRAs that have expertise and technical knowledge that the legislature desires to use in the regulatory policy-making process (Lupia and McCubbins, 1994; Ogus, 1994). The delegation of policy-making power to IRAs reduces the political transaction costs of regulation (Majone, 2001). On the other hand, governments, by establishing IRAs, can send a strong signal to the economy and does not interfere in operational affairs related to the market processes for political ends. Because the delegation of regulatory power to IRAs can ensure a credible commitment, it is a feasible and popular method for a credible regulatory commitment. However, there are necessary conditions in order to ensure regulatory commitment in a system with IRAs. One of them is the independence of IRAs. The independence of IRAs is the crucial component of an efficient regulatory process. The independence of IRAs that reduces political transaction costs is a precondition of credible commitment in the regulatory process. On the other hand, in order to

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10 Indeed, an argument for credible commitment is the time-inconsistency or the political uncertainty in the policy making-process (Majone, 2001; Moe, 1990). In modern democracies, principals are elected for a particular time period at regular intervals. While today’s politicians can exercise the political property rights at present, other ones with different and perhaps opposing interests can acquire the right at next elections. Then today’s political preferences are most probably subverted legally by tomorrow’s political authority (Moe, 1990). In such cases, elected politicians cannot ensure a credible commitment in long-run policies and the political property rights amounts to the discretionary powers. Delegation of the regulatory discretion to IRAs can solve such a time-inconsistency problem. But, it is needed to pay attention that the policy-making power has to be delegated necessarily to IRAs, but not an administrative agent. Because, when short-run policies in the institutional structure of the regulatory process deviate from the stable long-run policies, only an independent delegate can provide credible commitment in the long-term (Majone, 2001).
ensure a credible regulatory commitment, the legitimacy of IRAs also has to be guaranteed procedurally and substantively by political principals\(^\text{11}\) (Majone, 2001).

The executive structure and process is established with the aim of bureaucratic agencies responsive to the will of the legislature (McCubbins, 1985; Epstein and O’Halloran, 1999). This structure constitutes a form of the delegation of regulation. In this structure, the task of the executive is to implement the main regulatory policy or legislation decided by the legislature. The executive, particularly IRAs, only decides the secondary regulatory statutes that are compatible with the primary regulatory policy of the legislature. On the other hand, the delegation of discretion to the executive is subject to amendment and authorization by the legislature. The legislature determines the administrative structure and process that the executive has to abide. As a result, in the regulatory process, the legislature is principal and the executive is agent (McNollgast, 1987; 1989).

\subsection*{4.3 The Judiciary}

The last institution that is plays a role in the institutional design of regulation is the judiciary. The main task of the judiciary in the regulatory process is to review whether regulation is compatible with the constitutional structure of the country. The judiciary can also play a role as a rule maker in the regulatory process. The courts can annul and shift by reinterpretating regulatory laws (Spiller, 1990; Rogers, 2001; Stephenson, 2003). In the majority of cases, the implementation of regulations has a legal effect only through the courts. The judiciary can nullify legislation or regulations enacted by the legislature (Landes and

\(^\text{11}\) The well-designed institutional environment ensures both procedural and substantive legitimacy. The institutional environment that is created by democratically enacted statutes can ensure procedural legitimacy. On the other hand, the fully delegation of political property rights to IRAs is the guarantee of the agent’s independence. The guarantee is particularly strong when the legal basis of the transfer is not a statute, but a constitutional provision (Majone, 2001). The regulatory discretions and responsibilities of politicians and IRAs in the regulatory process need to be defined and be protected by the Constitution of the country. When the constitutional delegation of political property rights to IRAs limits to third party opportunism, the institutional design of regulation will ensure a credible regulatory commitment and minimize transaction costs. On the contrary, the uncertainty created by the ill-defined political property rights in the regulatory process can impede regulatory commitment and lead to high transaction costs.
Posner, 1975). Likewise, lobbying by interest groups on the legislature and the executive for a special interest may be negated only through the courts by declaring this action null and ineffective (Cross, 2003). In that case, the judiciary can obstacle the manipulation of the regulatory process by the rent-seeking activities of interest groups legislation through playing a role as a check and balance mechanism on the legislature and executive branches (Macey, 1988). An independent judicial review is necessary for a regulatory process with credible commitment and low transaction cost. Legislative and administrative processes with judicial review may provide substantial regulatory commitment and minimize transaction costs in the regulatory environments characterized by the explicit separation of powers12 (Spiller and Tommasi, 2005).

