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## The Political Dynamics of Corporate Co-Evolution: Replicating and Extending a Case Study

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## The Political Dynamics of Corporate Co-Evolution: Replicating and Extending a Case Study

### Abstract

Although a significant body of knowledge about the strategies that companies use in their interactions with their environments exists, much less is known about the political dynamics of these interactions in situations of co-evolution between companies and environments. In this case study, we analyze the interactions between the representatives of producers (RPs) of ornamental rock and government authorities (GA) in the Brazilian state of Espírito Santo (ESS). These interactions involved the regulation of heavy cargo transportation and resulted in a significant reduction in road accidents. In this analysis, we replicate a recently published case (Child, Tse & Rodrigues, 2013). Replicating cases is important to establishing validity and extending the generalizability of theoretical results (Vissak, 2010). However, replication is seldom conducted (Pacheco, York, & Hargrave, 2011). We address the following questions: Are the conclusions of Child et al. (2013) compatible with our observations in ESS? Do their concepts help explain the political dynamics of this current case? We conclude in the affirmative to these three questions but identify differences that are attributable to the differing contexts of these situations.

### Keywords

Co-Evolution, International Business, Political Dynamics, Case, Replication

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## The Political Dynamics of Corporate Co-Evolution: Replicating and Extending a Case Study

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*Although a significant body of knowledge about the strategies that companies use in their interactions with their environments exists, much less is known about the political dynamics of these interactions in situations of co-evolution between companies and environments. In this case study, we analyze the interactions between the representatives of producers (RPs) of ornamental rock and government authorities (GA) in the Brazilian state of Espírito Santo (ESS). These interactions involved the regulation of heavy cargo transportation and resulted in a significant reduction in road accidents. In this analysis, we replicate a recently published case (Child, Tse & Rodrigues, 2013). Replicating cases is important to establishing validity and extending the generalizability of theoretical results (Vissak, 2010). However, replication is seldom conducted (Pacheco, York, & Hargrave, 2011). We address the following questions: Are the conclusions of Child et al. (2013) compatible with our observations in ESS? Do their concepts help explain the political dynamics of this current case? We conclude in the affirmative to these three questions but identify differences that are attributable to the differing contexts of these situations. Keywords: Co-Evolution, International Business, Political Dynamics, Case, Replication.*

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Around the mid-1990s, a new perspective in organization theory began to intensively examine the dynamics of interactions between companies and their environments as well as the capacity of each to shape the other (Lewin & Volberda, 1999). This perspective became known as co-evolution. Since then, the potential of the perspective to explain phenomena involving organizations and their environments has been affirmed by several studies. Lewin & Volberda (2011), for example, have demonstrated that co-evolution can contribute to understanding outsourcing and the relationship between the activities of multinational subsidiaries and local public policy. Additionally, Murmann (2013) argued that co-evolution helped explain the results of competition among organizations in product markets. Recently, several researchers have emphasized the importance and urgency of advancing our understanding of the co-evolution of companies and their environments (Child & Rodrigues, 2011; Lawton, McGuire, & Rajwani, 2013; Lewin & Volberda, 2003; McGaughey, Kumaraswamy, & Liesch, 2013). For example, Pacheco, York, and Hargrave (2011) stated, “Relatively few have heeded the call of Lewin and Volberda (1999) and colleagues... for a more co-evolutionary perspective on organization-environment interactions” (p. 1).

This study contributes to the literature by analyzing the political dynamics of interactions between companies and their environments in situations of co-evolution. The objective is to understand how each party influences the other and the outcomes of these influences. We also seek to determine how the parties are different at the end than they were at the beginning of the process analyzed. It is attuned with call of Child et al. (2013) that

recently stated: “We still lack a systematic analysis of how the power and influence held by organizations and external parties might impact on their respective evolution” (p. 9).

To achieve these aims, we replicated a recently published case study. In replication, multiple cases are treated as a series of experiments, where each case confirms or disconfirms the inferences drawn from previous cases (Eisenhardt, 1989a, 1989b; Yin, 2014). The necessity and importance of replicating case studies has been emphasized by several authors (Vissak, 2010, p. 373) who note, “replication allows for confirmation and refutation of the findings of the first case, investigating whether they could be expanded to (somewhat) different situations”. Miles and Huberman (1994) discuss how to confirm findings of qualitative studies. They state that cross-case analysis and multiple case studies increase the strength of results and add, “Even stronger: replicate in a brand new case” (p. 274). Others (Morrison, Matuszek, & Self, 2010) claim, “one of reasons for a lack of relevance to contemporary issues is that many of the theories that are currently used in business research have not been replicated in recent years” (p. 278).

