

#### The political dynamic of co-evolution: a case study in a cluster in Brazil

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#### **Abstract**

Although a significant body of knowledge exists about what strategies companies use in their interaction with government, much less is known about how these interactions happen. Recently, Child, Tse and Rodrigues (2013) published a book in which they analyze the dynamics of co-evolution of organizations and institutions. It has, as unit of analysis, the development of a port in China. In the book, the authors state that five bases of power were available for both parties and apply these categories to analyze the political interaction that took place along the port development. In our research we apply the categories those authors ddeveloped to a sequence of events that occurred in the Espírito Santo State in Brazil, involving leaders of the ornamental stone cluster and government representatives. We address the questions: Are the power bases Child et al. (2013) defined applicable to the classification of the power bases leaders of the ornamental stone cluster and government representatives utilized in their interaction? In case not, which other sources of powers need to be postulated? We conclude that the bases of power are applicable but some amendments to them need to be done.

**Key words:** Co-evolution; International Business; Cluster; Institutional Change; Strategy



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#### Introduction

Although a significant body of knowledge exist about what strategies companies and economic sectors use in their interaction with government, much less is known about how these interactions happen and how both parts use their power bases to influence outcomes in their favor. Having identified this gap, recently, Child, Tse, and Rodrigues (2013) tried to contribute to the literature about these phenomena. To achieve this, they studied, from a political perspective, the dynamics of co-evolution of organizations and institutions. Their study has, as unit of analysis, the development of a port in China and the relation between managers of the port and government representatives.

As part of their effort, Child et al. (2013) state that five bases of power were used by the parties in their interaction: Material resources, coercion, legitimacy, references and influence. We describe these in the next section of this paper. They use those bases of powers as categories to classify and analyze political interaction that took place along the port development.

In this research, we apply the categories those authors developed to a sequence of events that occurred in the Espírito Santo State in Brazil, involving leaders of the ornamental stone cluster and government representatives. These sequence of events occurred over the negotiation of rules that would make the transportation by granite blocks safer truck of. These granite and marble blocks often weight over 30 tons and are transported for hundreds of kilometers in precarious conditions.

Our aim, in applying the five bases of power to unit of analyses different from the original one is to discuss if the five bases of power help understand the dynamics of interactions between organizations and government in different contexts and if they are sufficient to encompass all the levers that were used in those interactions. Additionally, we also wanted to know if the level of detail of the definitions of the bases of power were sufficient to allow classifications unambiguity. In doing so, we contribute to the discussion of the validity and generalizability of the concepts of the three authors.

#### Theoretical background

The relationship between companies and their environment is very important in organizational studies. Li, Zhao, Tan, and Liu (2008) argue that the company's relationship with the variables of the business environment and its monitoring is important for the survival of organizations and their competitive performance. However, not all authors consider the competitive environment in the same way, which gives rise to two main lines of thought in studies on strategic adaptation to the environment (Carvalho, Rosseto, & Vianna, 2011).

The first of these lines of research on strategic environmental adaptation is called deterministic view. According to environmental determinism, organizations adapt to observed changes in the competitive environment. The deterministic view posits that the environmental variables as external and uncontrollable by companies. Studies embracing the industry based vision (M. Porter, 1990) and transaction costs (Coase, 1937; Williamson, 1991) belong to this perspective



The second line of research is the voluntarism view, also called strategic choice (Carvalho et al., 2011). According to this aspect it is possible for managers to interact with the environment, reduce uncertainties in the company, since they can act proactively in the environment and thus modify it. This line correspond to the systemic theory (Ackoff, 1974; Bertalanffy, 1968) and organization ecology (Astley & Fombrun, 1983; Zacarelli, Fischmann, & Leme, 1980), and also the coevolution perspective.

The coevolution perspective combines two levels of analysis: company level and industry level. The company level combines routines, capabilities and management practices. The industry approach organization ecology, competitive dynamic and natural election (Lewin & Volberda, 1999).

