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**A Vocation for Industrial Transformation:  
Ideology, Organizational Isomorphism and Upgrading in the Guatemalan  
Sugar Industry**

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**Abstract**

Between the late 1970s and the 2000s, the Guatemalan sugar industry transitioned from a production model with deplorable labor conditions and low productivity to a highly efficient model with improved conditions. This paper traces the origin and diffusion of this upgraded model to a small team of managers motivated by Elite Solidarism, an interpretation of Vatican II Catholic social doctrine. It suggests that this ideology played the central causal role in this process of industrial transformation, as managers drew upon it to define the specific practices of the new model at one particular mill, and then encourage its diffusion.

Keywords: industrial upgrading; labor relations; sugar; ideology; isomorphism; Guatemala; Catholic Social Doctrine

Total word count: ~11,00 (13,200 with footnotes)

In *Economic Backwardness in Historical Perspective*, Gerschenkron (1962) argued that the “institutional instruments” and “ideologies” used to promote industrialization shaped the rate and characteristics of industrial transformations. Following this influential contribution, students of industrial change considerably deepened their understanding of the role of Gerschenkron’s “institutional instruments” through studies of banks and different state programs and policies. They also expanded the scope of institutions to include a variety of inter-firm networks, such as business associations, global value chains and clusters.<sup>1</sup> However, scholars largely neglected Gerschenkron’s emphasis, reminiscent of Bendix (1956) before him, on the role that “ideologies” played as drivers of industrialization processes and organizational change.

My central purpose is to rescue ideology as an explanation for the business practices associated with industrial upgrading. By shedding light on the causal role of ideology, I broaden the range of explanations in industrial upgrading theories beyond the well-established institutional variables. A case study of the Guatemala’s sugar industry provides the empirical material for this endeavor. During the last two decades of the twentieth century, sugar mills in the industry profoundly transformed their business models. They introduced new practices in production and supply chain organization, R&D, employment, and industrial relations. These practices allowed the industry to attain the highest production growth rates in Latin

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<sup>1</sup> For examples of studies on the role of the state, see Amsden (2003) and Evans (1995). On developmental business associations, see Doner & Schneider (2000). On global value chains and clusters, see Gereffi (1999), Humphrey & Schmitz (2002), Nadvi & Halder (2005) and Navas-Aleman & Bazan (2004).

America. During this period, the industry also tripled its share of world production. In addition, the new practices yielded increased product diversification and sophistication, and notable improvements in wage and living conditions for most workers. However, the practices also stimulated concentration of land and mill ownership, and elimination of mill worker unions.

To account for this transformation, I rely upon an ideational literature that causally links ideologies to economic and business practices and policies.<sup>2</sup> This literature builds on Weber's dictum that while "interests directly govern men's attitudes," often "the world images that have been created by ideas have, like switchmen, determined the tracks along which action has been pushed by the dynamic of interest" (Weber 1958: 280). Arguments in this ideational literature usually follow three steps. First, they document the emergence and main tenets of the ideology. Then they describe how a group of individuals interprets and adopts this ideology, and how the ideology molds their interests. And lastly they explain how this ideology, as interpreted by the group of individuals, is causally associated with the outcome of interest. Weber's (2002) seminal *Protestant Ethic and the Spirit of Capitalism* provides an example. The study begins by describing the Reformation and emergence of Protestantism in Europe. Then it details how the Calvinists understood the concept of predestination as demanding a rational ascetic lifestyle and tireless work toward a calling. And finally it causally links rational asceticism and tireless work to the development of capitalism.

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<sup>2</sup> For an overview of some of the central arguments in the ideational literature of political science, see Schmidt (2008).

I follow a similar procedure, also anchored in religion as the explanatory ideological variable, to account for industrial upgrading in Guatemala's sugar industry. During the 1960s, a distinct understanding of Vatican II Catholic social doctrine, which I label "Elite Solidarism," emerged in Latin America. Elite Solidarism most basically advocated a top-down interpretation of Vatican II that exhibited traces of Dulles' (1987) hierarchical "institutional model of the Church," and sharply contrasted with the better known, radically grassroots Liberation Theology. During the early 1960s, the teachers at an elite Jesuit high school in Guatemala City inculcated the central tenets of Elite Solidarism into a group of students. After high school, the group of students studied engineering and then entered a sugar mill, Tajumulco, as top managers. At Tajumulco, these new managers creatively relied upon their technocratic engineering background to translate the principles of Elite Solidarism into an innovative bundle of business practices. In a context of severe labor unrest and economic crisis, they introduced this bundle, radically changing the mill's business model. The bundle rapidly raised Tajumulco's production, and largely appeased its workforce by improving conditions and neutralizing the mill's union.

Following their introduction of the new bundle at Tajumulco, the managers assumed a role as industry-wide champions of the new model. They actively disseminated their practices across the industry's mills. Elite Solidarism's emphasis on elite collaboration largely motivated them in this new undertaking. Additionally, a number of profound economic and political crises, coupled with Tajumulco's emergence as an organizational archetype, softened opposition, especially among

the industry's older owners and managers, to their dissemination efforts. The crises involved broad labor mobilization that culminated with a strike of 80,000 seasonal workers in 1980, a rising minimum wage, and the collapse of demand for sugar. The diffusion process of Tajumulco's practices broadly resembled Powell and DiMaggio's (1983) mimetic and normative institutional isomorphism: in this highly uncertain context, other mills imitated Tajumulco, and managers at Tajumulco exploited different channels to encourage adoption of their practices. This isomorphic process not only led to the adoption of the bundle by all mills in the industry. It also spawned close inter-firm learning and collaboration, the construction of an encompassing, cohesive business association, the emergence of professional networks, and the creation of a number of supportive industry-wide agencies.

The setting for the case is especially well suited to examine the effect of ideologies on industrial transformation for at least three reasons. First, the industry upgraded its production and labor practices in the absence of most of the traditional "institutional instruments" provided by the state, development banks or inter-firm networks. Second, the sugar industries of neighboring countries, endowed with similar natural resources and faced with the same international environment of declining sugar demand and prices, failed to attain a similar transformation. And third, comparable Guatemalan industries, such as coffee or cotton, subject to a shared domestic context of political and economic crisis, and to similar society-wide processes<sup>3</sup> and state policies, failed to spawn such upgraded models.

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<sup>3</sup> Paige (1979 & 1997) provides an example of the possible effects of society-wide changes. According to his theory, as a society's non-cultivators shift their main source of income from the land to capital, they become economically stronger and more willing to negotiate with contenders, thereby reducing

The explanation of this case suggests important extensions and contributions to the industrial upgrading, ideational and neo-institutional organizational literatures. It enriches accounts of upgrading by shedding light on the role that managerial and firm agency play in industrial transformation. Traditional accounts often assume that latecomer firms follow the same upgrading paths as their industrialized country predecessors.<sup>4</sup> I argue instead that actors in firms sometimes transform their industries by exploring new, uncharted upgrading paths, even in the most unexpected locations. These actors may draw upon the abstract principles of their deeply held ideologies to blaze the new trails. Similarly, traditional accounts of upgrading often direct our attention to the predictable routines that firms enact in response to environmental change. In contrast, I suggest that at times actors react by engaging in experimentation and devising innovative solutions consistent with their ideologies.

The account also reveals that some of the institutional preconditions cast in the literature as necessary for upgrading may in fact emerge as byproducts of the process of industrial transformation. Moreover, their construction may be driven, at least in part, by ideology. For example, some previous research on industrial upgrading and self-discovery points to close inter-firm relations, encompassing business associations, or industry-wide agencies (e.g., R&D centers) as necessary “preconditions” (Amsden & Chu, 2003; Amsden, 1989; Doner & Schneider, 2000;

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the possibility of violent conflict. Interestingly, while some change in the source of income of non-cultivators may have taken place in Guatemala, the divergence in the outcomes of the three main agro-industries in the country – cotton, coffee and sugar – challenges the explanatory power of this theory’s emphasis on society-wide changes.

<sup>4</sup> See Herrigel (2000) for a contemporary critique of “unitary” accounts. For an insightful critique of the pitfalls of these traditional arguments as applied to upgrading and “full-package” adoption in global value chains, see Schrank (2004).

Rodrik, 2008; Saxenian, 2004). However, as this study shows, in the Guatemalan sugar industry these “preconditions” arose in tandem with, rather than before, the organizational changes of the industry’s firms. Furthermore, I argue that, like the other innovative practices of these managers, Elite Solidarity inspired their introduction. Driven by this ideology’s emphasis on collaboration, managers crafted these institutions as tools to promote teamwork and the diffusion of business practices.

In conversing with the ideational literature, the account illuminates the gap between an ideology and the practices it inspires. It suggests that to bridge this gap, actors engage in an exercise of translation from ideological diagnoses and guidelines to concrete practices. And it posits that to translate, actors may draw upon their professional training. This insight builds on a prevalent critique that faults the ideational literature for its view of ideologies as texts that actors blindly follow (Campbell, 1998; Schmidt, 2010). In addressing this critique, I show that the managers still found room under the ideological umbrella of Elite Solidarity to construct unique business practices. In building business practices that conformed to their ideological principles, the managers relied upon their engineering education.

Lastly, in its dialogue with the literature on institutional isomorphism, this study sheds light on the conflict and contention that processes of mimetic and normative isomorphism may involve, even in contexts of extreme uncertainty. Furthermore, the account suggests that processes of normative isomorphism may still unfold even in the absence of “instances of professionalization.” According to



DiMaggio and Powell (1983), these instances socialize professionals and thereby drive normative isomorphism. While this account does not dispute their importance in other organizational fields, it suggests that in their absence, actors may craft alternative instances that also foster adoption of shared norms and values, collaboration, practice diffusion, institutionalization (i.e., theorization and objectification, and sedimentation), and isomorphism (Scott, 2008; Tolbert & Zucker, 1996). Moreover, in addition to the usual factors driving diffusion (e.g., uncertainty, individual ambition, professional affinity), ideology may motivate actors as they painstakingly construct these alternative institutions.

The rest of the paper is organized as follows: Section 2 briefly describes the research methodology. Section 3 contrasts the industry's prevalent business models before and after the transformation. The fourth section walks through Tajumulco's upgrading process and managers' introduction of new practices. The fifth section traces the industry's process of institutional isomorphism. I conclude the study with a discussion of the main theoretical implications of the account.

## **Methods**

The research informing this paper focused on describing and explaining upgrading across the industry. To address this central concern, I relied upon semi-structured interviews, field visits, and existing industry studies and statistics.<sup>5</sup> I conducted fieldwork in Guatemala during June, July and August of 2010, and January and March of 2011. The fieldwork involved 48 interviews with 43 key informants in

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<sup>5</sup> To obtain statistical information, I visited the National Institute of Statistics (INE), the Central Bank (BANGUAT), the Guatemalan Library of Congress and the mill association's headquarters.

