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Conference Paper

Execution and leadership: Fulfilling conflicting responsibilities in utility regulation

19th Biennial Conference of the International Telecommunications Society (ITS): "Moving Forward with Future Technologies: Opening a Platform for All", Bangkok, Thailand, 18th-21th November 2012

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Execution and Leadership: Fulfilling Conflicting Responsibilities in Utility Regulation

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Executive Summary

Utility regulators serve in two potentially conflicting roles: An implementer of policies established by others and someone providing leadership to effect change. The regulator's success will depend upon his or her ability to properly perform these roles at the appropriate times, to manage the pressures that these roles bring to the regulatory system, and to limit how the roles sometimes work at cross purposes.

In the regulator's formal role as an implanter of policies and laws, he or she establishes regulatory rules and processes, and makes regulatory decisions, under authority provided by the country's lawmakers and policymakers. A successful regulator provides the policymakers with the information they need to be confident that their policies are being implemented faithfully and efficiently. However, the regulator should keep in mind that lawmakers and policymakers are subject to political pressures and that the regulator's work can sometimes relieve these pressures or increase them. Understanding the political context of regulation, and understanding what politicians need from regulators in order for them to be successful are critical for the regulator to succeed. A regulator that fails in managing these relationships will find himself or herself micromanaged, second guessed, and without adequate support.

As if the formal work of regulation were not hard enough, the regulator also plays a leadership role due to his or her unique position within the regulatory system. This leadership role helps stakeholders and policymakers find the nexus of three spaces: (1) Knowing and implementing what is possible (the technical work of engineers, financial experts, lawyers, etc.); (2) Identifying values and priorities (the work of politics, dialogues, and negotiation); and (3) Aligning systems (the work of managing people and organizations). Too often, these three spaces do not overlap. For example, sometimes people want and think they should have things that are not achievable; in other words, they do not understand reality. The work of leadership in regulation is mobilizing people to deal with the challenges of aligning what people want with what can be done.

This leadership role can conflict with the formal role because the act of leadership affects the higher authorities and the formal structure. The regulator might find him- or herself challenging the work that lawmakers or policymakers are doing, challenging the information and expertise of the utility, and disappointing customers by providing the bad news that sometimes costs are higher, service is necessarily slower to be delivered, or both, relative to what customers believe they should have.

How can a regulator be successful in such an environment? A regulator should carefully map crucial relationships, know their natures, and build a strong regulatory agency. The regulator should also stir and steer, but always with humility, knowing that by stirring the pot the regulator is surfacing problems that others might think the regulator should leave alone, and that by steering the regulator is providing direction that policymakers and lawmakers properly see as theirs to provide, but which they cannot provide because of their limited information and knowledge.

JEL Codes: D02, D72, D80, L32, L38

Keywords: Leadership, Regulation, Policy, Utilities

I. Introduction

The minister for public utilities of the small island country got to his point quickly. Looking quizzically at the public utility regulator whose agency was but four years old, the minister asked, “The utility has always kept the lights on. And it is always responsive when I need something. Why do I need you?” Why indeed?

Many regulators around the world have found themselves in similar provocative positions. A utility regulator in the United States was informed by her governor that she would not be reappointed to her position if she failed to vote favorably on a telephone company’s proposal. Another U.S. governor announced to the media that he would not reappoint commissioners that voted in favor of an electricity price increase. A regulator from a developing country received a phone call from his prime minister, informing the regulator that his resignation had been accepted. The regulator had not offered his resignation.

Being a utility regulator is dangerous work. Not in the sense that the regulator is at risk of suffering physical harm because of her duties, but because she is in the way when utility managers want policy favors or when politicians want to provide benefits for constituents and powerful special interests. The regulator is also an easy target for the press and the media when they need titillating headlines that induce people to buy newspapers or tune into broadcast news. In a nutshell, the regulator is designated to do a job that by its design provides disappointments to important stakeholders, and these disappointments prompt many stakeholders to target the regulator as the cause of the displeasure.

Making matters even more precarious, the regulator serves two potentially conflicting roles. One is a formal role of carrying out policies through price controls, service quality enforcement, market monitoring and the like. The other is an informal role of influencing policy by advising policymakers, provoking special interests to think more broadly about policy issues and changing economic realities, and providing everyone – even those that oppose the regulator – with credible, understandable information on how the complex system of utility service and regulation works.

In this paper we examine the implications of utility regulators serving these two potentially conflicting roles. We explain that the regulator’s success will depend upon her ability to properly perform each role at its appropriate time, to manage the pressures that these roles bring to the regulatory system, and to limit how the roles sometimes work at cross purposes.

In the regulator’s formal role as an implanter of policies and laws, she establishes regulatory rules and processes, and makes regulatory decisions, with authority passed down by the country’s lawmakers and policymakers. A successful regulator provides the political authorities with the information they need to be confident that their policies are being implemented faithfully and efficiently. However, the regulator should keep in mind that lawmakers and policymakers are subject to political pressures and that the regulator’s work can sometimes relieve these pressures or increase them. Understanding the political context of regulation, and understanding what politicians need from regulators in order for politicians to be successful are critical for the regulator to succeed. A regulator

that fails in managing these relationships will find himself or herself micromanaged, second guessed, and without adequate support.

As if the formal work of regulation were not hard enough, the regulator also plays a leadership role due to his or her unique position within the regulatory system. This leadership role helps stakeholders and policymakers find the nexus of three spaces: (1) Knowing and implementing what is possible (the technical work of engineers, financial experts, lawyers, etc.); (2) Identifying values and priorities (the work of politics, dialogues, and negotiation); and (3) Aligning systems (the work of managing people and organizations). Too often, these three spaces do not overlap. For example, sometimes people want and think they should have things that are not achievable; in other words, they do not understand reality. The work of leadership in regulation is mobilizing people to deal with the challenges of aligning what people want with what can be done.

This leadership role can conflict with the formal role because the act of leadership affects the political authorities and the formal structure. The regulator might find herself challenging the work that lawmakers or policymakers are doing, challenging the information and expertise of the utility, and disappointing customers by providing the bad news that sometimes costs are higher, service is necessarily slower to be delivered, or both, relative to what customers believe they should have.