Coevolution, as a research framework assumes that companies and their environments evolve together (Child et al., 2013). Its fundamental premise is that the entities or organizations evolve in relation to their environments, and at the same time, these environments evolve in relation to them (T. B. Porter, 2006). The term, that has its origins in biology, consolidates the notion of interdependence and mutual adaptation between the organization, governments and other actors of the environment. The positioning of the organization in an attractive business environment coevolves with the company, that build superior resources and capabilities and reaches top performance (Stead & Stead, 2013).

#### Coevolutionary perspective

The concept of coevolution, when applied to companies is known as corporate coevolution. According to Stead and Stead (2013), this concept can help companies better adapt to environmental changes, as it enables the evolution of their values and ways of thinking, for example, in understanding the importance of environmental sustainability to their operations. The corporate co-evolution is based on two premises. The first states that companies and their environments are interdependent, that is, interact so that the development of the company and the environment occur concurrently. The second premise assumes that, although organizations do not define the environmental conditions in which they operate, they don't accept them passively. Companies, as well as to adapt the forces of the environment can also influence it and help to shape the environment (Child et al., 2013).

T. B. Porter (2006) identifies six characteristics of co-evolution in the organizational literature: specificity, reciprocity, simultaneity, genetic fixing, expanding boundaries and perpetuity. Specificity connects the coevolution of the company with the location of its operations and its industry. Reciprocity addresses the issue that multiple changes at different levels of analysis permanently affect the firms' movements. Simultaneity relates to the fact that change is mutual among agents in complex adaptive environment in which companies operate. The characteristic called genetic fixing by the author differentiates coevolution from coadaptation. The expansion of boundaries surpasses simple cause and effect and assumes that a change has ramifications that act as a wave in the business context and its consequences can be cyclical. Finally, the characteristic of perpetuity points to the fact that the movement is continuous, adaptive and emergent. The latter differentiates the coevolution from inductive strategy.

In addition to understanding these traits, when analyzing organizational phenomena from the perspective of co-evolution, it is important to focus on the actors in the environment that influences and affects their evolution. Thus, the aim of the analysis of the actors from the perspective of power relations is to identify the influences of each participant in the context



analyzed (Lewin & Volberda, 1999). This review discussed in detail two groups of agents, company and government. This is because, among other reasons, companies can act in a participatory manner in the development and implementation of public policies (Lawton, McGuire, & Rajwani, 2013). It is noteworthy that stakeholders also influence the social environment, such as media and press, civil associations and entities representing social categories (Stead & Stead, 2013).

Among the various institutional actors, government and companies form an arena of mutual influences in which business unfolds. The government's actions can be understood from the point of view of the political system existing in the country and of the governmental actors (Lazzarini, 2011). The political system involves the political parties and their representatives. Governmental actors can be understood as being composed of the executive branch as well as indirect agents, such as state-owned companies, pension funds and regulatory bodies. The government's role can be divided into macro levels (federal government), meso (states) or micro (local). In this context, companies can increase their bargaining power with the public sphere in the co-evolutionary process through the mobilization and the increase of their legitimacy in one or more levels of these levels of action. The mobilization encompasses actions such as lobbies and coalitions. The increase of legitimacy implies aligning accepted goals with socially (Child et al., 2013).

#### Power relations and co-evolution

In the analysis of how power relations impact the co-evolutionary dynamics, Child et al. (2013), taking French Jr and Raven (1960) as a launching point, propose a model that consolidates the bases of power of the government and enterprises in these relationships, as well as their influence in the process of co-evolution. The model is founded on five bases of power: material, coercion, legitimacy, references and influence. This model is illustrated in table 1:

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Resource materials: the most important material resource that a company can have to influence the environment is the availability of financial resources for investment (Child et al., 2013). Another possible contribution of business is the transfer of knowledge and companies technologies or management practices. The government, by its turn, can leverage companies positions by lending them money via development banks (such as BNDES), state banks or pension funds (such as Previ) (Lazzarini, 2011).

Coercion: In business activity, direct coercion by government or company is unlikely, at least explicitly. Corruption and other malpractices have been described in the literature and may include local and foreign firms (Cuervo-Cazurra, 2006). Besides this aspect, equity participation and campaign donations create bonds that can influence the allocation of government resources, as well as the granting concessions and licenses (Lazzarini, 2011). Managing these relationships requires careful consideration by all parties, company and government, to foster public - private relations.