The case that this study replicates (Child et al., 2013) analyzed the interactions between companies and their environments in a sector heavily controlled by the Chinese government from a political perspective. The interactions occurred between a company developing a large modern port in Shenzhen and the Chinese government between 1993 and 2002. Hutchison Port Holdings (HPH), a branch of Hutchison Whampoa Limited (HWL), a multinational conglomerate that develops and operates ports, invested in a sizeable port container in the city of Shenzhen. The port was built and operated by Yantian International Container Terminals (YICT), a joint venture between HPH and the Shenzhen government. The case study describes the process of building the port from the initial Chinese authorities’ initiative to identify a partner for the project in 1993 until 2007, when it became the world’s largest container port in throughput volume. The authors detail the evolution of port capacity and service quality, institutional barriers that were overcome, difficult negotiations and initiatives by both parties and their consequences. That study derives a model that explains how political processes influence corporate evolution. An earlier case study of the same topic by the authors has been praised as “extraordinary work” in a book review of one of the most influential journals in this field (Freeman, 2010a, 2010b).

This case study analyzes the process of formulating cargo transport regulations in Brazil between 2007 and 2010 in ESS among RPs of ornamental rock and GAs. The issue at stake was regulating the transport of ornamental rocks in the state. Hundreds of ornamental rock blocks are extracted every day in the northern part of the state, and each block weighs approximately 30 tons. For historical reasons, these blocks are processed in the southern part of the state and exported through the Vitoria Port in the central part of the state. Several hundred blocks are transported by truck every day. The distance from north to south is approximately 400 kilometers, while the distance from the south to Vitoria is approximately 150 kilometers. During the first half of 2007, the number of accidents and the amount of damage to roads caused by this transportation peaked. In response to a major accident in 2007, government agencies quickly promulgated regulations for weight limits for each type of truck, brakes and other truck systems, and how blocks must be tied to the chassis.

These regulations reduced the number of accidents involving trucks loaded with ornamental rocks but left several other issues unsolved. Among other things, regulations did not stipulate how slabs were to be transported, ignored the issue of containers and did not specify fines or penalties for infringing the new regulations. These regulations also created serious difficulties for the quarries and truck companies. The most severe restrictions were the specifications for trucks, which, although adequate for the transportations of rocks on roads, made some quarry locations difficult or impossible to access.

The issues created by the 2007 regulations produced a complex and long interaction between the RPs and GAs that created the new regulations issued at the end of 2010. This is a process that this paper analyzes to determine whether the main conclusions reached by Child et al. (2013) are valid in a different context.

The regulation of ornamental rock transport in ESS is a propitious case for which to replicate the original study because of its similarities and differences with the Chinese case. Similarity of context implies the prediction of similar results, a required condition for replication. Differences allow for expansion (Johnston, Leach, & Liu, 1999). Both of these cases occurred in emerging countries in government-regulated environments in the infrastructure sector of the economy. Yet, Brazil differs from China in that it is more politically democratic and economically decentralized (Business Monitor International Ltd., 2011).

In addition to the political dynamics of co-evolution, two other factors make this case relevant. First, this case analyzes interactions between companies and the government, which forms a critical part of the company environment. Lazzarini (2011), for example, emphasizes the importance of the government among the various actors, including companies, that influence how business unfolds.

Second, these examples are situated in major emerging economies. Emerging economies provide a quite different context for co-evolution than developed economies do because institutions tend to be weaker in these economies. Institutions, “the formal and informal rules of the game” (North, 1990), are a key aspect of a company’s environment because they affect contract enforcement mechanisms and levels of trust among players (Shirley, 2008). Additionally, emerging economies have been less studied from a co-evolution perspective than others economies have (Child, Rodrigues, & Tse, 2012a).

By replicating Child et al. (2013), we contribute to the increased validity and generalizability of their conclusions and, thus, to knowledge about co-evolution from a political perspective, particularly in emerging economies. We also contribute to a small number of cases that have been replicated, which is a process of central importance to the construction of robust theory utilizing case studies.

### **Theoretical Framework**

The nature of the relationship between companies and their environment is among the most studied and debated issues in organizational theory and strategy. In the 1950s, General System Theory had already noted the importance of the environment to organizations (Boulding, 1956). However, for most of the field’s history, the debate has been between perspectives that view organizations as largely determined by their environments and others that perceive organizations as having considerable influence on, or even as determining, their environments. Perspectives that see organizations as being determined by their environment with little possibility of influencing it include the Positioning School in strategy (Porter, 1980) and the Contingency Perspective in organizational theory (Burns & Stalker, 1961; Donaldson, 1987). In these perspectives, either management creates an organizational structure consistent with the environment or the organization suffers and eventually disappears. These environmental variables are external to and uncontrollable by companies. The second body of research suggests that companies and management have a larger arena for action and agency. According to these perspectives, it is possible for managers to act proactively within the environment and to modify it. Perspectives that adopt this positions include Systemic Theory (Ackoff, 1974; Bertalanffy, 1968), Strategic Choice (Child, 1972; Whittington, 1989) and Resource Dependency (Pfeffer & Salancik, 1978; Salancik & Pfeffer, 1974). These perspectives argue that, in many circumstances, markets are not as competitive

and unforgiving of inefficiency as the Contingency Theory assumes and that managers can retain an organization's structure or strategy by altering the contingencies. The expression "strategic choice" was coined by Child (1972) to describe this possibility.