Consequently, we divide the institutions of regulation into three branches: as the legislature, the executive and the judiciary. The legislature decides the primary regulatory policy and makes the laws that are fitting to those policies. The executive put in force the laws and decides the secondary regulatory statutes that are compatible with the primary regulatory policy. In particular, the IRAs exactly act as such. The judiciary reviews the laws. Thus, in the model of the separation of powers, the regulatory policy is carried out by the political institutions of regulation and the function of each institution is different. Each institution is independent from the other. However, they have to interact with each other for a successful regulatory performance.

5 The Design of the Institutional Structure of Regulation: The Basic Model

By using discussion and inferences above as a background, we can construct a model for understanding the institutional design of regulation. The analysis of the supply of regulation is an institutional design problem. An important component in the institutional design of

12 However, Landes and Posner (1975) and Crain and Tollison (1979) argue that, even under the separation of powers system, politicians and interest groups can manipulate to maximize their self-interests legislative activities.
regulation is regulatory governance and it is shaped by the institutional structure of regulation (Levy and Spiller, 1994; Spiller, 1995; Spiller and Tommasi, 2005). Regulation can be modeled as a product that is produced by the institutional interaction of regulation. As illustrated in Figure 1, because regulation is a policy occurring as the outcome of interaction between the legislature, the executive-IRAs and the judiciary under the separation of powers system, we accept regulation as an outcome of a game with three players. Hence, we introduce a regulation function as per the interaction among the political institutions of regulation as:

$$\mathcal{R} = \mathcal{R} (L, E, J)$$

Accordingly, regulation ($\mathcal{R}$) is determined by the legislature ($L$), the executive ($E$) and the judiciary ($J$). The interaction between $L$, $E$, and $J$ reveals the transaction costs and regulatory commitment of the regulatory process and the utility resulted from the regulation outcome is defined over per-transaction costs and regulatory commitment. Transaction costs reduce and regulatory commitment increases when the expected compromise between $L$, $E$, and $J$ is fulfilled. The confrontational institutional interaction of regulation increases transactions costs and reduces regulatory commitment. This means that there is a trade-off between transaction costs and regulatory commitment in the regulatory process.

Accordingly, we assume that there exists a trade-off between transaction costs and regulatory commitment at the different decision points of regulation. Figure 2 illustrates that there is negative correlation, therefore a trade-off between transaction costs and regulatory commitment in the regulatory process, *ceteris paribus*. For example, while the regulation for levels $TC_0$ and $RC_0$ is the point $a$, an equilibrium, a change in the regulation level on the curve $R$ shifts the combination of regulatory commitment and transaction costs. While regulation moves from $a$ to $b$, a decrease from $RC_0$ to $RC_1$ and an increase from $TC_0$ to $TC_1$ will occur.
The game defined here, where the agents are $R$, $L$, and $J$, is a non-cooperative game since every agent aims to maximize his own utility. Because we don’t try to analyze this interaction only over a game theoretical model, to get rid of many technical details, as we discussed in the previous sections, it is assumed that the utility of all agents are in line with the public utility of regulation outcome, without giving explicit utility functions for each agent. Therefore, we can conclude that with the Nash Equilibrium of this game, the optimum point for both the institutional design of regulation and individuals will be attained, since the equilibrium maximizes both the utility of agents and the public utility resulting from the regulation outcome. In other words, with the assumption that the utility of institutions are positively correlated with the public utility of regulation, we can conclude that when a point is achieved as equilibrium of this game, it is the outcome where the utility of all agents are maximized. However, we will claim that this point may not be Pareto-efficient in this model, as it is in most of cases.

