

Politics, Transaction Costs, and the Design of Regulatory Institutions,

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Comments Welcome

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1. Introduction

With the wave of infrastructure privatization that has spread throughout the world, many countries are working on the creation of new regulatory institutions to monitor the behavior and performance of their newly privatized infrastructure monopolies. Little conceptual work has been done on the optimal design of these new institutions. To try to improve our understanding of what this design should take into account, it seems reasonable to try to review the work on organizational design that grew from developments in principle-agent theory in the 1980's and draw some policy lessons. In this literature, regulation is generally viewed as a game between various players with different degrees of knowledge and information required to make the choices that lead to the efficient and fair allocation of resources. The understanding of the incentive problems underlying these games provides some useful lessons on the optimal design of the regulatory regime. But this is not enough. We also need to improve our understanding of the internal organization of the government to assess the importance of the institutions responsible for the implementation of these regimes.

To progress in this direction and provide better analytical support for the recommendations made by practitioners, we have to move away from the standard normative approach, which has been the cornerstone of the economics of the public sector so far. In the standard normative context, the government has generally been viewed as a single entity with a larger possible set of policy tools, a perfect ability to commit, and endowed with a clear objective function (the maximization of social welfare).¹ This is not enough to assess the efficiency of the internal organization of a government.

This understanding requires, as suggested by Coase (1937) and developed by Williamson (1975, 1985), the recognition that the organization of hierarchies is the result of a minimization of transaction costs.² These *transaction costs* have to be isolated in order to draw any policy-relevant lessons from these theories. The first transaction costs we will look at are dependent on the extent of the informational problem faced by the government, and on the limitations in the scope governments have in relying on the market to implement some of its regulatory responsibilities. For instance, the right of regulating an industry cannot be sold to outsiders. Yet, while the state exerts regulatory rights, some aspects of this responsibility can be subcontracted (auditing, detailed studies leading to rate or price cap revisions, etc. ...).

In addition, a more policy-relevant theory of regulatory institutions has to deal with transaction costs reflecting difficulties in writing fully contingent contracts. Contracts often cover only a finite amount of time, and are therefore not necessarily binding to future generations and future governments. This often leads to a renegotiation of some administrative and incentive costs. Moreover, a unified, centralized government body ruling the economy in its entirety does not exist. Politics is, at its core, competition between the several principals involved in public decision-making. As noted by Moe (1986) and Wilson (1989), bureaucrats are subject to a multitude of influences and regulatory rights, and work

¹ Baron and Myerson (1982) and Laffont and Tirole (1993),

² Importantly, transaction costs only matter because government intervention takes place under asymmetric information. Under symmetric information, the internal organization of the government has no bites on the outcome of its intervention. Coasian bargaining within the government makes the internal distribution of regulatory rights within the government be irrelevant. Transaction costs are therefore dependent on the extent of the informational problem faced by the government at the time of intervening. When different institutions are associated with different values of these transaction costs, there is scope for their comparison and for a somewhat rough optimization over regulatory structures.

on an issue is often shared among several agencies.³ Last, there is no government intervention, not even regulation, without an attempt by coalitions to manipulate its outcome. Regulatory contracts and institutions have to account for the possibility of a capture of the bureaucracy by interest groups.

Our thesis is this: When these transaction costs are taken into account, *structures and processes will affect regulatory outcomes and hence should be recognized explicitly in the design of incentives based regulation*. First, *the structures affecting the regulatory outcome* include the distribution of regulatory rights among different levels of the government, the objectives given to agencies, and the voting procedures used to elect political principals, all of which influence regulatory decisions.⁴ This is not recognized by the normative approach to Public Economics. Second, *processes matter to regulatory outcomes*. The timing of government intervention, the length and the span of control of different regulatory bodies, and the design of the communication channels within the regulatory hierarchy affect the regulatory outcome. A failure to address these influences is bound to over- or under-estimate the effective impact of incentive based-regulation on regulatory outcomes.

To explain more clearly how structure and processes matter to regulatory outcomes, the paper is organized as follows. Section 2 sets up the stages of our analysis. It describes the four-layer hierarchy (voters-political principals-regulators-regulated agents), which has been the fundamental source of analysis of New Regulatory Economics so far. At each of these layers, transaction costs can influence the optimal design of the organization of the government. The rest of the paper demonstrates how the main types of transaction costs can influence this design. Section 3 describes the government failures that arise from contract incompleteness. Section 4 proposes possible solutions to each of these failures, beginning with the observation that structures and processes matter. The point of this section is to show how different forms of contract incompleteness may countervail each other. Section 5 concludes by developing some applications.

2. A Stylized Multi-Layer View of the Regulatory Process in Restructured Infrastructure

Restructuring processes in infrastructure generally leave monopolistic providers in the distribution of electricity, gas and water. In the absence of any regulation of price, quantity and quality, monopolists would restrict the firm's quantity and would charge an excessively high price to consumers. Regulation is needed to reach a higher level of social welfare but it cannot be done directly by consumers because of the well-known free-rider problem in collective actions.⁵ It must therefore be designed and enforced by institutional regulators who act in the name of voters and who can only handle a limited number of tasks because of standard bounded rationality problems. As an immediate consequence, the control of the quality of service, of the price structure and the decision on the rate of return on investment are left to a utility regulator.

³ Landis (1960) in his report to the President newly elected offers a remarkable survey of these overlapping responsibilities. See also Kahn (1988) seminal book on regulation.

⁴ In the UK for instance, the electricity regulator was given specific ranking of its responsibilities. He/She is responsible to secure all reasonable demand, proper financing and promote competition and the defense of the interest of consumers is subject to these three primary responsibilities. (see Electricity Act 1989)

⁵ Even if sometimes governments subsidize consumer associations to create a bilateral monopoly.

However, this control is imperfect. Regulators face informational asymmetries in their relationship with the firm they regulate. They do not know the exact technologies of the firm and the elasticity of its demand. They have little knowledge about the internal incentive structure of the firm and the contracts that it may have with non-integrated input suppliers. Regulators have limited tasks to perform, but they often have limited instruments to carry out their functions. For instance, the Environment Protection Agency (EPA) in the US is only allowed to *ban* the use of some chemical products, but in principle it could use more fine-tuned incentives to limit pollution damages.

Control imperfections also stem from the fact that regulators are not accountable for their acts directly to consumers, but instead to “political” principals. Often, these political principals belong either to the legislative or to the executive branch of the government. They can be endowed with a Federal or a State mandate and they can have tenures with quite different lengths. They have difficulties in controlling regulators who are generally at an informational advantage because of their expertise or simply because of their access to historical information.⁶ In most countries, the control exercised by the Congress on these regulators is indirect. There is a system of Committees and Subcommittees representing various constituencies, which is subject to various influences. In some cases (as in the US), part of the control is not under the Congress itself, but instead under a government budget office which exerts budgetary control of these agencies.

Political principals themselves can hardly be put on explicit incentive schemes for maximizing social welfare because of the free-riding problem that voter-consumers would be facing in controlling these political entrepreneurs.⁷ Instead, consumers use the rather rough and imperfect procedures inherent in voting to impose some accountability on the political principals. Only career considerations and the threat of political takeovers can adjust the political decision-makers' incentives. It should be noted that the political arena is not a perfectly competitive market. Enormous fixed costs must be incurred before entering this market. This reduces the scope for an efficient control of the incumbents.⁸ Moreover, voters are often only imperfectly informed regarding the effort and efficiency of the political decision-maker. They must therefore rely on rather imperfect measures of their own level of satisfaction before deciding on their voting strategy.⁹

Each of these layers of the government can be viewed as a principal-agent relationship with its own informational problem. The simplified overview of society that we get from the above picture is that society and its government are based on a sequence of vertical contracts that solve, more or less easily, a number of agency problems. Loss of control results as incentives trickle down the hierarchy through a system of delegation. However, government is not only vertical, but, as discussed in the introduction, much of its peculiarities come from its Multi-principal nature.¹⁰ Regulators share the control of the firm.

