MEDIATING REGIONAL DEVELOPMENT:
How metalworking firms forged lasting linkages with steel
in Ciudad Guayana, Venezuela.

by

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B.S. Systems Engineering, Universidad Metropolitana, Venezuela, 1992
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Submitted to the Department of Urban Studies and Planning in
Partial Fulfillment of the Requirement for the Degree of

DOCTOR OF PHILOSOPHY
Economic Development and Regional Planning

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ABSTRACT

Ever since the late 1950s, planners have lured large firms to lagging regions with the expectation that they will trigger local industrial activity. According to the literatures on unbalanced growth, growth poles, foreign direct investment, and global commodity chains, large firms can dynamize lagging economies by creating a market for inputs, which then stimulates and fortifies local suppliers. Yet in practice, many national and regional development efforts centered on attracting large firms have not elicited this hoped for, backward linkage effect.

This study researches why large firms arriving to lagging regions seldom induce local suppliers, and how they can. Existing studies relate linkage behavior to firm-specific or industry-specific variables. This research differs in looking at the process through which large firms develop links to local suppliers. Specifically, this study traces the evolution of backward linkages in Ciudad Guayana, Venezuela, where more than 100 small and medium metalworking firms developed to supply the large steel firm Siderúrgica del Orinoco (SIDOR) with maintenance, parts and equipment. Research of other steel-centered cases in lagging regions reveals that this linkage effect is uncommon. When it happens, local suppliers tend to disappear following their client firm’s restructuring. In contrast, Ciudad Guayana’s metalworking firms successfully survived SIDOR’s 1997 privatization to a foreign multinational, and head regional development efforts there today.

Two main findings emerge from this study. First, backward linkages do not occur automatically, for large firms arriving to lagging regions tend to resist local procurement. In Ciudad Guayana, both foreign firms and state-owned enterprises charged with regional development exhibited this resistance towards local suppliers. Second, local suppliers can build customer-supplier relations to these large, potential customers despite their initial resistance. To do so, local suppliers must simultaneously address the demand-side and supply-side difficulties that inhibit localized linkages. Local suppliers must convince potential customers to procure locally, and at the same time facilitate local firms’ investment in upgrading. This work requires significant collective action, mediation, and embeddedness on the part of local suppliers’ business organizations. Luckily, the case of Ciudad Guayana shows how local suppliers may develop these abilities within the process of building backward linkages itself.

Thesis Supervisor: Judith Tendler
Title: Professor of Political Economy
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<th>Acronym</th>
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<tr>
<td>AD</td>
<td>Acción Democrática: the most popular of the two traditionally hegemonic political parties. Blue collar, strong labor union backing, left of center. Has traditionally dominated the national confederation of unionized workers (Central de Trabajadores de Venezuela, CTV).</td>
</tr>
<tr>
<td>AIMM-Guayana</td>
<td>Asociación de Industriales Metalúrgicos y Mineros, Capítulo Guayana Business chamber grouping Ciudad Guayana’s metalworking firms.</td>
</tr>
<tr>
<td>ALCASA</td>
<td>CVG Aluminios del Caroní, C.A. Aluminum firm located in Ciudad Guayana, CVG holding</td>
</tr>
<tr>
<td>APPSO</td>
<td>Asociación Profesionales Planta Siderúrgica del Orinoco Interest group organization representing professionals working at state-owned SIDOR.</td>
</tr>
<tr>
<td>ASOPEMIA</td>
<td>Asociación de Pequeña y Mediana Industria Business chamber grouping Ciudad Guayana’s smallest firms. Some overlap in membership with the other two chambers, but not significant.</td>
</tr>
<tr>
<td>BAUXILUM</td>
<td>Result of the merger of Interalúmina with Bauxiven</td>
</tr>
<tr>
<td>BAUXIVEN</td>
<td>CVG Bauxita Venezolana, C.A. Company that mines bauxite. Now merged with Interalúmina and part of Bauxilum.</td>
</tr>
<tr>
<td>CIMG</td>
<td>Cámara de Industria y Minas de Guayana Business chamber grouping different Ciudad Guayana’s industrial enterprises. Significant overlap in membership with AIMM-Guayana.</td>
</tr>
<tr>
<td>CONACAL</td>
<td>CVG Compañía Nacional de Cal, C.A. Produces lime. CVG holding.</td>
</tr>
<tr>
<td>CONDIBECA</td>
<td>Consejo de Desarrollo de la Industria de Bienes de Capital Government organization in charge of promoting the development of a domestic capital goods industry. No longer exists.</td>
</tr>
<tr>
<td>COPEI</td>
<td>Comité Organizador para Electores Independientes Socialchristian party. The slightly less popular of the two traditionally hegemonic political parties. To the right of AD (white collar, business oriented), yet still left of center.</td>
</tr>
<tr>
<td>CVA</td>
<td>CVG Corporación Venezolana del Alumino, C.A. Corporation that now integrates Bauxilum, Interalumina, Venalum and Alcasa.</td>
</tr>
<tr>
<td>Acronym</td>
<td>Description</td>
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</tr>
<tr>
<td>CVG</td>
<td>Corporación Venezolana de Guayana National government parastatal charged with developing the Guayana region</td>
</tr>
<tr>
<td>DECATEC</td>
<td>Programa de Desarrollo de Capacidades Tecnológicas Program that AIMM-Guayana implemented between 1996 and 2000 to deepen the technological dexterities of the sector.</td>
</tr>
<tr>
<td>EDELCA</td>
<td>CVG Electrificación del Caroní, C.A. Hydroelectric power generation company. Built and operates the Guri, Macagua I and Macagua II dams. Currently builds the Caruachi and Tocoma dams.</td>
</tr>
<tr>
<td>FESILVEN</td>
<td>CVG Venezolana de Ferrosilicio, C.A. Produces ferrosilicate. CVG holding.</td>
</tr>
<tr>
<td>FIV</td>
<td>Fondo de Inversiones de Venezuela Government organization in charge of investing the “excess” money flowing into Venezuela at times of high international oil prices. Financed many of the CVG holding firms’ construction or expansions, which makes it the financial owner of most of Ciudad Guayana’s firms.</td>
</tr>
<tr>
<td>FONDIBIECA</td>
<td>Fondo de Desarrollo de la Industria de Bienes de Capital Non-government organization promoting the development of a domestic capital goods industry. Continued the work of CONDIBIECA after the latter lost government funding. Funded by the private industrial chambers in Venezuela.</td>
</tr>
<tr>
<td>INTERALUMINA</td>
<td>CVG Interamericana de Alumina, C.A. Company that transforms bauxite into aluminum. Now merged with Bauxiven and part of Bauxilum.</td>
</tr>
<tr>
<td>LSF</td>
<td>Leopoldo Sucre Figarella, president of the CVG from 1984 to 1992. Prominent member of the Acción Democrática party. Ex-military man. Strengthened the power of the CVG, ruled the corporation with an iron hand. Remembered as the “Czar” of Guayana.</td>
</tr>
<tr>
<td>MINERVEN</td>
<td>CVG Compañía General de Minería de Venezuela, C.A. CVG holding, gold mining.</td>
</tr>
<tr>
<td>Plan IV</td>
<td>Refers to SIDOR’s fourfold expansion undertaken from 1974 to 1980. Sometimes the term is used to mean the part of the complex actually built during the expansion, such as Midrex I and II, HyL I and II.</td>
</tr>
<tr>
<td>SIDI</td>
<td>Servicio de Información de Desarrollo Industrial Database/library with information on industrial opportunities in Ciudad Guayana. Run by the CVG Industrial Promotion Department. Underfunded, latest studies more than a decade old.</td>
</tr>
<tr>
<td>SIDOR</td>
<td>Siderúrgica del Orinoco Steel mill located in Ciudad Guayana, initially a CVG holding but privatized in late 1997 to a consortium of private Latin American steel companies. The CVG still holds 30% of the firms’ shares.</td>
</tr>
<tr>
<td>Acronym</td>
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<tr>
<td>SUIM</td>
<td>Sustitución de Importaciones</td>
</tr>
<tr>
<td>TECMIN</td>
<td>Proyectos Técnicos Mineros, C.A.</td>
</tr>
<tr>
<td>VENALUM</td>
<td>CVG Industria Venezolana de Aluminio, C.A.</td>
</tr>
</tbody>
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Introduction

Ever since the late 1950s, different literatures have recommended the attraction of large firms to lagging regions with the expectation that they will trigger local industrial activity. Unbalanced development and growth pole theories, and the literatures on foreign direct investment and global commodity chains coincide in presenting large firms as able to dynamize lagging economies by creating a market for inputs, which then stimulates and fortifies local supply activity. When large firms’ demand for inputs induces this supply response, we speak of localized “backward linkages”. Unfortunately, as I will illustrate later, many national and regional development efforts centered on attracting large firms have not elicited this hoped for, backward linkage effect. Precisely, current work on backward linkages tries to understand why backward linkage logic has not played out in practice.

In line with the current literature on backward linkages, I also aim to understand why large firms arriving to lagging regions have seldom induced local supply activity, and how they can. To do this, I delve into the case of Ciudad Guayana, Venezuela, to explain why localized backward linkages occurred there. Ciudad Guayana is an interesting case of backward linkages because the large steel and aluminum firms that originated this city belong to sectors that typically do not spur local suppliers. Mineral processing firms like steel do demand a steady supply of replacement parts and equipment. However, their continuous process nature introduces a heavy bias against procuring from unfamiliar suppliers of such parts and equipment. In particular, operations’ managers fear that using unfamiliar parts and equipment can damage other equipment and stop the plant altogether. Despite these constraints, more than 100 small
and medium metalworking firms grew in Ciudad Guayana, most of them to supply the large steel firm Siderúrgica del Orinoco (SIDOR). These firms manufacture and repair parts and equipment, and provide plant construction and industrial maintenance services. Surprisingly, these firms became sufficiently efficient to survive SIDOR’s privatization to a foreign multinational. My research of other steel-centered cases in lagging regions reveals that the backward linkage effect I observed in Ciudad Guayana is uncommon. When it happens, local suppliers tend to disappear following their client firm’s restructuring.

My research of the case of Ciudad Guayana departs from the current literature researching backward linkages in an important way. This literature focuses on supply-side deficiencies such as financing and infrastructure that make it difficult for local suppliers to produce competitively. In contrast, I do not even take for granted that large firms arriving to lagging regions will demand locally produced inputs. On the contrary, I use the case of Ciudad Guayana to explore the causal relation between the shape and direction of large firms’ demand for inputs and the corresponding local supply response.

The findings that emerge from Ciudad Guayana suggest that backward linkages do not occur as automatically as its compelling logic makes us think. First, large firms arriving to lagging regions tend to resist local procurement. This resistance occurs not only within foreign firms, like the current literature on backward linkages already observes, but also within state-owned enterprises charged with regional development, such as SIDOR. In effect, both state-owned SIDOR and private-foreign SIDOR initially resisted local procurement. Second, local suppliers have ample room for agency in building backward linkages to large, incoming firms, despite these potential customers’
initial resistance. To do so, local suppliers must simultaneously address both the demand-side and supply-side difficulties that inhibit localized linkages. On the one hand, local suppliers must convince potential large customers to procure locally, and on the other, facilitate local firms’ investment in upgrading. This work requires significant collective action and mediating abilities from local suppliers and their interest group organizations. Luckily, the case of Ciudad Guayana shows how these abilities can emerge through the process of building backward linkages.