As a research framework, co-evolution assumes that companies and their environments can evolve together (Child et al., 2013). Its fundamental premise is that organizations evolve in relation to their environments, while these environments simultaneously evolve in relation to the organizations (Porter, 2006). The term co-evolution, which originates in biology, consolidates the notions of interdependence and mutual adaptation among organizations, governments and other actors in the environment. Co-evolution regards both the environment and organization as evolving interactively over time (Murmann, Aldrich, Levinthal, & Winter, 2003)

Power is a critical element of effective managerial behavior (Kanter, 1979), but the political aspects of managerial activity are insufficiently studied. Political behavior tends to be perceived as "illegitimate, dysfunctional, self-interest behavior" (Hardy & Clegg, 1996, p. 629). Thus, the importance of political arenas is often underestimated, but corporate political activity (CPA) has emerged as a notable research framework to explain these political arenas (Lawton, McGuire, & Rajwani, 2013).

Lawton et al. (2013), in a recent literature review on the topic of corporate political behavior, find that CPA studies can be grouped into three domains. The first domain is composed of studies that apply the resource-based view (Barney, 1991; Wernerfelt, 1984) as a theoretical framework. The second includes studies that consider the institutional context, "particularly the extent to which institutional theory can inform our understanding of change and stability in CPA activities" (Lawton et al., 2013, p. 89). The third includes studies that focus on national political structures. For these authors, CPA emerges as the primary process for achieving organizational aims and objectives.

Lewin and Volberda (1999) analyze organizational phenomena from the perspective of co-evolution and affirm that it is important to focus on the actors in the environment that influence the evolution of organizations. Thus, the aim of analyzing these actors from the perspective of power relations is to identify the influence exerted by each participant in the selected context. Stead and Stead (2013) note that companies can influence several elements of the social environment, such as the media, civil associations and entities representing social groups.

In an extensive case study of Telemig, a Brazilian telecommunications company, Rodrigues and Child (2008) applied a political perspective to analyze how organizational culture, identity and metaphors evolved over three periods of a company's existence. Their purpose was to broaden the co-evolutionary perspective by including power dynamics (Freeman, 2010a, 2010b).

The first of three periods of the Telemig life cycle were examined, that is, the company's formative years "when the ideational and material characteristics that were laid down for the company... provided it with a continuing distinctive competence, especially in technology, that persisted as components of the company's identity in the eyes of the members long after" (Child, Rodrigues, & Tse, 2012, p. 1264). During the second period, from 1985 to 1993, Brazil restored its democracy and politics continuously intruded into company management because the company was state owned. During this period, the managerial council struggled to maintain the technical and meritocratic values of the company. During the final phase, from 1993 to 2000, governmental ideology emphasized the need to privatize companies such as Telemig. The authors illustrated how both the government and company management used symbolic and material resources to pursue their political goals (Freeman, 2010, pp. 175-176).

### **Main Conclusions of the Case This Study is Replicating**

The original case study analyzed the interactions between a company developing a sizeable modern port in Shenzhen and the Chinese government. The case is detailed in a recent book (Child et al., 2013) and summarized in a paper (Child et al., 2012).

These interactions occurred in Shenzhen as HPH, a branch of HWL, a multinational conglomerate that develops and operates ports, invested in a port container in the Chinese city. The port was built and operated by YICT, a joint venture between HPH and the Shenzhen government (Child et al., 2013).

The authors draw three main conclusions about the process of co-evolution. First, power sources, which can be classified using the French and Raven (1960) framework, provide the essential initial condition for the parties to influence each other. Second, the existence of power bases is not sufficient for co-evolution to occur; a relational framework must be developed by the actors. Third, initiatives expressed as tangible proposals that appeal to the interests of the other parties are also essential (Child et al., 2013, pp. 239-241).

The five categories of power bases used include material resources, coercion, legitimacy, reference and influence. Material resources provide the ability to confer benefits. Coercion is the ability to enforce conditions. Legitimacy is the exercise of power regarded as rightful by all parties. Reference lies in the identification of others with the power holder. Expertise creates a willingness to accept authority (Child et al., 2013, pp. 222-223).