⁶ See Kiewert and McCubbins (1991) for a thorough discussion of the issues raised by the delegation of some powers from the Congress to the bureaucracy.

⁷ There is a clear parallel between this discussion and of the firm as a monitoring technology due to Alchian and Demsetz (1972) and Holmstrom (1982).

⁸ See Myerson (1997) for a discussion of entry in the political market.

⁹ See the discussion of sociotropic voting rules of voting in Ferejoh (1986).

¹⁰ See Moe (1986), Baron (1985) and Martimort (1996b).

Political principals share the control of the regulatory policies at a given date, but they also share this control with their successors. Legislatures are themselves divided into numerous Committees and Subcommittees with their own objectives, each of them trying to influence the bureaucracy.¹¹ Moreover, the bureaucracy is not a unified body. Often agencies and bureaus compete with one another for resources, while at the same time bureaucrats compete for influence within a given industry.

With this complex description of the regulatory organization in mind, we can move to an analysis of the different contractual incompleteness' which impede the efficiency of the government's intervention.

3. Transaction Costs in the Government Organizational Structure

The overall organization of the government can be seen as a nexus of more or less explicit contracts linking stakeholders together. The absence of an overall grand and complete regulatory contract creates opportunities for hidden gaming which bring their own set of transaction costs. The contractual externalities that arise from the incompleteness of regulatory contracts is a reality that departs from the more idealized view of society in which unified control is feasible. This section reviews the relevance of the institutional design of transaction costs stemming from various types of government failure: lack of government commitment, the Multi-principal nature of government, and the excessive discretion of the various decision-makers in the regulatory process.

3.1 Lack of Commitment and The Need for Renegotiation

Because future contingencies may not all be foreseen at the time the government proposes a regulatory contract to the firm, and because new information becomes available as the regulator learns about earlier realizations of the contractual targets, renegotiation of the contract matters and can improve *ex post* efficiency. This may, however, lead to some counter-intuitive results for practitioners. To understand why, it is useful to draw a comparison between situations with and without full commitment.

Under full commitment, the optimal regulation of a public utility repeats the way the optimal static contract deals with the fundamental trade-offs between efficiency and rent extraction. In order to reduce the costly informational rent that can be obtained by efficient firms in mimicking less efficient ones through choosing the same menu of cost targets and lump sum transfers, regulators distort the costs and production targets towards less efficient values to make them less attractive for an efficient firm.

Without full commitment, after the first period of the relationship the regulator knows more about the private information of the firm and is willing to renegotiate the regulatory contract to improve second period efficiency. This search for increases in *ex post* efficiency may nevertheless introduce some perverse incentives from an *ex ante* point of view. Anticipating an increase in the power of incentives later on, efficient agents behave suboptimally in the earlier periods of the relationship. They tend, in particular, not to reveal their information and its revelation is slowed down in the hierarchy.¹² This is

¹¹ Moran and Weingast (1983) show empirically that the Congress has much of the bargaining power when dealing with the bureaucracy.

¹²The intertemporal inconsistency and its impact on decision rules have been forcefully made in the macroliterature which has analyzed the issue of rules versus discretion. See the seminal contribution of Kydland and Prescott (1977) and the survey

where the counterintuitive results show. For instance, rates of return may best be increased following a good performance. Regulated firms may best be allowed to plan new investments or to change their prices as new information on demand is learned. Otherwise, a public utility anticipating that a regulator will use the information revealed in the first period of their relationship to readjust the contractual terms has fewer incentives to reveal any information that can help improve the rent efficiency trade-off *ex post*.

The main point is that incentive compatibility constraints are hardened by the mere possibility of renegotiation. As a result, first period inefficient choices are made; underinvestment in specific assets, periods of inefficient technological choices, prices far above the marginal cost in order to manipulate the beliefs of the regulator on its marginal cost before the renegotiation stage, etc.... More generally, the inability to commit increases the transaction costs of contracting, something which is often underestimated by practitioners. Moreover, these higher transaction costs may be justified by the need to retain some flexibility in order to ensure that past regulators or political principals are not allowed to bind the future of society to a given regulation. This is important because consumers' tastes may change in the future, or the political principals themselves may change after an election and these new decision makers may favor other groups. Hence, society as a whole agrees on imposing limited terms for the mandates of its political principals to limit the possible intertemporal abuse of powers.¹³

3.2 The Multiprincipal Nature of Government

An important step toward assessing the real nature of the rent-efficiency trade-off discussed above, is to consider government intervention as coming from a whole set of different principals, each with its own objective.¹⁴ As a whole, these principals may have for a collective objective the maximization of the same social welfare function as that of a single benevolent regulator. However, each single principal has only a limited mandate to fulfill. For instance, the Environmental Protection Agency is concerned with protecting the environment, which is only one aspect of the consumers' welfare. At the same time, the Utility Regulator is concerned with controlling the rates of return, or the price cap and prices structure of the utility. Each of these agencies has only a partial view of the regulatory stake.¹⁵

The importance of this complex structure of government can be illustrated by three main themes in the literature dealing with multi-principals agency relationships: allocative inefficiency, rent distribution and regulatory rights, and the optimal levels of regulatory decentralization and the timing and voting right of the various agencies. These factors are all influenced by the design of regulatory institutions.

of the literature presented in Persson and Tabellini (1994, Introductory Chapter). In an agency context, it has been more fully understood with the works of Dewatripont (1989) and Laffont and Tirole (1990).

¹³ Constitutional rules exist which impose such limits. In France, there is no limit in the number of mandates that a political decision-maker may have in a row. The only limitations are on his span of control, i.e., on the number of mandates he may have simultaneously. In the US, a President can only have two mandates in a row.

¹⁴ This difference may be not so clear cut for the only reasons that within firms the central management is also part of a bunch of bilateral explicit contractual relationships with different stakeholders (creditors, customers, regulators, owners, etc...) having their own specific interest in the firm.

¹⁵ Baron (1985) and Martimort (1996b) analyze contractual settings describing these situations. Their basic assumption is that the splitting of responsibilities among the various regulatory agencies comes from a splitting of their monitoring technologies. As a result of this distribution of regulatory rights each of these agencies is only able to contract on its own sphere of responsibilities. Their non-cooperative behavior in regulating the industry follows. The regulation implemented is then a Nash equilibrium among various regulations offered in a decentralized way.

Allocative Inefficiency: Under this complex structure, the regulatory process introduces new distortions with respect to what would have been implemented under unity of command. The rent-efficiency trade-off, which results from the regulators' interactions, must capture the fact that a regulator typically does not take into account what the other regulators' schemes are when he offers his own regulatory incentive scheme. Allocative efficiency is affected by the separation of powers between those regulators.

Rent Distribution and Regulatory Rights: The non-cooperative behavior of rival regulators also results in the firm being offered excessively low or excessively high powered incentives, depending on the set of activities that they respectively control. When several regulators control *complementary* activities of the firm, they extract too much informational rent from it and the power of incentives tends to become excessively low.¹⁶ Each single regulator exerts a negative externality on the other. Cost-plus arrangements result from this overregulation.¹⁷ When regulators instead control *substitute* activities, the reverse phenomenon happens as a result of regulatory competition. Each regulator competes with the other for attracting the agent toward the activity under his own control. The common agent can play one principal against the other to escape their global control. In equilibrium, because now a principal exerts a positive externality on the others, higher powered incentives than what would have been collectively optimal end up being offered. Decisions rules are then closer to their full information values and allocative efficiency improves.¹⁸ As a result, the amount of informational rent that is kept by the firm is larger than what would be socially optimal.¹⁹

Levels of Decentralization: The number of agencies in control of the firm and the timing of their interventions change the outcome of this structural separation. Administrative processes and structures affect the outcome of the regulatory intervention. The larger the number of agencies controlling a given firm - allowing permits, subsidizing or monitoring it - the greater the inefficiency of the regulatory outcome. Indeed, an extreme version of the free-rider problem may arise when control is highly decentralized. It may not be worth allowing a given project to be done if one expects other agencies to restrict their own contribution to its financing. There is at least casual evidence in the US that such outcomes arise.²⁰ The experience of the EEC provides other examples in which local decisions are

¹⁶ Stole (1991) and Martimort (1992) and (1996a) and (1996b) present a general theory which analyzes the contractual externalities that appear under adverse selection when regulatory powers are shared between non-cooperating agencies.