Guatemala City and in Guatemala's southern region, where all the sugar mills are located. Interviews usually lasted between 1 and 4 hours. They addressed the history of the industry, its characteristics and its process of transformation.

To ensure a wide sample, I chose informants with varying experience and backgrounds. I interviewed owners and upper- and mid-level managers from 6 of the industry's 9 mill conglomerates; white-collar mill employees; high-level employees and former and current board members of industry umbrella organizations; businessmen involved in related activities (cotton, coffee); unionists and peasant organizers; NGO employees; academics; former guerrilla members; and former high-level government officials (a former president, and former ministers of finance, planning and the economy). Table 1 presents the distribution of interviewees by categories (some interviewees straddle more than one category).

[Insert TABLE 1 here]

In addition to interviews, I visited three mills and their numerous plantations during the harvest season, in January 2011. To vary my sample, I chose one of the largest mills in the industry, a medium-sized one and a smaller one. Visits involved daylong tours of the plantations and the mill. During these tours I briefly interviewed various workers and managers, observed the organization and execution of field and factory work, learned about the production process, and visited worker living accommodations.

## **Contrasting models: the practices and outcomes of upgrading<sup>6</sup>**

Upgrading is usually associated with increased firm competitiveness and higher value-added production. The literature on industrial upgrading discusses different types of upgrading processes. Upgrading may involve changes in product range and sophistication, production processes and technology, and firm functions (Bair, 2005; Pipkin, 2011). To capture these different possibilities I have grouped the practices of the prevalent business models in Guatemala's sugar industry into 6 axes: firm and industry functions, product sophistication, product diversification, production processes and technologies, inter-firm coordination, and labor conditions. The prevailing models in the industry in the 1970s and the 2000s differed markedly along these axes.

Before the late 1970s, several actors performed different functions in the industry's vertically disintegrated supply chain. Chief among them, independent plantations (i.e., plantations not owned by mills) produced a growing proportion of sugarcane. At their peak in the mid-1970s, they accounted for over 80% of total production. A growing number of mills, in turn, processed the sugarcane to produce only low-grade unrefined white and raw sugar. Their sugar production was comparable to production in neighboring Nicaragua and El Salvador, and vastly lower than in Cuba or the Dominican Republic. They sold most of it (over 70%) domestically through middlemen or in the US quota market.<sup>7</sup>

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<sup>6</sup> Unless otherwise stated, this section is informed by Bataillon, 2008; Bossen, 1982; COVERCO & International Labor Rights Fund, 2005; Figueroa Ibarra, 1980; Le Bot, 1995; Molina Calderon, 2005; Oglesby, 2002; Organizacion Revolucionaria del Pueblo en Armas, 1978; Valdez & Monzón, 2007; Wagner, 2007, and personal visits in January 2011.

<sup>7</sup> They exported the remainder to the lower-priced international spot market.

Plantation and mill production in this period relied on low-productivity processes and technologies. A thin crust of untrained field managers and supervisors assigned sugarcane plots to teams of migrant seasonal cane cutters, and paid a pre-set group rate. Cane cutters brought their own tools, learned how to cut cane from each other and independently defined the work process. Plantation owner investments thus remained marginal. Mill production processes mirrored those on plantations. Untrained operators worked with second-hand, imported machinery. Only one or two engineers directed the entire operation.

The plantation and mill workforce labored under deplorable conditions. Seasonal migrant cane cutters, an indigenous force constituting the vast majority of the industry's workers, slept with their families on the dirt floor of overcrowded Dante-esque galleys.<sup>8</sup> Recruited by abusive labor contractors in the highland regions of the country, cutters and their children toiled for over 14 hours per day. Average wages remained well below \$1 per day, and gun-brandishing supervisors often resorted to physical and verbal excesses.

Most of the remaining industry workforce, employed on a year-round basis, lived permanently in shantytowns, or "rancherías," on the plantations. They received certain benefits from employers, most notably plots of land. In exchange, they submissively complied with all employer demands. This manorial dynamic, however, began breaking down in the 1970s. An employer drive to raise production

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<sup>8</sup> Families settled in small sections of the cramped galleys, sleeping on the floor and setting up makeshift walls out of plastic or cloth. In only a few cases did cement walls or floors protect workers from malaria, polluted stagnant water, flies and insecticides. Most of these galleys lacked electricity or running water (Bossen, 1982; Figueroa Ibarra, 1980; Molina Calderon, 2005; Oglesby, 2002; Valdez & Monzón, 2007; Wagner, 2007).

by removing these workers from mill land triggered militant opposition.<sup>9</sup>

Permanent workers in at least 10 of the industry's 18 mills organized unions. By the late 1970s, constant strikes strained labor relations.<sup>10</sup>

Conflict and distrust also undermined two other sets of relationships in the industry. First, plantation and mill owners clashed over sugarcane quality, timing and price. And second, mills fiercely competed with each other for control of the protected domestic market.<sup>11</sup> In both cases, the state intervened. In consultation with industry representatives, state officials set sugarcane and sugar prices and established domestic sales quotas. Yet such interventions only partially stemmed the disagreements, as the state largely failed to enforce its regulations.

Cutthroat mill competition for the domestic market blighted potential mill collaboration. For example, not all mills joined the umbrella mill association. Of those larger mills that joined (e.g., Tajumulco, Acatenango, Pacaya), none volunteered representatives to the association's board. As a result, smaller mills controlled the board and the association proved incapable of monitoring its members. Unsurprisingly, the mill association also failed to complete many of its projects, such as R&D stations or a joint port facility. And it lacked the capacity to aid the government in enforcing mill quotas (Asociacion de Azucareros de Guatemala, 1974, 1976, 1982).

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<sup>9</sup> Similar contentious processes of change arose in other agroindustries (e.g., coffee, cotton, cattle ranching) throughout Central America during this period (Dunkerly, 1988; J. Paige, 1997; Williams, 1986).

<sup>10</sup> Most union members worked as mill operators, although permanent year-round field workers and supervisors also participated in the union. Their commonalities – essentially their permanent worker status and claims to mill land – held these different worker groups together in the unions.

<sup>11</sup> Similar problems affected other sugar industries. For an example, see Doner (2009).

By the 2000s, conditions in the industry had changed dramatically along the six axes of comparison (see TABLE 2). Mills not only carry out many of the functions previously performed by other actors in the supply chain. They have also added entirely new functions to the chain. For instance, a sharply reduced number of mills – eleven mills in 2008/2009, down from eighteen in 1979 – own or manage between 70 and 80% of the land sown with sugarcane. Independent plantations play only a marginal role. The mills have also begun purchasing land and mills in nearby countries (e.g., Nicaragua, Honduras) to expand production and access new markets.

[Insert TABLE 2 here]

Current plantation and mill production processes and technologies also differ markedly from those of the 1970s. Consequently, production and productivity have increased sharply (see TABLE 3). On plantations, teams of engineers direct highly trained workers specialized in each step of the partially mechanized production process. Employers provide all tools and invest heavily in R&D. In mills, managers and engineers oversee the entire sugar production process, which is executed by skilled technicians and operators. These changes, which began in the early 1980s, have produced impressive results: between 1980 and 2000, the Guatemalan sugar industry attained the highest average annual growth rates in production in Latin America (see TABLE 4). It also tripled its proportion of total world production (Food and Agriculture Organization of the United Nations, 2012) and left other industries with comparable production levels in the late 1970s far behind (see FIG. 1).

[Insert TABLE 3 here]

[Insert TABLE 4 here]

[Insert FIG. 1 here]

Furthermore, mills currently produce a wide range of sophisticated products, including electricity, fuel alcohols, drinking alcohols and candy. They also produce refined sugar (about 25% of production) and low-grade raw and white sugar, over 70% of which they export to the competitive international spot market.

Material conditions for workers also changed radically. Permanent workers, employed mostly in administrative, technical and maintenance activities, no longer reside on plantations, but in nearby towns. They receive extensive training, a number of benefits and high wages relative to other industries. At the same time, permanent worker unions in the industry have all but disappeared, as management has centralized decision-making and quashed worker voice. By 2010, only one mill union remained active.<sup>12</sup>

The major labor condition improvements, however, pertain to seasonal cane cutters. Mill human resource departments hire seasonal workers – who still represent over 70% of the workforce – on three- to six-month written contracts. Cutters reside in clean, ventilated, barrack-like residences and access a wide array of programs in nutrition, education, health and recreation. Work on plantations still

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<sup>12</sup> This outcome challenges Paige's (1979) theory, described above. The growing power of the capital-based non-cultivators was associated with active repression of mill unions rather than the increased openness to negotiation that Paige's theory predicts.

requires tremendous physical effort. But under a new compensation scheme, piece-rates with additional bonuses match or more often exceed the national minimum wage (hovering around \$4 to \$5 per day in the early 2000s) and the prevalent wage in comparable industries (COVERCO & International Labor Rights Fund, 2005; Oglesby, 2002). In addition, cane cutters receive a series of benefits from mills, including low-cost housing, support for production cooperatives, life insurance, low-cost loans, end-of-harvest bonuses, and matching saving accounts.

Finally, inter-mill dynamics and cooperation radically depart from the conditions of the 1970s. Mill ownership or management of close to 80% of sugarcane production has stifled most independent plantation-mill conflict. Similarly, inter-mill competition for domestic sales declined in parallel with the waning importance of the domestic market. Currently, the eleven remaining mills – all of them Guatemalan owned – participate actively in the umbrella mill association. They also collaborate in a number of initiatives, including joint sugar processing, technology and personnel sharing, an R&D and training institute, an export terminal, a corporate social responsibility office, and the industry's vast network of private roads for sugarcane transportation.

### **Tracing the transformation at Tajumulco: from ideology to industrial upgrading**

What explains the industry's transformation? Interviews with key informants suggest that Elite Solidarity, an ideology, played a central causal role in this case of industrial upgrading. Elite Solidarity, a distinct interpretation of Vatican II Catholic



social doctrine, stimulated and shaped the sugar industry's trajectory of change. It profoundly influenced the actions of a team of managers at one mill, Tajumulco. Guided by Elite Solidarity, these managers radically reorganized and upgraded production and labor deployment at Tajumulco. Then, they built a number of different industry-wide institutions to promote inter-mill collaboration and the diffusion of their transformative practices.

This central finding largely echoes a growing ideational literature linking ideology to economic policies and business practices. Profoundly influenced by Weberian arguments, this literature posits that ideology molds the interests of actors and, as a result, the solutions they devise for economic and business problems. In the economic policy realm, Blyth (2007) and Hall (1989) put forth two compelling examples of ideational arguments.<sup>13</sup> Blyth argued that in the context of the Great Depression, three competing sets of ideas (i.e., sound finance, anti-monopoly and administered prices) successively gained acceptance. Implemented by different state elites, each set of ideas produced distinct policies and institutions. Hall, in turn, focused on Keynesianism. He presented three approaches to explain how Keynesianism spread around the world. Each approach addressed a different group of individuals (i.e., economists, civil servants and public officials, and politicians) responsible for adopting Keynesianism and crafting macroeconomic policies accordingly.