The aim of this modeling is to analyze whether the institutional design of regulation is efficient or not. We define the efficiency of the institutional design of regulation through the
utility resulting from regulation. We say that efficiency is achieved, if the interaction among institutions results into the best outcome in terms of the utility of regulation. The utility of regulation will be defined more formally below. At this point, to emphasize, there will be no deviation from the outcome of the regulation game if the utility of agents are same with the public utility of regulation, which directly implies that the outcome will be a Nash Equilibrium even that it is not Pareto-efficient.

The model will be analyzed from two different points of view. Firstly, through defining several outcomes at the different points of regulation, we investigate the Pareto-optimality of regulation by using Kameda (2005) and Kameda et al., (2012). Secondly, we aim to explore the decision point through Nash Equilibrium analysis. Hence, with these two investigations, we want to clarify the Pareto-efficient Nash Equilibrium which is the best outcome in terms of designing the institutional structure of regulation in the real world.

5.1 A General Framework of the Regulation Game

We can construct a framework to model the regulation game. Figure 3 presents this framework for understanding how the regulatory policy is decided by L, E, and J, as the players of game and what it means in terms of regulatory commitment and transaction costs. We called the players L, E, and J as the political institutions of regulation earlier. In the figure, let λ and θ represent regulatory commitment and transaction costs, respectively. Points a, b, c, and d in the figure refer to the different points of regulatory decisions such as \( \mathcal{R} \). Four possible points (a, b, c, and d) are represented in the figure as the decision points of regulation (\( \mathcal{R} \)). Each of the points shows the different regulatory processes that L, E, and J may face. Points a, b, c and d for each different \( \mathcal{R} \) mean several regulation outcomes at the different decision points of regulation.
We use classic Von-Nuemann expected utility function which is also linear. Since the interaction among players determines λ and θ of $\mathcal{R}$, the utility of regulation is determined by $(\lambda - \theta)$. Hence, the utility of regulation at each point is represented by $U_{\mathcal{R}}(X_Z)$, where the value of $X$ is determined by $(\lambda - \theta)$.

$$U_{\mathcal{R}}(X_Z)$$

$$U_{\mathcal{R}}(\lambda - \theta)$$

While the regulatory process for each point $\mathcal{R}$ goes from $d$ to $a$, $\theta$ reduces and $\lambda$ increases. Since, while point $d$ means the bad performance of the institutions of regulation, point $a$ represents the first best regulatory policy and thus, a successful performance of the regulatory institutional structure. In that case, we can define the each point of regulation in terms of transaction costs and regulatory commitment.

$\lambda$: $0(d) \rightarrow 3(a)$

$\lambda < \lambda^1 < \lambda^2 < \lambda^3$

and

$\theta$: $3(d) \rightarrow 0(a)$

$\theta^3 > \theta^2 > \theta^1 > \theta$
So, while the regulatory decision-making process approaches from \( d \) to \( a \), we can express that \( \theta \) reaches the minimum level and \( \lambda \) to its maximum. According to the model, the accordance among the institutions of regulation increases, while regulation gets closer to \( a \) and \( a \) will be the decision point. Also, we can define regulation in terms of \( \lambda \) at the decision points of regulation, \( a, b, c \) and \( d \), respectively as:

\[
\begin{align*}
\lambda^3_R(a) \\
\lambda^2_R(b) \\
\lambda^1_R(c) \\
\lambda_R(d)
\end{align*}
\]

While the points of regulatory policy-making goes from \( d \) to \( a \),

\[ R(d) \rightarrow R(a) \]

We can write:

\[ \lambda_R(d) < \lambda^1_R(c) < \lambda^2_R(b) < \lambda^3_R(a) \]

Similarly, we can define regulation in terms of \( \theta \) at the decision points of regulation, \( a, b, c \) and \( d \), respectively as:

\[
\begin{align*}
\theta_R(a) \\
\theta^1_R(b) \\
\theta^2_R(c) \\
\theta^3_R(d)
\end{align*}
\]

While the points of regulatory policy-making goes from \( d \) to \( a \),

\[ R(d) \rightarrow R(a) \]