¹⁷ See also Bernheim and Whinston (1986) for an analysis of a common agency game under moral hazard case which also exhibits this under-provision of effort. Dixit (1996) discusses also a moral hazard model with linear schemes featuring also lots of the insights of the present model. He applies it to the organization of the bureaucracy. We discuss this model in Section 3.3.2.

¹⁸ This is true when a pure equilibrium of the contracting game between the principals exists, Martimort and Stole (1997) show that it may be possible to find information structures such that only mixed-equilibria exist with substitutes. In this case, only distributions of regulatory rules are offered in equilibrium by each principal. This suggests that the policy outcome may be quite fuzzy.

¹⁹ This discussion in terms of positive versus negative externalities between different government centers may offer an unifying framework to read the emerging literature on federalism and budget constraint (see Qian and Roland (1994)). This literature argues that the allocation of fiscal and monetary policies to the regional and the national levels is due to the nature of the externalities (respectively positive and negative) that decentralizing these policies imply on the budget constraint of local firms.

²⁰ For instance, in the US, transports has been said to be under an extremely inefficient regulation (Kahn (1988)). Noticeably, it is under several overlapping jurisdictions concerning the ICC, the CAB, the Federal Marine Commissions, the

financed by the supranational institutions in an environment in which goals and incentives are often not compatible.

Timing and Voting Right: The sequentiality of the intervention of different agencies calls also for excessive rent extraction and allocative distortions that are now even larger than in the simultaneous game.²¹ For instance, the Stackelberg leader position of the EPA in designing environmental taxes vis-à-vis local States agencies worsens the case for the separation of the regulatory responsibilities on environmental issues between the State and the Federal levels of the government. Regulation becomes extremely stringent. An interesting interpretation of these sequential timings is that the Stackelberg leader benefits somewhat from a veto right and only accepts regulations that guarantee his constituency a minimal utility. As long as the regulators have quasi-linear utility functions independent of the regulated firms' private information, the identity of the vetoing principal has no effect on the regulatory distortions. But when this assumption is rejected, the decentralization of regulatory responsibilities can lead to an optimal assignment of regulatory instruments that is also hierarchical.²²

In an open rule system, Congress is free to amend any proposals made by a committee. This means that the regulators face multiple principals. In this type of setting, regulatory agencies are able to exploit one of these principals against the other and increase their own powers regarding the decision being implemented. To shift the policy closer to its most preferred outcome, which turns out to be that of the median-voter, the veto of the presidency is needed as an institutional option.²³

3.3 Discretion of the Decision-Makers

In the regulatory hierarchy, discretion matters at two different levels: First, at the level of the political principal; and second at the level of the regulatory agency itself. We sometimes distinguish between formal and real authority. As discussed in Aghion and Tirole (1997), real authority lies in the hands of agents implementing the final regulatory decision, i.e., in our case the regulators and bureaucrats. Instead, political decision makers are endowed with the formal authority to make public decisions. Both are important and need to be recognized to understand how the overall design of regulatory institutions influences regulatory outcomes.

3.3.1 Discretion of the Political Principal

The Received Theory: Frictionless Influence. A line of research commonly associated with the Chicago School of economics is often quoted by practitioners to argue the importance of political risks and discretion in the design of regulatory institutions. This research illustrates very clearly the idea that political principals who have some discretion regarding the set of policies that can be implemented, are

FPC, the Bureau of Public Roads, the Department of Commerce, etc See also, Landis (1961) for a discussion of the externalities associated to these separation of powers among agencies and its consequences on regulatory efficiency: Delays in decision-making, overloads due to inter-regulatory agency conflicts to be settled, etc.

²¹ See Martimort (1996b) for a formal proof of this assertion.

²² See Estache and Zheng (1995) for a model discussing the optimal instrument assignment in the context of multiple lawyers of regulators playing Stackelberg game.

²³ This veto can be easily modeled in an agency framework as a constraint on the well-being of the president.

subject to a number of conflicting influences exerted by different pressure groups, i.e. consumers, firms, taxpayers etc...²⁴ This line of research has put forward the idea that the political principal puts some values on the contributions or the amount of bribes that he receives from the interest groups, but also considers social welfare. Contributions are valuable for the political decision-maker, first because they help him finance his electoral campaigns and second because these bribes may be only pure perks. Social welfare matters because political decision-makers have reelection concerns and it gives an aggregate measure of the satisfaction of society.

The first prediction of these papers are that the interest groups are powerful, i.e., they affect the economic outcome when they are able to circumvent the celebrated free-riding problem in collective actions. These papers are, however, unable to assess the true reasons why free-riding is less an issue for some group forming than for others. The true parameters underlying the influence of an interest group are not characterized. As a result, the outcome of the game is almost immediate: Lobbies influence the policy outcome by moving the choice of policy toward their own preferred outcomes. The political decision-maker maximizes a welfare function which favors interest groups.²⁵ Importantly, even if he does not provide a formal treatment of this issue, Posner (1976) nevertheless also stresses the view that the force of an interest group may depend on the institutional setting. Structures matter in defining the power of a group. The main problem is that it is also difficult to see how the contract between an interest group and the political decision-maker is more enforceable than any other contract aimed at controlling this political decision maker in the first place. Because it ignores the agency problem that makes the control of these political principals impossible, this line of research is unable to give a clear account of the role of the regulatory institutions in constraining their behavior, as well as that of the different pressure groups. Hence, it has little to offer in terms of specific policy advice.

Political Principals and the Distribution of Rents. An interesting alternative approach is proposed by Baron (1989) and Laffont (1995). They do not restrict *a priori* the set of instruments available to the political decision-makers. However, they make explicit the assumption that the choice of the political principal is made through a voting procedure. Society is composed by voters with different preferences on the level of regulation that should be implemented. In fact, these preferences may directly come from ideology or from the different shares of the regulated firm that each group of voters individually gets. As a result of the voting procedure, the regulatory choice of the median voter is implemented. The case to reduce discretion is due to the fact that this political principal does not maximize social welfare defined as an aggregate of the voters' utilities, but instead the welfare of the median-voter, his constituency, and not society as a whole.

An important corollary of this line of research is that suboptimal contracts like average cost pricing or simple quotas can now find a rationale. Even if these tools are imperfect ways of transferring wealth between groups, they can also be used to tie the hands of the political principal by reducing his discretion. But a full endorsement of these instruments would require a better understanding of the way in which different constituencies can try to align the preferences of the political decision-maker with their own. In other words, what is lacking is a complete full-fledged treatment of how campaign contributions and other forms of influence by interest groups affect the outcome of the political game, and therefore the incentives of a political candidate to align his policy with that of an interest group. Indeed, these political

²⁴ Grossman and Helpman (1994).

²⁵ See Helpman (1997) for a survey of this literature.

principals are putting some value on reelection which may depend on the number of voters who choose them and the preferences of the latter are likely to be affected by the stringency of the regulation.²⁶ Another unsolved issue is the exact role played by institutions on the final economic outcome. The voting procedure used to select the political principal is somewhat exogenous. Yet it would seem important to know how different districts which are affected differently by regulation aggregate their preferences through the voting procedure.

3.3.2. *Discretion of the Regulators*

An interest group can be active not only before the enactment of a regulatory policy, as discussed above, but also at its implementation stage. In other words, interference with the regulatory process can also arise within the regulatory institution and this is something practitioners tend to be very much concerned with. This concern is the main anchor to the debate on accountability, independence and autonomy. The problems can arise from three main sources: internal vs. external influences on the regulators; conflicts between the legislative powers and the bureaucracy; and the complex dynamics of bureaucratic behavior.