The literature on business decisions has adopted comparable arguments linking ideology to the interests and the consequent practices of distinct groups of

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<sup>13</sup> Blyth (2002), Campbell (1998), Dobbin (1997) and Hall (1993, 1994) provide other examples of policy-related ideational accounts.

individuals. For instance, Guillén (1994) explored how management intellectuals and practitioners in the United States, Spain, Germany and Great Britain devised and diffused business techniques. These were broadly consistent with different managerial paradigms. In a starkly different context, Geertz (1956) described how religions affected the economic strategies and activities of different groups in a town in East Java, Indonesia.<sup>14</sup>

All these ideational studies bring agency to the forefront of causal explanations. They shed light on how groups of actors, guided by ideology, can devise distinct practices and policies even under similar circumstances. This emphasis on agency promises to enrich the industrial upgrading literature. In contrast to many of the traditional accounts, it suggests that actors, even in the most unexpected places, may devise new, uncharted upgrading paths and novel solutions to pressing problems. Such was the case in Guatemala's sugar industry.

All these ideational studies also rely upon a similar pattern in the construction of the argument: they identify an ideology, describe how a group adopts it, and then specify how this group enacts practices and policies that largely conform to it. I largely follow this procedure in the following sections.

However, my account refines our understanding of the mechanisms through which actors translate ideologies into practices. It elaborates on "the process by which such ideas go from thought to word to deed..." (Schmidt, 2008: 309). The account sheds light on the considerable room that managers enjoyed in translating the principles of Elite Solidarism into concrete problems. Furthermore, it suggests

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<sup>14</sup> For other examples of ideational accounts of business practices, see Boltanski & Chiapello (2005) and Geertz (1963).

that as they engaged in this translation, managers drew upon their professional training as engineers to construct the new practices.

The ideology and its bearers: Catholic Social Doctrine, Elite Solidarism and the managers of Tajumulco

Vatican II Catholic Social Doctrine emphasized the pursuit of the common good as its guiding principle. In this pursuit, the Church instilled a sense of mission and moral responsibility among its flock. Not unlike Weber's Calvinism, the post-Vatican II Church demanded that its followers put their faith to the test in secular life. During the 1960s and 1970s, Papal Encyclicals and other Church documents called upon the Church's "sons," especially the more able and privileged "apostles of development," (Pope Paul VI, 1967) to abandon a purely spiritual understanding of salvation (Berryman, 1973; Dulles, 1987; Gutiérrez, 1970). It urged them to actively work to "answer the cries" of "suffering peoples" and to create "an economy which is put at the service of man" (Pope Paul VI, 1967).

In its definition of the common good, Vatican II Social Doctrine developed a set of second-order principles. First, it demanded respect for human dignity and the rights "which pertain to the necessities of life, health care, education... professional training, housing, work, and suitable leisure and recreation (Pope John XXIII, 1961:11). The Church sought to "awake in [Latin American Catholics from the lower classes] a sense of personal dignity, hope and confidence that they [could] change their fate..." (Smith 1975: 23). Workers, for example, were not "mere cogs in the

machinery” of firms but, like the rest of humanity, “the foundation, the cause of every social institution” (Pope John XXIII, 1961: 5).

Second, the Church urged subsidiarity in society (Stepan, 1978). It defended private property as inscribed in natural law. The State should refrain from performing functions readily fulfilled by “smaller or lower societies” (Pope John XIII, 1961: 9). Instead, it should support private enterprise in the pursuit of economic development. In this vein, the Church starkly drew “the fundamental opposition between Communism and Christianity,” making it clear that “no Catholic could subscribe to even moderate Socialism” (Pope John XXIII, 1961: 5).

Third, building on a long Catholic tradition emphasizing the corporate solidarity of mankind (Smith, 1975), the Church underscored “the principle of human solidarity and Christian brotherhood” (Pope John XXIII, 1961: 4). This principle stood in opposition to both the Marxist emphasis on class warfare and the Liberal preference for unrestrained competition. The Church strongly encouraged Catholics to “work together in harmony,” their individual efforts “proportioned to the needs of the common good” (Pope John XXIII, 1961: 7).

However, despite the Church’s effort to provide a clear, coherent doctrine, its principles drew varying, and at times even contradictory, interpretations among Catholics (Dulles, 1987; Smith, 1975). Throughout Latin America, these contrasting interpretations, which underscored different aspects of the doctrine’s teachings, spurred distinct decisions and actions.

On the one hand, the Church spawned the better known, more progressive and even revolutionary Liberation Theology (Berryman, 1973; Gutiérrez, 1970;

Smith, 1975). To pursue the common good, Liberation Theology encouraged bottom-up democratic participation through such mechanisms as Freire-inspired conscientization campaigns<sup>15</sup> in impoverished areas. It envisioned transformative grassroots involvement in the construction of a new society as constituent of individual human dignity. It also decried paternalistic approaches to change and resisted hierarchical initiatives, even from the European Church. Many of the bearers of Liberation Theology strove for harmonious social relations through the creation of such organizations as Christian Base Communities, cooperatives and peasant movements.

However, there was an alternative, more conservative interpretation often dismissed as a mere reaction to Liberation Theology or as an attempt to preserve the status quo. I label it Elite Solidarism. Elite Solidarism underscored the transformative role of society's more economically privileged individuals. Church bearers of this interpretation directed their energies to the private education of children from the upper and middle classes (Smith, 1975). They envisioned these children, the owners, managers and top politicians of the future, as the most effective agents of change.

In opposition to Liberation Theology, Elite Solidarism advocated an understanding of social and economic reform that echoed many of the strongly hierarchical conceptions of authority in Dulles' "institutional model of the Church."<sup>16</sup>

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<sup>15</sup> According to Smith (1975), "the Paulo Freire method of conscientization, [combined] Biblical themes of Exodus and liberation with techniques for self-determination and community organization" (9).

<sup>16</sup> Dulles (1987) explains that under this model, "The Church is not conceived as a democratic or representative society, but as one in which the fullness of power is concentrated in the hands of a ruling class that perpetuates itself by cooption" (30-31).

Children educated in elite Catholic private schools essentially became the electi. As the Church's "apostles of development," responsibility fell upon them to lead the flock in the pursuit of the common good.

In Guatemala, the young men who would become leading managers in the sugar industry studied at Saint Ignatius, one such elite, all-boys Jesuit school in Guatemala City. Most of them graduated in 1963 as members of the school's fourth class.<sup>17</sup> They received the traditional Jesuit humanist education, influenced during the 1960s by the Elite Solidarism interpretation of Vatican II social doctrine.

Their participation in summer "conscience-raising" courses, or "Cursillos de Capacitacion Social," proved just as influential as their formal classes. Organized jointly by Saint Ignatius teacher-priests and teacher-nuns from the all-girls Maryknoll school, Heart of Mary, the short-lived Cursillos brought together over 50 students from Saint Ignatius, Heart of Mary and, to a lesser extent, other elite Catholic schools (e.g., Saint Marcellin Champagnat). Lasting only a few years in the 1960s,<sup>18</sup> they covered theoretical and hands-on material. In theoretical classes, "we studied laissez-faire liberalism, capitalism, and neo-capitalism, and saw how these doctrines provided the rationale for the corrupt and exploitative labor practices... We learned how Marx and Engels developed the doctrine of Communism to explain class struggle as part of the historical evolutionary process... Finally, we turned to Christian social doctrine, as expounded in the key papal encyclicals... finding in its

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<sup>17</sup> Five students from this class entered Tajumulco. One student a year older and another two years younger also entered in this first cadre of Saint Ignatius-educated managers.

<sup>18</sup> The Cursillos appear to have become radicalized over the few years that they lasted, as frustrated mentors and students increasingly abandoned Elite Solidarism for Liberation Theology. According to one interviewee, after parents complained and withdrew their children from the schools, school directors closed down the Cursillos. Soon after, the military governments of Guatemala would also deport some of the leading foreign Cursillo mentors (e.g. Marjorie Melville was expelled in 1968).

program of justice, equal opportunity, and charity to right the world's evils” (Melville & Melville 1971: 131-132).

The hands-on component, in turn, served to both awaken a sense of social responsibility and develop a methodical lifestyle akin to Weber's asceticism. Cursillo activities began at 5:30 a.m. and finished at 11 p.m. Students visited impoverished areas and prepared projects on social injustice in Guatemala. Discipline was “semimilitary” (Melville & Melville 1971: 130). Mentors assigned chores to students and encouraged them to work as a team.

According to Porras (2009), a graduate from Saint Marcellin Champagnat who participated in the Cursillos, the goal was to “awaken the social conscience of young people” who “given their social position and educational opportunities, were called upon to perform leadership roles in politics, the economy and society. The idea was to create a process of reforms and social changes motivated by the Christian ethic, but also to build an efficient barrier against Communism”<sup>19</sup> (36). One participant described the success of the Cursillos: “the social Christian tradition had a huge impact on the students...People usually focus on the revolutionary effects [of these courses] but they don't realize how the moderate people of that group have had a very important influence on what has happened in Guatemala as well, and on the sugar industry's relative modernization specifically” (Personal communication with former guerrilla member, July 20, 2010).<sup>20</sup>

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<sup>19</sup> Melville & Melville (1971) echo this anti-Communist bent of the Cursillos.

<sup>20</sup> Participants in the Cursillos followed different paths. Melville & Melville (1971) recount how four graduates of the Maryknoll's Heart of Mary left their privileged Guatemala City life to teach in an Indigenous community in the highlands. Others joined Jesuit and Maryknoll missions working with producer cooperatives. Still other participants joined the revolutionary movement.