A relational framework is an institutionally sanctioned arrangement that connects actors through participation in a common discourse (Child et al., 2013, p. 29) and is a social construction that requires initiatives and time to evolve (Child et al., 2013, p. 58). In the book, the authors describe how the HPH chairperson cultivated his personal ties with Chinese national leaders and how carefully he dedicated attention to building his capability to influence their decisions. The authors also emphasize that YICT management systematically planned and allocated resources to allow lobbying of state and local authorities.

As for specific proposals, YICT management, on different occasions, presented specific plans to the Chinese authorities. These plans strengthened their ability to exercise influence as they appealed to the interests of the other party and increased the legitimacy of the company in the eyes of the authorities (Child et al., 2013, p. 241).

In a replication, the propositions presented by the original case become the hypotheses to be assessed by the study (Morrison et al., 2010). Therefore, the hypotheses of this case can be formulated as follows:

Hypothesis 1. The power bases that each party uses to try to influence the other can be classified into the five categories presented by French & Raven (1960);

Hypothesis 2. The interactions that lead to co-evolution occur within a relational framework established through several initiatives by senior members of the parties and that take time and effort to evolve;

Hypothesis 3. The exercise of power is strengthened by initiatives expressed in tangible proposals that appeal to the interests of other parties.

### **Case Study Methods**

To achieve the study objectives, a qualitative methodology is adequate “as it is well suited for the purposes of description, interpretations and explanation” (Lee, Mitchell, & Sablinski, 1999, p. 164). This study examines how relationships evolved over time and why

they evolved this way. These are characteristics of process theorization, a research strategy typical of the qualitative “camp” (Langley, 1999, p. 692).

A case study approach was chosen as the research method to achieve the study aims by exploring a real-life, contemporary, bounded system through in-depth data collection from multiple sources and report it through description. These are the defining characteristics of a case study (Creswell, 2013). This study aims to understand a complex social phenomenon and determine how the events comprising the phenomenon unfolded. Case studies are especially relevant to research requiring extensive and in-depth description of social phenomena (Yin, 2014). This case study was developed according to a classical, detailed roadmap (Eisenhardt, 1989a, 1989b) to build theory from case studies.

### **Creating Instruments and Entering the Field**

According to Eisenhardt (1989a, 1989b), after defining the research question, the next steps in a case study are selecting the case, crafting instruments and entering the field. In this study, one researcher maintained extended contact and a trusting relationship with key players in the ornamental rock sector in ESS from previous research. These conditions were used by the researchers to enter the field. With the active involvement of the superintendent of CentroRochas, the Brazilian ornamental stone exporters’ union, a list of individuals who had actively participated in a working group that proposed revision to the 2007 regulations was contacted. Several individuals agreed to be interviewed. Then, level 2 questions, that is, questions to be answered by the researchers (Yin, 2014, p. 87), were formulated. The following are examples of these level 2 questions: Had there been disagreements among the parties involved in the formulation of the regulations? On which subjects? How were the disagreements solved? What were the most important contributions made by each party? A total of twenty level 2 questions were formulated. Level 1 questions, that is, questions directed at specific interviewees, varied according to the function of the person being interviewed and were formulated before each interview.

The researchers interviewed 13 individuals who were heavily involved in or affected by interactions between the government and these companies. Five respondents were key members of a working group that created the proposal that led to Resolution 354, which was issued in 2009, and included major revisions to the 2007 resolution. Two interviewees were truck drivers, two were engineers who helped adapt trucks to transport the heavy blocks, two were quarry owners and one was a quarry security manager. Several interviews were conducted in the field, allowing the researchers to observe how trucks are loaded and blocs tied to the truck bodies. The interviews were recorded and transcribed. After the interviews, the authors exchanged several emails with the interviewees requesting supplementary information and clarification.

### **Analyzing Data**

To understand how a situation evolves over time, the “data consist largely of stories about what happened and who did what when—that is, events, activities, and choices ordered over time” (Langley, 1999, p. 692).

The first step of data analysis was identifying the events that caused the regulations to be issued and those that occurred during the process of formulating and implementing these regulations. These tasks were completed by direct interpretation (Stake, 1995).

A major strength of the case study method is that it allows for data triangulation, that is, the use multiple data sources, and investigator triangulation, that is, confrontation of interpretation among different researchers (Patton, 1999). Triangulation allows cross-



checking, which is a fundamental resource to increase qualitative research credibility (Janesick, 1994). Triangulation improves the quality of the research because it reduces respondent bias and increases support for the researcher's conclusions (Vissak, 2010).

In this study, data triangulation was achieved by gathering data from participants who represented the government and companies and who had different, often conflicting, perspectives of the events. Data triangulation was enhanced by access to the working group resolutions, drafts, and analysis.