Internal and external influences: Bureaucracies are the nexus of conflicting influences. Regulatory agencies are no different and are subject to several influences, in particular, the internal influence of a political principal representing the voters' interests, and the external influence of interest groups. As a result of this multiplicity of efforts in curbing his behavior, the "regulators-bureaucrats" end up being vested in the status quo and it becomes extremely hard to provide any incentives.²⁷ There are two ways to influence the bureaucrats' incentives: first, wages; second implicit incentives, i.e., career concerns. In addition, exogenous restrictions on the set of instruments available to the different political principals controlling the bureaucracy may help to reduce the scope of the bureaucrats in regard to rent-extraction.²⁸ When different principals, for instance different Committees, are affected by the activities of the bureaucrat-regulator, which are substitutes, the latter can play one principal against the other to get more freedom. The bureaucracy goes its own way. The solution is to increase accountability by exposing the bureaucrat and making available private information on the effectiveness of the bureaucrat's behavior. Simple institutional rules like the public release of regulatory information may allow this kind of information sharing between multiple principals. In a nutshell, regulatory processes can matter in curbing the bureaucracy and practitioners are right to emphasize this point.

The Conflict between the Legislative Power and the Bureaucracy: An agency problem between the political principal, the Congress and the regulatory agencies can also create the conditions necessary for the capture of these regulators by an interest group.²⁹ The agency is used by Congress as a monitoring system observing signals regarding the private information of the public utility. This

²⁶ Laffont and Boyer (1995) build such a model. They assume that a political decision-maker is reelected with a probability which is proportional to the amount of campaign contributions he receives. This amount is in turn linked to the informational rent that the interest group gets from regulation. Grossman and Helpman (1996) try to endogenize the weight that a political decision makers put on an interest group as coming from a campaign contributions game.

²⁷ Spiller (1991) and also Wilson (1989)

²⁸ Dixit (1996)

²⁹ Laffont and Tirole (1993, Chapter 13). Kiewert and McCubbins (1991) make the important point that the delegation process from Congress to the bureaucracy leads surely to the abdication of any power.

discretion in the hand of the regulator gives him some power or, put differently, some real authority.³⁰ Indeed, by bribing its regulator, the firm can insure a misuse of his power. The regulator will prefer taking perks or a position in the industry later on rather than obey the regulatory mandate he has received. Again, this is why it makes so much sense to restrict future interactions between a regulatory and the firms it is regulating.

This means that on top of the usual incentive constraints, a regulatory contract must also satisfy a set of collusion-proof constraints to insure that the regulator does not misuse his power. This does not come cheap to society.³¹ The existence of communication costs in the formation of the capturing coalition or the presence of some transaction costs due to the non-enforceability of the side-contracts will generally prevent the regulator from getting the full informational rent of the firm. Capture can only be effective when a stake exists in concealing from the political principal information which is favorable to the regulated agent. This happens quite often in the context of utility privatization for instance.

The problem is that the constraints needed to avoid collusion/corruption affect the terms of the trade-off between efficiency and rent-extraction. To limit the regulator's incentives to collude with an efficient firm which earns some informational rent from regulation, the political principal has to reduce further the regulatory stake. This in turn increases the distortions in the production decisions when compared to the problem free environment. Moreover, these distortions have to be greater when collusion is relatively more efficient, i.e., when the transaction costs of side-contracting are low. Low-powered regulation is then called for to limit the scope for collusion. They indeed imply lower levels of rent for efficient types and therefore less possibilities for corrupting regulators. These low-powered incentives also correspond to the choice of more bureaucratic rules for the agency. The latter is given less power and less discretion. The point of this all is that processes also matter and can be quite costly to an efficient outcome.

The Dynamics of Bureaucratic Behavior: Part of the reality of regulation is that there are side-contracts between a regulator and the interest group he regulates. Since they are not legal, they cannot be enforced by a court of justice.³² The regulator is lenient with the firm as long as his prospects for getting "bribes" or future employment opportunities in the industry are high. The firm is ready to "bribe" the regulator as long as he remains lenient in his stances. Modeling capture or influence of the interest group as an enforceable side-contract hides some features of the dynamics of capture. Martimort (1997b) shows that side-contract agreements become easier to enforce when the regulator is better informed about the firm or when the preferences for the future of the administrative branch of the government are more pronounced than the preferences for the future of the political principal himself. The discrepancy between the long-term objectives of the bureaucracy and that of the political principals matter and affect the regulatory outcome. In sum, transaction costs of side-contracting are endogenous and depend on mere regulatory institutions. Again, the point is that structures matter to regulatory outcomes.

³⁰ As Niskanen (1971) has forcefully argued, information is the key which allows the bureaucracy to pursue other objectives than social welfare maximization.

³¹ The regulatory agency is assumed to have all the bargaining power when offering the side-contract to the interest group. In other words, there is little competition within the bureaucracy for the exercise of power.

³² A noticeable exception is given by political campaign contributions.

4. The Whole Picture: Transaction Costs at Play

In this section, we take a broader perspective on regulatory institutions to try to see how a more coherent design of regulatory institutions can be used to reduce the influence of the government failures discussed in section 3 on regulatory outcomes. Following an argument already applied with some success by Williamson (1985) regarding the theory of the firm, we argue that the optimal regulatory institutions are those which minimize the overall transaction costs of contracting. To test the implications of this paradigm for the internal organization of the government, we use the results highlighted in the last section to better understand how through playing contractual externalities against one another, the other may help improve social welfare. This second-best approach is obviously subject to the same weaknesses as any other second-best analysis. We nevertheless think that this second-best approach turns out to be extremely useful for getting a richer picture of the internal organization of the government.

4.1. How to Improve Commitment?

The first step in the search for a regulatory institution that minimizes transaction costs, and hence interference with desirable regulatory outcomes, is to look for an approach that guarantees a commitment by all parties involved to deliver on their responsibility. Since contracts between the firms, the regulators, the executive and the legislative powers are likely to be quite incomplete, the specification of renegotiation rules is quite critical and so are the systems of checks and balances as discussed below.

4.1.1 Renegotiation Rules and Separation of Powers

A well-known result among political scientists, and part of the recent folklore of the industrial organization economists, is that the design of rules and processes at the renegotiation stage can improve commitment.³³ One particular choice is the separation of powers between different regulatory agencies. This is not something that practitioners like to recommend. Indeed, the idea of unifying regulatory responsibilities under a single umbrella institution is quite a common recommendation. Theoretical research suggests that this may not be the best strategy when commitment capacity by the government to the regulatory contract is limited or when renegotiation is a likely outcome of the reform process.

No Commitment at All: Under an extreme form of incompleteness, in which regulatory contracts are limited to cover only the current period because of some type of constitutional constraint for instance, Olsen and Torsvik (1993) show that it may *be better to split up the control of the firm* between two regulatory agencies rather than leaving all the control rights in the hand of a single omnipotent regulator.³⁴ Under separation, both regulators control the firm's output. As a result of this complementarity between their regulatory tools, their free-riding in providing incentives to the firm implies that there is an excessive extraction of the firm's rent in the second period of the relationship. The firm receives excessively low-powered incentives under separation. The main benefit is that this makes it less valuable for an efficient firm to hide its type in the first period of the relationship. As a result, there is more information revelation in earlier periods and total intertemporal welfare may increase. It should be clear however, that second period benefit should be traded off against the cost of the first period competition between the different

³³ This point has for instance been forcefully made by McCubbins, Noll and Weingast (1986) and (1989). See also Spiller (1991) and Spiller and Levy (1995)

³⁴ More exactly, their model deals with the issue of privatization and the consequences of the structural separation between the owners of the firm and its regulator.

agencies. In sum, the overall benefits of separation are finally unclear when one assesses its impact from an intertemporal point of view. The more general result is that there may exist an optimal degree of decentralization in the regulatory charter, i.e., an optimal number of agencies in control of a given firm. This number optimally trades off the cost of a larger static inefficiency coming from the coarser sharing of regulatory rights against its dynamic benefits.³⁵

Renegotiation: Renegotiation improves *ex post* efficiency, however, the free-rider problem among regulatory agencies at the time of renegotiating the contract makes this *ex post* improvement harder to achieve.³⁶ Separation improves the commitment ability of the government, but there is a twist. Intertemporal welfare increases with separation only when the latter takes place at the renegotiation stage. The optimal regulatory charter requires, therefore, a cooperative offer of the regulatory contracts when regulation of a firm starts. It also requires the splitting up of the regulatory rights among various agencies at the renegotiation stage. Generally, this type of optimal regulatory charter is unfeasible.³⁷ The more important result that practitioners may want to keep in mind is that the excessive splitting of the responsibilities of regulatory agencies may be good for regulatory outcomes.