This introduction is structured as follows. First, I discuss how the concept of backward linkages has influenced both the theory and practice of economic development. Then I review both the empirical literature evaluating to what extent backward linkages occur in practice, and the literature researching the contrast between aspirations and reality. Third, I portray how the case of Ciudad Guayana can add to the existing understanding of backward linkages. After discussing briefly the methodology I used to research the Ciudad Guayana case, I delve into an outline of the dissertation itself.

i. The Elusive Nature of Backward Linkages

Backward linkages, more than a theory, is a logic about industrial sequence, a logic so compelling that for the last fifty years it has permeated the literature and practice of regional and national economic development. Yet as I will illustrate in this section, the compelling notion that large-scale investment will stimulate a local supply response has often not occurred in practice. The contradiction between expected outcome and reality has already triggered research on why backward linkages are so elusive. It is against this discussion that I set my case study of Ciudad Guayana.
The logic that investment in a large-scale industry would create a demand for inputs, which could subsequently trigger a second round of investment in input-producing industries, first gained substance with Hirschman (1958). In his *Strategy of Economic Development*, Hirschman coined the expression “backward linkage” to capture the effect of industrial activity inducing a local supply response. In *Strategy*, Hirschman used both the “backward linkage” and “forward linkage”\(^1\) logics to build a development theory he named “unbalanced growth”. In unbalanced growth theory, countries should focus their scarce decision-making abilities and financial capital on a given industrial sector. The growth of this targeted industrial sector would create imbalances in the demand for inputs and the supply of outputs that would trigger a subsequent round of industrial investment, i.e. the backward and forward linkages.

As the name itself implied, Hirschman’s unbalanced growth theory directly countered the balanced growth theory that Rosenstein-Rodin (1943) and Nurkse (1952) proposed at the time. In contrast to Hirschman’s recommendation to focus investment on a lead sector, balanced growth theory argued for simultaneous investment in several different large-scale industries. The combined demand of the workers in all these industries provided impetus for continued industrial growth. That is, industrial production stimulated demand for other industrial goods indirectly, through the wage bill. This contrasted with Hirschman’s unbalanced growth proposition that industrial production itself would directly demand further industrial production.

Backward and forward linkage *logic* – that is, that any investment creates market disequilibria that stimulates subsequent investment – turned out to be extremely

\(^1\) “Forward linkage” refers to how the output of an industrial activity may stimulate other firms to invest in another industrial activity that processes that good further or uses it as an input to manufacture a final product.
compelling outside those early debates of balanced or unbalanced growth. In effect, this notion appears in many different literatures, even if with different names. For example, the same logic underlay Perroux’s (1955 and 1961) “growth pole” theory of how “propulsive industries” would trigger industrial development by creating imbalances in the demand and supply of goods\(^2\).

Implicitly, backward linkage logic—not always the concept per se—also appeared in arguments in favor of foreign direct investment. Ever since the 1970s, foreign direct investment (FDI) proponents have argued that multinationals arriving to developing countries or regions can inject dynamism to local suppliers of inputs (Kindleberger 1969, Caves 1982, Meier 1995). In the early discussions about foreign direct investment, its proponents gave this backward linkage effects secondary importance. The more important effects of FDI lay in financing investment in capital scarce, labor abundant countries or regions, and promoting export-oriented industries (Lall 1978). Yet recently, the argument that foreign direct investment can fortify local suppliers gained a stage of its own. Last year (2001), the United Nation’s Council on Trade and Development (UNCTAD) World Investment Report dealt exclusively on the connection between foreign direct investment and backward linkages, by that name. In the report, UNCTAD advised developing countries to attract foreign direct investment with the argument that backward linkage effects would stimulate local industrialization (UNCTAD 2001).

\(^2\) Hirschman and Perroux had similar ideas about the ways in which economic development was uneven and cumulative, and the mechanisms through which growth could potentially generate growth elsewhere. Hirschman himself remarks on the similarity between Perroux’s thinking and his own in *Strategy*. The difference between them is that while Hirschman clearly specified his theory of development and the mechanisms of it in *Strategy*, Perroux’s ideas were never so clearly specified. In fact, Perroux was sometimes so vague in delineating his ideas of economic development that much of what we know of it is the interpretation of pupils like Boudeville, interpretations that sometimes differed in important respects from what Perroux had actually said (Higgins 1981, 1988).
However, backward linkage logic never developed into a full theory because nobody specified the mechanisms by which demand for inputs translated into local supply. In particular, where would local firms get the technology required to manufacture the demanded inputs? How would they be able to compete with more sophisticated, foreign firms? Hirschman, Perroux and FDI proponents talked about possible knowledge transfer from the input-demanding firms, yet in all three cases, the discussion about these topics remained vague, and the resolution to these questions unspecified.

Throughout the 1950s, 1960s and 1970s, developed and developing countries alike directed large-scale domestic and foreign investment to lagging regions with the hope that they would generate “second-round investment effects”—namely backward and forward linkages.³

Today, partly because of the failure of many of these experiences, there is much less faith about the ease with which large-scale investment in lagging regions will automatically elicit a local supply response. It is not that large-scale investments, whether public, private, or foreign, do not buy inputs, but that they often do not buy them in the surrounding region. This “leakage” out of the locality directly contradicts the potential of large-scale investment to generate the demand spillovers implied by backward linkage logic. The following recent empirical examples illustrate these kinds of leakage effects.

The first example comes from Europe, where Amin et al. (1994) studied the local supplier content of a handful of world-renowned companies (Hewlett Packard, Lotus, BASF, and Allied Signal) that had located manufacturing plants in lagging European regions such as Brandenburg (Eastern Germany), Portugal, Ireland, Scotland and Rhone

³ The Netherlands, the Soviet Union, Japan, United States, Sweden, Poland, Canada, Italy, India, Libya, Pakistan, Venezuela, Chile and Tanzania experimented with growth pole policy during the 1950s, 1960s and 1970s to solve problems of regional development (Kuklinski 1972, Florio 1996).
Alpes (France). They found that these companies’ extent of local purchasing was disappointing overall, even for those firms making investments in the Rhone Alpes, a region that differed from the other ones studied in that it had traditionally had high levels of local productive integration and strong links with local universities. Interestingly, these researchers found that the least embedded plants in their study were those in electronics. This contrasts to the widespread perception of high-tech industries as more embedded in their local economies (Amin et. al. 1994).

Another European example concerns large-scale investments in Italy’s lagging South. In the early 1990s, Florio (1996) surveyed 260 large firms (more than 1000 employees) throughout Italy to research the results of the Italian government’s three-decade long policy of directing large-scale investment to the Southern region (1950 – 1980). He reports that more than half of the large manufacturing plants located in the South buy less than 10% from their regions, while only 15% of the plants in the North show such weak linkages to Northern suppliers. Surprisingly, this even holds for the automotive industry, an industry supposed to elicit strong localized supplier linkages. Fiat’s Southern plants purchase more than 95% of the value of their inputs from the north. In contrast, the Northern Fiat plants buy most of their inputs locally.

When we turn our eyes to developing countries, we encounter similarly disappointing results. For example, Mexico’s successful maquila industry is one of today’s most notorious cases of absent backward linkages. Granted, maquilas have contributed to an increase and diversification in Mexico’s absolute export earnings – automobiles and electronics are now exported from Mexico. Yet Mexico’s maquilas have had a limited impact on the rest of the economy. One study states that maquilas buy less
than 2% of their inputs from Mexican companies (Battat, Frank and Shen 1996). For example, within the automobile sector, US-owned auto assemblers import virtually all auto parts. Japanese assemblers have relocated their own first tier local suppliers from abroad, but these in turn have not developed local sub tiers of suppliers (Dussel Peters, Piore and Ruiz Durán 1997). In the consumer electronics sector, a new local content regulation under NAFTA is not achieving the desired increase in purchases from local suppliers. Rather, electronic maquilas are reacting to the regulation by either vertically integrating or relocating their foreign suppliers to close locations (Carrillo 2002).

In Sri Lanka, a boom in garment production has not induced investment in textiles, which Kelegama and Foley (1999) attribute to poor infrastructure and lack of finance. In Ireland, researchers first found a rise in local procurement following the arrival of foreign-owned electronics firms. But upon closer inspection, this rise appears less successful as a case of localized backward linkages, because many of these “local” suppliers are foreign owned (Görg and Ruane 2000). In the Philippines, despite a local content requirement of 40%, foreign car assemblers purchase less than 15% of their components locally, and manufacture the rest in-house (Battat, Frank and Shen 1996).

These examples are not meant to detract from the significant economic benefits that lagging regions can derive from the presence of large firms. On the contrary, large firms can generate significant employment – a priority indeed for lagging regions. Moreover, large firms often induce spillovers different from the backward linkage effect, but just as important. For example, by virtue of their large size, large firms often have superior muscle power to negotiate with government for better physical and productive infrastructure. When government responds to these needs, the resulting provision of
roads, electricity lines, training centers and other public goods may improve the working environment and competitiveness of smaller and perhaps even competing firms⁴.

**Why are backward linkages so elusive? The literature’s explanations**

Yet the contradiction between the compelling backward linkage logic and the leakage effects of large-scale investment just described begs analysis, particularly given the continued policy emphasis on backward linkages (at least as applied to FDI). We can find two different explanations in the literature, one focusing on the difficulties involved in local supply, and the other focusing on large firms’ demand behavior.

**Supply-side explanations to the difficulty of localized backward linkages**

The current literature recommending FDI based on beneficial backward linkage externalities is not naïve about their difficult prospect. The World Investment Report (2001) recommending foreign direct investment echoes an earlier World Bank study in recognizing that in the majority of cases, backward linkages from foreign companies to local suppliers fail to materialize (UNCTAD 2001, Battat, Frank and Shen 1996). Both these studies place the problem on supply-side inefficiencies that render local suppliers uncompetitive. In developing countries, the lack of financing, training facilities, infrastructure, R&D and technological development programs inevitably leads potential local suppliers to have higher prices and lower quality than what their foreign clients require. These arguments have had a long standing within the literature tracing the linkages from transnational companies in developing country settings (e.g. Lall 1978).

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⁴ See Gulyani (1998) for a description of how automobile assemblers in India worked with government for a joint public-private provision of better roads and electricity service, which improved the operating conditions of these assembler’s input-supplying firms. In the Brazilian Northeast, large garment firms’ ability to get the national training center to locate training facilities close to them significantly benefited those small garment firms located in the same urban regions as these large firms (Dohnert 1998).
Outside the context of foreign direct investment, other studies that research the absence of backward linkages in developing countries agree with these results (e.g. Kelegama and Foley 1999)\(^5\).