The remainder of this paper is organized as follows. Section II describes the relationships of the policymakers, regulators, operators, and citizens, highlighting the formal role of the regulator and the proper lines of authority, accountability, and communication. The third section the regulator's informal leadership role, including tools and frameworks for regulatory leadership. The final section is the conclusion.

II. Regulatory Authority, Accountability, and Communication

We recently examined the situation of one African country that was experiencing turmoil in its regulatory system. Formed about seven years earlier, the regulatory agency was preparing for its first major review of electricity prices. But a number of inexplicable complications were making the planning difficult. One complication was that the government had approved new electricity generating contracts without the regulatory agency's knowledge. The contract prices were high by international standards, so was the agency expected to simply pass these high prices on to consumers? One of the country's goals was to expand the percentage of households that had electricity, which then stood at about 20 percent. How could the poor be expected to begin using electricity when prices were escalating rapidly? Similarly the government and the nation's state-owned electric utility had reached agreements for new loans, the building of transmission lines to connect with neighboring countries, and the like, without any communication with the regulatory agency. The agency head felt powerless to challenge the prudence of the economic decisions, and was upset that the utility appeared to have gone over his head to preempt regulatory authority by dealing directly with policymakers.

After weeks of effort, the head of the agency was able to secure a meeting with a recently appointed minister for energy, who reported to a senior minister who oversaw all infrastructures. This meeting was held in the context of a three-day workshop for ministry, regulatory agency, and operator executives and staff on the basics of utility regulation and utility pricing. The senior minister gave opening comments at the workshop, but then left to attend to other matters. The newly appointed minister and her staff stayed.

During the first hours of the workshop, guest speakers described the role of utility regulators, including how regulators set prices, examine investment decisions and contracts, and establish and enforce performance targets. The speakers also drew distinctions between the government's policymaking role and the regulator's implementation role. In the question and answer periods, the ministry staff asked a number of questions and expressed surprise that the work of implementing policy was to be done by the regulatory agency. The ministry staff knew of the agency, but had little knowledge of its function, and so had been working directly with the utility on policies and implementation. Indeed the ministers and ministry staff that had responsibility for utility issues had never met anyone from the regulatory agency: This workshop was the first such meeting.

As the discussion progressed about the roles of ministries and the roles of the regulator, the minister for energy became uneasy and pointedly asked the regulator: "How can I simply sit back and hope that you carry out my policies correctly? My staff knows what I want and I can talk directly with the utility. Why shouldn't they implement my policies? Why should I trust an agency I know little about and over whom I have little control?"

She had asked the most critical questions about authority, accountability, and trust upon which regulatory institutions are to be built: What is the source of the minister's authority and what authority is reserved for the regulatory agency? How can she hold the regulator accountable for his work and the performance of his agency? What relationships and procedures should be in place so that the ministry and the regulator can trust each other?

What emerged from the discussion was a model, illustrated in Figure 1, for relationships between policy makers, regulators and their agencies, operators, and customers. The figure shows that authority runs vertically beginning with the citizens. Policy makers act as representatives of citizens, much as a board of directors of a private company serves as representatives of shareholders. Policymakers identify policy priorities, such as the economics of prices, importance of service quality, the significance of externalities, and the import of service availability. Policymakers communicate these priorities to head(s) of regulatory agency, who the policymakers also hire. This authorization is done differently in different jurisdictions and may take the form of statutes, policy statements, etc. The agency head(s) are then responsible for developing the agency and its staff, establishing regulatory rules and procedures, and making decisions on prices, service quality, and the like in an effort to achieve the policy priorities. It is the utility's responsibility to make efficiency business management decisions within the boundaries and frameworks set by the regulator. Text Box 1 elaborates on this authority framework.

PLACE FIGURE 1 ABOUT HERE

Text Box 1. Authority Roles***Authority scope of policymakers***

- *Reflect on outcomes*
- *Decide what the system supposed to produce*
- *Consider why it does or why does not perform as desired*
- *Respect citizen expectations*
- *Balance the long run and short run*
- *Select agency head(s)*
- *Define and refine the vision for the utility services*
- *Adapt policies to evolving circumstances while recognizing needs for long-lived investments*

Authority scope of the regulatory agency

- *Establish prices, service standards, incentives and market rules*
- *Enforce decisions*
- *Reflect on utility outcomes*
- *Adjust rules, procedures, and decisions as needed*

Authority scope of the operator

- *Determine means to meet financial goals subject to regulatory decisions*
-

Accountability in Figure 1 runs vertically from the bottom up, beginning with the operator. Both formal and informal methods are used to achieve accountability. Through enforcement actions and the application of other incentives, the regulatory formally holds the operator accountable for following the regulator's rules and decisions. In turn policy makers formally hold the agency head(s) accountable for achieving policy goals through their reappointment, budgetary, and law-making functions. In both instances, informal processes, such as meetings, public dialogues and workshops, public statements, interviews, and the like are used to hold persons and organizations accountable with a lower level of tension and perhaps a lower cost than could be caused with more formal processes.

The accountability relationship between citizens and politicians is different from the other accountability relationships because the politicians serve as individual representatives of the citizens rather than as an organization serving the citizens. Citizens formally hold politicians accountable through elections, but also informally hold politicians accountable through pressures or endorsements expressed through the media, public forums, and the like.

Text Box 2 provides additional details on the accountability mechanisms.

The discussion with the minister and regulator concluded with an agreement to hold another meeting to detail the reports that the regulator would provide to the minister on performance of the sector and the agency, and

a schedule and format for ministry-regulatory agency discussions about the reports, external events, and future directions.

Later in the workshop and after the minister had left, the agency head and the head of the power utility had a frank discussion about frictions between the two organizations. The details of the discussion are unimportant, but the basic theme is important. The two leaders of their organizations found numerous flaws in the conduct of each other's organization, including lack of communication, surprising announcements, and unexplained changes in positions and decisions. Fortunately the leaders

resisted the temptation to simply debate and openly explored the pressures that each was under and the sources of those pressures. To their surprise, they discovered that each truly wanted to cooperate

with the other, but that pressures and demands from politicians in the country led each to appear to act in bad faith towards the other. In a sense, whether deliberately or accidentally, the politicians were playing the operator and the regulator against each other, with the consequence of diminished regulator and operator performance for the citizens of the country.