We can write:

\[ \theta^3_R(d) > \theta^2_R(c) > \theta^1_R(b) > \theta_R(a) \]

Point \( a \) is the regulation outcome where the expected net utility in a new policy-making is maximum. Now, we can write the net expected utility in the regulatory policy-making
according to \( \theta \) and \( \lambda \). If decision for regulation results in point \( a \), the expected utility for regulation is

\[
U_R(a) = (\lambda^3 R(a) - \theta R(a))
\]

Similarly, the utility at point \( b \) is,

\[
U_R(b) = (\lambda^2 R(b) - \theta^1 R(b))
\]

the utility at point \( c \) is,

\[
U_R(c) = (\lambda^1 R(c) - \theta^2 R(c))
\]

and, the utility at point \( d \) is,

\[
U_R(d) = (\lambda R(d) - \theta^3 R(d))
\]

Then, the order of the net expected utility for regulation (\( R \)) that is carried out as a result of the interaction between \( L, E, \) and \( J \) at each point is, in turn:

\[
U_R(a) > U_R(b) > U_R(c) > U_R(d)
\]

Also, we can rank the utility of regulation in terms of the set of the possible outcomes of regulation as:

\[
U_R(a) > U_R(b) > U_R(c) > U_R(d)
\]

While regulation moves ahead point \( a \), a trade-off between \( \theta \) and \( \lambda \) is observed. The maximum level of the net expected utility for regulation is point \( a \) where \( \lambda \) reaches to maximum level (3) and \( \theta \) is at minimum level (0). Therefore, for the first best policy of regulation, the regulation policy has to be fulfilled at point \( a \). Is this actually possible?

### 5.2 Pareto Optima for Regulation

By following Kameda (2005), in our model, we can define four states (achievable and unachievable) of the regulatory policy, \( U_R(a) \), \( U_R(b) \), \( U_R(c) \), and \( U_R(d) \). Figure 4 illustrates the payoff matrix revealing the utility of regulation at each decision point. We can use this
illustration to define the Pareto optima for the decision points of regulation. If $U_R(a) > U_R(b) > U_R(c) > U_R(d)$, therefore $U_R(a)$ is Pareto superior to $U_R(b)$, $U_R(c)$, and $U_R(d)$. Or, $U_R(b)$, $U_R(c)$, and $U_R(d)$ are Pareto inferior to $U_R(a)$, since $U_R(d) < U_R(c) < U_R(b) < U_R(a)$. By using the set of these solutions, we can define strong Pareto superiority or inferiority and thus, the efficient and inefficient points of regulation. Accordingly, when we define $k_i$ as $U_R(a)/U_R(b, c, or d)$, then $U_R(a)$ is Pareto superior to $U_R(b)$ and the other points, if and only if $k_i > 1$ for all the points of regulation $a$, $b$, $c$, and $d$. Note that, we can have this conclusion, since the ordinal preferences of institutions on decision points are determined by the utility of regulation. Or, if and only if $k_i < 1$ for all the points of regulation $a$, $b$, $c$, and $d$, then $U_R(b)$ and the other points are Pareto inferior to $U_R(a)$. Thus, we can define strong Pareto superiority and inferiority. $U_R(a)$ is strongly Pareto superior to $U_R(b)$, $U_R(c)$, $U_R(d)$ and $U_R(b)$, $U_R(c)$, $U_R(d)$ are strongly Pareto inferior to $U_R(a)$. According to this definition, we can infer that $U_R(a)$ is the Pareto efficient point of regulation, while $U_R(b)$, $U_R(c)$, and $U_R(d)$ are the Pareto inefficient points of regulation.