Legitimacy: The credibility gained by a group in similar operations legitimizes their demands. Still, it is important to give attention to the maintenance of competition between enterprise so as to minimize adverse effects on competition (Child et al., 2013; Lawton et al., 2013; Lazzarini, 2011).



References: As the entrant party is recognized by the government as an expert in the industry, this recognition gives status to the company. This position, as a result of its reputation, may help in obtaining agreements with the government (Child et al., 2013).

Influence: The status arising from the specialization in the core activities of the company confers recognition of its experience in the industry. In this case, the recognition of business capabilities can be the source of the influence and respect for it (Child et al., 2013).

Table 1. Bases of power – government and companies

Bases of	Definition:	Government	Companies Example
power		Examples	
Material	Possession of material	Concession of	Possibility of technology
resources	resources that provide	fiscal incentives	transference, investments and
	the ability to reward	Support by state	job generation. Possibility of
	and confer benefits.	banks.	increased tax revenue.
Coercion	Ability to enforce	Withholding	Capacity to enforce
	conditions and withhold	operation licenses	contractual terms by insisting
	rewards.	and authorizations.	that agreed conditions are met.
Legitimacy	The exercise of power		Alignment between world
	is considered legitimate	legitimized by law.	class standards and local
	by the parties.		objectives. Implementation of
			standards ahead of local
D 6			regulation demands.
Reference	Identification by others	Government	Global and local reputation of
	with the power holder	regarded as	parent company and local
		guardian of national	CEO.
T C1	TO .	interest.	<b>D</b>
Influence	The experience	Government	Recognition of operational
	attributed to the agent	experience in	and managerial competences.
	that leads to a	hinterland	
	propensity to accept his or hers authority.	development.	

### Source: Adapted from Child et al. (2013)

#### Methodology

The sequence of events was chosen because it has been going for long and is representative of interactions that occur continually. The process of interactions among private organizations and governmental representatives, that took place between 2007 and 2012, was chosen as unit of analysis because it involved a set of complex interactions dealing with the regulation and common pool resources CPRs, an issue of great importance for emerging markets, which economies tend to rely significantly in the exploration of natural resources. The exploitation of these types of resources creates and is often dependent of some kind of agreement about CPR regulations.

In the process of data collection for this research, the authors conducted four members of the workgroup that put forwards the suggestions that led to the 354 Resolution. Those interviews duration was of 90 minutes on average and they were recorded and transcript.



After the interviews the authors exchanged several emails with the interviewees, asking for supplementary information and clarification.

The authors also had access to extensive written material on the circumstances that lead to the promulgation of the 264 Resolution, to internal documents developed by the workgroup and to legal documents dealing with the events. Part of these materials is public and part was provided to us by the group members. Previously to the research on the particular topic that resulted in this paper, the authors ha conducted extensive research work in the ornamental stone cluster of the Espírito Santo State. They were quite familiar with the ornamental stone transportation problem and with the terms involved with the trade.

From the data, the most important events in the process of interaction were identified. The authors then, individually, inferred which of the five power bases, if any, had been more relevant to the event outcome. If they could not agree on this, the event would be discarded.

#### Dimension stone cluster of the Espírito Santo State

The extraction of dimension rocks in the Espírito Santo State begins in the 1950s with rudimentary methods. Italian immigrant began to extract blocks from queries and to sell them to other states in Brazil. There the stones were processed and transformed into tiles, kitchen tops, or gravestones. In the 1980s, with the emergence of gang saws that used steel shot as abrasives and semi-automatic stone slab polishing machines the ornamental stone industry matured and became economically relevant for the state (Villaschi & Sabadini, 2000).

Between 2002 and 2007, taking advantage of the of American construction bubble, the industry experienced explosive growth. Domestic exports grew from about US\$ 200 Million per year to more than US\$ 1 billion. Throughout this period, the Espírito Santo State has represented more than 60 % of Brazilian production and export of ornamental stone, and in certain years this percentage approaches 80 %. The sector contributes to 7 % of the State gross product, and generates more than 20 thousand direct jobs (Avrichir & Chueke, 2012).