**Demand-side explanations to the absence of localized backward linkages**

Yet irrespective of local supplier capabilities, there seem to be firm-specific and industry-specific reasons that predetermine large firms’ procurement behavior. To what extent do large firms buy inputs locally, in the first place? The literature on industrial linkages explores precisely this question. For example, Hoare (1985) reviewed 14 cross-industry and cross-country studies documenting the linkage pattern of different kinds of firms, both domestic and foreign, in almost all imaginable industries\(^6\). He arrived at the following picture. First, firms that come from outside a given region tend to form fewer local linkages than those indigenous to the region, even when local suppliers are readily available. Second, plants with more decision-making autonomy tend to engage more with local suppliers than externally managed, branch plants. A change in the ownership of a firm frequently disrupts linkage patterns. Large and organizationally more complex firms such as publicly owned, multi-plant and/or multi-national companies tend to have less localized linkages than smaller, single-plant, privately owned and technically unsophisticated companies. An increase in organizational complexity is linked to lower local linkage ties. Hoare’s study presents a trustworthy picture about large firms’ linkage

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\(^5\) Perroux, writing about multinational investment in LDCs, thought that developing countries lacked the “transmission lines” that would spread growth from propulsive industries outwards. Therefore, he concluded, in LDCs the “development of poles” was more probable than “development poles” (Higgins 1981).

behavior because the cases he reviewed concerned mostly developed regions in
developed countries. Therefore, these regions did not exhibit the supply-side deficiencies
that affect linkages in developing countries or regions. Still, studies in lagging regions

What about industrial sectors? According to the current literature trying to
increase the links between foreign firms in LDCs and local suppliers, the technical
characteristics of the industry should affect the likelihood of localized backward linkages
(eg. Battat, Frank and Shen 1996). For example, industries that process raw materials,
such as the metallurgical and petrochemical, should have a lower likelihood of localized
backward linkages than those whose final product incorporates manufactured
components. Examples of the latter are automobiles and the consumer electrical and
electronics industries. Yet predictions about industry correlations do not always hold in
practice. For example, this same study found low localized backward linkages for the
automobile sector in the Philippines and Mexico (Battat, Frank and Shen 1996). Hoare’s
(1985) review also produced contradictory results as to the linkage behavior in given
industry types. Most authors he reviewed believed that some industrial sectors are more
prone to develop local backward and forward linkages than others. However, these
studies contradicted each other on this account. One study for example cited leather and
clothing as having high local backward linkages, while another found the opposite. The
inconsistencies between these studies’ predictions and actual results suggest that there
must be other dynamics influencing backward linkage development that differs from firm
and industry-specific explanations.
What the case of Ciudad Guayana adds to backward linkage research

With my study of the metalworking sector in Ciudad Guayana, I aim to provide a fresh perspective to the problem of why backward linkages seldom occur in practice, and how they can. First, I follow a research method completely different from that common to the literature. Most studies reviewed above measure linkage behavior at one point in time. They then regress or describe trends between these measurements and a number of firm and industry characteristics. These studies pursue the praiseworthy objective of understanding what characteristics make localized linkages more or less probable. Yet as important as this understanding is, in my view this methodology has one shortcoming: it does not capture the process of building backward linkages. Therefore, it cannot explain why we do not see linkages when we expect them to happen (i.e. automobiles in Mexico), or why we do in situations where they are unlikely (i.e. steel in Ciudad Guayana).

Moreover, these correlation studies do not capture changes in linkages over time. Yet backward linkages invariably change over time, as large firms adapt to local markets and local suppliers invest in upgrading. For example, a study of longitudinal panel data on 325 firms in the Irish electronics sector finds that over time, linkages at the firm level increase (albeit at a diminishing rate). Still, by not researching the process of building backward linkages, even these longitudinal studies make educated guesses about the reasons behind these changes.

My case study of backward linkages in Ciudad Guayana tries to address these shortcomings by throwing light on the dynamics of linkage formation. I chose to study

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7 These authors explain that as incoming large firms (many of them multinationals) learn more about the local environment, their transactions costs of procuring locally decrease. Yet in the same study they mention that many foreign suppliers have been settling in Ireland to supply its growing electronics industry, which raises questions of to what extent the increase in linkages is due to adaptation to the local market, and to what extent to an increase in the local sources of supply (Görg and Ruane 2000).
the development of Ciudad Guayana’s metalworking sector because it grew around an industry noted for a low likelihood of backward linkages—steel. Moreover, the privatization of the steel mill that originated this metalworking industry to a foreign multinational allowed me to observe to what extent and in what ways globalization affects established backward linkages. Finally, Venezuela is also an unlikely place to find backward linkage development. Due to its relatively small population (23 million), the country has small internal markets. In addition, Venezuela’s economy has steadily contracted during the past 25 years, making markets smaller still. Discovering how backward linkages developed, and then outlasted privatization in this unlikely setting harbors important lessons about backward linkage formation.

Aside from methodology, my research differs from the current literature backward linkages in its theoretical approach. In describing the process of backward linkage formation in Ciudad Guayana, I use an analytical framework similar to that of current global commodity chains (GCC) literature. This literature does not deal directly with the topic of backward linkages. However, it examines an analogous, demand-driven development dynamic. In particular, the GCC literature researches how large, monopsonistic firms in advanced industrial nations make procurement decisions from firms in developing nations, and how these decisions affect development trajectories. The difference with backward linkages is that the large firms that the GCC literature researches do not typically locate within developing countries. Often, these firms only retail, and do not manufacture as in the cases of backward linkages.

The GCC literature influenced my work by providing the perspective that demand-side aspects of customer firms determine supply responses. In particular, the
content of what the buyer demands from the supplier – e.g. simple manufacture as opposed to design activities – can help suppliers develop some skills but atrophy others (Gereffi 1999, Humphrey and Schmitz 2000). For example, in the Brazilian Sinos Valley, which during the 1980s had become a thriving shoe cluster mostly attending the domestic market, those shoemakers that subsequently manufactured solely for global buyers ceased to use their design abilities (they relied on their clients for design) and eventually lost them through lack of practice. In contrast, shoemakers that continued manufacturing for the domestic Brazilian market continued developing their design skills (Bazan and Navas-Alemán 2001).

While unpacking the process of backward linkage development in Ciudad Guayana, I too looked for, and observed this interaction between demand-side and supply-side effects. Interestingly, and in contrast to both the backward linkage literature and the GCC literatures, I found that the buyer does not have sole control over the destiny of the buyer-supplier relation. While it is true that the buyer ultimately decides whom it wants to buy from, the demand-driven perspective of both literatures does not provide room for agency on the part of prospective local suppliers or concerned policymakers of what to do to build links between established large buyers and potential local suppliers. The following section presents the case of backward linkages in Ciudad Guayana in more detail to create the space for this different analytical perspective.

ii. Ciudad Guayana: why it presents a puzzle in backward linkages

The “Corporación Venezolana de Guayana” (CVG), and state-led industrialization

Ciudad Guayana epitomizes state-led industrialization and growth pole interventions fashionable in the 1950s and 1960s. In 1960, the Venezuelan government
created a public development agency called “Corporación Venezolana de Guayana” (CVG) and gave it the mission to develop Guayana, Venezuela’s Southern region (see Figure i.1). To develop Guayana, the CVG invested more than US $30 billion over a period of 42 years (1960-present), most of it in the city of Ciudad Guayana\(^8\). This money financed infrastructure (roads and hydroelectric power) a complex of large-scale, publicly owned steel, aluminum, and other mineral processing industries, and some of the city construction itself\(^9\). By 2002, and despite efforts to privatize many of its holding firms, the CVG owned more than 80% of 15 different large-scale, natural resource processing and service industries\(^{10}\) (See Table i.1).

Apart from its supervisory role of Ciudad Guayana’s state-owned enterprises, the CVG acted as a regional development corporation. Up to the mid 1990s, the CVG stimulated private investment, promoted regional projects (including forestry, mining, agriculture and tourism), and managed public municipal services. Following a neoliberal reform program launched in the 1990s, the CVG has given up municipal provision and slowly started to promote small and medium industry, micro enterprises, commerce and services and the “reconversion” of industrial workers laid off in the early 1990s (Rakowski 2000).

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\(^{8}\) The figure comes from a 2000 presentation by a CVG top executive (YB 03/00), who in turn got it from Jóvito Martínez Guarda, an expert on the history of the CVG and its enterprises.

\(^9\) Initially, central government agencies such as the Ministry of Public Works and the Ministry of Education were responsible for building housing and schools in Ciudad Guayana. Yet early on, given the urgency of providing housing and schooling to the wave of poor immigrants that flooded the city site, the CVG undertook some of the housing and school construction itself (Davis and McGinn 1969, Corrada 1969).

\(^{10}\) The CVG has influence on many more firms, yet as a minority shareholder. For example, in 1997 the CVG had shares in 54 firms. Of these, only 17 were direct subsidiaries – the same subsidiaries as in Table i.1, except that two merged into one (Bauxiven and Venalum into Bauxilum) and one disappeared (Inmobiliaria Rolf). The CVG had minority ownership in the remaining 33 firms, all of which were joint ventures with national or foreign capital (CVG Gerencia de Estadísticas 1997).
Caption: In 1969 Guayana was composed only of the Bolivar State and the Delta Amacuro Territory. Several "regionalization" decrees expanded the geographical domain of the region. The last of them in 1980 incorporated the Amazonas Territory and created a total extension of 488,000 square kilometers, more than half the size of the entire Venezuelan Territory (Martinez Guarda, 1996).
Table i.1: CVG owned enterprises in Ciudad Guayana, 2002

<table>
<thead>
<tr>
<th>Sector</th>
<th>Firm</th>
<th>Annual Production*</th>
<th>Distribution of ownership</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminum</td>
<td>Alcasa</td>
<td>202,000 tons</td>
<td>CVG 92.69% Reynolds 7.31%</td>
</tr>
<tr>
<td></td>
<td>aluminum ingots, cylinders, foil, etc.</td>
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<td></td>
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<tr>
<td>Bauxilum</td>
<td>Bauxite and Alumina</td>
<td>4,900,000 tons bauxite 1,700,000 tons alumina</td>
<td>CVG 99.10% Alusuisse 0.90%</td>
</tr>
<tr>
<td>Carbonorca</td>
<td>Anodes for processing for aluminum</td>
<td>196,000 tons</td>
<td>CVG 95.8% Foreign 4.2%</td>
</tr>
<tr>
<td>Venalum</td>
<td>Aluminum ingots</td>
<td>414,000 tons</td>
<td>CVG 80.72% Japanese 19.28%</td>
</tr>
<tr>
<td>Iron and Steel</td>
<td>Ferrominera Orinoco</td>
<td>19,500,000 tons</td>
<td>CVG 100%</td>
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<tr>
<td></td>
<td>Iron ore</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Fesilven</td>
<td>67,000 tons</td>
<td>CVG 73.17% Private 26.84%</td>
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<tr>
<td></td>
<td>Ferrosilicate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minorca</td>
<td>Iron ore bricks</td>
<td>970,000 tons</td>
<td>CVG 100%</td>
</tr>
<tr>
<td>Electricity</td>
<td>Edelca</td>
<td>75,167 GWH</td>
<td>CVG 89.10% Finance Ministry 10.90%</td>
</tr>
<tr>
<td></td>
<td>Electricity generation</td>
<td></td>
<td></td>
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<tr>
<td>Mining</td>
<td>Minerven</td>
<td>2,900 kg.</td>
<td>CVG 100%</td>
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<td></td>
<td>Gold mining</td>
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<td></td>
<td>Conacal</td>
<td>384,000 tons</td>
<td>CVG 100%</td>
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<td></td>
<td>Lime</td>
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<tr>
<td></td>
<td>Tecmin</td>
<td></td>
<td>CVG 100%</td>
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<tr>
<td></td>
<td>Mining studies</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Ferromintec</td>
<td></td>
<td>CVG 100%</td>
</tr>
<tr>
<td>Agro industrial</td>
<td>Proforca</td>
<td>460,412 hectares of pine plantation</td>
<td>CVG 85% Conare 15%</td>
</tr>
<tr>
<td></td>
<td>Forestry</td>
<td></td>
<td></td>
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<tr>
<td>Services</td>
<td>CVG International</td>
<td></td>
<td>CVG 87.6% Private 22.4%</td>
</tr>
<tr>
<td></td>
<td>Purchasing arm of CVG firms</td>
<td></td>
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<tr>
<td></td>
<td>Ferrocasa</td>
<td></td>
<td>CVG 80.61% Other government 20.39%</td>
</tr>
<tr>
<td></td>
<td>Housing development</td>
<td></td>
<td></td>
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</tbody>
</table>

Sources: CVG 1996, OAEF 2002 (Production figures are from 1995)

When the Ciudad Guayana program was conceived in 1960, it responded to national as well as regional objectives. Nationally, Ciudad Guayana was Venezuela’s attempt to “sow the oil” by using oil revenue to finance industries that would continue to provide foreign exchange once oil depleted\(^\text{11}\). Following Rostow’s “stages of growth”,

\(^{11}\) From 1945 to 1961 Venezuela averaged an impressive rate of GDP growth of 8.4%/year, the highest rate in Latin America in the postwar period (Hassan 1967). However, planners estimated that to keep up with this growth rate and offset a steady population growth of 3%/year Venezuela would have to quadruple its output of goods and services. Since oil reserves were expected to decline in the long run, national planners were keen to reduce dependency on oil revenues. Studies suggested that Venezuela should focus
planners envisioned that Ciudad Guayana’s heavy industrialization plan would constitute Venezuela’s “takeoff”. At the same time, influenced by Raúl Prebisch and the Economic Commission for Latin America (ECLA) planners were eager to alter Venezuela’s economic development path, which up to then had depended on the export of unprocessed raw material. A natural way to move away from Prebisch’s “dependentista” model was to add value to Ciudad Guayana’s vast natural resources. Moreover, in the eyes of nationalist intellectuals, Venezuela had to start exploiting Guayana’s riches. Up to the Ciudad Guayana project, only two foreign companies, US Steel and Bethlehem Steel, had mined the vast iron ore reserves of the Cerro Bolívar, exporting it for further processing to their steel mills abroad (Martínez Guarda 1996).