In interviews, the managers described how this education shaped their lives. They developed close friendships and some married women from Heart of Mary (Personal communications with managers, former guerrilla members, former CUC organizers, 2010 and 2011). More importantly for our purposes, the Jesuits and their courses inculcated in them “the same questions, the same interests... the commitment” to “participate and actively work to change this country” (Personal communications with managers, June 14, 2010; July 19, 2010; July 20, 2010; August 9, 2010). Much like Weber’s Calvinism, Elite Solidarity set a higher standard for its “electi” and instilled in them a vocation: it encouraged them to “pursue the Christian ideal of a career as an opportunity to serve those less fortunate rather than simply as a means of earning money...” (Melville & Melville, 1971: 129). As a result, the managers cast themselves as a team of enlightened leaders, morally responsible for unilaterally effecting change.<sup>21</sup>

Their adoption of Elite Solidarity’s interpretation of Vatican II social doctrine became evident in interviews. They intimated an understanding of the common good that emphasized fulfillment of human material needs and largely dismissed subaltern participation and social transformation. The contrast between the managers’ Elite Solidarity and Liberation Theology extended to the second-order principles. They circumscribed human dignity to respect of the individual and “satisfaction of their basic needs... food, housing, clothing, education and recreation” (Personal communication, July 14, 2010). They openly opposed worker and peasant

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<sup>21</sup> As one manager put it: “We had been trained with this style of management of our subordinates very oriented toward social justice... We have been pioneers in the sugar industry, first in the labor changes... then we were at the vanguard” of production changes. (Personal communications with managers, 2010).



organization, deeming it detrimental to business. They limited corporate solidarity to collaboration among the privileged electi. Lastly, their interpretation of the principle of subsidiarity underscored the staunch defense of private property, putting them at odds with ideas of shared control of the firm with labor (Personal communications with managers, July 19, 2010 and January 19, 2011).

From ideology to practice: translating Elite Solidarism to a new business model at Tajumulco

After graduating in the mid-1960s from Saint Ignatius high school, the future managers entered the national public university. Without exception, they studied at the engineering department and finished their professional training by the early 1970s.<sup>22</sup> Shortly after, they joined one of the most influential mills in the industry, Tajumulco. At the time, Tajumulco, which had once led the industry as the largest producer, faced mounting problems. Seven other mills had surpassed its production by 1973 (Asociacion de Azucareros de Guatemala, 1974). Furthermore, following the sitting management's clumsy attempts to remove permanent workers from mill-owned land, workers mobilized. They revitalized the mill's dormant union, turning it into one of the largest and most militant in the industry.

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<sup>22</sup> The fourth class to graduate from Saint Ignatius followed different paths after graduation (importantly, not all of them participated in the *Cursillos*). Of the twenty-nine graduates, five entered the engineering department of the national university and then the sugar industry; five joined Jesuit training (only one completed the training to become a member of the Jesuit order); at least four also entered the national university but graduated as doctors and architects (one of the doctors and one of the architects then worked closely with the sugar industry); at least one joined the guerrilla and died in the civil war; and at least two actively participated in politics (former President Oscar Berger (2004-2008) and Vice-President Eduardo Stein (2004-2008), whose government employed a number of individuals associated with the sugar industry).

In this context, Tajumulco's owning family made the drastic decision to replace its entire management team. The young, French-educated scion of the family assumed the presidency of the organization. Over the next few years, the team of Jesuit school graduates successively entered the mill in top positions (e.g. mill production manager, human resource manager, agricultural production manager). By the mid-1970s, they controlled all but one of the top five management positions in the mill, forming a small cohesive team.

Scott (2008) has argued that both demand- and supply-side pressures can foster the development of new organizational practices: they may arise out of pervasive problems demanding solutions, or they may be pressed upon organizations by actors in privileged roles. Both types of pressures played a role at Tajumulco. Influenced by Elite Solidarity and challenged by the troubling state of the mill, the newly appointed managers defined their vocation to pursue the common good as a mission to transform the mill's business model. This mission combined the responsibility to upgrade production with the duty to improve worker conditions, especially for seasonal cane cutters. The existing sense of crisis at the mill facilitated their project of transformation: distressed by the mill's decline, the owning family gave the managers "carte blanche." Managers took the opportunity to craft a unique response to the crisis (Personal communication with manager, July 14, 2010).

Managers spent considerable energy changing the "shocking" and "undignified" conditions of mill cane cutters. As one of the managers recalled, "one felt responsible for the situation. We could cry or we could see how to change [it]. It

was a shock [to see those conditions], but our main goal [was to] raise wages and living conditions..." (Personal communication with manager, January 19, 2011). According to another manager, "we had been taught that subordinate treatment must be directed toward social justice... the worker was not just another element in production, like machinery, but a human being with all the characteristics of dignity of a human being. So treatment of this human being must be dignified" (Personal communication with manager, June 14, 2010).

Thus, Elite Solidarity provided a diagnosis of the problem and general guidelines to address it. But managers needed to translate them into concrete practices. In translating, they relied upon their professional training. Guillén (1994) documents a unique engineering approach to management and production processes. In his study on management models, he notes that engineers tend to focus on problems of inefficiency, and of management arbitrariness and lack of control. From this perspective, "management ought to tell workers exactly what to do and how to do it, and supervise them closely" (9). In her work describing the "Old Guard" in Arizona's Orme Dam project, Espeland (2001) complements this characterization of engineers. She describes an engineering ethos that "underscores man's obligation to transform nature, and a robust confidence in his ability to control and manage nature rationally." Interestingly, religion (Christian theology) also influenced Espeland's "Old Guard" engineers – they portrayed themselves as "progressive social reformers" redressing "urgent social problems" (411).<sup>23</sup>

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<sup>23</sup> According to Espeland, for these engineers "transforming nature was a way to complete God's work; it was a testimony to one's faith, creativity and skill... Nature was conceived as an unfinished product; as raw materials provided by God, nature required man's intervention" (411 – 412). In

In Guatemala, managers deployed the engineering professional ethic to devise technocratic solutions to the problems that Elite Solidarism diagnosed. Certainly other engineers had preceded them in top industry positions, but the sense of a larger mission distinguished the Jesuit-educated managers: they methodically introduced their practices not only to take control of all aspects of production, but also to fulfill their responsibility as electi.<sup>24</sup> The doctor responsible for Tajumulco's medical care system, himself a classmate of the managers at Saint Ignatius, recalled the "great change. They put buses [to transport workers]... Then we brought the nutritionist to see what menu we gave cane cutters. I remember the firm [chose] the most expensive menu, with eggs, meat, milk, enough tortillas, vegetables, fruit... And [cane cutters received] housing, mattresses, lockers, showers, soap, dishes, an adequate eating area with tiles, hydration with sodium and potassium... [And] for every Quetzal the cutter saved, the firm gave them fifty cents" (Personal communication with doctor, March 22, 2011). These changes redounded in notable labor condition improvements, but also deepened manager control of the workforce.

Such improvements proceeded alongside the transformation of production processes. Managers faced an economic problem as pressing as the social problem of worker conditions. They urgently required productivity increases to improve the mill's performance, appease the owning family and underwrite the costs of their human resource and employment practice innovations. As one of the leading

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addition to Christian theology and an engineering ethos, Espeland also points to "myths about Western settlement" as influencing the ideology of these engineers.

<sup>24</sup> Similarly, other young, urban-based individuals had previously been employed at the mills (Molina, 2005), but the sense of mission set the new managers apart.

managers explained, “what happens is that there are two easy systems. One was to say [to workers], ‘eat shit,’ we’ll pay you this [low wage]. The other said, ‘no, look, we’ll raise wages’” without changing anything else. “But [a third] more complicated system was to say, ‘no, look, we’ll raise wages, but we will also change the work systems [to raise productivity]” (Personal communication with manager, January 19, 2011). Managers chose this third option. Their choice demanded a new business model for the mill.

Accounts of other cases of sugar industry upgrading often emphasize the role of state industrialization support or foreign direct investment. Yet in Guatemala, managers could count on neither. Unlike the Brazilian, Mexican or Thai states, for instance, the fiscally weak and war-focused Guatemalan state failed to develop the bureaucratic, fiscal, technical and clientelistic capacities necessary for state-led modernization (Barzelay, 1986; Doner, 2009; Mertens, 2008; Pereira, 1997).<sup>25</sup> Furthermore, in contrast to the 20<sup>th</sup> century industries of Peru and some Caribbean islands, Guatemalan mills remain domestically owned, their only contact with international firms restricted to brokers uninterested in production upgrading<sup>26</sup> (Ayala, 1999; Mintz, 1974, 1986; Paige, 1975).

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<sup>25</sup> Nor did the Guatemalan state bureaucracy enjoy the necessary embedded autonomy to promote upgrading (Evans, 1995). Rather, adversarial business-state relations characterized most of the 1970s and 1980s as the military increasingly sought to wrest control of economic policy from the traditional business sector (Dosal, 2005; Valdez & Palencia, 1998). Such friction extended to the sugar industry (Personal communications with manager, June 8, 2010). As a result, the state provided the sugar industry with none of the developmental support policies documented elsewhere (Amsden, 2003; Evans, 1995; Kohli, 2009). Protective tariffs constituted the sole exception, but these created no comparative advantage insofar as all other sugar-producing nations similarly protected their industry.

<sup>26</sup> At the time, these buyers focused on purchasing raw sugar.

Instead, the Guatemalan sugar industry followed an uncharted upgrading path. Manager agency, though rarely recognized in the industrial upgrading literature, played a central role in paving this path. Seeking inspiration to devise new production practices, for instance, managers traveled abroad, a first in the industry. They visited Colombia, Brazil, Australia and other sugar producing countries to observe different sugar production models. They defied mocking and criticism by managers and owners from other mills, most if not all of them educated in schools other than Saint Ignatius (Personal communications with manager, January 14, 2011).

Relying on their engineering background, the managers wove the observations from their travels into a unique quilt of production practices. The new model rationalized every step of production. On the plantations owned by Tajumulco, managers introduced scientific management, an unsurprising choice given their engineering background. They took full control of decision-making in agricultural production by disbanding the traditional team-based system and separating work conception from execution. Managers then focused on individual cutters. They developed time-and-motion studies, spent copiously on worker training, and changed the wage setting mechanism to a piece-rate. Wages, complemented by performance-based bonuses, surpassed the minimum wage and rewarded individual performance rather than job category (Oglesby, 2002). Managers also introduced new technology, importing and improving upon the Australian machete and mechanizing parts of the production process (e.g., cane transportation from field to mill).

The managers devised a similar transformation in the mill. They hired a Miami-based Cuban engineer with vast experience in sugar milling to assist them in redesigning, renovating and expanding their processing facilities. They invested heavily in new machinery and trained lower level technicians and operators. Lastly, they hired an entire cadre of young engineers. As graduates of Saint Ignatius or the public university's engineering and agronomy departments, most of the newcomers moved in the same social circles as the managers. Along with new recruits at all levels of the organization of the mill, they underwent pervasive on-the-job-socialization emphasizing Tajumulco's new business approach.

These changes in production delivered almost immediate results. Between 1973 and 1976, the mill's sugar production quadrupled. The period was marked by booming international prices and a rising US quota allocation for Guatemala (Asociacion de Azucareros de Guatemala, 1977; United States Department of Agriculture, 2012), which triggered rapid growth across the industry. But Tajumulco's growth far surpassed that of all other mills, as it doubled its proportion of the industry's total production. By 1977, the mill ranked as the top producer in the country, accounting for almost 20% of the industry's total production (see TABLE 5).