As in the original case, the identification and ordering of events was relatively straightforward (Child et al., 2013, p. 62). In this case, the main events, described in the following sections, were the peaking of the accident rate, issuing of the resolutions regulating cargo transport and negotiating processes resulting in the formulation and implementation of these regulations.

Next, the main initiatives of the parties were identified. To reduce the risk of bias in this process the researchers utilized investigator triangulation (Yin, 2014, p. 116). Each researcher compiled a list the main initiatives, which were subsequently reviewed. Only those events upon which both researchers agreed were included in the analysis.

A central aim of this study was verifying whether the power bases used by the companies and government representatives in the processes could be classified into the five categories postulated by the authors of the original case (hypothesis 1). The authors individually categorized each initiative by its power source. Then, they crosschecked their associations. The list of initiatives and the power base with which they were associated are presented in Table 1.

## **The Regulation of Ornamental Rock Transportation in ESS**

### **The Context**

The ornamental rock sector is quite important to the Brazilian economy. It exports over US\$ 1 billion a year or approximately 0.5% of total Brazilian exports. Overall, the sector value chain employs 120,000 workers and is composed of approximately 10,000 companies. Approximately half of production and 70% of exports occur in ESS. Ornamental rock accounts for 7% of the state gross product. (Avrichir & Chueke, 2012; Chiodi, 2013; Vidal, Babisk, & Castro, 2008). The value chain includes marble and granite mines quarries, primary processing companies (sawdust) and secondary processing companies (polishing to produce a finished product). In addition, there are technical service providers, national machinery manufacturers and suppliers of other industrial inputs.

ESS is one of 26 Brazilian states. It is situated just north of Rio de Janeiro in the southeast of the country. ESS has a population of nearly four million people and a per capita GDP of approximately US\$ 11,000, the fourth highest in Brazil. The state economy has been growing at a rate nearly twice as high as that of the rest of the country largely due to increased production and export of commodities, especially of iron ore and petroleum.

The ornamental rock business in ESS began in the 1950s when Italian immigrants began to extract blocks from quarries and sell them in other Brazilian states. There, the rocks were processed and transformed into tiles, kitchen tops, and gravestones. In the 1980s, with the emergence of gang saws that used steel shot as abrasives and semi-automatic rock slab polishing machines, the ornamental rock industry matured and became economically relevant to the state (Villaschi Filho & Sabadini, 2000).

Between 2002 and 2007, taking advantage of the of American construction bubble, the industry grew at a rate of 30% per year. Exports grew from approximately US\$ 200 million per year to over US\$ 1 billion during this period. Additionally, ESS went from

exporting nearly 100% raw blocks to exporting approximately 50% block and 50% slab. A ton of granite slabs is worth 4 times more than the raw material.

With the depletion of granite deposits in the southern part of the state, extraction now occurs in the northern part, where the quantity and variety of quarries is larger. Historically, processing occurred in the south in and around the city of Cachoeiro do Itapemirim, the productive center of a cluster that spans fourteen municipalities. Processing continues to take place there due to the advantages of agglomeration.

The distance between the places where the blocks are mined in the northern part of the state and Cachoeiro do Itapemirim is approximately 400 km. Export occurs mainly through the port of Victoria, located near the center of the state. The distance between Cachoeiro and Vitoria is 150 kilometers. Because the railway system is inadequate, all rock transportation (except a small percentage of raw blocks, which are shipped directly to Victoria by rail) occurs by truck.

The daily transportation of hundreds of granite blocks, many weighing over 30 tons, over these distances poses a major challenge to the maintenance of state roads (see Figure 1). This shipping also represents a permanent threat to the safety of vehicles that travel on these roads. Excess load reduces the expected life of pavements by an average of 23% (Albano, 2005). Between January and July 2007, there were 62 traffic accidents involving vehicles transporting granite on federal roads (Zanello, 2007). During the same period, there were 170 arrests for excess truck loads. Over 800 tons were withheld from 86 trucks by the road police between May and July 2007. Most of these accidents are caused by blocks that are poorly tied to trucks, which fall off the rack at curves or when the vehicle accelerates or brakes.



**Figure 1.** Granite blocks transported untied; accidents are caused by rock transportation.

Until 2007, there was no specific regulation of the transportation of ornamental rock. In December 2007, an accident immediately killed four people and four others later died from the injuries caused by the accident. This accident brought great visibility to the issue. In December 2007, the National Council of Transit (Contran), the federal department

responsible for issuing and updating traffic laws, issued Resolution 264, the first regulations to establish security requirements for the transport of ornamental rock.

### **The Process of Co-Evolution**

Resolution 264 established the following three requirements: blocks must be tied to the truck during transportation, drivers who transported ornamental rocks were required to take a specialized 50-hour training course, and each type of truck used in rock transportation was required to conform to corresponding weight limits (Sindirochas, 2010a).