Planners however also envisioned that Ciudad Guayana’s heavy industrialization path would reverberate across the whole Guayana region. Following growth pole theories in vogue at the time, the CVG expected that its investment in hydroelectric power, steel investment on iron and steel, sponge iron, aluminum, metal products, heavy machinery, electrochemical, and forest products such as pulp and paper. These industries would not only provide intermediate products for already existing assembly industries like automobiles, but could also fuel exports to the rest of the world. Ciudad Guayana was close to rich iron ore veins and on the banks of the navigable Orinoco river, which provided easy means of transportation to world markets. Studies concluded that if these iron, heavy machinery, and other activities located in Ciudad Guayana, cost and location attributes would confer to them a competitive advantage in world markets (Rodwin 1969).

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12 The Guayana region has incredible mineral wealth, energy generation capacity, and natural beauty. Guayana has proven reserves of 14.5 billion metric tons of iron ore (1.9 bn high grade, 12.6 low and medium grade), 8,000 tons of gold (12% of world reserves), 4 billion metric tons of bauxite, and important reserves of diamonds (5.8 mm kilates), dolomite (143 mm tons), quartz (85 bn tons), manganese (2 mm tons), nickel, tungsten, quartzite, chrome, kaolin (40 mm tons), magnetite (5 mm tons), columbite (550 tons), vanadium, uranium, and titanium. The Caroni river on which Ciudad Guayana lies has a hydroelectric power generation potential of more than 25 million kilowatts and currently supplies 70% of the electricity consumed in Venezuela. The Orinoco river has a longitude of 2,060 km and flows at a rate of 30 million liters of water per second. It offers a channel of navigation from Guayana to the Atlantic Ocean. To the north of the Orinoco there are natural gas reserves of 3.2 billion cubic meters. Guayana has 75% of the natural forests in Venezuela, including planned pine plantations covering more than 600,000 hectares. The region harbors lakes and rivers with a fishing potential of more than 70,000 annual tons. Finally, Guayana has numerous natural marvels, such as the Angel Falls (highest waterfall on earth), the exotic Tepuys, and hundreds of bird and plant species unique to the planet. Almost 9 million hectares are protected as national parks. (CVG 1996, CVG 1999).
and aluminum would create backward, and forward linkages (Alamo Blanco and Ganz 1969a). That is, these large-scale industries would induce private investment in upstream industries (equipment, engineering, and producer services), downstream industries (automobiles and machinery), and would increase demand for consumer goods (Martínez Guarda 1996).

**The steel mill SIDOR and backward linkages**

Of the CVG enterprises, the steel mill “Siderúrgica del Orinoco” (SIDOR) was the first and largest until its privatization in 1997. SIDOR started production in 1962, barely two years after the CVG came into being, at 750,000 tons/year and 3114 workers. By 1971, SIDOR was producing 1.2 million tons/year. During the 1970s, favored by high oil revenues, SIDOR more than quadrupled its production capacity to 5 million tons/year, becoming as large as Brazil’s CSN (5 million tons), Gerdau (4.6 million tons) and Usiminas (4.2 million tons), the largest steel mills in Latin America (Martínez Guarda 1996, BNDES 1998b). By 1984, SIDOR employed over 16,000 workers, almost one sixth of Ciudad Guayana’s labor force of the time. This number decreased to 10,741 workers in 1997, just prior to privatization (CVG Gerencia Corporativa de Estadísticas 1997). In the meantime, the company had restructured in line with trends in the world steel industry, as well as prepared for privatization (Rakowski 2000).

SIDOR protagonizes my story of backward linkages in Ciudad Guayana, as the steel mill generated around it a group of over 100 small and medium metalworking suppliers. These firms produce spare parts, repair pieces, and do maintenance work for

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13 However, state-owned SIDOR’s peak production occurred in 1989 at 3.8 million tons (the company never achieved its installed capacity), which makes SIDOR more comparable to slightly smaller Brazilian steel mills like CST (3.65 million tons) and Cosipa (3.6 million tons) and to the largest steel mills in Argentina (Siderar with 3.5 million tons) and Mexico (Ahmsa with 3.7 million tons) (BNDES 1998b).
SIDOR and for the other large firms in Ciudad Guayana. They cut, bend, heat and shape metal to produce steel structures, boilers, storage tanks, high-pressure vessels, hoppers, gas ducts, piping, valves and pressure sprinklers, and provide industrial construction\textsuperscript{14} and maintenance services (AIMM-Guayana 2000). Some of these metalworking firms have developed incipient engineering and design capabilities\textsuperscript{15}, and the two largest boast exports of oilrigs and steel bridges abroad. In 1997, the year of SIDOR’s privatization, 27\% of the steel mill’s \textit{total} purchases went to Ciudad Guayana’s \textit{metalworking} sector, an amount of over US$ 72 million.

Ciudad Guayana’s metalworking firms constitute the third largest formal industrial employers in Ciudad Guayana. Of Ciudad Guayana’s more than 100 metalworking firms, about 60 are formal and belong to the business organization specifically representing the sector, AIMM-Guayana\textsuperscript{16}. These formal firms jointly employ more than 3,000 workers and directly supply SIDOR and the CVG’s aluminum firms. At the same time, these firms subcontract work to the rest of the firms in the sector. Subcontractors tend to be informal, smaller firms grouping metalworking skills but no infrastructure. There is no registry of their employment. Counting \textit{formal} employment only, the metalworking sector is the third largest in Ciudad Guayana, following the CVG-owned aluminum smelters (around 9,000 workers combined) and now-private SIDOR (around 6,500 workers), which are also the two largest employers in Venezuela. Moreover, the metalworking sector is the second largest private industry in Ciudad Guayana after private-foreign SIDOR.

\textsuperscript{14} Industrial construction refers to the construction of large size industrial equipment, such as warehouses, railway girders and structural steel buildings. It also includes assembly of mechanical parts (AIMM-Guayana 2000).

\textsuperscript{15} By 1995, 10\% of a subset of firms producing capital goods had patents (Fondibieca 1995).

\textsuperscript{16} Asociación de Industriales Metalúrgicos y Mineros, Capítulo Guayana.
Figure i.2 Employment in the Guayanese Steel, Aluminum and Metalworking Industries


Puzzle 1: Why did metalworking firms in Ciudad Guayana arise, given low likelihood of backward linkages in steel?

The first puzzle about backward linkages in Ciudad Guayana is that local metalworking suppliers developed at all, given the nature of the steel industry. Up to SIDOR’s privatization, most metalworking firms in Ciudad Guayana sold more than 80% of their output to SIDOR (OM 7/01). Yet according to current literature on backward linkages, steel firms have a low likelihood of promoting localized backward linkages (Battat, Frank and Shen 1996). In contrast to assembly-based industries, which incorporate a large number of components susceptible to third party manufacture\(^\text{17}\), raw

\(^{17}\) Classical examples high linkage industries are automobiles and consumer electronics, where components constitute 70% and 40-50% of sales value respectively (Battat, Frank and Shen 1996).
material processing industries such as steel do not incorporate components. Therefore, they have a low likelihood of promoting backward linkages (Halbach 1989). 

Aggravating steel firms’ low likelihood of localized backward linkages, SIDOR initially had no contact with local suppliers because of a supply-side constraint: local suppliers simply did not exist in Ciudad Guayana. After all, Ciudad Guayana and SIDOR came to life on what had previously been barren land. Therefore, from the outset SIDOR imported metalworking replacements and equipment, and built a huge internal workshop to perform metalworking repair and maintenance.

In the steel industry of the 1960s and 1970s, SIDOR’s import and vertical integration behavior was common practice. Most steel mills, like SIDOR, had to adapt to regions with few or nonexistent local metalworking suppliers. For example, upon its arrival to the interior city of Ipatinga in the 1960s, Brazilian steel mill Usiminas (the star of Brazilian state-owned steel firms), internalized the production of metalworking parts, maintenance and repairs (FB 02/02). Also in the 1960s, the Italian state-owned enterprise Italsider, located in the city of Taranto, Southern Italy, built a huge internal workshop to fulfill its parts, maintenance and repair requirements (Masi 1982).

Given the huge sunk costs of vertically integrating metalworking maintenance and the manufacture of spare parts and equipment, what caused SIDOR’s demand for metalworking to extend outwards into the region, such that the development of an external metalworking sector became possible? Indeed, by asking this question I am touching on a central issue of backward linkages not addressed by the literature: time and

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18 This incidentally contradicts Hirschman’s observation that iron and steel industries had the highest combined backward and forward linkage potential. Hirschman’s appreciation derived from examining Chenery and Watanabe’s industrial linkage matrix for advanced industrial countries (1958). Perroux also believed that iron and steel had great propulsive strength (1988).
the path dependency associated with it. Backward linkages hinge on the opportunities afforded by a sudden increase in demand. Yet input production is not automatic; it takes time for potential suppliers to set up firms and acquire skills and technology. Like SIDOR and the steel mills mentioned above, large firms arriving to regions with no pre-existing suppliers must initially find other ways to satisfy their input requirements. In theory, their investments in these other means of supply should act as sunk costs that inhibit their demand for inputs from extending towards local suppliers. This indicates that to understand local backward linkage formation we should look not only at the initial demand imbalance caused by the large firm’s arrival, but to later events that cause the large firm’s demand to suddenly shift towards local sources of supply. In the case of Ciudad Guayana, what made state-owned SIDOR turn from vertical integration to local supply?

Outside observers argue that state-owned SIDOR turned to local procurement in order to promote local industry (APG 1997). Yet my research indicates that this is not a sufficient explanation. True, as state-owned enterprises elsewhere, SIDOR had the objective of helping to develop the Ciudad Guayana region, including local suppliers (Vernon 1985). Yet, in direct opposition to this development mandate, state-owned SIDOR plant managers resisted local procurement. Even though this resistance is contrary to what we would expect of state-owned enterprises, it turns out that state-owned steel mills at Vitória (Brazil) and Taranto (Italy) also resisted procuring metalworking parts and pieces from local suppliers (Villaschi and Santos de Deus 1998, Capriati 1991). As I found out in Ciudad Guayana, plant managers within steel firms resist local procurement out of fear that experimenting with unfamiliar suppliers for those
replacement parts and maintenance services crucial for the plant will cause failures that
damage other equipment or worse, halt production altogether. That state-owned steel
firms in three different countries would counter their development mandate underscores
the strength of these managers’ distrust towards local suppliers.

My finding that large-scale potential clients would resist local procurement and
thus inhibit local supplier development is not novel for the backward linkage literature.
Hirschman himself observed that in developing countries, established industrialists
tended to resist local procurement out of distrust for local suppliers’ capabilities (1971).
Similarly, the current literature on backward linkages documents unwillingness from
foreign firms established in LDCs to interact with local suppliers (Battat, Frank and Shen
1996, UNCTAD 2000). Yet while Hirschman worried about how to overcome this
resistance on the part of client firms, the current literature does not consider it a problem.
Still, as I explain later, this resistance largely determines the development possibilities of
the supplier sector.