[Insert TABLE 5 here]

The dramatic efficiency gains on the agricultural front also prompted a shift in land tenure patterns, even though government land tenure regulations remained

unchanged. Until then, independently owned plantations produced most of Guatemala's sugar cane. Yet, with the advent of the new production system on the plantations, Tajumulco managers realized the magnitude of their field productivity gains and the potential economies of scale of the new production organization. They thus wrested land from independent producers. Constrained by their economic limitations and traditional views on production, and enticed by the high prices Tajumulco could offer, most independent producers rented or sold their land rather than trying to adopt Tajumulco's new field practices. For the few that resisted their onslaught, Tajumulco managers would eventually offer guidance and inputs in a pedagogical fashion reminiscent of large buyers in global value chains (Gereffi, 1999; Navas-Aleman & Bazan, 2004).

In addition, managers accelerated the removal of permanent workers from mill land against staunch union opposition. The method of removal sheds light on another facet of the transformation: the hierarchical and autocratic manner in which managers executed the changes. For the mill union, the question of permanent worker residence constituted a central mobilizing issue. Born and raised on mill land, depending on the mill for year-round employment and relying on mill-provided plots for additional income, permanent workers organized in the union resolutely opposed removal.

For managers, the challenge involved more than simply recovering mill land. They sought to regain total managerial control of all facets of production. As an opposing "coalition," to use Cyert and March's (1963) terminology, the union stood in their way. Elite Solidarity once again steered the trajectory of their



transformation, providing a powerful ideological justification for their decisions. Their hierarchical view of change undergirded the imposition of their version of the common good. From their unitary view of the firm, which rejected any notion of class conflict, unionists who opposed them simply ignored the potential benefits of the changes or worse, consciously pursued particularistic interests to the detriment of the good of the community.<sup>27</sup> This view echoes Espeland's documented "insularity" among the "Old Guard" Arizona engineers, i.e. an inability to "imagine that their comfortable assumptions about the world" generate dissent and a tendency to perceive opposition as "both baffling and deeply threatening" (415).

Furthermore, managers' unswerving defense of private property, couched in their interpretation of the principle of subsidiarity, reinforced their resistance to unions. In the 1970s Cold War context of Guatemala, managers vociferously accused unionists of promoting the "subversive" idea that "the firm is owned by those who work there" (Personal communications with manager, January 19, 2011). They blurred the line between the union and the Guatemalan Marxist guerrilla, conceiving the union as an enemy that brainwashed workers, infiltrated the workforce, and supported guerrilla attacks on mill facilities and personnel (Personal communications with managers, July 14, 2010; July 19, 2010; January 19, 2011).

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<sup>27</sup> The following quotes evince managers' view of themselves as agents of change, often facing ignorant or even immoral opposition: "We had to teach these people how to be clean, how to brush their teeth..." "We had to teach [cane cutters] how to eat with glasses, forks, plates." "There was terrible promiscuity... so we said to the [male] worker, 'now you'll come work by yourself and you can send your money back to your woman.'" "At the time there were all those movements, socialists, communists, that went against what we were doing... but they themselves came to realize that what we were doing [was beneficial] and then they would even defend us." Managers also claimed that once the union weakened, leaders took money, abandoned their followers and flew to Italy. (Personal communications with managers, 2010).

The position of managers regarding the union also proved consistent with their restricted understanding of the principle of human dignity. While they zealously worked to improve the material conditions of the majority of the workers, managers labored with equal energy to quash any prospect of worker empowerment.

Thus, emboldened by Elite Solidarism, managers summoned a number of strategies to remove permanent workers from the land and dissolve the union. They built them new subsidized housing projects and guaranteed them their jobs. Playing on the union's opposition to the project, managers turned all those who moved to the new housing projects against the union. They also implemented more subtle strategies to undermine union cohesion and allegiance, such as "many committees to always have communication with workers: sports committee, culture committee, etcetera" as well as soccer tournaments and a firemen club (Oglesby, 2000; Personal communication with manager, June 14, 2010). Additionally, managers fired at least forty unionists in two waves: after a 1976 strike ruled illegal by the Ministry of Labor, and in the early 1980s, once their other strategies had severely weakened the union. Finally, while managers vehemently denied any involvement,<sup>28</sup> the Guatemalan Truth Commission, created to investigate war crimes during Guatemala's 36-year civil war, reports that in the early 1980s the military, with employer acquiescence, kidnapped and disappeared three union leaders.<sup>29</sup> As a

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<sup>28</sup> An interviewee who participated in the "Cursillos" and then joined the guerrilla movement corroborated the managers' denials. This interviewee, who also served as one of the main organizers for a massive cane cutter strike in 1980, laid the blame for the human rights abuses squarely on the shoulders of the older generation of mill owners and managers (Personal communications with former CUC organizer, August 9, 2010).

<sup>29</sup> A fourth unionist reappeared later.

result of these strategies, by the mid-1980s the union existed only in name (Comisión para el Esclarecimiento Histórico, 1999).

This type of justification for the autocratic imposition of change, couched in Elite Solidarity, extended to all areas of the mill's transformation. For instance, to overcome cane cutter resistance to the individualized approach to cane cutting, the introduction of the Colombian-devised cane cutting technique, or the imposition of the use of the Australian machete, managers pursued strategies akin to those employed in removing permanent workers from the land (e.g., paying higher wages to workers who adopted the new methods and tools, leaving the more difficult tasks to non-cooperative workers or firing them, hiring Colombian cane cutters to demonstrate the benefits of the new techniques).

### **The transformation of the rest: practice diffusion, collaboration and institutional isomorphism**

Tajumulco's stellar performance during the mid-1970s ignited curiosity across the industry. Some of the younger owners and managers in mills like Tacana, Santa Maria, Zunil, Siete Orejas and Acatenango-Atitlan quickly expressed interest in imitating the innovative practices. Notably, few if any of these interested owners and managers attended Saint Ignatius high school. Nor did they share the missionary zeal of the Tajumulco managers.

Yet, with this interest also came criticism, reflecting an ideological barrier to diffusion. More conservative actors in the industry, many of them members of an older generation, called the Tajumulco managers "crazy or communists" (Personal

communication with manager, June 14, 2010). They questioned the decision to improve worker conditions, and scoffed at all attempts to introduce production practices from abroad because “here in Guatemala, people can’t do anything” (Personal communication with manager, January 19, 2011).

A number of events in the 1970s and early 1980s softened this conservative hostility. The industry underwent a generational change. Many of the older owners retired. Younger family members replaced them.

This generational shift coincided with a series of profound political and economic crises. First, as in many other sugar industries (e.g., those in Brazil, Mexico, Peru<sup>30</sup>), permanent mill workers across the industry unionized and struck to demand higher wages, job security and an end to forced evictions from mill land (Le Bot, 1995; Wagner, 2007; Personal communications with managers, 2010). Second, in the midst of the 1980 harvest season, cane cutters, along with coffee and cotton pickers, mobilized and organized an 80,000 worker strike. Led by the peasant organization Comité de Unidad Campesina (CUC),<sup>31</sup> the strike kindled elite fears of a broad indigenous uprising<sup>32</sup> as it paralyzed agricultural production in the region. It also forced the military government to raise the minimum wage by 200% (Brockett, 1998; Jonas, 1991; Le Bot, 1995; May, 2001).

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<sup>30</sup> See Mertens (2008), Paige (1975) and Pereira (1997).

<sup>31</sup> The CUC had strong ties to the guerrilla organization, Ejército Guerrillero de los Pobres (EGP). In fact, one of the main organizers of the strike, whom I interviewed, also participated in the EGP. At the same time, the strike was not necessarily driven only by military imperatives – as some mill owners and managers were quick to argue – but by the appalling labor conditions on sugar, cotton and coffee plantations.

<sup>32</sup> A member of the guerrilla movement who also studied in a Catholic high school described how “that harvest struggle” had “an enormous psychological impact on the Guatemalan bourgeoisie... Since we were kids and for generations they have told us, ‘when the Indians raise their machetes...’ And then I saw [a picture of the strikers] and said to myself, ‘now [the bourgeoisie] shat themselves’ as they did, in fact, shit themselves...” (Personal communications with former guerrilla member, July 29, 2010)

Third, in the late 1970s and early 1980s the industry faced a spectacular collapse in the demand for sugar. A 74% decline in international prices between 1976 and 1979 decimated comparable sugar industries in neighboring countries (e.g., Dominican Republic, Barbados<sup>33</sup>). Prices would remain depressed for most of the 1980s (United States Department of Agriculture, 2012). Additionally, between 1979 and 1981, the US Congress suppressed Guatemala's sugar quota as part of a larger reduction in the US sugar quota program. At the time, quotas represented close to 20% of Guatemala's production (Asociacion de Azucareros de Guatemala, 1981). Lastly, with the Latin American Debt Crisis that hit Guatemala in the early 1980s, domestic sugar demand fell by 25% between 1980 and 1983 (Centro Guatemalteco de Investigación y Capacitación de la Caña de Azúcar, 2010).

These political and economic crises called the beleaguered industry's traditional model into question. As DiMaggio and Powell (1983) have argued, such uncertainty may breed mimetic institutional isomorphism. Organizations often come to resemble each other as managers, weary of taken-for-granted theories relating means to ends, "actively seek models upon which to build." In this search, "organizations tend to model themselves after similar organizations in their field that they perceive to be more legitimate or successful" (152) – what Scott (2008) calls "organizational archetypes."

In Guatemala, Tajumulco emerged from the crisis as the most successful sugar mill, taking on the role of an organizational archetype. Despite the uncanny alignment of economic and political crises, Tajumulco kept its production stable

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<sup>33</sup> See Drummond (1996), Macdonald & Demetrius (1986), Schrank (2008).

throughout the period; the mill's 1980/1981 harvest production equaled its 1976/77 record and accounted for over a fifth of the industry's total production. The rest of the industry's mills, facing similar economic and social circumstances, adopted a "traditional war economy" approach.<sup>34</sup> They fared much worse as their production fell by an average of over 20% between 1975/76 and 1980/81 (Asociacion de Azucareros de Guatemala, 1982). At least four mills declared bankruptcy over this period.

In addition to Tajumulco's increased productivity, its management's ability to take full control of production by weakening the mill union became widely accepted by other owners and managers as the "best" strategy in the industry. The decline of the industry's two largest mills in the early 1970s, Toliman and Cerro Quemado, allegedly a consequence of the unchecked strength of their unions, bolstered this view. In contrast to these two mills, argued interviewees, Tajumulco managers neutralized the union, took full control of production and could thus introduce necessary changes (Personal communication with managers, June 7, 2010; July 19, 2010; January 19, 2011). Of course, Tajumulco's success in raising productivity and total production in the 1970s, well before the disbandment of the mill's union in the 1980s, calls this interpretation into question.