Figure 4 The Payoff Matrix for the Utility of Regulation
Although $U_{\mathcal{R}}(a)$ is the Pareto efficient point of regulation, this solution is not a realistic one. Because, from the perspective of NIE as elaborated above, $\theta$ within the regulatory institutional structure in the real world is inevitably positive, it is not possible that the politics of regulation is decided at point $a-R$ with ($\theta = 0$). Consequently, a Pareto superior or efficient regulatory policy is a utopian and hypothetical equilibrium for the regulatory processes in the real world. Instead, a compromise among the institutions of regulation at the closest point to $a-R$, where $\theta$ is 0, means the Pareto efficient regulatory process of the real world from the perspective of NIE. Because of there is no a world, in which $\theta$ is 0, in other words, it is imperative to prefer the second best rather than the first best for the institutional design of regulation. As shown in figure 3, this point corresponds to $b$ ($(2 = \lambda^3) \ b \ (\theta^l = 1)$) rather than $U_{\mathcal{R}}(a) \ (\lambda^3_{\mathcal{R}}(a) - \theta_{\mathcal{R}}(a))$. In figure 4, this point corresponds to $b$, where $\lambda$ is still bigger than 0, but not 0.

However, the second best regulatory policy can still refer to the Pareto superior equilibrium of regulation. Because $U_{\mathcal{R}}(b)$ is Pareto superior to $U_{\mathcal{R}}(c)$ and $U_{\mathcal{R}}(d)$, except for $U_{\mathcal{R}}(a)$ that is impossible in terms of parameters $\lambda$ and $\theta$. If we exclude the equilibrium point of $a$, which can be achieved only hypothetically, and $U_{\mathcal{R}}(a)$ from game by accepting that the political institutions of regulation in the real world cannot reach to point $a$, the set of probable outcomes will consist of $U_{\mathcal{R}}(b)$, $U_{\mathcal{R}}(c)$, and $U_{\mathcal{R}}(d)$. In that case, $U_{\mathcal{R}}(b)$ is Pareto superior to $U_{\mathcal{R}}(c)$ and $U_{\mathcal{R}}(d)$. Hence, the first best regulatory policy of the real world should be evaluated by making a distinction between the utopian and hypothetical Pareto superior equilibrium and the Pareto superior equilibrium of the real world. This outcome suggests that the first best Pareto superior equilibrium may not exist for the regulatory policy in the real world. The first best regulatory policy of the real world is the second best Pareto superior equilibrium of regulation. In other words, whereas the regulatory policy corresponding $U_{\mathcal{R}}(b)$ is hypothetically Pareto inferior to $U_{\mathcal{R}}(a)$, it is realistically a Pareto superior equilibrium to
U_{R}(c) and U_{R}(d). This solution shows that U_{R}(a) is the utility resulting from an unachievable Pareto superior equilibrium in terms of four probable states of the regulatory policy, whereas U_{R}(b), U_{R}(c), and U_{R}(d) are the set of achievable utilities resulting from Pareto inferior equilibria. Among these inferior ones, the superior one is the utility resulting from point \( b \).

The solution also means that the NIE approach is different from the perspective of Neoclassical Economics in explaining the economic issues, since according to Neoclassical Economics by using tools of game theory, in the real world we should expect that the first best outcome should be observed. However, from the perspective of NIE, we can make a distinction among the decision points in terms of whether they can be observed in the real world or not. Hence, when we exclude some decision points, we can conclude that the point \( b \) can be achieved as equilibrium. Note that, the point \( b \) is worse for all agents, therefore one can make a single deviation to point \( a \), when the point is not excluded but when it is not available the point \( b \) becomes both Nash Equilibrium and the Pareto-efficient point. It is the second best solution, however as we explained above the first best solution is not attainable.

### 5.3 Nash Equilibria for Regulation

We defined the Pareto superior/efficient and inferior /inefficient equilibria of regulation. However, it is difficult to say that there is a standard Nash equilibrium in terms of game theory in our model. Since a game has three components: agents, actions and preferences. Although we have not defined the preferences and actions clearly in our model to maintain simplicity\(^{13}\), the necessary assumptions and framework to analyze the Nash equilibrium of the game are attained. First, note that we defined four possible outcomes \( a, b, c \) and \( d \) by