Resolution 264 significantly reduced the number of accidents involving rock transport (Sindirochas, 2010b) but left critical issues unaddressed and created major problems for the producers and transporters of rocks. Although the regulations included time allowances of six to eighteen months for implementation, allowing the trucks and quarries time to adjust to the new requirements, Sindirochas negotiated two six-month postponements of the implementation deadlines for some of the changes.

Resolution 264 left several critical issues unaddressed. For example, how slabs, the processed granite blocks that constituted approximately 50% of total rock transport, should be transported; the widely used transport of rock in containers; and the transport of smaller rocks were not addressed. Furthermore, the resolution did not establish the penalties that should be imposed on violators of the resolution.

The unaddressed issues associated with increased control of transportation by the Federal Road Police (FRP) exposed drivers and quarry owners to increased uncertainty because decisions varied according to how local patrollers interpreted the regulations. Even more important, the type of truck required by Resolution 264 to transport heavy blocs was adequate for road transportation, but posed considerable difficulties or completely prevented access to the precarious trails that have to be travelled to reach some quarries. Truck access to some of these steep trails, which have grades of up to 60 degrees, is supported by cranes. During 2009 and 2010, Sindirochas, the rock producer's union, negotiated with federal authorities twice to obtain six-month extensions of the deadlines (Sindirochas, 2010a). Sindirochas created, with other sector associations and participation from representatives of the federal, state and local authorities, a working group to propose modifications to Resolution 264 (Reis, 2010).

The core of the working group was composed of representatives of local associations and technicians. Their meetings were generally attended by 5 to 8 people. However, periodic meetings with a larger group in which representatives of the three levels of government were represented also occurred. Estimates by interviewees of the number of meetings held by the larger group varied between 15 and 20. The representatives of the Thematic Chamber for Vehicles (CTAV) were important participants. 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.

During the process of developing proposed 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 halted at different speeds to determine which methods of tying cargo to the trucks were adequate. Because vehicles must climb steep slopes in quarries that have grades of up to 60%, tests were performed under these extreme conditions as well. For tests to be considered valid, the drivers of the vehicles were certified engineers. Several tests involved closing roads to regular traffic as well as mobilizing the FRP along with other departments. Over 4,000 kilometers were traveled by vehicles carrying rocks for these tests.

The working group propositions encompassed rules governing the transport of slabs, cargo in containers and smaller rocks. They established penalties for violators. They also improved the existing rules on securing blocks to trucks by providing more details and safety tests, making annual vehicle inspection mandatory and specifying how this inspection was to be performed. They solved the issue of maintaining access to quarries by authorizing smaller trucks to transport the heaviest blocs by adapting them to reduce the axel load and making them safer. In June 2010, Contran issued Resolution 354, which replaced 264. This resolution implemented most of the changes proposed by the working group. However, it did not solve all the problems. Several truck drivers avoid these controls by using lateral roads on which the FRP is not present. Additionally, some quarries use trucks licensed in neighboring states with less stringent requirements. However, the number of accidents in some years was reduced by 30% and fatalities by over 80% of the 2007 levels (Reis, 2010). The number of trucks inspected at the most rigorous inspection centers exceeded 900 in 2013, an increase of 40 trucks since 2011. Although we could not obtain statistics about average fleet age, all interviewees opined that fleet age had diminished significantly and their condition improved. All our interviewees thought that, although the regulations can be further improved, the current situation is an improvement over conditions in 2007.

## Findings

### Use of Power Bases by the Parties in the ESS Case

Child et al. (2013) found that both GAs and RPs used five power bases. In this study, we observe that GAs and the RPs use four bases. The GAs used coercion, legitimacy, reference and expertise. The RPs used material resources, legitimacy, reference and expertise.

#### Material Resources

Material resources “provide the ability to reward and confer benefits” (p. 222)<sup>1</sup>. Examples in the China case include heavy HPH investment in the expansion of the Yantian port and initiatives to reorganize the agencies operating within Chinese ports by the central government (p. 232). Examples of initiatives using this power base are the significant investments by YICT and concessions of tax and operational benefits provided by the Chinese government.

In ESS, the RPs had at their disposition extensive extraction and production, transportation and financial resources. They used these resources to hire experts to develop technical solutions, such as improved locks and other tying mechanisms, and to pay for the extensive tests conducted.

In contrast, the researchers did not find any indication that material resources were used by GAs in ESS. GAs did not invest in resources, pay for expenses, or reorganize relevant agencies and structures.