Text Box 2. Accountability Mechanisms

***Accountability for Operators:
Rewarded or punished by
regulator based on***

- *Costs and price performance*
- *Investment and service availability*
- *Service quality*
- *Externalities*

***Accountability for Regulators:
Pressures and tenure
impacted by***

- *Affordability of prices*
 - *Effectiveness of service quality and availability*
 - *Management and transparency of regulatory process*
 - *Legitimacy with public*
 - *Credibility with operators, investors, and politicians*
 - *Legitimacy with public*
-

What was happening at least in part to the two organizations was a confusion of government roles at the policy level. On one hand there was a sector policy for development, system expansion, and affordable prices. There was also an economic policy that sought to bring capital into the country through contracts with donor organizations and making deals with foreign entities seeking to make strategic investments in the country. There were also political interests that sought to be seen as providing value to important constituents. Figure 2 illustrates a governance framework that helps resolve the sector policy and economic policy conflicts by formally dividing them at the policy level so that the regulator can make regulatory decisions taking the financial conditions and abilities of the firm as given, just as would happen if the firm were privately owned, and the operator could make financial and operating decisions to serve the interests of its owners, subject to the regulatory rules and mechanisms, just as a

privately-owned operator would. A first step for effecting such a model is a political separation between the overseers of sector policy from the overseers of the financial performance of the firm.

PLACE FIGURE 2 ABOUT HERE

The heads of the two organizations agreed that their next step should be a workshop for political leaders so that they could better understand the sector and its regulation, in the hope that such knowledge combined with further frank discussions would lead to less political involvement in the details of the sector and its regulation.

Unfortunately, although the ministry, regulatory agency, and operator made good progress and made bold steps, they were unable to put their plan into action. As too often happens, an upcoming national election and some personal missteps by the agency head resulted in a change in upper management at the regulatory agency and further politicization of the sector. The new leaders have not yet tried to pick up where their predecessors had left off.

The conclusion of this case study in how a regulatory practices leadership in his formal role demonstrates the importance of being able to anticipate political changes and informally practice leadership to ensure the continuity of important initiatives. These issues are the focus of our next section.

III. Regulatory Leadership in a Political Environment

Figure 3 illustrates the informal leadership role of a regulator. The three circles represent the spheres of what is possible given the realities of law, economics, engineering, and the like; what people would like to do as expressed in their political involvement and public forums; and how things can get done, given their abilities to manage complex systems, the relationships that exist, etc. Only work that occurs at the nexus of these three spheres is sustainable. But the professionals in each sphere are not necessarily well informed about where the other spheres lie, and so may be unwilling to make the professional concessions needed to find the nexus. When the issues are about utilities, the regulator can be in a unique position to help find that nexus. Not that the regulator sees everything that others do not – indeed the regulator has her own blinders – but because of her role as head of an independent regulatory agency, she can be less of a stakeholder to a particular view and could be the first to sense when the system isn't working. This allows her a different credibility and a balcony view (Heifetz 1994) that can be used to raise difficult questions and challenge conventional wisdom. But acting on this can conflict with her formal regulatory role because she could be crossing a line into a space that politicians see as theirs. And that can be dangerous.

A politician's world is different from that of anyone else.¹ To get a glimpse into what it is like, we describe the recent experience of a prominent legislative leader whose party was winning majorities in both legislative chambers and that would also control the executive branch. Addressing a national audience of local politicians and business leaders, who had assembled for a summit on broadband policy for the country in the hope of being able to develop ideas that could break what appeared to be a partisan gridlock on several major issues, he was asked a question that seemed innocent enough. But his answer was startling in its bluntness and condescension. The questioner asked how the speaker and his party planned to work with the party that was out of power to develop bipartisan policies. The politician's response was quick and confident, indicating that he had thought about this. "We don't have to," he said. "We have won." His confidence proved to be misplaced. Over the next few years his party lost several elections, including crucial seats in the legislature, and was unable to move forward its primary policy agendas except with very narrow margins in the legislature, and even then there were numerous public protests against the policy initiatives.

The politician's response to the questioner and the difficulties his party faced illustrate a paradox in political life: Political parties elect their politicians to go and fight the bad guys, namely the politicians of the other party. It is tempting for a politician in party A to pander to this view in how he pursues his agenda. But there are problems with this approach. One problem is that a number of

¹ We would like to acknowledge the advice of Marty Linksy in providing insights into the politician's world.

citizens of the country view him and the politicians of party A as the bad guys, and when these citizens see party A carrying out what they see as a bad-guy agenda, these citizens get up in arms. Another problem is that in many political systems the party in power often needs votes from other parties to pass legislation. So a politician voted into office to fight the bad guys must work with them to make progress on important and controversial issues. And when his political supporters see him working with those they consider to be the villains, he risks becoming one of them.

What does this have to do with utility regulators? Regulators work in a political context, as Figure 4 illustrates. Both formally and informally, the regulator is involved in many relationships that she must manage well to be successful. In each relationship, the stakeholder wants something from the regulator and the regulator wants something from the stakeholder. For example, she has a two-way relationship with newspapers. The newspaper needs to attract readers to survive and wants at least two things from the regulator. One is information that readers can use to better their lives, such as tips on saving on utility bills or information on changes in telephone numbers. The regulator wants the newspaper to distribute this information because the regulator is trying to get such information into the hands of the public. The second thing a newspaper wants from the regulator is controversy because that sells papers. Generally this is not something that the regulator wants to provide to the newspaper, but it is sometimes unavoidable. What the regulator does want in this context is for the newspaper to distribute the regulator's message. For example, it might be that electricity prices are going to increase. The newspaper wants to focus on the controversy, but the regulator wants the substantive reasons for and the benefits of the price increase to show up in the story. To be effective, the regulator has to frame these messages in ways that makes them useful for the news story from the newspaper's perspective, which means that they add to the story in a way that makes people want to become readers of the paper.

Each of the regulator's relationships has this nature of a two-way transaction, or should if the regulator is to be successful. This is true even of the relationship with the politician. To understand what the politician wants from the regulator, and what the regulator wants from the politician, the regulator needs to understand the politician's world. As Figure 5 illustrates, the politician also lives in a world of two-way relationships, which the politician must manage well in order to keep his job (i.e., win the next election) and one of these relationships is with the regulator.