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\(^{13}\) Clearly, in the model, we don’t define the utility of regulation by taking into account a set of strategies defined by the profiles of the political institutions of regulation as players. Instead, we define the utility of regulation as per the different values of \( \theta \) and \( \lambda \) occurred in the different equilibria corresponding each regulatory policy in the different points such as \( a, b, c, \) and \( d \). That is, the points \( a, b, c, \) and \( d \) represented in the model mean the probable points that would arise by normally the actions of the institutions of regulation \( L, E, \) and \( J \). In that case, the values of \( \theta \) and \( \lambda \) are not determined by the strategies and payoffs of the institutions of regulation as players, while the utility of regulation is determined as per the values of \( \theta \) and \( \lambda \).
specifying preferences of the institutions as agents over them. This is done with the assumption that agents’ preferences over these regulation points are same and the utility resulting from regulation for public also represents the same preferences. Therefore, it is clear that Nash Equilibrium of this non-cooperative game will be the point that is preferred as top choice for all agents, the point $a$. Note that, when an agent deviates\textsuperscript{14} from point $a$ whatever happens is worse than the point $a$. Hence, there is no single profitable deviation from this outcome for any agent which makes the point the Nash Equilibrium. This is the standard equilibrium notion for this game.

In that case, we can explain this situation in a little more detail for understanding what the different decision points of regulation mean. Because the point $a$ for each player is better than the other points $b$, $c$, and $d$, we can say that this point is a Pareto superior Nash equilibrium to the others. At the same time, this point represents the first-best Pareto optimal Nash equilibrium where anyone of the political institutions of regulation doesn’t dare to deviate its decision selfishly. In such point, any institution cannot improve its utility without decreasing the utility of some other institutions. Since the aim of each institution playing a role in the regulatory process is to optimize its own interest by maximizing public utility through regulation. That is, the reason of the existence of the institutions of regulation is to ensure the first-best regulatory policy. If we assume that the first-best regulatory policy is a policy that maximizes public interest, they will maximize both their own utilities and public utility by the first-best regulation. Because $U_R(a)$ means the first-best regulatory policy when $\theta = 0$ and $\lambda = 3$, there is no reason for a single deviation of one of the institutions in this point. Consequently, the point $a$ illustrated in figures 3 and 4 is a Nash equilibrium. On the other hand, because $U_R(a)$ is strongly Pareto superior to $U_R(b)$, $U_R(c)$, and $U_R(d)$, the point $a$ represents a Pareto superior Nash equilibrium. Moreover, because $\theta$ at this point is zero and $\lambda$.

\textsuperscript{14} We do not know what will happen when he deviates.
represents the highest value that it would take, \( a \) refers to the first-best Pareto optimum Nash equilibrium.

However, we can make an extra comment here by departing from Game Theory. The point \( a \), from the perspective of NIE, is an unachievable outcome in the real world. Therefore, we should exclude it from the set of possible outcomes. That is to say, agents’ decisions can only result into the points \( b, c \) and \( d \). When we are allowed to assume this, the conclusion that \( b \) will be the equilibrium point, will be valid. Note that, we still have the assumption that preferences of agents over outcomes are same. Hence, there is no single profitable deviation from point \( b \) for any agent, because the deviations to point \( a \) are not allowed and the deviations to points \( c \) and \( d \) are not profitable. Then, we can conclude that the second best point for agents \( b \) is the Nash Equilibrium.

If we accept that \( \theta \) within the regulatory policy-making processes in the real world is unavoidably positive, then, this equilibrium that refers to the first-best Pareto optimal Nash equilibrium will be a utopian and hypothetical one from the perspective of NIE. In that case, the first-best Pareto optimum Nash equilibrium of the point \( a \) also means the Pareto border of the institutional design of regulation. That is, whereas \( a \) means the set of unachievable \( U_R(a) \) in the real world, points \( b, c, \) and \( d \) refer to the set of achievable Pareto efficient states, \( U_R(b), U_R(c), \) and \( U_R(d) \). This Pareto border separates the set of achievable states from the set of unachievable states. Accordingly, \( U_R(a) \) is the first-best Pareto optimal Nash equilibrium in terms of the institutional design of regulation, but it means the unachievable regulatory policy in the real world. In such a case, the outcome suggests that the institutional design of regulation in the real world will never put in force in the first-best Pareto superior Nash equilibrium.