#### Coercion

Coercive power is the “ability to enforce conditions and withhold rewards” (p. 222). In the Chinese case, RPs use of their capacity to enforce contractual items by insisting that government fulfilled agreements before the YICT made payments. The GAs threatened the YICT with the possibility of competing terminal facilities.

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<sup>1</sup> All references in this section are to Child et al., 2013)

In the ESS case, GAs also use coercive power. GAs can issue new regulation or changes existing ones, and their decrees have the power of law. As one working group member said, “The director of Contran, he can issue a decree right now and prohibit everything, he has a powerful pen.” RPs can also exercise coercive power when they delay or withhold payment of taxes, for example, but no indication of this behavior was identified by the researchers.

### **Legitimacy**

In the Chinese case, GAs and RPs had and used legitimate power, “the exercise of power regarded as rightful by all parties”. The legitimate power of the RPs was based on its world-class standards. They used legitimacy to create a pilot site for national reforms in port customs administration. GAs were legitimated by laws and the official status of its agencies. They used legitimacy to simplify transit and clearance procedures at the YICT port, for example.

In the ESS case, both parties had and used legitimate power. The existence and use of legitimacy by RPs is evident in the demand that the government create a working group to address changes to Regulation 264. Legitimacy is also present because the government agreed to most of their demands, including postponing implementation of Resolution 264. Evidence of this government power includes the fact that Contran’s right to issue regulations was established by the Brazilian Congress and sanctioned by the President of the Brazilian Republic in 1997. This right was used extensively to demand the validity of RPs propositions through tests and other evidence. Although the RPs resented these demands, they never questioned Contran’s right to make them.

### **Reference**

Reference power “lies in the identification of others with the power-holder” (p. 222). In the YICT case, the company’s reference power stemmed from the reputation of its CEO and its famous parent company. It used reference to “secure unprecedented terms on ownership and management rights” (p. 233). The government had reference power as the guardian of national interests and it used its reference power to ensure that YICT became the official point of reference for China’s port reform (p. 233).

In the ESS case, RP reference power is demonstrated the membership of over 400 of 1000 ornamental rock companies in ESS that are voluntarily members of and contribute money regularly to Sindirochas, the state union of these companies. Many companies contributed time and resources to the working group, which was interpreted by the researchers as evidence that RPs made use of their reference power. The attendance of the ESS governor and other authorities at some meetings of GAs with RPs was interpreted as evidence of reference power.

### **Expertise**

Expert power is the power derived “from having special information relevant to the situation”. In the YICT case, the government possessed expertise in the logistical operation of development in the hinterland, which it used it to disseminate the practices pioneered by YICT to other container ports. HPH was recognized as an expert organization in cargo handling (p. 222), which it used it to pilot national reforms in port customs administration (p. 234).

In the ESS case, RPs used their expertise in engineering, developed over years of adapting trucks to ornamental rock transport, to improve locking systems and demonstrate to the governmental authorities that the alternatives they proposed met safety requirements. An engineer who participated in the group said, “we tested, documented, filmed everything. If not, they would not authorize it”. Government representatives used knowledge to question the propositions made by the working group, and they refused certain propositions based on this knowledge.

Table 1 summarizes the main initiatives that RPs and GAs made through each power resource. A similar summary for the Chinese case can be found in the original study (pp. 223-224). The majority of power sources were present and used by the parties in ESS, which supports hypothesis 1.

**Table 1:** *Power Resources Relevant to the Co-Evolution of Firms and the Environment*

<b>Company Initiatives</b>	<b>Environmental/government Initiatives</b>
Material resources	
Used financial resources to hire specialists to help elaborate the technical proposals. Used machines, trucks, and financial resources to develop and test these technical proposals. Used magazines, websites and other mass media resources to promote their perspective on the regulations.	
Coercion	Could accept or veto propositions made by company representatives.
Legitimacy	
Sindirochas is the official and sole union of ornamental rock companies in Espírito Santo. Obtained six-month postponements of regulation implementation twice. Demanded the creation of a working group to solve the problems of Resolution 264.	Right of government representatives to issue regulations legitimated by law. Demanded clear evidence for every proposition made by company representatives
Reference	
Sindirochas represents over 400 of 1000 ornamental rock companies who voluntarily adhere and pay an annual fee. Associated companies contributed time and resources to test the working group propositions.	State governor and other authorities attended meetings at GAs request.
Expertise	
Used local knowledge of truck mechanics, safety requirements and legislation to develop technical propositions. Presented detailed report of proposals to modify Resolution 264 to authorities.	Used knowledge to contest propositions made by RPs.

### **Relational Framework and Specific Proposal**

In the ESS case, as in the Chinese case, an “institutionally sanctioned arrangement that connected actors in a common discourse ” (p. 29) was essential for co-evolution to occur. The institutional sanctioned arrangement was represented by the working group and several meetings with the GAs that composed the CTAV. As in the original case, it took time and

initiative from the parties to evolve and was cultivated by the RPs. Thus, we find support for hypothesis 2.