Managers and owners from other mills also admired how Tajumulco management regained the upper hand in the fields following the 1980 seasonal worker strike. In the strike's aftermath, managers deepened their methods of control. They created a detailed database to keep track of seasonal workers and

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<sup>34</sup> See Molina Calderon (2005) for a description of this approach at one of the industry's mills. Most generally, the approach involved deep cuts in mill employment and sugarcane purchases.

rehired only the more productive and obedient. They also substituted the mill's human resource department for labor contractors; expanded the menu of benefits available to cutters; and provided written contracts for all workers. As a result, by the mid-1980s the managers could boast complete control of an "obedient" labor force.

Surprisingly, rather than exploiting their comparative advantage by jealously guarding their practices, Tajumulco managers responded to the interest of managers and owners by encouraging imitation. In an industry traditionally burdened with acrimonious relations between mills, managers provided a number of reasons for this seemingly counterintuitive decision. Some argued that with a saturated domestic market, competition shifted to the infinitely large international market where sharing practices posed no competitive threat. Others claimed that sharing indebted borrowing mills that would then pay back the favor if Tajumulco ever needed a spare part. In still other cases, managers revealed a nationalist perspective: "Why would you be selfish? We were already number one, and the more benefits workers receive, the more Guatemala rises..." (Personal communications with managers, June 14, 2010; July 19, 2010).

In all cases, however, managers emphasized that by sharing practices, they fostered cross-mill collaboration: "if we were an isolated mill in a small place, we couldn't do much. [Together] we could have an association, set up the research center... We needed better collaboration so it was logical to open up" (Personal communication with manager, January 19, 2010).

Yet why did the previous generation (or contemporary managers from other mills) fail to grasp the seemingly evident need to share practices and collaborate? After all, saturation of the domestic market had haunted mills since the 1960s, eliciting confrontation and state intervention. Similarly, spare part scarcity represented an even greater problem in the past, when mills imported all their equipment from abroad. Finally, other mills (and even Tajumulco in the 1960s) had ranked as top producers, but none developed the kind of nationalist concern for Guatemala's "rise" that would lead them to promote collaboration.

Echoing Weber, Blyth (2007) has convincingly argued that "in order to specify the content of interests, one must have previously specified the beliefs that an agent has about what is desirable in the first place." In Guatemala, managers' decision to share their practices, and the reasons they provided for this decision, shed light on their beliefs. They bring into relief the powerful influence that ideology exerted over their interests. The principle of human solidarity and Christian brotherhood, which drove the teamwork at the Cursillos and later at Tajumulco, shaped managers' understanding of what was desirable. It suggested a distinct approach to address the industry's collective action problems. This approach set forth inter-firm sharing and collaboration as a self-evident solution consistent with their interests. The contrast is stark with the industry's previous competitive lenses, which emphasized the advantages of acting independently. Under those previous lenses, sharing and collaboration seemed irrational and counterproductive.

However, despite Tajumulco management's openness to sharing, other mills still faced significant challenges to imitation and adoption of the new model. The



transition demanded costly investments in such areas as training, equipment and process design. It also faced resistance from two coalitions within the mills: disgruntled and, in some instances, unionized workers distrustful of management initiatives; and surviving conservative owners and managers who remained skeptical of any labor condition improvements, especially for indigenous seasonal workers. This contentious nature of diffusion sheds light on the complications associated with mimetic isomorphism. It suggests that even under extreme uncertainty, significant barriers may stifle imitation.

Recognizing these barriers to diffusion and availing themselves of their increasingly respected positions within the industry, the team of Tajumulco managers took an active stance as “champions”<sup>35</sup> of the model. DiMaggio and Powell’s (1983) concept of normative institutional isomorphism captures this manager-led process of diffusion. According to these authors, normative isomorphism involves “the collective struggle of an occupation to define the conditions and methods of their work, to control the production of producers, and to establish a cognitive base and legitimation for their occupational autonomy.”

They further note that in driving isomorphism two “instances of professionalization,” universities and professional networks, play a central role. These instances of professionalization ensure that professionals of the same type (e.g. managers) “view problems in a similar fashion, see the same policies, procedures and structures as normatively sanctioned and legitimated, and approach decisions in much the same way.”

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<sup>35</sup> DiMaggio (1988) describes champions as a set of individuals spearheading institutional diffusion.

Yet, the Guatemalan sugar industry differed in two important respects from this ideal situation, suggesting important extensions to the normative isomorphism literature. First, DiMaggio and Powell posit that professional affiliation, or “desire to secure” their position and “further their own careers,” drives managers to promote practice diffusion. But in Guatemala, Elite Solidarism’s interpretation of the principle of human solidarity and Christian brotherhood largely explains managers’ efforts to promote elite collaboration and sharing.

Second, the industry lacked DiMaggio and Powell’s instances of professionalization. Only a handful of professionals worked in the other mills of the industry, their networks barely drew members, and mills seldom followed their norms and standards. Therefore, the Tajumulco managers had to make up for their absence. To foster normative isomorphism, they built new institutions from the ground up and redeployed existing ones created for other purposes.<sup>36</sup> In this endeavor, they often faced significant opposition.

The managers resorted to three channels of diffusion throughout the 1980s and 1990s: organized field visits, personnel mobility, and an encompassing business association. Interestingly, such institutions are often portrayed as “preconditions” for upgrading in the literature (Amsden, 2003; Schneider and Doner, 2000; Rodrik, 2008). Yet, while these institutions certainly accelerated the diffusion of the new model, they largely emerged as byproducts of the upgrading process. Tajumulco

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<sup>36</sup> This finding echoes Cammett's (2005) argument that “ideas do not spread spontaneously” and “collective action... is never assured.” Instead, leaders must promote them. Furthermore, in fostering collaboration, leaders can “revitalize” existing organizations.

managers and their allies created them as they sought to promote diffusion and upgrading.

The first channel of diffusion that Tajumulco managers employed built on the existing but neglected practice of organized field visits. During these visits, Tajumulco employees showed their new practices to colleagues from other mills. Importantly, employees, like the managers, understood and described the entire bundle, including both the production and labor practices, as internally consistent. Engaged in a process of theorization,<sup>37</sup> they portrayed each individual practice as indispensable for the adequate performance of the whole. When visitors returned to their mills and imitated Tajumulco, they also assumed this causal link between the complete bundle of practices, on the one hand, and the observed productivity outcomes, on the other.<sup>38</sup> In other words, institutionalization of the practices proceeded as they became objectified<sup>39</sup> (Tolbert and Zucker, 1996). Notably, the labor practices in this bundle acquired an almost mythical aura as sources of high productivity. In fact, the labor practice-productivity relationship carries such acceptance that, in an instance of Tolbert and Zucker's (1996) "sedimentation,"<sup>40</sup> the

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<sup>37</sup> Scott (2008) defines theorization as "a formulation of why and how the innovation is effective and an identification of the class of problems or organizations for whom it is suitable" (126).

<sup>38</sup> The manner in which managers in Guatemala recast this set of practices, initially motivated by Elite Solidarity, in purely efficiency terms, bears a striking resemblance to Dobbin & Sutton's (1989) description of the firm level consequences of the "Rights Revolution" in the United States. They argue that while the different legal requirements of this Revolution stimulated firms to establish different offices to manage compliance, firm middle managers later "reconstructed these departments as components of human resource management and articulated theories of how each contributed to productive efficiency" (455).

<sup>39</sup> According to Tolbert and Zucker (1996), objectification "involves the development of some degree of social consensus among organizational decision-makers concerning the value of a structure, and the increasing adoption by organizations on the basis of that consensus" (182).

<sup>40</sup> Tolbert and Zucker (1996) argue that when sedimentation has occurred, typifications are transmitted to new members of organizations "who, lacking knowledge of their origins, are apt to treat them as 'social givens'" (181).

current younger generation of owners and managers consistently repeated it in interviews as a fact.<sup>41</sup>

In addition to promoting imitation, these field visits stimulated initial interactions and exchange of ideas among professionals from different mills, laying the groundwork for future processes of normative institutional isomorphism. In particular, the visits eventually spawned the creation of the Sugar Technician Association (STA). Saxenian (2004) and Amsden (1989), among others, point to such concentrations of technical expertise as preconditions for upgrading. But in Guatemala the STA emerged in the late 1980s. Currently, it gathers most of the upper-level mill technicians in the industry.

A second channel that Tajumulco managers relied upon to promote the diffusion of practices involved personnel mobility across the industry (see FIG. 2). At least five upper-level managers created consultancy firms that simultaneously disseminated the Tajumulco practices to multiple mills. Scott (2008) has emphasized the importance for diffusion of such “intermediary” organizations and actors. In Guatemala, they advised on such areas as mill upgrading, field production upgrading, human resource management, and even medical and dental services and worker nutrition.

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<sup>41</sup> For example, one young mill owner explained that “the fact that we transformed the worker who came with his family into a worker who must be an adult, who receives adequate nourishment, all the protections of the law and health services... that has a cost, but workers perform better and that lowers your production costs, and over time it’s beneficial for us.” A middle-aged manager at another mill echoed similar arguments: “When I arrived in the sugar industry 27 years ago [in 1983], the conditions in which cane cutters lived were inhuman... But administrators and mill owners realized that if they had their worker well fed, he would be more efficient and produce more” (Personal communications with managers, Jun 7, 2010; June 9, 2010).

More commonly, Tajumulco employees took permanent high-level positions at other mills and industry organizations. These employees had “already learned the lessons” because “[Tajumulco had] developed a school... they were trained with the [Tajumulco] philosophy” (Personal communication with doctor, March 22, 2011). As they moved to other mills, they disseminated the bundle of practices and replicated the hierarchical strategies used to impose them. In addition, they engaged in experimentation and developed new practices.

[Insert FIG. 2 here]

In fact, soon other mills added production and employment practices to the original Tajumulco bundle (e.g., new pest controls, irrigation mechanisms, improved worker meals).<sup>42</sup> For example, Luis Benitez, the former human resource manager at Tajumulco, introduced life insurance for cane cutters at his new place of employment, the Acatenango-Atitlan mill (Personal communication with manager, July 19, 2010). Such initiatives contributed to a healthy competitive environment. Teams of employees at each mill strove to outperform their peers in other mills. Soon, Tajumulco-like schools encouraging employee-led innovation and sharing had taken hold across the industry.

In addition to raising production and eliciting sharing and innovation, the diffusion of the model affected other areas of business. Although mills raised labor standards, they also quashed unions by employing the anti-union tactics pioneered

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<sup>42</sup> See Wagner (2005) for examples of the innovations developed at different mills.

at Tajumulco. Furthermore, competition across mills prompted changes in land tenure. Mills increasingly preferred to buy or rent independent producer plantations. The collapse of the similarly located cotton industry,<sup>43</sup> as well as the government's decision to liberalize sugarcane prices in 1987, accelerated this process of land concentration (Personal communications with former Minister of the Economy, July 5, 2010). Finally, mills diversified into new products, such as alcohol and electricity. Encouraged by the Tajumulco example, owners and managers traveled abroad to learn about them.