The critical observation at this point is the best outcome is Nash Equilibrium for the most simple model, but when we add an assumption to the model which can be justified with the
perspective of NIE as it is done in the previous sections, the best outcome is not there anymore and the second best point becomes the new Nash Equilibrium of the game. In that case, if we combine the equilibrium analysis of this game with the Pareto-efficiency analysis for regulation game, we can say that the realistic outcome will not become the first-best Pareto optimal Nash equilibrium. Hence, the decision for the regulatory policy has to be made at another point where $\theta$ is not 0. On the other hand, this point has to be positive, but not $c$ and $d$. Besides, the value of $\lambda$ should also go on to be bigger one than the value of $\theta$ for $k_i > 1$ above. Consequently, the best outcome for regulation in the real world in Figure 4 is sphere $b$ where:

$$\theta = 1, \lambda = 2 \text{ and } \lambda > 0.$$  

This point represents the Pareto superior Nash equilibrium of the real world. Unless players $L$, $E$, and $J$ deviate, $\theta$ and $\lambda$ will not change. Thus, the expected benefit for the regulatory policy-making is maximized in the equilibrium on the sphere $b$. Besides $b$ represents the set of achievable $U_{\mathcal{R}}(b)$ in the real world and at this point, institutions will dare to deviate. There is not yet a single deviation in the game. Thus, $b$ that is Pareto superior to $c$ and $d$ will continue to become the Nash equilibrium. This outcome shows that the best institutional design of regulation would only exist in the second-best Pareto superior Nash equilibrium as a best political outcome in the real world. As a consequence, as pointed out by Spiller (2012) as well, the NIE approach to regulation rejects the notion of “optimal” regulation.

6 Conclusion

This paper tried to introduce a basic and general theory of regulation from the viewpoints of regulatory commitment and transaction costs of NIE. It treated regulation as a game supplied by the institutions of regulation, the legislature, the executive and the judiciary, and
modeled it as the interaction among these institutions from the regulatory commitment and transaction costs perspectives. The outcomes of the paper are different than the studies that have been made so far. A distinctive feature of the paper is that it has provided a framework for understanding how the institutions of the regulatory policy-making processes interact and that it has revealed what the interaction among institutions in terms of regulatory commitment and transaction costs means.

The pre-NIE literature on regulation argued that the failure of regulation stems from that it is put in force to obtain artificial rent to the regulated industry, but not to ameliorate market failures, because regulation is manipulated by the private interest groups. This paper suggests that an important component of the failure of regulation results from its institutional weakness. Regulation itself as the rule of game constructs the institutional structure that players and organizations are needed to abide. The failure or weakness of the institutional design affecting the efficiency of regulation naturally leads to limited credibility and positive transaction costs on the players such as investors and organizations. If the failure of the institutional structure increases, regulation brings about high transaction costs and incredible regulatory commitment. On the other hand, the well-designed institutional structures refer to the regulatory processes with the relatively low transaction costs and credible commitment.

The paper showed that the first-best policy outcome for regulation is not possible. This finding is compatible with the perspective of NIE. The institutional design of regulation cannot ensure the first best outcome in a world with positive transaction costs. In such a regulatory environment, naturally, the highest credible regulatory commitment cannot also be possible in terms of economic agents such as investors. In that case, the institutional structure of regulation in the real world can be designed inevitably at the second best Pareto efficient point. From the perspective of NIE, the first best policy outcome for regulation is not
possible, due to the first-best Pareto-optimal institutional design of regulation leads to the utopian and hypothetical design of the Neo-classical approach to regulation.

Consequently, the paper presents a base to clarify our understanding regarding the institutional interaction of regulation. In short, from the perspective of NIE, the duty of the institutions of regulation is to minimize transaction costs arising as a result of the interaction and to guarantee the credible regulatory commitment for investors that their investments have to be protected against opportunistic behavior by sitting and next governments. However, this is a difficult job. The next step is to develop and to apply the inferences and the suggestions of the study through the theoretical and empirical studies and to obtain evidence for the outcomes of the study.

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