With the depletion of deposits of granite in the southern part of the State, extraction activity is now conducted in the north of it, where the quantity and variety of quarries are large. For historical reasons at first, and the advantages agglomeration foster, processing continues to be done in the south, in and around the city of Cachoeiro do Itapemirim, productive center of a cluster that spans fourteen municipalities.

The distance between the places where the blocks are mined in the north of the Espírito Santo State and Cachoeiro do Itapemirim is approximately 400 km. Export is done mainly through the port of Victoria, located in the center of the state. Between Cachoeiro and Vitoria, the distance is 150 kilometers. Between the northern production pole and Vitoria there is a 200 kilometers distance. As the railway system is highly insufficient, all stone transportation (except for a small percentage of raw blocks, which go directly from the north to Victoria by rail), is done by roads with trucks.

The daily transport of hundreds of granite blocks, many of which weigh more than 30 tons, over these distances is a major challenge to the maintenance of the State roads. It is also a permanent threat to the safety of vehicles that travel on these roads. Not to mention the logistics and cost to businesses. The cost of transport block can represent up to 30 % of its value, when it arrives to the southern state. The attempt of the Brazilian State and Espírito Santo State to negotiate regulations and enforcement of stone transportation, in order to reduce roads attrition and the number of victims it causes, is the object of our analysis.



#### **Dimension stones regulation on transportation**

Accidents involving trucks carrying rocks have happened in the State of Espírito Santo since the beginning of ornamental stone extraction. However, the problem worsened considerably as the activity was intensified. Between January and July 2007, there were 62 traffic accidents involving vehicles transporting granite on federal roads. The most conservative estimates hold that over twenty people were injured and four died (Zanello, 2007). The more pessimistic maintain that twelve people died just in one accident in which a bus crashed into a block of more than 30 tons and was completely destroyed. The smaller numbers discrepancy in numbers is probably explained by the fact that smaller numbers probably considered as deaths only fatally injured people that die on the spot. The bigger take into account also those that occur later, in hospitals. In the same period, there were 170 arrests for excess load. Over 800 tons were withheld by the road police between May and July 2007, from 86 trucks.

In December 2007, The National Council of Transit (CONTRAN), the federal department responsible for the regulation and updating traffic laws, issued Resolution 264, the first to establish security requirements for the transport of dimension stones. This resolution established mainly three things: the requirement that the blocks were tied to the truck for transport; the requirement that drivers who transported dimension stones toke a specialized training course lasting 50 hours and set weight limit for each types of truck (SINDIROCHAS, 2010).

It was not possible to establish for sure the impact that the resolution had on the number of accidents. While the union of producers rocks of the Holy Spirit says that it was great, people we interviewed claimed that there was only a slight reduction, and that it was due to the decrease of exports that happened in 2008 and 2009 due to the economic crisis. Resolution 264 left many critical issues open. The most important were: It did not regulate as slabs, the processed granite block, that made for about 50 % of the transport, should be transported; it did not regulate the transport of stone in containers, that were widely used in stone transportation; it said nothing about the transport of smaller rocks and did not establish the penalties that should be imposed on violators of the resolution.

In 2009, representatives of several Espírito Santo State associations formed a working group and investigated ways of securing cargo transport, the requisites for secure transportation in relation with the weight and dimensions of the cargo, types of vehicles indicated to transport different cargo weights and sizes; the distribution of weight by wheel under different transport conditions and so on. The group was composed of representatives of the union of the producers of ornamental stone in Espirito Santo, of the exporters' association of rocks (Sindirochas), of the union of the industry of trucks and road equipment (Fetransporte), of the National Department of Transport Infrastructure (DNIT), of the Federal Road Police (PRF), the association of the companies that inspected the trucks before licensing (Angis) among others. It was assisted, all the time by an expert in engineering transportation, with experience in the design and implementation of modifications in trucks to adapt them to the needs of transporting stones. This expert was appointed by the union of producers to assist the group on technical issues (Reis, 2010). The working group held between 10 and 15 meetings among its members and with various representatives of the Thematic Chamber Vehicle Issues (CTAV) in Victoria and Brasilia. The thematic chambers are technical groups, whose members are representatives of the three levels of government and of organized



segments of the society. Their function is to assist Contran in technical matters related to traffic. The members of CTAVs are selected by the Director of Contran and appointed by the Minister of Cities.