How to overcome large firms’ resistance to local procurement? Hirschman offers
the suggestion of government pressure\(^\text{19}\). In fact, during import-substituting
industrialization, many developing countries used government pressure to coerce
transnational enterprises to procure locally, with detrimental effects according to some of
the literature\(^\text{20}\). Indeed, the backward linkage literature abstains from recommending any

\(^{19}\) Other than state action, Hirschman thought that another way to diminish established industrialists’
resistance to input-producing firms is if their inputs “occasionally experience curtailments, due to foreign
exchange shortages“. Since at the same time investment in backward linked industry requires foreign
exchange, Hirschman thought that alternating periods where foreign exchange is scarce and then abundant
is the best way to provide both the motivation and the means with which to invest in backward linked
industry (1971).

\(^{20}\) See Lall (1978) for a review of studies on the linkage effects from foreign direct investment in
developing countries. Lall himself observes that most studies only researched linkages superficially — in
majority of cases by measuring import-trends — yet concluded that wherever linkages formed, they emerged
demand-side intervention to increase local backward linkages precisely on the argument that these pressures resulted in inefficient local suppliers (Battat, Frank and Shen 1996). Interestingly, in the case of Ciudad Guayana, government pressure did not entirely overcome state-owned SIDOR’s resistance to local procurement. In the 1980s, and stimulated both by local politics and by national government pressure, the CVG required its holding enterprises to increase local procurement. SIDOR complied by executing an internal import-substitution program. At Taranto, Italy, a similar dynamic occurred. The state-owned steel firm Italsider increased ties to local metalworking firms following heavy political pressure (Capriati 1991, Piattoni 1999). Still, in both Ciudad Guayana and Taranto, political pressure was not enough to surmount plant managers’ resistance to local procurement. In the particular case of Ciudad Guayana, enduring pockets of resistance ended up curtailing SIDOR’s import-substitution drive from its full potential. At Taranto, Italsider’s continued resistance towards local suppliers meant that few local metalworking firms developed skills beyond that of metalworking maintenance (Capriati 1991).

Yet if political pressure alone cannot explain metalworking firms’ ability to overcome SIDOR’s resistance to local procurement, what can? Obviously, the different results between Ciudad Guayana and Taranto indicate that something other than political pressure is needed to reduce client firms’ resistance to local procurement. To avoid repetitiveness, I preview the answer in the next subsection.

due to protectionism and doomed to high costs and inefficiency. In other words, these studies’ results coincided with apriori expectations of the effects and vices of import-substitution.
**Puzzle 2:** What enabled metalworking firms to survive the change of ownership and increased pressures posed by SIDOR's privatization?

For some international and domestic authors, Ciudad Guayana embodies the failure of state-led development. Evaluations of the CVG’s action typically side with a mainstream literature discrediting large-scale, government-owned industrial investment of the type that occurred in Guayana (e.g. Enright, Francés and Saavedra 1996, Coronel 1995, Sweeney 1990). Indeed, almost throughout their history, most of the CVG enterprises, including SIDOR, encountered problems reaching their installed capacities, turning profits, and matching the productivity levels of similar firms around the world. Most authors acknowledge that neither Ciudad Guayana nor the heavy industries would have existed without the CVG. Yet observers argue that the enormous size of public investment distorted all kinds of economic and political incentives, which ended up affecting the performance of the CVG firms and those linked to it. As one author expressed it, Ciudad Guayana represents “a monument to the failure of the modernization paradigm” (Rakowski 2000: 9).

Since 1989, the Venezuelan government has attempted to inject dynamism to Ciudad Guayana and its enterprises by dismantling the political and economic structure that prevailed over the previous thirty years. Neoliberal reforms lie at the core of the package. At an economic level, the reform program seeks the privatization of the CVG enterprises. In effect, in December 1997 the Venezuelan government successfully sold the CVG’s steel mill Siderúrgica del Orinoco (SIDOR) to “Consorcio Amazonia”, a

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Latin-American consortium of private steel firms. SIDOR’s privatization symbolizes the demise of the modernization paradigm in Ciudad Guayana, as SIDOR was the first and the largest of the CVG enterprises. Other enterprises like CVG Fesilven and the aluminum complex have also been slated for privatization. From an administrative and fiscal standpoint, since 1989 the CVG has slowly transferred municipal service management and funds to the mayor’s office in Ciudad Guayana. Both privatization and the devolution of central to municipal authority have occurred within national efforts to restructure the state.

As we would expect, shortly after SIDOR’s privatization in December 1997, SIDOR’s new private-foreign managers severed links to local metalworking suppliers (Interviews, Rakowski 2000). This type of change following privatization is not uncommon. Research on how ownership changes impact supply structures finds that service links are usually “lost” to the suppliers of parallel services already used by the new parent firm” (Hoare 1985, p. 71). In Latin America, a number of studies researching the impact of trade liberalization, privatization and structural adjustment confirmed this observation. Foreign firms that acquired Latin-American state-owned enterprises during the 1990s tended to rupture existing supply structures, particularly of local engineering and technical services, preferring to hire foreign subcontractors (Cassiolato and Lastres 2000).

Note 22: The sales price of $2.3 bn was 50% above the asking price. The CVG retained 30% of SIDOR’s shares for a subsequent public offering to the company’s workers, which up to the current date has not happened. The 70% of the shares that Consorcio Amazonia bought were distributed in the following manner: 28% to Grupo Techint (Argentina), 21% to Hylsa (Mexico), 14% to Sivensa (Venezuela) and 7% to Usiminas (Brazil) (INGBarings 1997). The CVG’s shares give it no voting rights.

Note 23: The national government chose to privatize SIDOR first because 1) it had a big international debt burden which weighed down the government, 2) SIDOR needed money to invest in automatization technology to keep up with other steel firms around the world, but given its debt burden, the company itself could not provide this capital, 3) from the CVG enterprises, it was the best managed. Therefore, the government considered that SIDOR’s sale would give a good image for the privatization of the other CVG firms (EJ 05/01, ARL 07/01, Newspaper articles, ING Barings 1997).
2000, Katz 2000). At Taranto, a similar break-up between Italsider and local suppliers followed the former’s privatization (n.a. 1998).

What is surprising from the case of Ciudad Guayana however is how quickly local metalworking firms reconnected to private-foreign SIDOR. Indeed, in February 1999, a bit over a year after privatization, local metalworking firms signed a pact with private-foreign SIDOR, which among other things committed the steel firm to increase local metalworking procurement (ACES 1999). Moreover, following SIDOR’s privatization, metalworking firms quickly tapped other markets outside Ciudad Guayana. By 2001, those firms that prior to privatization had been most active within AIMM-Guayana (the local metalworking business association) had been capable of either diversifying their sales away from SIDOR, making different products, or both.

Local metalworking firms’ ability to reconnect to private-foreign SIDOR shows not only good mediation skills, but also that the sector had developed acceptable quality and price standards in the former state-owned period. These two capabilities contrast starkly to those of local suppliers surrounding the steel mill Italsider, at Taranto (Italy). First, local Tarantine metalworking firms failed to upgrade their technological capabilities and reduce their market dependency on Italsider prior to its privatization (Capriati 1991, Piattoni 1999). Moreover, in contrast to Ciudad Guayana, the business associations representing local suppliers at Taranto antagonized Italsider’s new private owners, instead of mediating a solution to the conflict (n.a. 1998).

Indeed, firms in Ciudad Guayana invested significantly in technology and market diversification prior to SIDOR’s privatization, and in fact, during their relationship to state-owned SIDOR. But what can explain this, especially given the characterization of
Ciudad Guayana as a basket case? In theory, state-owned SIDOR as a government enterprise charged with local development should have had low requirements of the local metalworking sector. Privatization should have rid SIDOR of economic distortions, placing greater competitive pressures on its backward linked sectors (APG 1997). Yet in this case, the technical deficiencies local metalworking firms started out with were on their way to resolution before privatization.

The Guayanese metalworking sector’s development of technical and marketing skills prior to privatization raises the question of what causes suppliers to develop skills. In focusing on the supply-side deficiencies that thwart supplier development, the current backward linkage literature implicitly acknowledges this question as important. Yet in focusing solely on supply-side variables, this literature misses half the picture. For example, up to now I have described two government led, steel-centered cases, one at Taranto (Italy) and the other at Ciudad Guayana. In both cases, the steel mills resisted local procurement. In both cases, politics played a role in overcoming resistance. In Ciudad Guayana, through their relationship with SIDOR, metalworking firms evolved from providing industrial maintenance to manufacturing complex metalworking inputs. In Taranto, few metalworking firms progressed in this way. If anything, Taranto, a city with a previous industrial and metalworking history, had a supply-side advantage over newly created Ciudad Guayana. Why then did metalworking firms evolve in Ciudad Guayana and not in Taranto? Obviously, supply-side conditions alone cannot explain this difference.

This dissertation contends that the type of customer-supplier relations that metalworking firms in Ciudad Guayana developed with state-owned SIDOR, their close
ties to political actors in Ciudad Guayana, and their ability for collective action gave local suppliers both the motivation and resources to deepen their technical and marketing skills. Interestingly, these three institutions (customer supplier relations, embeddedness, collective action) emerged from metalworking firms’ activity of building backward linkages. In contrast, the inability of Taranto’s metalworking firms to strike long-term relationships with Italsider and their weak associationalism stumped Tarantine metalworking firms’ development (Capriati 1991).

**Backward linkages: easier than other types of linkages?**

In contrast to the development of backward linkages in Ciudad Guayana, no forward linked industries ever emerged there. Ciudad Guayana’s industrial activity still centers on the production of hydroelectric power, steel and aluminum, and neither the expected downstream industries such as automobiles nor the consumer goods industries such as clothes, food processing and furniture making ever arrived. Today almost everything, from cars to lettuce, comes from the most industrialized Venezuelan regions along the Northern Central Coastline. Moreover, despite different attempts by the CVG

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24 Steel and aluminum could be considered as forward linked industries to the local hydroelectric power facilities that the CVG started building in the 1960s and continues building to this day. Had these hydroelectric power plants not existed, neither the steel mill nor the subsequent aluminum smelters of Ciudad Guayana would have been feasible, as these firms demand huge amounts of electrical power. The CVG’s hydroelectric power generation firm EDELCA currently operates three facilities that together produce 12,900 megawatts of electricity (CVG 1996), supply 70% of Venezuela’s energy consumption, and export power to Northern Brazil.

25 The failure of agriculture is particularly disappointing given that the CVG invested heavily on research on the agricultural and animal husbandry (water buffalo!) potential of the Orinoco Delta and in 1967 built a system to protect a portion of 170,000 hectares of this delta from periodic inundations. The agricultural and animal husbandry program was one of the most polemic of those that the CVG ever carried out, and was finally abandoned (Martinez Guarda 1996). From being in the field, my hunch is that conflicts over land tenancy make it risky for would-be farmers to cultivate promising areas close to Ciudad Guayana.

26 Similar to growth pole experiments elsewhere, consumer goods industries in Ciudad Guayana succumbed to competition from firms in older industrialized Venezuelan regions. (See Graziani (1978) for an explanation of how the increased employment created by large-scale investment in the Italian South failed to develop local consumer goods industries because these succumbed to competition from the more developed Northern Italian firms.)
to stimulate investment in machinery and tractor producing firms, forward linked industry
never took off in Ciudad Guayana because of the city’s distance from consumer
markets.