What is the politician's world like? As we described above, the politician has a relationship with political supporters who want the politician to fight the bad guys. For obvious reasons, it would be problematic for the regulator to become an instrument in that fight, but it has happened. For example, in the case of the Maryland Public Service Commission several years ago, the new governor of the state was the first Republican to hold the office in over 20 years (Jamison et al. 2006). The Democrat-controlled legislature wanted an opportunity to make him look bad and thus lose the next election. The Commission naively stepped into the situation when it was faced with the unavoidable task of approving a 72% increase in electricity prices. Rather than spend time with the public and media, the regulator spent time with the governor and the industry trying to work out transition deals to soften the blow. The legislature made an issue of the meetings, many of which were behind closed doors, and the media was more than happy to report every accusation. On a theme of cleaning up corruption, the legislature

voted to disband the Commission and replace it with an organization that the bad-guy governor had not corrupted.

There are other features of the politician's world that regulators should note. One is that the world of a politician is flat relative to most people's experiences working in organizations. For most of us, our workplace is hierarchical and our bosses sanction or authorize our work. This sanctioning feature is largely missing in most politicians' worlds. Most politicians compete with other politicians for power, and the power struggle is both open and expected. Even in situations where a party in power has a prime minister who wields significant power, the power exists only as long as he is able to serve the needs of the other politicians who agree to his having the power. When he loses their favor, he loses his power.

What do these features of non-hierarchy and open ambition mean for the regulator? The lack of hierarchy means that the regulator, or at least the regulatory agency, must have workable relationships with many politicians. It is insufficient to have relationships only with the politicians currently in positions of great influence because the distribution of power across politicians is volatile. This need for multiple political relationships can be difficult for regulators serving in systems where their appointments come about because of associations with particular powerful politicians. An example of this is the United States where commissioners in federal regulatory agencies are often appointed because of associations with influential senators or congressmen. To formulate the broad range of political relationships that the regulatory agency must have to be effective, a regulator in an agency with a single agency head must commit some disloyalty to her political sponsor to establish relationships with some of the bad guys. A regulator in a commission context is in some sense a less complicated situation because different commissioners can have different political relationships, giving the commission itself a wide range of fruitful dealings with politicians. But this creates other difficulties because it creates the opportunity for the outside political divides and suspicions to map themselves into the agency, causing frictions between commissioners. This happened in a U.S. federal agency several years ago. It was well known that the chairman was a long-time, personal friend of the Vice President. Other commissioners openly accused him of hiding information and controlling the staff resources in a way that served the agenda of the administration at the time, and that denied other commissioners adequate opportunities to influence commission decisions. We are not passing judgment on whether or not the acquisitions were correct. Rather our point is that the difficult climate within the commission was enabled by the diversity of political relationships across the commissioners, and perhaps enhanced by the closeness of some of the associations. A successful regulator needs to be able to navigate such waters by being close enough to politicians to be on friendly terms, but not so close as to be unable to serve at arms length.

How can regulators be effective in an environment where politicians are openly ambitious? The keys to success here in some ways contradict the keys to success implied by the non-hierarchical structure of politics. A politician has at his disposal many things that he may use to promote his career, include controversies that call attention to him and that present him to the public as a champion for constituents' interests. For example, the current economic crises in Europe has challenged the careers of politicians who have promoted the idea that government benefits to constituents must decrease to stabilize economies and promote growth. Parallel with this, the stock of politicians who point to people

outside of their own country as the villains has risen. A successful regulator will keep these ambitions at arms length, recognizing that they exist, but not becoming a tool for the ambition if at all possible. For example, one utility regulator in the Caribbean openly developed professional relationships with politicians in the opposition party to diminish the chances of his agency becoming an item of controversy for the opposition party. This was successful because when the opposition party came to power because it largely did not interfere with the regulatory agency.

Furthermore, like most of us, the politician wants to keep his job, which means winning the next election. There are politicians who are willing to put their jobs at risk for a cause or because of principle – the U.S. Senators of which former U.S. President John Kennedy wrote about in his book “Profiles in Courage” are examples – but even politicians who stand on principle keep their jobs only if they make choices that win votes, so the behaviors of successful politicians are similar across the political spectrum, even if the politicians differ in their character and motivations.

How does this need for politicians to survive elections impact the regulator? The regulator should be aware of which regulatory issues could become political issues and seek to diminish the heat that the issues might cause. Providing the media, the public, and the industry with clear and unbiased information ahead of the issue becoming controversial might do this. The regulator should also avoid hiding or being seen as hiding information as secrecy is an opportunity for opponents to conjecture about what the missing information says, and provides the media with daily stories about speculations, leaks, and the like. The regulator should also avoid surprising politicians currently in power with unpleasant news that they have not prepared for. The surprises might cost them politically, and cause the politicians to be less trustful of the regulator.

As these lessons imply, it is imperative that the regulator build trust with the stakeholders in Figure 4. The two-way dealings are not always simultaneous; so one party in giving something will be guarded if he doubts that the other will be faithful to the implied quid pro quo. Trust is built through repeated performance.