The solution may be to go for sequential moves of the regulatory decisions. For instance, the federal government may act as a leader in renegotiating regulatory contracts. Then local governments follow by offering complementary regulations. This type of institutional framework corresponds to what is used in the Common Agricultural Policy in the European Community. In sum, the case for separation as a way to improve commitment through the precise fine tuning of the regulatory process is an ambiguous one. Nevertheless, we believe that it has strong relevance.

4.1.2. *Checks and Balances*

The recommendation in favor of separation also comes up in the discussion on checks and balances. Sometimes the lack of commitment comes from the inability to contract *ex ante* on a variable which provides a valuable signal on the firm's performance, one that becomes only available at the interim stage. For instance, the future profitability of a firm or the quality of its products cannot be assessed at the time of the writing of the contract.

Tirole (1994) shows that creating different agencies with each having a specific objective function improves commitment. Indeed, these agencies intervene differently depending on the realizations of this signal. For instance, an agency concerned with consumer's surplus intervenes following evidence that the firm will charge a high price in the future. A Ministry of Finance, concerned with the profitability of the firm will terminate projects that turns out to have intermediate cost overruns. Allocating the right to intervene between "tough" and "soft" agencies according to the *ex post* realization of the signals readjusts the *ex ante* incentives of the firm and improves intertemporal welfare. In a similar vein, Lewis and Sappington (1991) analyze the intertemporal separation of powers between two short lived principals. They take the allocation of tasks between both regulators as given but show that this separation, i.e., the impossibility of regulators transferring money from one period to the other because they are under the

³⁵ Olsen and Torsvick (1995)

³⁶ Martimort (1997) shows why and how the separation of powers acts as a commitment at the renegotiation stage to have a tough renegotiation among the different non-cooperating agencies controlling the regulatory agenda.

³⁷ See Kahn (1988) for a discussion of the expansion of regulation over time.

control of different regulators, may be helpful in protecting the non-verifiable investment of the regulated firm.

In both of these papers, a system of Checks and Balances is constructed in which different agencies react differently to the information they may receive. The design of the objective function of the regulators then becomes an important tool to control both the regulated firm and readjust the incentives of the regulator to intervene. The discussion of the specific objectives is, however, something practitioners seldom deal with explicitly.

4.1.3. Elected Political Principals and Independent Agencies

The above discussion focused only on the case of a benevolent principal unable to commit himself to an intertemporal behavior. The splitting of the social welfare function among several agencies was helpful but things become different in the case of a political principal. Elected political principals cannot commit the future of society to a particular regulation. However, because they have a majority, they often have the possibility of creating independent agencies and relinquishing some of their powers and responsibilities to them. Of course, the threat of losing future elections makes them create independent agencies that will still represent their constituencies even in case of political defeat. Examples abound in regulation, but perhaps the most striking one belongs to the macroeconomics arena. The choice of relinquishing the control of monetary policy to an independent central bank is a way for a government in favor of a monetarist policy to commit future generations to it, even if future governments might be more willing to allow higher levels of inflation.

We are not aware of any formal theoretical analysis along these lines in the framework of the New Regulatory Economics. We nevertheless conjecture that relinquishing regulatory rights to independent agencies may have social benefits, at least from an *ex post* point of view. More groups are represented in the regulatory decisions that are taken *ex post* and future minorities are somewhat protected. The *ex post* regulatory outcome is closer than that which would have been chosen by a benevolent regulator. However, at the time of enacting a regulatory agency with similar objective functions as its own, a non-benevolent government creates his own competition. As we have shown earlier, this competition entails inefficiency. Competition between government bodies extracts too much rent from the constituency it is supposed to protect. Relinquishing regulatory powers has also *ex ante* costs.

4.1.4 Credibility of Commitment to a Regulatory Charter

An important problem of the models we have just surveyed is that they assume that the commitment to creating an agency and incurring the administrative costs that it requires, is interpreted by the regulatory players as a credible signal that the newly defined objectives and responsibilities of this agency are not going to be overruled in the future. Institutional designs have to be credible to have any bite.

The credibility of the separation between various agencies can be enforced by standard reputation-like arguments. As argued by the reputation literature, because they are long-term players, agencies should be able to impose their most preferred regulatory outcome, i.e., should be able to render their structural separation credible. This argument is a little loose and suffers from two underpinnings: First, if reputations could be build by agencies to improve their collective commitment abilities, a single agency could certainly also build a reputation for not renegotiating any regulatory contracts in the first

place; second, agencies themselves may be long-term players but bureaucrats often have limited tenures. One should understand how collective reputations could establish among cohorts of regulators, especially when they sometimes have different intrinsic preferences on the stringency of regulation.

4.2. How to Limit the Scope for Non-Benevolence?

Since non-benevolence is to be expected, it seems reasonable to look for ways to limit its scope. One way of doing so is by focusing on the simplicity of the instruments of regulation. We already discussed this possible remedy to the non-benevolence of political principals. Regulatory contracts could be simplified to leave less leeway to the political decision-makers. This suggests that simple rules like the constraints on the use of discretionary transfers and the short-term mandates of political principals can be written as constitutional rules aimed at controlling these non-benevolent principals. More generally, the use of instruments which are not sensitive to information, like for instance quotas, is a way to curb the non-benevolence of political decision-makers, even if it creates other problems when contract enforcements are a problem, as is typical in many reforming countries and in environments in which information is limited.

Another way of dealing with non-benevolence, which is important in countries with an inefficient public sector in need of reform, is to figure out what is the optimal speed of reform. Dewatripont and Roland (1991) show that a benevolent principal willing to impose some layoffs on an industry is likely to prefer to gradually impose these layoffs rather than impose them right away when its policy has to be accepted by a majority of voters/workers within the sector. Under unanimity, it is a well known result from the incentive literature that the optimal policy should be implemented with full commitment.³⁸ Under majority rule, the political principal prefers to impose its reform gradually, i.e., workers leave an industry at different dates depending on their efficiency. By doing so, the principal learns some information on the workers' efficiency and can use it to credibly threaten to shift majorities in the future. He can impose some concessions from some groups in the majority today by threatening them with being in the minority tomorrow. Allowing the political principal to use such credible threats increases his bargaining power. Reform processes are important when the political game imposes only majority voting.

4.3 Separation of regulatory powers as a way to prevent capture

Under integration of the regulatory powers, collusion is quite efficient and society must incur a large cost of capture. For instance, bad projects are too often allowed and the budgetary burden on society increases. Instead, asymmetric information between partially informed regulators and the firm they regulate weakens their ability to extract advantages from the firm. Asymmetric information implicitly increases the transaction costs of capture. The overall cost of capture borne by society is diminished by the introduction of competition between asymmetrically informed bureaucrats.

The structural separation between different regulatory agencies can act as a commitment to prevent regulatory capture by some interest groups. For instance, splitting the control rights on the firm's output between a Public Utility Commission and an Environmental Protection Agency helps prevent the capture of the regulatory process by the producer. Several regulatory agencies with specific missions are

³⁸ See Baron and Besanko (1992).

now each controlling only one dimension of the overall performance of the firm. Their incomplete knowledge about the dimensions that they do not directly observe puts them at a disadvantage vis-à-vis a the firm in the collusion game. Their individual ability to extract rents from the firm is then weakened. Instead, if the regulators have been merged, they would be able to fully observe the performance of the firm. Their demands for bribes could perfectly match the supply, i.e., the informational rent which is left to the firm if the regulator behaves in a lenient way.