Additionally, as in the original case, the RPs presented specific proposals to the authorities. These proposals included drafts of a resolution that were condensed in Resolution 354. Thus, hypothesis 3 is also supported.

### **Case Discussion**

The results of this the case analysis indicate several similarities and a few differences with the Child et al. (2013) study on which this section highlights and comments.

Both cases indicate that categories based on French & Raven (1960) can be helpful in identifying the sources of power resources and the initiatives each party made to translate these resources into actions focused on influence, which supports hypothesis 1 (see Table 1). Yet, some differences appear in the usage of the power resources. While Child et al. (2013) affirms that all five power resources were available to and used by both parties, in this case, we observe neither indications of material resources used as a base by GAs nor the use of coercive power by RPs.

Possible explanations of the differences in use of the power bases are the nature of the issue at stake and the tendency of Brazilians to act cordially. While in the YICT, co-evolution focused on the construction of a capital intensive facility, in the ESS, it involved an intangible good. Several studies of Brazilian culture have found that a central trait is the tendency to act cordially (Prado Junior, 2011) and avoid conflict (Tanure & Duarte, 2005).

Using a relational framework, this case confirms the claim made by Child et al. (2013) that co-evolution requires a formal arrangement for interactions between government and company representatives and investments of time and effort by both parties.

However, a difference emerged in the nature of the relational framework. While in China, contacts occurred consistent with a private persuasion approach (Li, Feng, & Jiang, 2006), in ESS, they followed an open advocacy pattern. Private persuasion occurs when the party interested in promoting changes meets government representatives in private or attempts to influence them through lobbying. In open advocacy, the party interested in promoting changes organizes public forums or involves the media. As other authors note (Li et al., 2006), open advocacy requires a society that is tolerant of criticism of existing policies. Differences from the Child et al. (2013) study can be attributed to the fact that while Brazil ranks 44th worldwide in democratic institutions, China ranks 143th (Economist & Unit, 2013).

Consistent with this result, we suggest an additional proposition to those developed by Child. In democratic, emerging market countries, the relational framework will tend to be open and institutionalized, while in more autocratic countries, it will tend to be hidden and oriented towards lobbying.

In both cases, company representatives made specific proposals that catered to the objectives of GAs to mobilize support. In the Chinese case, YICT made proposals that were coherent with Chinese objectives to build a large container port. In the ESS case, the RPs made suggestions that were compatible with increasing the safety of ornamental rock transportation while not increasing the cost or unnecessarily complicating the process. In both cases, firms can alter institutions to their advantage by aligning their interests with those of government. In the Chinese case, YICT built and retained significant equity in a major world port. The Chinese government attained its desire world-class container port. In the ESS case, the RPs were able to contain transportation costs and avoid significantly increasing restrictions on certain types of trucks and equipment. The GAs were able improve



transport regulations and reduce the number of accidents caused by ornamental rock transportation.

### Conclusions and Implications

This case study analyzed the political dynamics of co-evolution by replicating a previous study focused on the same topic. This paper analyzed an extended interaction between a government and company representatives focused on the regulation of ornamental rock transport in ESS. Unregulated rock transportation caused accidents and damaged roads. The resulting process produced new regulations that met GA objectives while satisfying the companies involved.

Several context similarities and differences with the original case are important. Similarities include their location in emerging markets with regulated environments in the transportation sector.

This replication confirmed several conclusions of the original case. Power resources, which can be categorized according to the French and Raven (1960) framework, were available and used by the parties in their interactions; these interactions occurred in a relational framework that required time and effort to evolve. The fact that each party made specific proposals that appealed to the other one indicates that legitimacy was important for co-evolution to occur.

One major difference emerged from the replication. While in the original case the relational framework was hidden and centered on a lobby, the replicated case was more open. This difference is consistent with the relationship identified in previous studies between the openness of a society to criticism of policies and the type of advocacy practiced.

This replication contributes to theory by increasing the external validity of the important conclusions reached about the political process of corporate co-evolution, which remains an under-researched topic in the organization-environment relationship. From a practice perspective, this case confirms and expands results that can be used by companies and governments to influence one another. These results provide a detailed roadmap of how to conduct such interactions.

This paper also provides a methodological contribution because case studies replications, although important to theory development, are seldom practiced in the field of organization studies. This study implements several methodological recommendations for case study replication.

Although increasing the validity of the results of previous studies of the political dynamics of co-evolution, this case does not support all the propositions of the YICT case. Replicating the aspects that are not included and verifying that aspects that were can provide an important contribution to the theory and practice of corporate co-evolution.

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