This contrast appears to fulfill initial theories of backward linkages as being easy,
and particularly easier than other types of linkages. Hirschman (1958) had posed that
forward linkages as only “permissive” in the sense that the output of a large-scale firm
may stimulate further processing in a downstream industry. Yet forward linked
investment might not happen if there are no markets for these downstream industries’
products. On the other hand, backward linkages are easier because the market problem
resolves itself: a prior working industry – steel in this case – guarantees a market for
supplies. In line with the belief of backward linkages as easy, those observing Ciudad
Guayana’s metalworking sector often describe its development as a “natural”
consequence of the demand of the city’s steel and aluminum mills (Rodríguez 2001,

Yet the development of this backward linked sector was not easy. First, a close
look at the development trajectory of Ciudad Guayana’s metalworking sector reveals that
these firms had to collectively surmount significant resistance on the part of its main
customer in order to develop. In contrast to a literature portraying state-owned enterprises

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27 In effect, the main markets for these goods lie 500 miles away in the Center North coastal areas
surrounding Caracas, where more than two thirds of the Venezuelan population lives. Most of the industries
manufacturing these goods (transnational) were already located or preferred to locate in the older industrial
“belt” going from Caracas to Valencia. There they were close to consumers and to the administrative seat
of national government in Caracas, where all decisions on tariffs, local content requirements and such were
made. At the time, Valencia sought to attract industry away from Caracas with one of the best-organized
industrial promotion programs in the country (Friedmann 1969). This also provided a powerful location
incentive to would-be investors. The CVG “bowed over” to this powerful locational driving force and
actually helped finance at least 2 companies in Valencia. These firms constitute a forward linkage to the
aluminum sector, for they manufacture automobile wheels – B.W.A. de Venezuela and Ruedas de
Aluminio C.A. (RUALCA). However, they lie outside our region of interest.
as promoting the development of national suppliers, state-owned enterprises in Ciudad Guayana and SIDOR in particular resisted local procurement. This demand-side obstacle to the development of local suppliers contradicts the original conception of backward linkages as easy or automatic. Moreover, it underscores how problems with the market can become an obstacle in building backward linkages, an area of inquiry that today’s literature, following the compelling logic of backward linkages, takes for granted.

Second, every step of the metalworking sector’s development, from plant construction to industrial maintenance, and subsequently to the repair and manufacture of parts and equipment, hinged on the structure of customer-supplier relations that the sector had with SIDOR. Inter-industry governance structures determined whether metalworking firms progressed up the next step in the skill and capital investment hierarchy. Short-term ties to SIDOR permitted only industrial maintenance. When metalworking firms were able to mediate more long-term, cooperative relations, they were also able to invest in the fixed capital and skill acquisition to produce more sophisticated services. Currently, the literature on backward linkages focuses solely on supply-side aspects. Because of the perceived failure of import-substituting industrialization, the backward linkage literature has given up on regulating demand. Yet in abandoning demand-side variables, this literature fails to recognize how demand and supply interact; in particular, how the shape of the customer-supplier relation affects local firms’ supply-side response. The advantage of focusing on customer-supplier relations is that they offer ways to stimulate local supplier investment without protecting them excessively, or placing unreasonable burdens on the client firm. This format radically differs from that of import-substituting
industrialization, where suppliers often enjoyed full protection and client firms bore the brunt of their inefficiency.

Finally, local suppliers in Ciudad Guayana actively participated in forging the customer-supplier relation that worked to both their and state-owned SIDOR’s advantage. They did so by using their business association AIMM-Guayana to mediate conflicts inherent to customer-supplier relations. Interestingly, local suppliers’ collective action abilities became stronger precisely because of AIMM-Guayana’s mediation of the customer-supplier relation. This picture of local suppliers as helping to shape the customer-supplier relations contrasts with the literature on backward linkages, which does not give local suppliers any room for agency. Moreover, it provides food for thought to the collective action literature, which normally does not notice how social capital or associationalism sometimes emerges from resolving conflicts (Tendler and Schmitz 1999).

iii. Research Methods

The case of Ciudad Guayana offered the opportunity to make interesting comparisons about the process of developing backward linkages. These comparisons led my fieldwork. First, there was the obvious contrast between state-owned SIDOR’s relationship to local metalworking firms and private-foreign SIDOR’s. Yet even within state-owned SIDOR’s relation to local suppliers, there was further opportunity for contrast. For example, metalworking firms that specialized solely in metalworking maintenance had a different relationship with state-owned SIDOR and a different (worse) trajectory following privatization than those that evolved into manufacturing. Those firms actively participating in the industrial chambers during the 1990s tended to invest
more in technological upgrading and market diversification that those that had not, and consequently to do much better after privatization.

The fieldwork part of the research involved more than 8 months spent in Ciudad Guayana and more than 120 interviews. I include a table detailing the number of interviewees in each category at the end of this introduction. Aside from these interviews, I participated as an observer in several of the meetings held at the metalworking firms’ business organization AIMM-Guayana, including three meetings of the Steel Alliance (the institution that metalworking firms developed with private-foreign SIDOR) and one of the workshops for DECATEC (a program to develop the sector’s technological capabilities).

I conducted open-ended interviews on the most part. I considered applying a survey to metalworking firms but desisted after trying out a pilot survey on two firms. I realized that although I needed to gather standardized information on these firms’ characteristics like employees, age, and technical background of the entrepreneur, I made much better use of the interviews by asking open-ended questions about each particular firm’s development trajectory. I used a “snowball” methodology to locate fruitful interviewees. There could be some selection bias in my choice of metalworking entrepreneurs, as I tried to interview the more successful firms. However, towards the end

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28 I interviewed 3 current and 7 former CVG managers, 13 former state-owned SIDOR managers, 11 current and 2 former private-foreign SIDOR managers, 26 local metalworking entrepreneurs and 6 executive managers, 2 current and 4 former consultants to the metalworking sector. In Ciudad Guayana’s business associations, I interviewed 9 former directors, 4 executive managers and 3 current board members. Of supporting institutions, I interviewed 2 managers and 1 former director of the local government run vocational training institute (INCE), 2 former managers of the local technology development institute (FUNDACITE-Guayana), 1 former director of the national technology development institute (CONICIT), 2 former presidents of the government organization funding many of Ciudad Guayana’s enterprises (FIV), 2 former managers of the government fund promoting the development of the capital goods industry (FONDIBIECA), and the director of a local bank. At the city government level, I interviewed 1 former mayor, 1 former executive manager and 1 consultant.
of my research, I also interviewed firms that ran out of business following SIDOR’s privatization. Most of my interviews with entrepreneurs occurred at their place of work and included a tour of the firm.

In every important category – e.g. state-owned SIDOR, private-foreign SIDOR, local metalworking firms, the CVG, and the industrial associations – I was fortunate enough to find key informants whom I interviewed more than once. With some of these informants, the interviews extended over three hours. Upon my return to Cambridge, I still conducted interviews over the phone.

Apart from the interview material, I conducted archival work to confirm or disconfirm my more general findings. I consulted the CVG library, SIDOR’s library, the CVG’s Industrial Promotion Library, Edgar Yajure’s library, and the archives of both AIMM-Guayana and the CIMG (the two industrial associations significantly representing metalworking firms). Moreover, I visited central office for statistics and information (OCEI) to gather industry data. I also searched the historical archives of the national newspaper El Universal.

iv. Outline of the dissertation

The chapters of this dissertation provide a picture of the technical evolution of the metalworking sector over time: from plant construction to metalworking maintenance in the 1970s, and from maintenance to manufacturing and repairing parts and equipment in the 1980s. At the end of the progression are firms’ specialization and market diversification efforts of the 1990s, both in preparation for and in response to SIDOR’s privatization. More importantly, the chapters discuss categories of arguments that can and cannot explain the observed changes at each point in time.
Chapter 1 deals with the structural variables that could explain the first rise of the metalworking sector in a region as desolate as the Ciudad Guayana of the 1970s. In this chapter I discuss how the local demand for inputs, trade, and industrial sector cannot explain the development of a local metalworking industry in Ciudad Guayana. Rather, I zero in on the circumstances that first provided metalworking firms an opportunity to develop skills, and then cast SIDOR’s eyes to the possibility of local procurement. This discontinuity came about with SIDOR’s fourfold expansion in the mid 1970s. The chapter describes a technological sequence intrinsic to metalworking that promotes “easy” backward linkages: that of plant construction to metalworking maintenance.

Chapter 2 deals with the question of why firms upgraded during the 1980s from maintenance to the production and repair of parts and equipment. This chapter explores the obvious political explanation that state-owned SIDOR engaged in upgrading local metalworking firms because of its role as a state-owned enterprise. Moreover, in this chapter I also examine the extent to which the CVG promoted backward linkages to fulfill its mandate to develop Ciudad Guayana.

I find that politics did influence the development of metalworking firms, yet not in the expected form. A government mandated import-substitution program required SIDOR to increase its level of local procurement. Local metalworking firms’ lobby constituted an additional pressure. This political dynamic forced SIDOR to implement an import-substitution program despite the resistance of its operations personnel. In the end, SIDOR’s import-substitution drive had short-lived results, because it did not offer local metalworking firms a sustained market for the substituted parts and products. Rather, a
particular procurement system that surged at the margins of the import-substitution program allowed the development of the sector.

_Chapter 3_ looks into the governance of customer-supplier relations to examine why this particular local procurement system enabled the development of the local metalworking sector. I find that key to the functioning of this system was the mediation of AIMM-Guayana in the procurement relation between SIDOR and local metalworking firms. Collective mediation solved conflicts of interest inherent to the customer-supplier relation. Moreover, collective mediation enabled a transparency in the contract allocation and pricing process that focused firms’ efforts on upgrading, rather than on rent seeking. As an added, unforeseen effect, AIMM-Guayana’s mediation in this “second Open PO” system increased this industrial chamber’s ability to address supply-side deficiencies affecting the sector collectively.

_Chapter 4_ examines the question of why metalworking firms initiated restructuring (meaning technological specialization and market diversification) prior to SIDOR’s privatization. I find that economic arguments can partly explain this shift. Namely, in the early 1990s state-owned SIDOR itself went through an industrial reconversion program that lowered demand for metalworking firms’ product yet increased its requirements of local metalworking firms. Yet in parallel, significant changes in the political superstructure in Ciudad Guayana dispersed an ideology of becoming independent from the CVG’s state-owned enterprises. Metalworking firms’ embeddedness within this superstructure gave them both the motivation to restructure and provided resources to do so. Curiously, metalworking firms’ embeddedness resulted from their efforts to build backward linkages during the previous two decades.
Chapter 5 examines the shifts in the relationship between metalworking firms and private-foreign SIDOR shortly after privatization. As in other privatization experiences, immediately following privatization private-foreign SIDOR cut ties with local metalworking firms. Yet the metalworking sector turned this situation around relatively quickly using mechanisms similar to those it used during state-owned SIDOR period. Namely, private-foreign SIDOR needed government assistance to confront a severe crisis following privatization. For various reasons, this assistance seemed unlikely. This gave metalworking firms the opportunity to present themselves as allies in the process of seeking this assistance from government.

Chapter 5 also compares and contrasts process through which metalworking firms built relationships to state-owned SIDOR and to private-foreign SIDOR. Surprisingly, these processes offer enough similarities to indicate generic problems and solutions to backward linkages. In particular, common to both processes are the political dynamics that accompany the first linkages, the importance of organizations of collective interest in mediating developmental customer-supplier relations, and the impact of the form of procurement on collective action.