The argument for separation has to be considered much more carefully than what this quick assessment suggests. The various interactions between separation and regulatory outcomes are discussed next in some detail.

4.3.1 The efficiency and the distributional consequence of separation

The efficiency and distributional consequences of the structural separation are somewhat ambiguous. On the one hand, the separation of powers can be a way for the interest group to escape the control of its incompetent or corrupted regulators. This is the standard argument given by practitioners on why a public utility commission, for instance, is better than sector specific regulators.³⁹ Efficient firms can get rents from every dimension of information observed by the regulators. Henceforth, they can better fool them when regulators do not cooperate. On the other hand, the discretion of partially informed regulators who may be corrupted may justify a reduction in their individual power which can be obtained through separation. Because of the asymmetric information they face, regulators exert their individual power in trying to capture benefits from the industry only when the latter is inefficient. Hence, to diminish the discretion of these regulators, only the informational rent of these less efficient firms needs to be reduced. Therefore, less efficient firms unambiguously lose from the structural separation of powers and this is how regulatory outcomes improve under the separation of regulatory powers. Inefficient firms suffer from the more bureaucratic rules followed by each single agency to reduce the cost of collusion-proof. Separation advocates for the use of more bureaucratic rules. The choice of communication channels and the choice of more bureaucratic rules are two complementary tools used to improve the design of the internal organization of the government. Again, structures and processes move hand in hand.

4.3.2. Separation and the firm's budget constraints

Separation has not only ambiguous distributional consequences, but it also has an ambiguous allocative impact. Indeed, separation may both harden and soften the firm's budget constraint depending on the extent of the adverse selection problem that the government faces. Separation may indeed call for less or more projects being accepted by the regulatory charter when several agencies are used to help the decision making process. For small (resp. large) uncertainties, less (resp. more) projects are still allowed under separation. In this case, rules are not too bureaucratic under integration because even if the single regulator gets captured, the stake of collusion and the cost for society remain small. The single regulator under integration keeps enough discretion to allow the pursuit of some bad projects. As we discussed above, rules are more bureaucratic under separation and bad projects are more likely to be stopped by a charter with several regulatory agencies.

³⁹ Laffont and Martimort (1995) show how efficient firms may be able to play advantageously one regulator against the other.

This result is in sharp contrast with the one obtained by Dewatripont and Maskin (1995). These authors show that some form of decentralization of the rights of refinancing projects hardens the firm's budget constraint.⁴⁰ Similarly, Schleifer and Vishny (1993) discuss how corrupted regulators holding complementary permits are able to extract an excessive amount of bribes from the firm leading to insufficient entry on the market, i.e., hardening its budget constraint.⁴¹ In sum, the theoretical jury is still out on the impact of separation on specific regulatory outcomes. Practitioners have generally already decided against it in developing countries with limited institutional capacity.

4.3.3. Separation and communication problems

Until now, we have assumed that communications between each regulator and the principal were taking place simultaneously. The benefits of separation also exist when we allow one regulator to observe other regulators' information before deciding on the degree of collusion with the firms regulated. This hierarchical organization captures the often observed asymmetry in the role of different regulators intervening at different stages of the regulatory process. For instance, the procedures for merger control differ across countries but in general require two stages to be completed sequentially; notification and investigation. According to Nutall and Seabright (1993), who compare the different organizations of regulations, in some countries, such as the United Kingdom, two distinct bodies are in charge with each of these tasks, respectively the Director General for Fair Trading and The Monopolies and Merger Commissions. In the European Economic Commission, a unique body, the Merger Task Force performs both activities. Even if one could agree with these authors and recognize that a concentration of the tasks speeds up the regulatory process, it may also involve greater costs in terms of capture. Laffont and Martimort (1995) show that a sequential separation between regulators still helps in fighting capture. However, the gains of reducing the cost of collusion-proof constraints are only obtained vis-à-vis the first intervening agency, which is only partially informed and therefore at a disadvantage in the bribery game with the regulated firm. The sequential separation between the regulators comes with an asymmetry between their real authority and the level of bureaucratic procedures they follow. Regulators moving first follow more bureaucratic procedures and are entitled to less formal authority than regulators moving last. Again, structure and processes matter on the regulatory outcome.

4.3.4. The Life Cycle of Regulatory Agencies and Transaction Costs

⁴⁰ The main focus of Dewatripont and Maskin (1995) is the organization of the banking sector. They show that a banking sector in which lenders are constrained in the size of the loans they offer can be used as an effective incentive device. When lenders have a limited ability to finance projects, a venture needs to look for refinancing by other lenders who are at an informational disadvantage vis-a-vis initial lender. As a result, the cost of capital increases and this hardens the ex ante incentives of the firm to complete projects earlier. Obviously, the logic of their argument also applies to regulatory agencies with limited budgets.

⁴¹ Their approach is cast in terms of exogenous stakes of collusion and exogenous bribery strategies. We already address in Section 3.2 this excessive rent-extraction which arises in a multiprincipal models when the latter control only complementarity activities of the agent. The weakness of this approach is that it overestimates the problem of control of the bureaucracy by modeling no control at all. Because, it has no normative underpinnings, there is no place for a welfare comparison between regulatory institutions. Multiplying the number of regulators to induce inefficiencies in the bribery game is also an argument that the Public Choice literature has put forward (Miller, Shughart and Tollison (1984)). This approach suffers nevertheless from the same weaknesses as Schleifer and Vishny (1993).

Institutions affect the efficiency of the collusion game between the interest groups and the regulatory agencies. The key to getting a richer vision of the capture transaction is to see it as a self-enforceable side-contract between the regulator and the firm it regulates. This is the natural theoretical framework to analyze this collusion, but it is also the most realistic way, the formalism of regulatory processes and rules are often dominated by less formal processes and rules.⁴² This is because there is no court of justice to enforce these illegal agreements and the party to the contract must rely on "words of honor" to fulfill their agreements. The common view argues that the repetition of the regulatory game is good because it allows for less opportunistic behaviors by the regulator.⁴³ This is in fact not the case in a repeated game environment in which the regulator is always the same. The expectations of the regulator on future advantages deriving from friendly behavior toward the industry, and the expectation of the industry on lenient behavior from the regulator are the glue that allows these illegal agreements to be self-enforcing.⁴⁴

These informational rents, which will be under the control of the regulator in the future, create the stakes for starting collusive relationships immediately. The higher the stakes in the future, the higher the cost of capture today. Since more and more opportunities for collusive behavior may emerge over time, the optimal regulatory charter calls for smaller and smaller regulatory stakes as time goes on. Therefore, one should also impose more and more bureaucratic rules as agencies grow older. In other words, the bureaucratization of the government intervention is an unavoidable outcome.⁴⁵ Agencies follow a so-called "Life Cycle". They begin by behaving in the public interest and then become more and more under the influence of interest groups. They then become vested in the status quo and overly bureaucratized.

This Life Cycle view of regulatory agencies modeling as capture also gives firmer theoretical foundations to the Laffont and Tirole (1993, Chapter 13) model of capture, which instead assumes enforceable side-contracts, although the long-run outcome of the regulation is the same as that obtained with a static model of capture.⁴⁶ The key novelty of the analysis is to derive the efficiency of the side-contracts from the institutional structure. These side-contracts, because they are not enforceable and rely on a dynamic process to establish, suffer from some transaction costs. These transaction costs of capture change with simple institutional constraints: they decrease with the amount of information that the regulator gets on the firm; they decrease with the discount factor of the principal, i.e., with the discrepancy between the time horizon of the political principal and that of the firm; and, they decrease also with the discount factor of the bureaucracy. Changing these parameters increases the value of the continuation of capture for the regulator and the firm. The capture transaction is now easier to be enforced.

The consequences of this endogenization of the transaction cost of capture for institution design are immediate. First, arm's length regulation, in which the political principal exerts the regulatory rights

⁴² See Tirole (1992) and Martimort (1997) for models along these lines.

⁴³ Salant (1992), Salant and Woroch (1993) and Gilbert and Newbery (1993)

⁴⁴ See Fudenberg and Maskin (1986) for a general proof of the Folk Theorem in repeated games.