IV. Conclusion

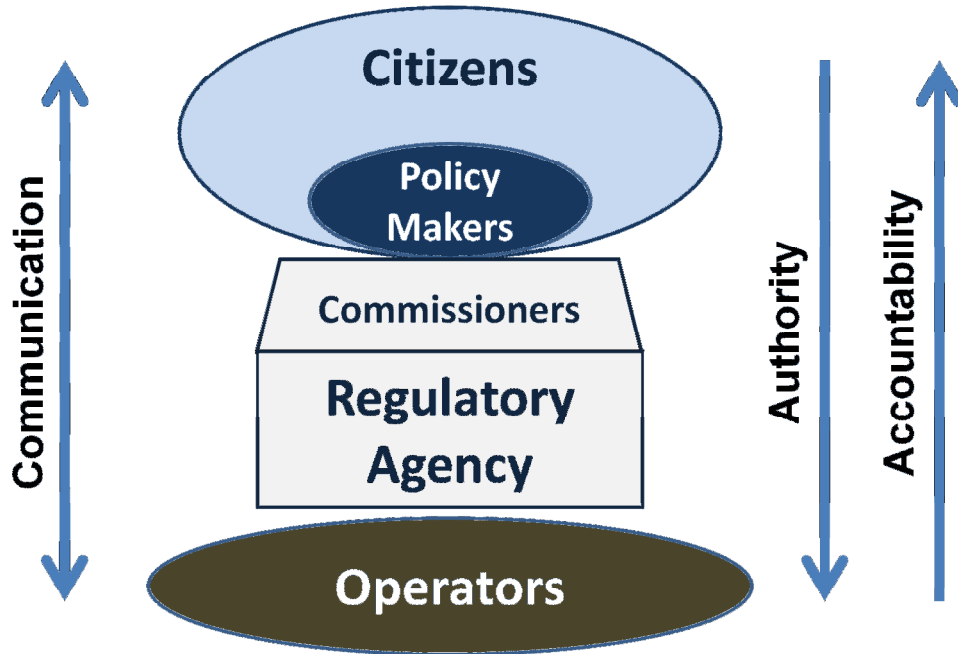
In this paper we have examined the formal and informal roles of the regulator, and examined how they can come into conflict. In a sense this complexity comes from the fact that an independent regulatory agency is a creation of a political process that, because of long-term policy goals, has agreed to restrain itself by the agency’s independence, but that sometimes finds it difficult or maybe even impossible to satisfy short-term political needs without infringing upon the agency’s independence. It is the regulator’s leadership skills – not her talents as a lawyer, engineer, economist, etc. – that she must call upon to successfully sustain the regulatory system.

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Figure 1. Regulatory Governance Model

Regulatory Governance Model



Adapted from Brown (2006).

Figure 2. Clarifying Roles

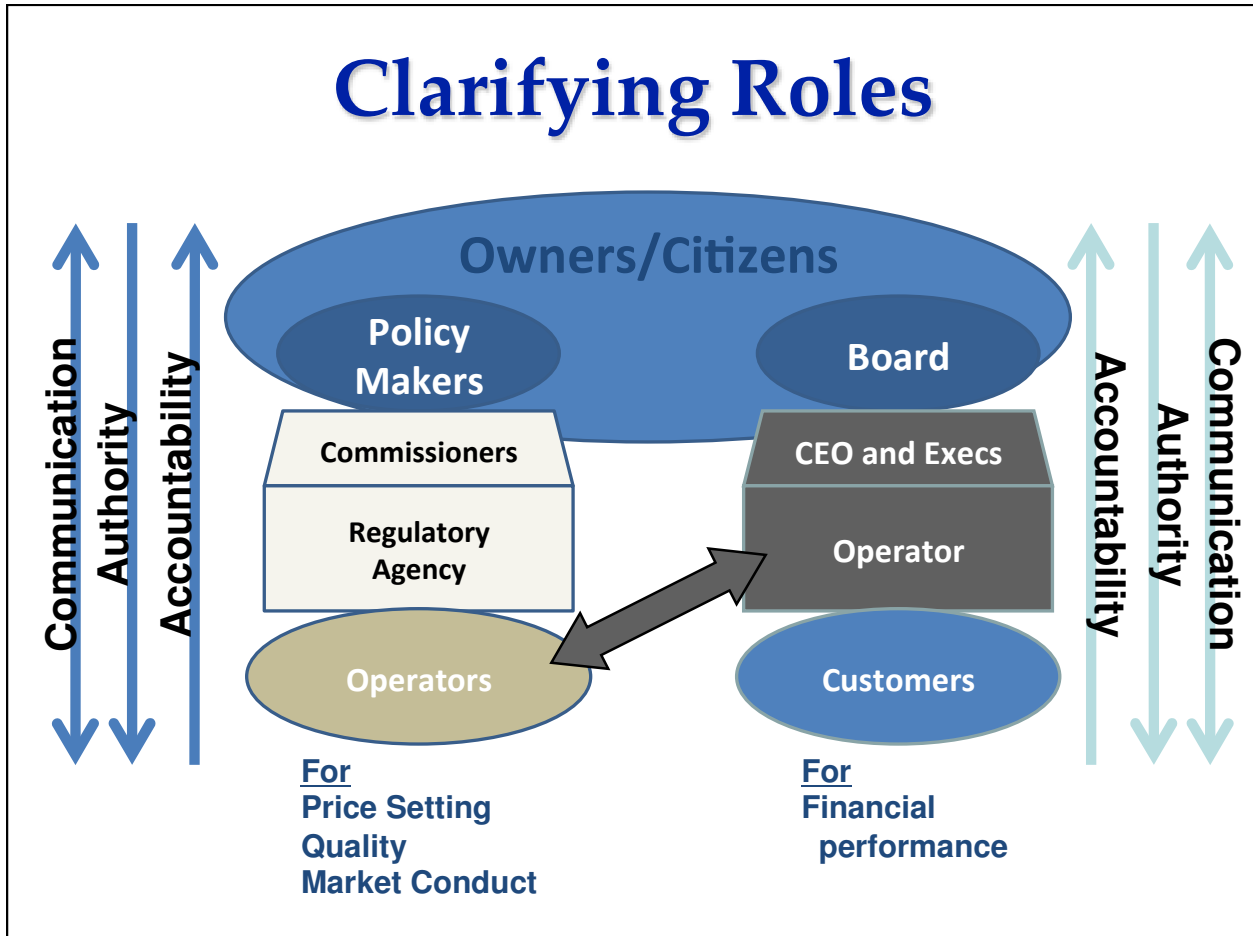
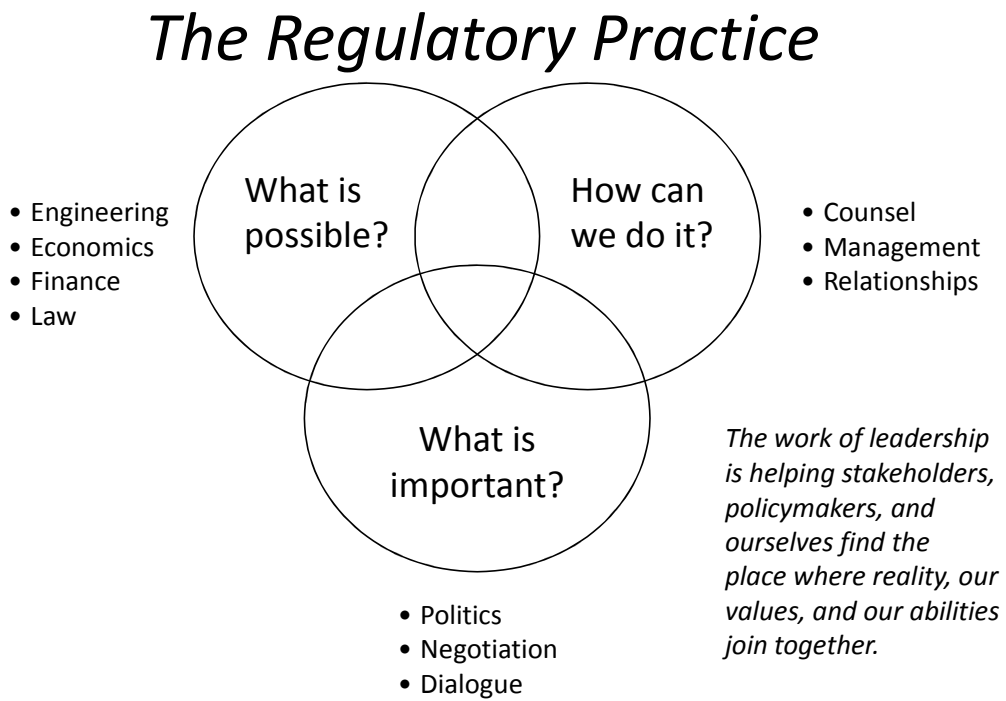