The mill business association constituted the third channel that Tajumulco managers relied upon to diffuse their practices and promote collaboration. As DiMaggio and Powell (1983) would predict,<sup>44</sup> the managers rose to occupy top-level positions in the association. They replaced the small mill owners who had traditionally held those positions. The managers also encouraged representatives from other large mills, such as Santa Maria and Acatenango, to actively participate in the association.

As they sought to encourage collaboration in the association, however, they encountered resistance and distrust from older members. To overcome it, Tajumulco managers pursued a number of strategies. They forged close relations with younger owners and managers from larger mills. In addition, "instead of

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<sup>43</sup> If an agro-industry in Guatemala seemed poised for a transformation in the early 1970s, it was the cotton industry. Receiving significant support from the state, cotton production boomed throughout the 1950s, 1960s and early 1970s. However, as in the sugar case, international prices for cotton collapsed in the late 1970s and early 1980s, and the industry faced labor mobilization. However, unlike the sugar industry, it never recovered from these shocks and by the late 1980s few producers remained. For more on the cotton industry, see Williams (1986).

<sup>44</sup> They argue that "managers in highly visible organizations may have their stature reinforced by representation to participate in the boards of other organizations, participation in industry-wide or inter-industry councils, and consultation by agencies of government" (DiMaggio & Powell 1983: 153)

managing the discussion at the owner level,” they engaged managers or engineers and gradually introduced these professionals into industry-wide organizations. Tajumulco managers also actively sought out other owners. One manager described how he “went personally from one mill to another... We went to talk with each one because they wouldn’t talk to each other...” (Personal communication with manager, January 19, 2011).

Lastly, managers and their allies built on existing but dysfunctional association projects and created new industry-wide initiatives. For instance, they completed construction of an R&D center in 1992, and an export terminal in 1993, both unfulfilled dreams of previous association leaders (Asociacion de Azucareros de Guatemala, 1977). Similarly, the managers devised and implemented an aggressive industry export strategy to drastically diversify their markets. They also created an industry-wide social responsibility agency.

Slowly, through these strategies, the managers and their allies overcame opposition. They ensured participation of all mills in the association, promoted the emergence of a number of industry-wide institutions and successfully diffused their model to across the industry. Indeed, by the late 1990s most mills in the industry shared Tajumulco’s model. They relied on authoritarian labor relations, but had also improved material conditions for workers. They focused on exporting and rapidly increased their production. Through heavy investments, they redesigned their production processes, introduced new technology, and diversified into more sophisticated products. Moreover, they adopted a collaborative approach to address industry-wide problems.

## **Upgrading, Ideology and Isomorphism**

One of Gerschenkron's (1962) central contributions was to challenge the assumption of a universal trajectory of industrialization. The case of the Guatemalan sugar industry bolsters this critique. On the one hand, the industry lacked many of the conditions that authors often underscore to explain transformation processes in comparably upgraded sugar industries. On the other hand, the industry attained significantly different outcomes from comparable industries facing similar initial conditions. While it emerged from the international sugar crises of the late 1970s and 1980s with a new model, the battered sugar industries of countries such as the Dominican Republic or Barbados never recovered their previous export performance. And although the Guatemalan coffee and cotton industries, sharing a geographical location with the sugar industry, faced the same domestic economic and political conditions of crisis, society-wide transformations and state policies, they deepened their reliance on their traditional practices instead of spawning an upgraded model.

In explaining the intriguing variation of industrialization trajectories, Gerschenkron deployed ideology as one of his explanatory variables.<sup>45</sup> Bendix (1956) had relied upon a similar explanatory strategy before him, focusing on the "ideologies of management" to account for variation in labor relations across

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<sup>45</sup> He illustrated his argument by referencing the role of Saint Simonian ideas in France under Napoleon III, when the country industrialized under the aegis of a "well-defined group" of Saint Simonian socialists in "positions of economic and financial influence..." (23).<sup>45</sup> Drawing from their shared Saint Simonian views, this group crafted a unique trajectory of industrialization that privileged large banks, such as the Credit Mobiliere, as the "institutional instruments" supporting industrial transformation in France.



English, Soviet, American and East German firms. More recent ideational accounts have pursued largely comparable agendas in their critique of “unitary” explanations of economic policy and business practices (Blyth, 2007; Guillén, 1994; Hall, 1993).

Beyond their use of this Weberian explanatory variable, a number of these ideational accounts also carve out room for actor agency. They draw attention to cases sharing roughly similar structural conditions but diverging in their outcomes. To explain this variation, they endow groups of actors with both the capacity to influence outcomes and the guidance of an ideology, and trace how they construct distinct practices and policies.

My account draws from the powerful insights of this ideational literature to explain variation in industrial transformation. It sheds light on ideology, an explanatory variable seldom considered in the upgrading literature, to account for the distinct trajectory of Guatemala’s sugar industry. The ideology, Elite Solidarism, represented a distinct interpretation of Catholic social doctrine. It provided the central impetus for a manager-led process of change.

The account also brings into relief actor agency. Traditional upgrading accounts tend to portray firms as automatically and predictably responding to institutional preconditions. As a result, they often focus on revealing the presence or absence of these preconditions. In contrast, my account suggests that even in the absence of preconditions associated with upgrading success (e.g., a supportive, bureaucratically competent state or a large international buyer sharing knowledge with suppliers), or the presence of those usually paired with failure (e.g., conflicting cross-firm relations, dependence on highly protected domestic markets without a

state to discipline firms), actors may still blaze new upgrading paths. Specifically, it traces the process through which managers followed the guidelines of Elite Solidarism to devise the upgraded model at one of the industry's mills, Tajumulco.

However, in exploring managers' translation of Elite Solidarism into practices, the account also illuminates the gap separating ideology from "deed." As Schmidt (2008) and Campbell (1998) suggest, ideology provides some leeway for actor construction of solutions. In Guatemala, Elite Solidarism generated a diagnosis and general guidelines for action at Tajumulco. But managers also relied upon their engineering backgrounds to creatively devise the new bundle of practices.

Ideology and agency also played a central role in the industry's process of institutional isomorphism. Guided by Elite Solidarism, and specifically by the principle of human solidarity and Christian brotherhood, managers promoted adoption of their practices at other mills. They encouraged imitation through three channels of diffusion: field visits, personnel mobility and active participation in the mill association.

The account of this process of diffusion offers useful extensions and contributions to the upgrading and neo-institutional organizational literatures. With regard to the upgrading literature, it suggests that many of the institutions usually portrayed as preconditions for industrial transformation may in fact emerge as byproducts of these processes. In terms of the neo-institutional organizational literature, it brings to light the tremendous contestation that isomorphic processes, even in contexts of extreme uncertainty, may involve. At least two coalitions within mills, namely disgruntled permanent workers and older owners and managers,

opposed the adoption of Tajumulco practices at their mills. Wary of the consequences of the new model, these bearers of the traditional approach forced Tajumulco managers to develop a number of strategies to overcome their resistance.

The account also describes a process of normative institutional isomorphism in a context initially lacking DiMaggio and Powell's (1983) "instances of professionalization." In so doing, it sheds light on actor construction of institutions that fulfilled a similar role, promoting diffusion of practices, widespread adoption of norms and values, and institutionalization. Managers encouraged personnel mobility, promoted the development of dynamic professional networks, created consulting firms and a number of industry-wide agencies, and actively participated in the business association.

Lastly, the account suggests that in this task managers were largely driven by their ideological commitments, specifically Elite Solidarism's interpretation of the principle of human solidarity and Christian brotherhood. This finding extends the drivers of isomorphism recognized by the literature beyond the traditional explanations (e.g., uncertainty, professional affinities and personal ambitions).

In concluding, it is important to note that while suggestive of a number of theoretical insights, this study draws only from a single case. Therefore, further research is required to corroborate and elaborate upon these findings in other cases and contexts. Studies on the explanatory role of ideology – including Catholicism in Latin America, since a significant portion of the region's business elite is educated in private Catholic schools and universities – promise to fruitfully expand our

understanding of the causes of industrial transformation in the developing world. And research on the *processes* of upgrading will likely offer important clues regarding the organizational changes inherent in these transformations.