In order to develop its proposition of changes to Resolution 264, the group held, among other activities, road tests with vehicles loaded with various types of cargo. These vehicles were accelerated and broken at different speeds, to check the suitability of different forms of tying cargo to the truck. Because vehicles have to climb stiff slopes in quarries, with inclinations of up to 60 % and make this suspended by tractors, tests were performed under these extreme conditions as well. For the tests to be considered valid, the drivers of these vehicles had to certified engineers. Several tests involved closing roads to regular traffic, as well as mobilizing of PRF, and among other departments. In all, more than 4,000 kilometers were traveled by vehicles, for those tests.

The working group made suggestions on several of issues not resolved by Resolution 264. The suggestions encompassed rules for the transport of slabs, cargo in containers and of smaller stones. It established penalties for violators of the resolution. It made mandatory annual inspection of vehicles used to transport of heavy loads and specified how this inspection were to be done and the requirements for the licensing of the institutions authorized to perform these inspections (ITLs).

The group's proposal was submitted to CONTRAN. Despite having been previously discussed with members of the CTAV, the final resolution, published in July 2010, represented significant progress to the regulation of the transport of dimension stones. It contained, though, major changes to the proposal of the working group and upset many of its members. The major changes were the suppression of the specifications of how the trucks should be inspected by the ITLs and on how the process of the ITLs should be done. Among the requirements for inspection that were deleted was that the truck should be submitted to a subjected to a mechanized inspection. Those changes created the possibility that the fundamental annual check of the truck conditions could be significantly eased, resulting in insecure vehicles been used for cargo transport. The changes also introduced the possibility of tying devices that the working group had not foreseen and, which according to some respondents, were less secure. Interviewees suggested that the changes were introduced to accommodate less legitimate business interests, which were not exposed during the group's work.

#### The enforcement issue

The issue of verifying compliance with the rules and the impositions of penalties was always complicated in the case of the verification of the conditions of cargo transportation in Espírito Santo. At least three bodies are directly involved. Besides the PRF, and Contran, to which we have referred previously, an organ that plays a central role in this regard is the National Department of Transport Infrastructure (DNIT).

DNIT is the agency responsible for operating, maintaining and restoring waterways, railroads and federal roads, as well as the ports and intermodal interfaces. In addition, in federal roads, it is responsible for giving fines for trucks carrying overweight. For this, it has to install and keep weigh scale stations. The problem of non-enforcement of road rules was the subject of many complaints by citizens and reports in the local media (Melo, 2007). In June 2007, DNIT signed a compromise, with the Federal Public Ministry of the ES, to install five fixed and two mobile scales for weighing cargo by the end of 2008. At the time there was only one scale operating in the State.



The agreements are signed in the course of a lawsuit and were approved by a federal judge presiding over the trial of the cause. If the defendant, Dint, disregarded the agreement, the prosecutor may petition to justice to enforce it to comply (Ministério\_Público\_Federal, 2007).

Despite having signed the agreement, by 2010, DNIT had installed only four scales in Espírito Santo (Rolke, 2010). Moreover, the fines given in the weigh stations in operation were not charged against the offenders. They were not sent to the offenders because the contract with the Postal authority had been terminated, due to non-payment.

#### Comments about the use of the bases of power in dimension stone transportation

The regulation of the ornamental stone transportation in the Espírito Santo State required a lot of negotiation among the parties involved. Several conflicting interest had to be dealt with. Broadly speaking, while the representatives of the producers were interested in having the least regulations and simpler, not to increase direct cost much, the government representatives went more or less in opposite direction. They wanted restrict the weight per tire of trucks and the have the most secure tying system possible.

Although these interests were common to the representatives of several organizations, somehow dividing them in two groups, within each group, interest not always coincided. Above all, matters that were important to one organization eventually were not for another of the same group.