Figure 3. The Regulatory Practice



Adapted from Jamison and Castaneda (2011).

Figure 4. Regulator's Political Context

Regulator's Political Context

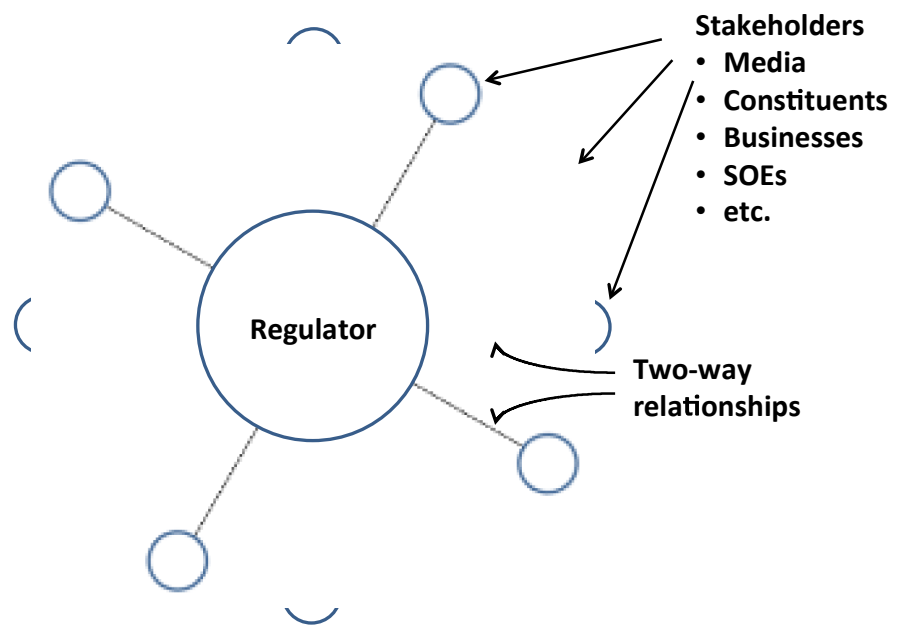
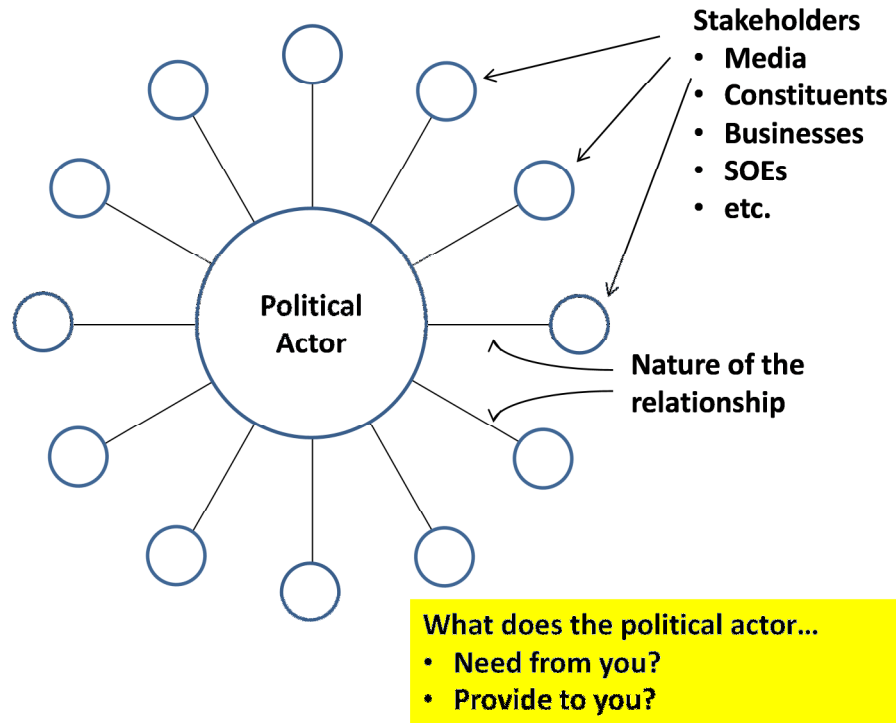


Figure 5. Politician's Context

Political Context



Technical Supplement

Several principles of neoclassical economics, behavioral economics, institutional economics, applied psychology, and neuropsychology underlie this paper's conclusions. This technical supplement identifies those principles and demonstrates how they lead to the paper's findings. The principles include utility maximization, hidden information, what you see is all there is, economies of division of labor, institutional norms, and costs of communication.

We consider a characteristic function game (N, u, Γ) in which up to four players choose individual actions and institutional rules in order to maximize individual utility. Two of the players – the citizens and the politician – are the game's owners, meaning that they can play the game by themselves or invite up to two others – an infrastructure operator and a regulator – to participate. More formally, we let $N = \{c, p, r, o\}$ represent the set of players, where c is the citizens, p is the politician, r is the regulator, and o is the infrastructure operator. The characteristic function is a function, denoted u , that associates with every subset $S \subseteq N$, a value $u_{\Gamma}(S)$, which represents the value created when players S come together and act according to the institutional rules, Γ (North 1990).