In the conclusion I discuss how the case of Ciudad Guayana modifies current understanding of building backward linkages. First, backward linkages do not seem to occur automatically. On the contrary, in Ciudad Guayana, both state-owned SIDOR and private-foreign SIDOR resisted local procurement. Their resistance mimics that of other large firms documented in the literature. This resistance, combined with the lack of markets in lagging regions, creates a downward spiral that disincentivates supplier upgrading and further reinforces large firms’ unwillingness to procure locally.
The case of Ciudad Guayana offers a way to escape this Catch 22 cycle that is different from traditional accounts of government pressure à la import-substitution. While political pressure helped local firms forge connections to both state-owned SIDOR and private-foreign SIDOR, it is not enough to explain the sector’s upgrading. Rather, the customer-supplier relation that developed between state-owned SIDOR and local firms, which blended long-term commitment with competition, provided correct incentives for suppliers to invest in their own development. Such a progressive relationship became possible through the mediation of the industrial association representing the metalworking sector, AIMM-Guayana. At the same time, AIMM-Guayana’s mediation of the customer-supplier relation strengthened this collective organization’s ability for collective action. Finally, in the process of building backward linkages, AIMM-Guayana forged close ties to other political actors in Ciudad Guayana. These ties allowed the metalworking sector to obtain both the resources and motivation to restructure prior to privatization.
v. Appendix 1 – The metalworking sector in figures

Relationship with SIDOR

Figure v.1. Formal employment in the Guayanese Metalworking sector against SIDOR’s volume of production


Table v.1. Main events affecting SIDOR and the metalworking firms

<table>
<thead>
<tr>
<th>Year</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1974–1980</td>
<td>SIDOR quadruples its production capacity from 1 MM tons to 4 MM tons. Construction of Venalum, expansion of Alcasa</td>
</tr>
<tr>
<td>1983–1989</td>
<td>Import-substitution drive within the CVG enterprises</td>
</tr>
<tr>
<td>1987–1997</td>
<td>SIDOR develops long-term commitment, open procurement system with metalworking firms</td>
</tr>
<tr>
<td>1989 (regional level)</td>
<td>Causa R, a local political party with labor roots, wins mayoralship of Ciudad Guayana and governorship of the state of Bolívar in Venezuela’s first direct elections for local government.</td>
</tr>
<tr>
<td>1994–current</td>
<td>Metalworking firms engage in collective attempts at upgrading, reconversion, penetrating other geographical markets.</td>
</tr>
<tr>
<td>1996</td>
<td>Venezuela opens petroleum sector to foreign exploration and exploitation of marginal fields.</td>
</tr>
<tr>
<td>December 1997</td>
<td>SIDOR’s privatization</td>
</tr>
</tbody>
</table>
2. Metalworking sector against the rest of Guayana’s industries

Figure v.2. Gross Output in the Guayanese Metalworking, Steel and Aluminum Industries

Guayanese metalworking industry has always been Guayana’s largest private industrial sector. This changed in 1997 with SIDOR’s privatization. SIDOR now became the largest private industry in Guayana.
Figure v.3. Guayana’s Industrial Employment (1975-1997), excluding aluminum and steel

3. Guayana’s metalworking sector against National metalworking industry

Except for the years in which SIDOR restructured in some way or another (1983, 1992-1994, 1997) the metalworking sector in Guayana performs better in employment terms than does the Venezuelan metalworking sector.

Figure v.4. Employment in the Venezuelan Metalworking Sector
Figure v.5. Guayanese metalworking industry against the national metalworking industry, percent changes in employment


4. Guayana’s metalworking sector after 1997

From 1994 onwards the CVG ceased making censes of regional industry; the national information and statistics center OCEI also ceased counting industry after 1997. These post-1997 data come from trimester surveys that the CVG conducts of a sample of each of Guayana’s industrial sector. These surveys are meant to capture each sector’s change in prices, placed orders, employment, and finished products with respect to the previous trimester. Note that while production at Guayana’s basic aluminum and steel industries (including SIDOR) fluctuates widely in the period 1997 – 2000, the orders placed in the Guayanese metalworking industry are relatively stable. This I take as evidence of the ability of Guayana’s metalworking sector to diversify markets away from the large-scale, aluminum and steel processing industries in Guayana.
Figure v.6. Guayanese Steel and Aluminum Industries: Production Trends

![Graph showing production trends from 1997-I to 2000-IV. Key: ■ Increased Production ■ Stable Production ■ Decreased Production.]

Figure v.7. Orders Placed in the Guayanese Metalworking Industry

![Graph showing order trends from 1997-I to 2000-IV. Key: □ Increased Orders □ Stable Orders □ Decreased Orders.]

vi. Appendix 2 – Categories of interviewees

<table>
<thead>
<tr>
<th>Category</th>
<th>Positions</th>
</tr>
</thead>
<tbody>
<tr>
<td>CVG</td>
<td>3 Former Presidents</td>
</tr>
<tr>
<td></td>
<td>1 Former VP of Industrial Planning</td>
</tr>
<tr>
<td></td>
<td>3 Former VPs of Industrial Promotion</td>
</tr>
<tr>
<td></td>
<td>1 VP of Commercialization</td>
</tr>
<tr>
<td></td>
<td>2 Industrial Promotion Directors</td>
</tr>
<tr>
<td>State-owned SIDOR</td>
<td>2 Former Presidents</td>
</tr>
<tr>
<td></td>
<td>1 Former VP Operations</td>
</tr>
<tr>
<td></td>
<td>1 Former VP Purchases</td>
</tr>
<tr>
<td></td>
<td>2 Former Purchase Managers</td>
</tr>
<tr>
<td></td>
<td>1 Former Purchase Officer</td>
</tr>
<tr>
<td></td>
<td>1 Former Maintenance Director</td>
</tr>
<tr>
<td></td>
<td>1 Former Central Workshop manager</td>
</tr>
<tr>
<td></td>
<td>1 Former R&amp;D Manager</td>
</tr>
<tr>
<td></td>
<td>1 Former Quality Control Manager</td>
</tr>
<tr>
<td></td>
<td>1 Former ISI Director</td>
</tr>
<tr>
<td></td>
<td>1 Former Quality Control Officer</td>
</tr>
<tr>
<td>Private-foreign SIDOR</td>
<td>1 VP of Planning</td>
</tr>
<tr>
<td></td>
<td>1 VP of Purchases</td>
</tr>
<tr>
<td></td>
<td>3 Purchase Managers</td>
</tr>
<tr>
<td></td>
<td>1 Former Plant Manager</td>
</tr>
<tr>
<td></td>
<td>1 Former Maintenance Manager</td>
</tr>
<tr>
<td></td>
<td>2 Institutional Relations Director</td>
</tr>
<tr>
<td></td>
<td>2 Quality Control Officers</td>
</tr>
<tr>
<td></td>
<td>2 Purchase Officers</td>
</tr>
<tr>
<td>Metalworking Firms</td>
<td>26 Metalworking firm owners</td>
</tr>
<tr>
<td></td>
<td>6 Quality Control directors or Executive</td>
</tr>
<tr>
<td></td>
<td>Managers</td>
</tr>
<tr>
<td>Consultants to the Metalworking Sector</td>
<td>2 Technology Development Consultants</td>
</tr>
<tr>
<td></td>
<td>1 Quality Control Consultant</td>
</tr>
<tr>
<td></td>
<td>2 Organizational Development Consultants</td>
</tr>
<tr>
<td>Cámara de Industriales y Mineros de Guayana (CIMG)</td>
<td>4 Former Directors</td>
</tr>
<tr>
<td></td>
<td>1 Executive Manager</td>
</tr>
<tr>
<td>Asociación de Industriales Metalúrgicos y Mineros Guayana (AIMM-Guayana)</td>
<td>3 Former Directors</td>
</tr>
<tr>
<td></td>
<td>3 Former or actual participants of the board</td>
</tr>
<tr>
<td></td>
<td>of directors</td>
</tr>
<tr>
<td></td>
<td>1 Executive Manager</td>
</tr>
<tr>
<td>National AIMM</td>
<td>1 Executive Manager</td>
</tr>
<tr>
<td>Asociación de Pequeños y Medianos Empresarios (ASOPEMIA)</td>
<td>2 Former Directors</td>
</tr>
<tr>
<td></td>
<td>1 Executive Manager</td>
</tr>
<tr>
<td>Organization</td>
<td>Positions held</td>
</tr>
<tr>
<td>------------------------------------------------------</td>
<td>---------------------------------------------------</td>
</tr>
<tr>
<td>Cámara de Comercio de Guayana</td>
<td>1 Executive Manager</td>
</tr>
<tr>
<td>Instituto de Capacitación Empresarial (INCE)</td>
<td>1 Director</td>
</tr>
<tr>
<td></td>
<td>1 Former instructor and director</td>
</tr>
<tr>
<td></td>
<td>1 Former instructor and consultant</td>
</tr>
<tr>
<td>Banks</td>
<td>Director of Banco Guayana</td>
</tr>
<tr>
<td>FUNDACITE-Guayana</td>
<td>1 Former Director</td>
</tr>
<tr>
<td></td>
<td>1 Former Executive Manager</td>
</tr>
<tr>
<td></td>
<td>1 Former President of CONICIT</td>
</tr>
<tr>
<td>City government (Almacaroni)</td>
<td>1 Former mayor</td>
</tr>
<tr>
<td></td>
<td>1 Executive Manager</td>
</tr>
<tr>
<td></td>
<td>1 Consultant</td>
</tr>
<tr>
<td>Fondo de Inversiones de Venezuela</td>
<td>2 Former Presidents</td>
</tr>
<tr>
<td>Fondo de Desarrollo de la Industria de Bienes de Capital (FONDIBIECA)</td>
<td>2 Former Managers</td>
</tr>
<tr>
<td>Aluminum Sector</td>
<td>1 Former VP of Venalum</td>
</tr>
<tr>
<td></td>
<td>1 Former Manager of Bauxiven</td>
</tr>
</tbody>
</table>
Chapter 1: Technical considerations and “easy” first backward linkages

When we evaluate the technical characteristics of Ciudad Guayana’s first industries with the literature on backward linkages, the existence of Ciudad Guayana’s metalworking sector comes as a surprise. In effect, the steel, hydroelectric power and aluminum firms that the CVG first erected with growth pole expectations have all the characteristics that current research links to a low likelihood of backward linkages. First, these firms are in raw material processing sectors, which have an intrinsic low likelihood of outsourcing (Battat, Frank and Shen 1996)\(^{29}\). Second, these firms are large, technically sophisticated, and have traditionally been externally controlled (headquarters in Caracas, even for private SIDOR), characteristics which decrease the likelihood of localized backward linkages (Hoare 1985). Third, Ciudad Guayana’s origins as a truly lagging region – a place where virtually nothing existed except a fishing village and two foreign encampments mining iron ore directly abroad – meant that it lacked vocational schools, training institutes, technology support centers, R&D, and testing laboratories. This lack of access to skills and technology would have inhibited localized backward linkages even in industries using many components like automobiles (UNCTAD 2001, Battat, Frank and Shen 1996). Finally, despite Ciudad Guayana’s remoteness, it has, through various means, remained open to trade from both other regions in Venezuela and from other countries. Ease of trade typically inhibits the development of localized/domestic backward linkages (Battat Frank and Shen 1996, Weisskoff and Wolff 1977).

\(^{29}\) This contrasts to Hirschman’s original observation of steel as having the highest combined likelihood of forward and backward linkages (Hirschman 1958). Hirschman based his analysis on a table produced by Chenery and Watanabe, which quantified the extent of backward and forward linkages for developed countries (Weisskoff and Wolff, 1977).
In spite of the literature’s predictions, I found that the technical characteristics of Ciudad Guayana’s large steel and aluminum firms did not eradicate the possibility of localized backward linkages. Rather, these same technical characteristics helped Ciudad Guayana’s metalworking sector develop, yet in a surprising way. Specifically, the plant construction and plant expansion work carried out in Ciudad Guayana during the 1970s provided local firms with an opportunity to enter the metalworking sector. First, in what seems to be an “easy” technological sequence, this work provided local firms with technical experience in the metalworking maintenance trade. Second, this work also provided local metalworking firms opportunities to network with their would-be employers at the end of the construction work. Interestingly, this sequence also occurred in the initial development of metalworking firms around another steel-based growth pole experiment in Taranto, Italy.

In the rest of the chapter, I first analyze the structural reasons why we would not expect to see backward linkage development in Ciudad Guayana. Then I explain the dynamics that accounted for the emergence of a local metalworking sector, and how it mimics that of Taranto’s. Finally, I explain why we do not witness the same dynamics between metalworking firms in Ciudad Guayana and the CVG’s aluminum firms.