In fostering their interest and positions, representatives of the different organizations used their bases of power. Although they avoided making explicit reference to them, especially coercion power, they became apparent along the process. Table 2 summarizes how the five bases of power were used by the players in the process. To these five powers we propose that a six one, legislative power be added. We also propose that the base of power used by DNIT in order not to comply with MPF impositions have to be further investigated in order to be more clearly identified and specified.

Sindirocha made two important uses of the material power conceded to it by the fact that it has several hundred associates, that own the processing facilities that transform blocks in slabs and the machines used in block extraction. It enlisted the assistance of an expert, whose knowledge was fundamental to all the work done by the group. It also provided the funds to cover most of the expenses. With that it managed to circumscribe the limitation of weight carried by the trucks and the changes that had to be done by the truck owners to their vehicles to make them safer. Although this last issue interested the Fetransporte a lot, it was important for Sindirochas, as if the trucks had to be significantly modified, the cost of transportation could be increased and availability of trucks diminished, at least temporarily.

Table 2: Base of power

Organization

Base for power used

Example of how power resource was



Sindirochas		Material resources	relevant Its financial resources made it possible for it to hire a specialist in design and implementation of truck modifications, who played a central role in devising and testing. It also allowed it to issue most of the expenses of the working group.
DNIT		Material resources	Controls the budget necessary to invest in scales to weight trucks as well as roads constructions and amelioration.
		Coercion	Its capacity to impose fines in issues pertaining to the conservation of roads is central to the enforcement of the rules established
Fetransporte		Legitimacy	The fact that it was it associates that owned and drove the trucks gave it legitimacy to press for less changes in trucks
Angis		Expertise	Its experience in inspecting and certifying vehicles made it recognized as expert on inspection certification
Ministério Federal	Público	Coercion	Can impose sanctions on all the other parties.
		Legitimacy	Its intervention is legitimated by law Enjoys public support. Is seen by the
		Reference	Brazilian public as the less corrupt of public agencies.
Contran		Coercion	Has the power to adopt, reject or make changes to the suggestions made by the working groups. Made use of this power and suppresses and changed important points, in the last minute, without discussing with the group who had worked for months in the proposal and consulted with it all along.
PRF		Expertise	Its experience in dealing with drivers and assisting accident victims made it recognized as an expert in ornamental rock transportation.
		Coercion	Its capacity to impose fines is central to the enforcement of the rules established

Fetransporte joined forces with Sindirochas to limit the changes the resolutions imposed on trucks. For a while, some participants argued that the new regulation should make it mandatory that center of gravity of the trucks should be lower than it is now. This change, if it has been approved, would make most vehicles used today in the transportation of stones



useless, and would force significant investments by the truck owners. The Fetransporte representative argued strongly against this point and this proposal was quickly rejected by the workgroup.

Angis main interest was in implementing the inspection process that trucks had to pass every year and making the certification of companies authorized to make this inspections difficult to attend. It insisted in that these companies were required to have ISO 9000 certification and automated means of test. Its interest was considered by the workgroup, as the proposal included these requirements. But it was partially defeated, as the final resolution was altered by the Contran authorities, making the inspection and certification processes lighter.

Also, Ministério Publico Federal is an organization feared for its power of imposing sanctions and respected by the general public. It is less permeable to corruption imposed sanctions on DNIT. Interestingly enough, DNIT was able to quite ignore the MPF sanctions. The reason DNIT was able to do so is not clear. It may be to the fact that it had strong support by high ranked officials in the government. It may be that it used parts of the material resources it controlled to maneuver the things its way.

Finally, Contran was consulted and had its positions taken into consideration all along the proceedings carried by the workgroup. Most test and studies done by the workgroup were done in order to convince and prove positions to Constran's representatives. Yet, Contran, at the last minute, cuts important points of the proposal. We sustain that the base or power used by Contran is not adequately identified by Child et al. (2013) model. It was not legitimate power, as the change was not viewed as legitimate by the workgroup members. It is not coercion power, either, as it did not involve imposition of sanctions or withdrawing rewards. We suggest it has to do with the fact that it can legislate, create rules that oblige and constrain other parties that give it this power.

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