In this game value is created by infrastructure services. Citizens are the consumers of the services. There are up to three other functions that can be performed according to the institutional rules. One function is the production of the services. The politician, regulator, and operator are all technically capable of producing the services, but the operator has the best skills for production. Another function is that of establishing policy, i.e., identifying institutional rules as they relate to how value is distributed among the players and across citizen groups and what the aspirations of the game's coalition should be with respect to value produced. The politician is more skilled at policy than are the other players. The third function is that of regulation, namely specifying the processes used to implement policy and to enforce policy. The regulator is more skilled at regulation than are the other players.

We assume that playing the game creates non-negative utility for the game's coalition and that each player's opportunity cost is zero, meaning that each player receives a utility zero if she is not included in the game coalition, i.e., $u_{\Gamma}(S) > 0 \forall i \in S$ and $u_{\Gamma}(j) = 0 \forall j \notin S$.

We examine *** scenarios for the game. In the first scenario, c and p choose to play the game alone, i.e., $S_1 = \{c, p\}$. In this scenario, all rents $u_{\Gamma_1}(S_1)$ accrue to the citizens and the politician. The regulator and the operator are not included and so each receives her reserve value of zero. The value $u_{\Gamma_1}(S_1)$ is created by citizens and the politician, with the politician serving in the roles of policymaking, regulation, and production. The characteristic function u for this scenario is as follows:

$$u_{\Gamma_1}(\{c, p\}) = u_{\Gamma_1}(S_1)$$

$$u_{\Gamma_1}(\{i\}) = 0 \forall i \in N$$

Citizens and politician can divide a positive payoff from this scenario, so they would be more willing to engage in this scenario than not play the game.

Now consider the situation where the citizens and the politician invite a second participant, either the regulator or the operator, to participate in the coalition. Inviting the regulator is scenario 2 and inviting the operator is scenario 3. In scenario 2 $S_2 = \{c, p, r\}$ is the scenario coalition and value $u_{\Gamma_2}(S_2)$ accrues to the citizens, the politician, and the regulator. The operator is not included and so receives her reserve value of zero. The value $u_{\Gamma_2}(S_2)$ is created by citizens, the politician, and the regulator. We dismiss as inconsequential to our analysis divisions of labor in which one party in the scenario's coalition plays a role that would be more efficiently played by another party in the scenario coalition. In scenario 2, this means that the politician serves in the role of policymaking and the regulator serves in the role of regulation. It is unimportant which serves in the role of production because neither is efficient in this role. This institutional structure allows for at least some greater specialization than scenario 1, so the characteristic function u for this scenario is as follows:

$$u_{\Gamma_2}(\{c, p, r\}) = u_{\Gamma_2}(S_2) > u_{\Gamma_1}(S_1)$$

$$MC_r|_{\Gamma_2} = u_{\Gamma_2}(S_2) - u_{\Gamma_1}(S_1)$$

$$u_{\Gamma_2}(\{i\}) = 0 \quad \forall i \in N$$

Where $MC_r|_{\Gamma_2}$ is the marginal contribution of the regulator being in the scenario coalition with institutional rules Γ_2 . Citizens, the politician, and the regulator can divide a positive payoff from this scenario, so they would be more willing to engage in this scenario than scenario 1. Citizens and the politician must receive non-negative payoffs whose sum is at least as great as $u_{\Gamma_1}(S_1)$. The regulator must receive at least a non-negative payoff.

In scenario 3 $S_3 = \{c, p, o\}$ is the scenario coalition and value $u_{\Gamma_3}(S_3)$ accrues to the citizens, the politician, and the operator. The regulator is not included and so receives her reserve value of zero. The value $u_{\Gamma_3}(S_3)$ is created by citizens, the politician, and the operator. Dismissing as inconsequential divisions of labor in which one party plays a role that would be more efficiently played by another party in the scenario coalition, the politician serves in the role of policymaking and the operator serves in the role of production. It is important which serves in the role of regulator, even though neither has strong skills in the area. The principle at work is the principal-agent problem (Laffont and Tirole, 1994). At one level the operator has hidden information – unobservable abilities, unobservable effort, or both – and without oversight would use this hidden information to its advantage. To diminish this problem, the politician performs regulations that specify reward systems for improved performance. These reward systems permit higher rewards if the operator produces as if it has high talents for production, higher rewards if the operator produces as if it were exerting high effort, or higher yet rewards if the operator produces as if both were true. The rewards system is made up of promises by the politician to provide certain payoffs and penalties based on what the politician can observe the operator providing to citizens, and contains two critical features. One of the features is the agreement on what and how the operator will communicate with the politician. The other feature is the set of constraints on the

politician that ensure that she will keep her promise to provide rewards or withhold penalties according to the promises made. Development and enforcement of the first feature works well because that makes both the politician and the operator better off. The section feature is more problematic because, once the operator performs, the politician has an incentive to renege. Absent a regulator or court system to enforce political promises, the operator will underperform based on the belief that the politician will behave opportunistically. (Spiller 2005)

Establishing and enforcing such rewards takes skill, effort, and resources, as do playing the role of policymaker, so the politician, having limited skills and resources, and wishing to avoid exerting effort for which she is not rewarded, does not find it optimal to perfectly perform either regulation or policymaking. This leads to the second principal-agent problem, the one between the citizens and the politician (Villalonga 2000). The citizens cannot directly observe the politician's abilities or effort, so they do not know the extent to which the politician is working for the betterment of the citizens, or to better herself. Since the definition of a successful politician is the politician who wins the next election, the politician has an incentive to establish institutional mechanisms that communicate her performance to the citizens, although in a way that biases the citizens' beliefs towards favorable views of the politician. Understanding this, the operator has an incentive to communicate directly with the citizens as to the performance of the system, but this incentive is dampened by the politician's ability to behave opportunistically if the operator is too disruptive, or to include in its rules diminished rewards to the operator should the operator stir up the citizens. The politician's ability to limit information provided to citizens lowers the system's efficiency.