⁴⁵ As suggested by numerous political scientists: Lierson (1949), Bernstein (1955), Huntington (1966) and Downs (1967) among others) but also by sociologists and finally by practitioners (Kahn (1988)

⁴⁶ Martimort (1997)

itself and where there is little room for an active bureaucracy, could be preferred to a more day-to-day relationship with the firm, which occurs under regulation. The recent move away from regulation and towards antitrust policies observed in European countries can be provided with a rationale along these lines. Indeed, antitrust policies make little use of *ex ante* monitoring devices and correspond in fact to the use of *ex post* monitoring controls. Courts, and often poorly informed judges, are given large degrees of discretion in an absolutely non-predictable way in order to break any scope for capture by the industry. The reinforcement of antitrust agencies throughout Latin America for instance could be seen as a significant potential improvement of the potential efficiency of regulatory outcomes for the same reason.

The Life-Cycle view of regulatory agencies also shows that the composition of the agency itself matters. As discussed by Wilson (1989), we can isolate three different types of regulators; the so-called "careerists," who are more likely to move to the industry they regulate once they have finished their tenure in the civil service; the "professionals," who are former industry managers willing to keep some influence on the regulatory process; and lastly the "politicians," who see their civil service as a first step before taking a political position. All these types respond to different implicit incentives. Clearly, the two first groups are more likely to give a high continuation value on the fact of colluding with the firm. This suggests that shifting the balance of powers towards the "politicians" within the regulatory agency itself is optimal, which is not quite consistent with the standard recommendations given by practitioners, as suggested by the overview prepared by Smith (1996). Alternatively, playing on the tenures of the bureaucrats helps to fight capture. Short-term involvement in the civil service should nevertheless be traded off with the gain of longer lasting relationships like a better learning of the industry conditions.

4.3.5. Limited Commitment and the Degree of Honesty of the Policymakers

Simple "constitutions" which limit the intertemporal mandates of a government can be used as constraints to prevent capture.⁴⁷ At the time of designing the constitution, the "founding fathers" have to decide whether a government should be able to bind the future of society to a given policy or whether they should be given the regulatory rights only for a shorter periods. The cost of commitment is that a badly composed government could extract more rent from its ability to commit. Instead, short-term mandates are such that a badly composed government can be replaced with some probability by an honest one that is more willing to prevent capture with the industry. Political competition acts as a potential threat of regulatory capture. The cost of short-term contracts is, instead, that they are prone to the standard hold up problem.⁴⁸ Firms underinvest if they are *ex post* expropriated from their investment at the time of change in the regulatory policy.

When the political decision maker is, in all likelihood, dishonest, the optimal complete intertemporal contract or constitution calls for collusion-proof regulatory mechanisms. Instead, when dishonesty is less likely, letting collusion happen is optimal since it leads to an avoidance of paying the costs of an increase in the firm's budget to fight collusion. This outcome can also be implemented as a

⁴⁷ Laffont and Tirole (1993), Chapter 16

⁴⁸ See Williamson (1975) et Grossman and Hart (1986).

simple constitution which chooses *ex ante* between long-term and short-term contracting. In particular, a more efficient technology of collusion, i.e., a lower transaction cost of capture, calls for the choice of short-term contracts. Indeed, the dead-weight loss due to capture is less important under short-term contracting. This result is reinforced by Olsen and Torsvick (1995), who show that the benefits of offering a sequence of two short-term contracts with respect to writing a long-term contract increases with the transaction costs of side-contracting. A more efficient *ex post* capture induces a tougher reaction of the political principal and the regulatory stake is strongly reduced. In other words, there is an implicit competition between the political principal for the second period and the regulator when they make deals with the interest group. An increase in the efficiency of side-contracting hardens this competition. By playing the bureaucracy against a political principal who is unable to commit helps to improve welfare. The increase in the efficiency of the bureaucracy becomes a commitment device.⁴⁹ Collusion-proofness calls for little discretion and this is good when only short-term contracts can be written.

4.3.4. Delegation and Decentralization

One largely unanswered question in the theory of government remains its optimal degree of decentralization. The shrinking share of the government sector in all western economies, the failures of the socialist economies, and the discussion of the costs and benefits of federalism are all evidence that this debate is very current.⁵⁰

The Folklore of the Public Economics literature argues that decentralization is good because it allows local powers entitled with regulatory rights to use their local information to improve the provision of regulation, redistribution, or the production of public good at the local level. The standard argument is that these benefits of decentralization must be traded off against the costs coming from the lack of coordination in the regulatory policies of the competing states. Externalities arise from this decentralized exercise of regulatory rights.⁵¹

This argument is at best incomplete because it implicitly assumes that local principals are unable to communicate the information they learned at the local level to the upper level of the regulatory hierarchy. If such communications were available, a grand and centralized mechanism would be enough to coordinate all jurisdictions. Moreover, under seemingly innocuous assumptions like risk-neutrality, unrelated local shocks and acceptance of the federal contracts at the interim stage, i.e., after that local governments have learned their own information, there are decentralized ways of implementing the optimal coordinated regulatory policy. With a convenient set of budget allocations and grants at the local level, the Federal level can achieve the efficient policy by letting local jurisdictions have the formal authority for implementing local regulation.⁵²

⁴⁹ Sappington (1987) builds a related model.

⁵⁰ See Stiglitz (1994, Chapter 10) for a discussion of the centralization versus decentralization problems in this context.

⁵¹ We do not aim here at discussing the huge literature which, following Tiebout (1955), has analyzed these externalities. Few of these papers have really taken the agency perspective which is necessary to an institutional analysis. Klibanoff and Morduch (1994) is a valuable exception. They provide a model of decentralization based on informational constraints and discuss the meaning of residual regulatory rights in this context. Additional ideas are discussed in Estache, A., ed., “Decentralizing Infrastructure, Advantages and Limitations”, World Bank Discussion Paper, 290.

⁵² Baron and Besanko (1992) and Mookherjee and Reichelstein (1996) show this result in the context of the theory of the firm.

There are three possible ways to prove the optimality of decentralized structures. The first argues that the main benefit of decentralization comes from the ability of the local governments to collude with specific interest groups at the local levels.⁵³ This collusion is indeed socially optimal because it allows the overall contractual arrangement to use the shared information of the local behavior to improve on the centralized arrangement. Capture is not a curse for society, but on the contrary, it allows regulatory contracts to be completed.⁵⁴ A second solution is to recognize that implicitly, communication between the local and the centralized governments is assumed to be limited because, for instance, the so-called revelation mechanisms are not available.⁵⁵ Contracts are then incomplete. The mere existence of a communication constraint creates the scope for collusion at the local level between the regulated firm and its regulator. The structural asymmetry that decentralization introduces between these two layers of the hierarchy helps the central level use the local regulators to complete their regulatory contract. A third, less normative, perspective about the optimal organization argues that delegation may also help in the case of non-benevolent political principals elected through voting procedures. The basic idea is that the optimal organization trades off the incentive costs of decentralization (modeled as a moral hazard problem between the local regulators and the centralized one) and the benefits of decentralization, which is a better representation of the preferences of the local median voter by the local elected principals.

5. Lessons for a pragmatic approach to the design of regulatory institutions

Table 1 summarizes the main discussions covered in this paper. It suggests that there is a reasonable degree of consensus between practitioners and theorists on many of the issues covered here. In a nutshell, everyone seems to agree that utility regulation has to promote (static and dynamic) efficiency while it protects consumers from potential monopolist abuses, and investors and operators from political influence. Everybody also agrees that there is a trade-off between the credibility of the regulatory commitments and the flexibility required to rebalance, as needed, the interests of the various actors. Some degree of flexibility is desirable but the track record of governments in their use of flexibility is generally perceived as being so problematic that the rules built in the various privatization instruments are designed to limit this flexibility.

Since some degree of discretion is always available since regulatory contracts cannot foresee all future occurrences, safeguards are needed. One of the key components of these safeguard mechanisms analyzed, in some detail, by practitioners is the specific design of regulatory institutions. One of the key points made in this paper is that these safeguards sometimes reflect and sometimes imply transaction costs which influence or should influence the optimal rent-efficiency trade-off in ways which are sometimes ignored by practitioners.