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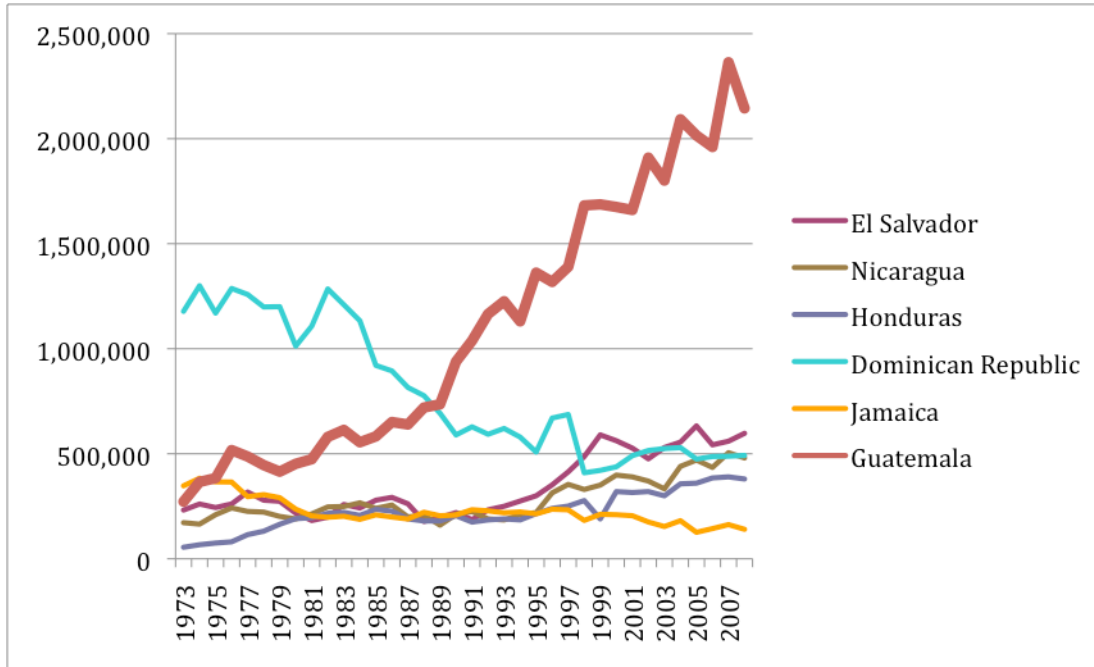
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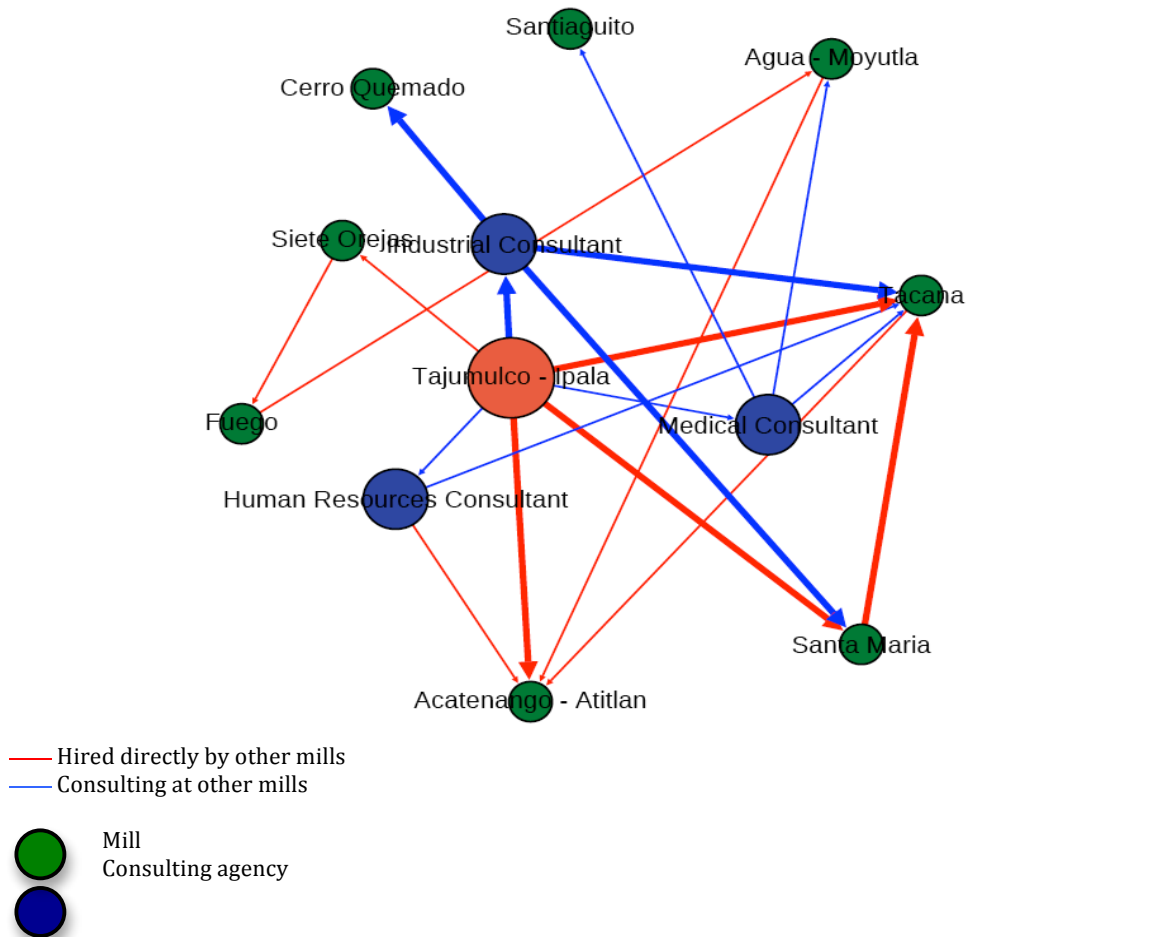
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Figure. 1. Raw sugar production (in metric tons) for selected countries, 1973 – 2008



Source: International Sugar Organization (1976, 1981, 1986, 1992, 1997, 2001, 2006, 2010)

Figure 2. Mobility across the industry of selected top Tajumulco employees during the 1980s, 1990s and 2000s<sup>46</sup>



Name*	Mills where employed and/or consulting after Tajumulco	Area of expertise
Hugo Romero	Siete Orejas, Acatenango-Atitlan, Agua-Moyutla, Fuego	Field production
Luis Benitez	Tacana, Acatenango-Atitlan	Human resources
Leonardo Hernandez	Pacaya, Acatenango-Atitlan	Mill management
Ramon Gomez	Santiaguito, Agua-Moyutla, Zunil, Tacana	Medical services
Jaime Medina	Ipala, Acatenango-Atitlan	Mill management

<sup>46</sup> In addition to top-level employees, interviewees described the mobility of numerous lower level workers, and I interviewed at least four mid and lower level employees at other mills who had previously worked at Tajumulco.

Manuel Ramirez	Santa Maria, Tacana, Siete Orejas	Industrial production
Lazaro Vega	Santa Maria, Tacana, Siete Orejas	Industrial production
Arturo Aguirre	Santa Maria, Tacana, Acatenango-Atitlan	Industrial production
Juan Figueroa	Tacana	Chemical processes
Pablo Mansilla	Santa Maria, Tacana	Industrial production

Source: Molina, 2005; Personal communications with managers and doctor, 2010.

\*All names have been altered to protect the anonymity of interviewees. All of them entered Tajumulco in the 1970s.

Table 1. Interviewees by category

<b>Category of informant</b>	<b>Number of informants</b>
Mill and plantation owners/managers	10
White collar mill employees	4
Industry umbrella organizations board members/employees	5
Businessmen from related activities	3
Union and peasant organization members/organizers	8
Former guerrilla members	3
NGO employees	3
Academics	4
Former high-level government officials	6

Table 2. Axes of comparison in the Guatemalan sugar industry

Axis of comparison	1970s	2000s
Firm and industry functions	<ul style="list-style-type: none"> <li>Vertically disintegrated production chain</li> <li>Focus on domestic sugar market and US quota</li> </ul>	<ul style="list-style-type: none"> <li>Vertically integrated production chain controlled by mills</li> <li>Primary focus on international market</li> <li>New industry functions: strategies of internationalization of production, brand name commercialization</li> </ul>
Product sophistication	<ul style="list-style-type: none"> <li>Raw and white unrefined sugar only</li> </ul>	<ul style="list-style-type: none"> <li>Increasing production of refined sugar (over 25% of total production and 40% of exports)</li> </ul>
Product diversification	<ul style="list-style-type: none"> <li>Only (raw and white unrefined) sugar production</li> </ul>	<ul style="list-style-type: none"> <li>Production of (raw, white, refined) sugar, electricity, fuel alcohol, drinking alcohol, candy</li> </ul>
Process/technology used in production	<ul style="list-style-type: none"> <li>Poorly trained migrant seasonal cutters responsible for cutting, packing and loading cane; low levels of labor productivity on fields; limited year-round jobs performed by permanent workers; workers supplying their own tools; non-existent agricultural R&amp;D; reliance on imported cane varieties; non-professional Spanish field administrators</li> <li>Second-hand, wasteful mill machinery; engineering expertise for mills provided by Cubans; limited professionalization among mill workers</li> </ul>	<ul style="list-style-type: none"> <li>Taylorist organization of production on plantations; hierarchical chain of command; piece-rate wages for workers with bonuses; high levels of labor productivity on fields; continuous training of cane cutters; mill-provided tools; mechanized bundling and loading of cane; just-in-time cane delivery; high investments in agricultural R&amp;D; professionalization of top echelons of plantation command chain</li> <li>High professionalization of mostly Guatemalan engineers in mills; hefty investments on processing equipment; training for all mill workers</li> </ul>
Inter-firm coordination	<ul style="list-style-type: none"> <li>Widespread mill-independent producer and mill-mill conflict demanding state intervention</li> </ul>	<ul style="list-style-type: none"> <li>Extensive inter-mill collaboration with limited state intervention</li> <li>Quelled plantation-mill conflict</li> </ul>
Labor conditions	<ul style="list-style-type: none"> <li>For migrant seasonal workers, substandard living conditions on plantations (galeras, poor quality meals, no personal hygiene facilities); negligible benefits; daily wages at or below the minimum wage; extensive</li> </ul>	<ul style="list-style-type: none"> <li>Migrant seasonal workers housed in specially constructed, clean dormitories with individual beds, bathrooms and showers, washing area; industrial kitchens provide workers with all meals; array</li> </ul>

<p>use of contractors for recruitment; family work involving widespread child labor</p> <ul style="list-style-type: none"> <li>• For permanent workers, housing on plantation land; access to certain mill/plantation-supplied services (water, electricity, food); year-round employment with benefits; relatively high levels of unionization at mills</li> </ul>	<p>of recreation facilities/opportunities; no child labor on mill plantations; only young men hired, no families; HR departments responsible for most hiring; written contracts; daily wages above minimum wage; wide array of benefits</p> <ul style="list-style-type: none"> <li>• For permanent workers, housing off plantation land, in nearby towns; extensive training and relatively high wages; only one (weak) mill union survives</li> </ul>
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Table 3. Overview of the production and productivity changes in the sugar industry

	1978/1979	2009/2010	% change
<b>Production metrics</b>			
Total sugarcane production (metric tons)	4,242,057	22,530,622	431.1%
Total sugar production (metric tons)	362,782	2,340,837	545.2%
<b>Capital and land productivity metrics</b>			
Cane (metric tons/hectare)	78.99	102.40	29.6%
Sugar (metric tons/hectare)	6.76	10.55	56.1%
Sugar (metric tons/ha/month)	0.59	0.92	55.9%
<b>Labor productivity metrics</b>			
Cane cutting (tons/worker day)	~1 - 2	~ 6	~200% - 500%

Source: CENGICANA 2008 and 2011; Oglesby 2000; Personal communications with managers, 2010.

Table 4. Average annual growth rates in raw sugar production, 1980 – 2000

<b>Country</b>	<b>1980-2000</b>	<b>1980-1990</b>	<b>1990-2000</b>
Guatemala	6.77%	7.58%	5.96%
Brazil	3.50%	-0.32%	7.48%
Colombia	3.31%	2.47%	4.15%
Mexico	2.90%	2.41%	3.40%
Dominican Republic	-4.11%	-5.26%	-2.93%
Cuba	-2.55%	2.18%	-7.07%

Source: International Sugar Organization (1981, 1986, 1992, 1997, 2001)

Table 5. Tajumulco total raw sugar production, percentage of total national production and rank in national industry (1970 – 1977)

<b>Year</b>	<b>Tajumulco Production (quintals)</b>	<b>Tajumulco's Percentage of Total National Production</b>	<b>Tajumulco's rank in the national industry</b>
1970/71	536,463	12.5%	4
1971/72	571,839	11.4%	4
1972/73	504,362	8.76%	8
1973/74	824,053	12.06%	4
1974/75	1,222,872	15.07%	1
1975/76	2,009,419	17.22%	2
1976/77	2,105,259	19.06%	1

Source: Asociacion de Azucareros de Guatemala (1971, 1972, 1973, 1974, 1975, 1976, 1977)