This institutional structure in scenario 3 allows for greater specialization in production than does scenario 2, but suffers from opportunism, principal agent problems, and limited information for citizens to discipline the politician. Nevertheless, empirical studies find that this arrangement is more productive than scenarios 1 and 2 (Villalonga 2000), so the characteristic function u for this scenario is as follows:

$$u_{\Gamma_3}(\{c, p, o\}) = u_{\Gamma_3}(S_3) > u_{\Gamma_2}(S_2)$$

$$MC_o|_{\Gamma_3} = u_{\Gamma_3}(S_3) - u_{\Gamma_1}(S_1)$$

$$u_{\Gamma_3}(\{i\}) = 0 \quad \forall i \in N$$

Citizens, the politician, and the operator can divide a positive payoff from this scenario, so they would be more willing to engage in this scenario than scenario 2. Citizens and the politician must receive non-negative payoffs whose sum is at least as great as they would receive in scenario 2. The operator must receive at least a non-negative payoff.

Now consider the situation where the citizens and the politician invite both the regulator and the operator to participate in the coalition. In this fourth scenario $S_4 = \{c, p, r, o\}$ is the scenario coalition and value $u_{\Gamma_4}(S_4)$ accrues to all four players. We dismiss as inconsequential suboptimal divisions of labor, which means that the politician serves in the role of policy making, the regulator serves in the role of regulation, and the operator serves in the role of production. This institutional

structure allows for greater specialization than any of the other scenarios, so we would expect for it to produce the greatest value. However, as we show next, this depends on the institutional rules.

To illustrate the importance of the institutional rules, we introduce an exogenous factor, z , which impacts outcomes. Each player can observe how z impacts her own effects on the value of the coalition, but not the effects on others' impacts.

We also introduce two other principles. One is a fallacy named by Kahneman (2011) as "What you See is All there Is," or WYSIATI. This fallacy is actually a limit on how players process information. Players observing z also imperfectly observe the effectiveness of other players and the actions of other players. Some players may be aware of their susceptibility to the fallacy, but nonetheless fall into its trap (Kahneman 2011). WYSIATI leads to micromanagement. For example, the politician, observing a lower than expected value from infrastructure services, may logically conclude that this results from a negative impact from z and costs of overcoming the information asymmetries between the regulator and the operator. But WYSIATI leads the politician to believe that the regulator isn't doing her job, maybe because of her own efforts to extract information rents from the politician, low abilities, or something else. The politician, observing z and outcomes, and being subject to WYSIATI, may conclude that she knows what the regulator should do and so micromanages the regulator. Of course the politician is not as capable as the regulator is at performing regulation, so micromanagement lowers the efficiency of the system. The politician is not the only player subject to WYSIATI. The regulator can fall victim to it, leading to micromanagement of the operator. So can citizens, leading to adoption of overly detailed constitutional constraints on politicians and to voting behavior that focuses on narrow, detailed issues.

In an attempt to overcome this problem, the politician introduces institutional rules that make it difficult for incumbent politicians to be voted out of office; provide a degree of independence to the regulator, which restrict the politician ability to micromanage the regulator and to behave opportunistically; and limit the regulator's ability to impose operating decisions on the operator. Such limits, however, create additional opportunities for players to benefit from information asymmetries, so the politician adds institutional rules that formalize communications from lower levels of authority to higher levels regarding z , the impacts of z , and outcomes. More specifically, the politician allows for herself mechanisms and resources for providing citizens with information on policy successes; requires the regulator to provide information to the politician on the value of infrastructure services, the technical efficiency by which they are provided, the presence and effects of z factors, and the efforts of the regulator to implement and enforce policies; and authorizes the regulator, in turn, to obtain the relevant information from the operator.

But $u_{\Gamma_4}(S_4)$ is not monotonically increasing in these controls. This structure is difficult to maintain because some elements of the system work against it and another principle comes into play, namely the cost of communication. One element of the system that works against it is the authority of the regulator to set prices. Price setting is highly technical, making it an area where the regulator has the best skills, and affects the aggregate value of the infrastructure because regulatory independence limits political opportunism. But price setting can be valuable to the politician because it impacts the distribution of rents among the citizens, distributes rents between citizens and operators, and can be

used by the politician to signal to citizens that the politician is acting on the citizens' behalf against regulators and operators who would take advantage of the citizens. Therefore micromanaging the regulator's ratemaking can be a tool for securing political careers. Citizens, being subject to WYSIATI, do not understand that the politician's micromanagement actually limits the size of $u_{\Gamma_4}(S_4)$, which in turn limits the citizens' payoffs.

Another element that works against the system is the communications process. The politician establishes communication channels that favor the politician. The regulator might defend itself against WYSIATI, and thus political interference, by establishing transparent regulatory processes that provide information on z , the regulator's abilities, and the regulator's efforts directly to citizens and the operator. The operator, too, can combat WYSIATI by communicating directly to the politician and the citizens, bypassing the regulator. These communications outside of the formal communications lines make the system less valuable to the politician.

The cost of communications also limits the effectiveness of the system. Providing formal information can be costly and the providers may be concerned that detailed information is difficult for non-experts to properly understand. Therefore the politician, the regulator, and the operator have an incentive to hide certain information, and the value of the system is thus diminished.

We can now express the characteristic function u for scenario as follows:

$$\begin{aligned}
 u_{\Gamma_4}(\{c, p, r, o\}) &= u_{\Gamma_4}(S_4) \\
 MC_r|_{\Gamma_4} &= u_{\Gamma_4}(S_4) - u_{\Gamma_3}(S_3) \\
 MC_o|_{\Gamma_4} &= u_{\Gamma_4}(S_4) - u_{\Gamma_2}(S_2) \\
 MC_{r,o}|_{\Gamma_4} &= u_{\Gamma_4}(S_4) - u_{\Gamma_1}(S_1) \\
 u_{\Gamma_4}(\{i\}) &= 0 \quad \forall i \in N
 \end{aligned}$$

Citizens and the politician adopt a system with regulatory independence only if $MC_r|_{\Gamma_4}$ is sufficiently large to increase the politician's and the citizens' payoffs. If $u_{\Gamma_4}(S_4)$ is diminished too much by the barriers described above, or if the payoff to the regulator for some reason would be greater than $MC_r|_{\Gamma_4}$, then the politician would seek to effectively implement scenario 3.

We begin with the relationship between the politician and the regulator.