The first set of generic issues practitioners usually cover on institutional design is the importance of the independence, autonomy, and accountability of the regulatory institutions for the sustainability of the reforms of regulated sectors. Most of the literature on transaction costs due to government failures

⁵³ Caillaud, Jullien and Picard (1996)

⁵⁴ See Itoh (1993) for this point in the framework of the theory of the firm.

⁵⁵ See Maskin (1976). Also, Laffont and Martimort (1995) takes explicitly this route and model collusion and limits of communication altogether.

covered here would agree with the need to meet these three criteria. It would, however, emphasize that the way in which the criteria are met is determined by the way in which the transaction costs are minimized, and this in turn drives the desirable design of the regulatory framework. The time dimension, for instance, is crucial. In practice, it means that if there are commitment problems, short term institutional contracts between the various players are more likely to ensure independence and autonomy. This has an impact on the duration of the nomination of the regulators. Short term contract may be better, yet typically, contracts for regulators are between 4 and 8 years and often with possibilities of renewal.

But the empirical debate on the design of the regulators' job goes further and this is a potential source of tension. According to one of the schools of thought discussed above, it would seem that what practitioners typically recommend - i.e. that ensuring that the regulators are appointed on the basis of professional rather political criteria - may not be the optimal strategy to minimize capture since the professional experts are likely to come from the sector they are supposed to regulate and are likely to return to it sooner or later. This is the case in most developing countries for instance. Most practitioners would reply that the idea of electing regulators may be just as dangerous in developing countries. Unless the democratic process is well oiled and has the required transparency and accountability, elected regulators are unlikely to be much more independent than professional regulators; they will simply represent different interests. What is interesting to note however is that while practitioners and theorists emphasize different sources of capture, both agree that one way of dealing with this risk of capture is to ensure that the selection process involves both the executive and the legislative branches.

Table 1: Summary of the main approaches to minimize transaction costs in the design of regulatory frameworks

	Impact on regulatory outcome if not taken into account	How to minimize transaction costs
Lack of commitment of government and need for renegotiation	<ul style="list-style-type: none"> • with more info in 2nd period regulatory want to improve incentive • this reduces incentive for efficiency in 1st period 	<ul style="list-style-type: none"> • “overincentivate” in period 1 • maintain flexibility to renegotiate to avoid overbinding commitments to private operators
Multiprincipal Nature of Government	<ul style="list-style-type: none"> • allocative inefficiency: because of horizontal coordination problems, more or less incentive • sub-optimal degree of decentralization and vertical coordination problems: cuts efficiency rent to firms and move towards cost plus regime • too low incentives build in contract when multiple regulators cover complementary activities because of overregulation • too much incentives build in contract when multiple regulators cover substitutes activities because of regulatory competition • sequentiality of regulatory decisions matter: 	<ul style="list-style-type: none"> • improve information and monitoring (formal yardstick competition will be a useful tool) • reduce number of players • let regulators share information to soften their competition • let regulators share information to soften their competition • give a veto right to head of state or institutions to which regulators are accountable to
Discretion of Political Principal	<ul style="list-style-type: none"> • structure driven direction of incentives because they drive the distribution of power of interest groups • politician favor median voter rather than majority of voters 	<ul style="list-style-type: none"> • how to fix structures? separation? • fix process by specifying decision making processes (including voting mechanism to ensure proper representation in decision making process) <p>suboptimal contracts (average cost pricing or quota) can be useful ways of tying the hands of politicians</p>
Discretion of Regulator	<ul style="list-style-type: none"> • internal influences: wages and promotions can be used to alter rent distribution; increase internal incentive to perform to reduce external influence and risk of collusion • conflict between legislative and regulators; need to reduce rent to cut risks of collusion • regulatory dynamics: side payments 	<ul style="list-style-type: none"> • increase accountability (disseminate information through any which way it is possible; including the media but this requires also educating the media) • cut rent and move towards cost- plus • fix structures to reduce risks

Autonomy covers various issues. Practitioners will generally argue that agencies need to have access to their own funding sources. Relying on budgetary transfers decided by politicians is often viewed as a threat to the independence of the regulators since an easy way to reduce the effectiveness of a regulator would be to cut its budgetary allocation. Levies on the regulated firms or the consumers of the regulated services are the most common alternatives, and can be viewed as user fees to be paid for the protection services provided by the regulators. To some extent, the regulatory fee approach also increases the accountability of the regulators since there is a more direct link between the source of their financing and what is expected from them.⁵⁶

But autonomy has to be more than just financial. It should also mean that the regulator can recruit its own staff. The achievement of staffing autonomy will often require an exemption from civil service salary and recruitment rules. It may also imply that these agencies have to be able to recruit external consultants when the required skills are not available locally to address specific needs. Autonomy in monitoring of compliance and enforcement deserves to be highlighted because it requires that specific instruments be assigned to the regulators. This match between instruments and institutions is also a recurring theme addressed by the theoretical literature, which does not provide closure, so there is little policy advice that be drawn beyond what practitioners have to say. To be effective in his role, the regulator must be able to impose penalties according to clearly defined rules. This is consistent with the emphasis on simple transparent rules that emerged from the literature reviewed in the paper. The other theme addressed here is that there is an ideal sequence in the decision-making process that depends on the distribution of information among the actors

Both practitioners and theoreticians agree that accountability requires transparency in the decision making process, which is unfortunately too often counterintuitive to many bureaucrats. It also requires an operating environment subject to simple and clear procedural rules, including stipulated deadlines for reaching decisions, detailed justifications of decisions, non-political reviews of decisions, opportunities for all concerned parties to be heard through public hearings (and hence greater interactions with consumer defense groups), and venues for appeal and provisions permitting removal of regulators in case of proven misbehavior. The practical challenge, however, is no longer the staffing. The challenge is to ensure that the information generated by this process is relevant to allowing the required accountability. This is, unfortunately, not the case in many countries since process oriented regulators tend to deal with details that have little to do with the distribution of the rent generated by the private or public monopolies providing utilities services. They deal with the formal regulatory issues rather than the real regulatory issues. In this case, transparency requirements become an alibi rather than an instrument that can be used by regulators.

Finally, practitioners tend to discuss their views on the optimal number of agencies. For all or most infrastructure sectors, they tend to recommend the creation of multisectoral agencies, i.e. a single regulatory agency as in the case of state-level regulators in the US, Canada and Australia, and national regulators in Costa Rica and Jamaica, rather than a sector or industry specific agency. This is one of the recommendations that appears to be at odds with what theory suggests. The case for *some* degree of separation of regulatory roles is made strongly by many of

⁵⁶ Also, there are potential problems here too since regulation is a public good and this will probably lead to some degree of free riding.

the papers surveyed here (but not too much since this can lead to unclear and complex overlapping of divisions of responsibilities). This apparent inconsistency can be reconciled in two ways. First, the practitioners' concern with the need to share regulatory resources (regulatory economists and lawyers, etc.) to deal with the limited regulatory capacity is generally not addressed by the theorists surveyed in this paper since their focus is on the US or the UK, probably the largest producers of "regulatory skills".⁵⁷ Second, the fact that some degree of overlapping of responsibilities is unavoidable (e.g. the regulation of environmental issues typically involves multiple government institutions) guarantees that the gains achieved through some degree of separation are achieved.

Considered jointly, the impact of transaction costs resulting from the difficulties involved in organizing governments often imply that less rent and less incentive needs to be built into the regulatory frameworks if transaction costs in general and collusion problems in particular are to be minimized. This is an important conclusion since it rejoins the recommendation from theory on the optimal strategy to deal with excessively high risk levels in privatization projects. There seems to be some truth that there can be too much of a good thing when considering the appropriate level of incentives to build into regulatory regimes.

⁵⁷ Exceptions include Spiller and Levy and Spiller (1993), Guasch and Spiller (1997), and Kahn and Kessides (1997)

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