1.1. From the structural variables at play in Ciudad Guayana, we would expect few localized backward linkages

Initially, few subcontracting opportunities available because few local metalworking firms

Studies researching why foreign firms arriving to developing countries tend to procure so little locally argue that these firms react to the dearth of locally efficient suppliers. According to these studies, local suppliers simply cannot meet the price and quality requirements of these foreign firms. Local suppliers’ deficiencies typically stem
from a weak or unsupportive institutional structure, including poor access to finance and
technology, discriminatory tax structures, or deficient infrastructure (Battat, Frank and

The first two CVG firms to operate in Ciudad Guayana (SIDOR in 1962 and
ALCASA in 1967\textsuperscript{30}) found themselves arriving to an environment that was an extreme
version of this situation. While SIDOR and ALCASA were government-owned, and not
foreign as in the above-mentioned studies, upon their arrival to Ciudad Guayana they not
only found a complete absence of local suppliers, but also had to adapt to an environment
that lacked even the basic infrastructure to make managers' lives tolerable.

Indeed, the Ciudad Guayana of the 1960s lacked all the basic amenities. In 1961,
the city had no telephone, and scarce housing, water supply, schools, roads, health
services, wholesale and retail trade, storage and warehouse capacity, and recreational
facilities:

Ciudad Guayana “lacks at the outset the basic foundations needed for urban and
regional development: a trained workforce of technicians and workers, established
community relations and loyalties, consumer and business facilities (…) Most
costs tend to be high, almost no amenities exist, and living conditions are bleak”
(Rodwin 1969, p. 9).

This lack of infrastructure was so serious, that it made it difficult for the CVG to
attract the technicians, professionals and businessmen needed to run the city’s state-
owned enterprises and start the envisioned upstream and downstream industries (Alamo
and Ganz 1969a).

Even a decade later, in the 1970s, living conditions in Ciudad Guayana were still
very precarious. For example, a mechanical engineer who had arrived to Ciudad Guayana

\textsuperscript{30} SIDOR started operation in 1962 at an output of 750,000 metric tons of steel per year, ALCASA in 1967
at an output of 12,000 metric tons of aluminum per year (Martínez Guarda 1996, CVG 1997).
in the 1970s told me that his first meal upon arrival was a chicken roasted in a hole in the
ground (Metalworking Entrepreneur (JU 7/2001)). Another successful metalworking
entrepreneur, an Argentine who moved to Ciudad Guayana in the 1970s and today owns
several firms, including a local bank, told me:

“When I arrived to Ciudad Guayana in the 1970s with an Argentine company that
was performing work for SIDOR for Plan IV, my first impression upon arrival
was that I wouldn’t be able to stay here, so precarious were living conditions in
the city. I called my wife in Argentina and asked her to cancel the moving
arrangements, but she had already shipped all our belongings in a container and
there was nothing to be done. Today I’m happy that her rush forced me to stay”
(OG, 8/2001).

In this environment of precarious physical infrastructure, it was very difficult for
local suppliers of any kind—even simple services like transportation, food provision and
cleaning—to arise. Ciudad Guayana’s state-owned enterprises coped with this situation
by vertically integrating the provision of every service, not just metalworking. For
example, state-owned SIDOR even built a food processing plant to attend the food
requirements of its employees (Ex State-owned SIDOR Manager (NN 7/2001)). With
respect to the metalworking services that are the subject of this dissertation, state-owned
SIDOR built an internal workshop and became self-sufficient in metalworking
maintenance and repairs (Ex-state-owned SIDOR manager (OM 8/2001)).

“When SIDOR was created, it was created with the idea of self-reliance because
there was nothing in the region. SIDOR’s Central Workshop covered one and a
half hectares and it had all the necessary machinery to repair locomotives,
“grúas”, and anything else. It had an electrical workshop, a foundry, a mechanical
workshop, and more.” (Ex-state-owned SIDOR Manager (IS 7/2001)).

State-owned SIDOR’s decision to internalize repairs and maintenance is similar to
that of other steel enterprises in the 1950s and 1960s. For example, in the 1960s,
Brazilian state-owned steel mill Usiminas, arriving to Ipatinga (Minas Gerais), also built
an internal workshop to serve its metalworking maintenance and repair needs (FB
Italsider, an Italian state-owned enterprise located at Taranto (Southern Italy), also internalized metalworking repairs and maintenance during the 1960s (Masi 1982). SIDERAR, a steel firm in the city of San Nicolás, 200km. away from Buenos Aires, was another example of self-sufficiency in metalworking repairs and maintenance until its restructuring in the late 1980s (Techint manager (PM 11/01)).

In part, these steel firms may have adopted Fordist practices popular in the 1950s and 1960s. For example, in those days, even automobile firms produced many of their critical components internally. In contrast, today’s automobile industry epitomizes the 1990s post-Fordist practices of decentralizing the manufacturing of parts and components (Helper 1991). Yet aside from practicing the Fordist ideas prevalent of the time, steel firms’ vertical integration of metalworking repairs and maintenance may have also responded to the supply conditions of the places where these firms located. For example, like SIDOR, Italsider and Usiminas located close to either iron ore mines (Ipatinga) or to shipping ports (Taranto). As in Ciudad Guayana, these locations did not necessarily have the industrial infrastructure to supply the firm with external metalworking repairs and maintenance services.

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31 USIMINAS’ internal workshop over the years became so large that it became a separate firm: USIMEC. USIMEC still belongs to USIMINAS, yet a large part of its activity is separate from that of the steel mill. Today, USIMEC builds steel, nuclear, and hydroelectric power plants, and has become the largest Brazilian-owned metalworking company in Brazil. (Usually however USIMEC does the less complex metalworking jobs and buys the technology abroad). (FB 04/02).

32 See Baer (1969) and Montero (2002) for an account of the location choice of Usiminas in Ipatinga, and Capriati (1991) for that of Italsider at Taranto.

33 Curiously, Taranto used to have a very important naval and military industry during the WWII years. Therefore, in theory some sort of metalworking infrastructure should have remained after these industries’ demise in the 1950s. Capriati (1991) however explains that most skilled workers immigrated to northern Italy following the end of the war. Upon the arrival of Italsider, the city had few skilled workers.
Easy inter-regional and international trade provided no need for local input suppliers

While vertical integration provided a response for non-tradables such as metalworking maintenance and repair\(^\text{34}\), how did SIDOR and the other CVG holding firms solve for the provision of metalworking parts and equipment? In effect, the high temperatures inherent to the production of steel and aluminum wears down equipment quickly, which means that these firms need to have a ready solution to the problem of spare parts. How did Ciudad Guayana’s large metal-processing firms – e.g. SIDOR, Alcasa and Venalum – satisfy the need to replace equipment and parts within the existing conditions of poor infrastructure?

Relatively easy interregional and international trade, coupled with high inventories, allowed Ciudad Guayana’s large firms to cope with the lack of local parts and equipment suppliers during the 1960s and 1970s. In surprising contrast to the rest of Latin-American countries, which had employed import-substitution policies during the 1960s and 1970s, Venezuela had kept an environment of relatively low import tariffs in those decades. In 1939, Venezuela had signed a Treaty of Commercial Reciprocity with the United States that imposed tariff limits on consumer and intermediate goods. Between 1961 and 1963, for example, the average tariff surcharge was only 21.6\%, and high tariffs only applied to products that represented less than 5\% of imports. Moreover, durable consumer goods, raw materials and capital goods not produced in Venezuela were exempt from import duties\(^\text{35}\) (Pérez Sáinz and Zarembka 1979). The Bolívar’s overvaluation up to the first major devaluation in 1983 further boosted imports.

\(^{34}\) Despite the non-tradable aspect of repairs and maintenance, not all maintenance and repairs could be done locally. For example, some transformers were sent to Brazil to be repaired because the technology required did not exist in Ciudad Guayana (Ex state-owned SIDOR purchase manager (RL 7/2001)).

\(^{35}\) Venezuela abrogated the treaty in June 1972 (Pérez Sáinz and Zarembka 1979).
Despite Venezuela’s relative openness towards international trade, wouldn’t Ciudad Guayana’s poor road infrastructure of the 1960s and 1970s have created some natural barrier to trade and thus facilitated an incipient import-substitution process? Not so. Ironically, in the 1960s and 1970s Ciudad Guayana’s large firms were almost better connected to more developed regions in Venezuela and to international trade centers than they were to the rest of the incipient city. In effect, all of Ciudad Guayana’s large firms located on the banks of the easily navigable Orinoco river. From their own shipping ports they embarked their iron ore, steel pipes, slabs and aluminum ingots to industrial centers in Venezuela’s major cities or to clients abroad, and brought back the necessary parts and equipment through the same route. In fact, by 1962, the Department of Raw Materials and Acquisitions of the CVG’s Siderurgic Division (this division would later spin-off as SIDOR) had offices in Caracas, Milan (Italy) and Pittsburgh! (CVG 1962).

To provide evidence of the transport facilities available to Ciudad Guayana’s firms, the following table shows the port situation in 1996. Although in the 1960s and 1970s these river ports were not so large as they are today, they existed and sometimes even preceded the construction of the owner firm.

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36 The Orinoco River is the second largest river in South America after the Amazon. It has a longitude of 2,060 km and flows at a rate of 30 million liters of water per second (CVG 1999b). Ciudad Guayana is located relatively close to the Orinoco delta, where the river flows directly into the Atlantic Ocean.

37 The following citation taken from a study researching Ciudad Guayana’s transport costs to large cities in Venezuela illustrates the ease of export and import: “One must conclude that for the Guayana region the lack of adequate transportation facilities does not represent a bottleneck in its economic development (…) Existing highways and deepwater shipping facilities are more than adequate to satisfy the transportation needs of the region during the planning period under consideration” (5-10 years) (Soberman 1969, p. 108). The same study mentions water transport as an ideal way to ship products to and from other Venezuelan cities because of these cities’ close access to deep seawater ports.
To cope with the need to import replacement parts and pieces, Ciudad Guayana’s firms held high inventories and developed routines to assess future demand and place orders. This seems to have been the case at least in SIDOR. As one ex-manager told me:

“Every three months an Italian would come with a briefcase to SIDOR. He would visit all SIDOR’s purchase departments, take back a huge package of design plans and specifications of the spare parts needed over the next three months, and ship them from Italy” (OM 7/01).

Could the delays involved in importing replacement parts and pieces have led SIDOR and the rest of Ciudad Guayana’s firms to engage in local supplier development programs? My research indicates that the steel sector is less sensitive to the location of input suppliers than sectors that demand a high volume of inputs, like automobiles. In fact, contrary to the current business school emphasis on close location and Just-in-Time systems, proximity to equipment and parts suppliers does not seem to be crucial in steel.

A manager from Latin American steel corporation Techint explained:

“Whenever a steel firm buys equipment from a supplier (for example, a certain type of oven), he [the supplier] guarantees within the contract the critical replacement parts for a given number of years, let’s say two years. These critical
parts are usually kept in stock, so it doesn’t really matter whether they’re manufactured nationally or abroad, because the stock allows one to have the time to import it” (EB 3/2002).

In sum, initial physical conditions in Ciudad Guayana were abysmal. At the same time, the city’s firms had good transport routes to other cities in Venezuela and abroad, and operated within a policy environment of overvaluation and mostly open trade. Ciudad Guayana’s large firms reacted to these conditions by internalizing non-tradable services like metalworking maintenance and repairs, and importing replacement parts and pieces from other parts of Venezuela or from abroad.

Cluster of large potential clients, but in process-based industries where there is little scope for backward linkages

Still, as the Table 1.2. shows (following page), Ciudad Guayana has an impressive cluster of large industrial firms, many of them born during the 1970s. In terms of backward linkages, could these firms’ aggregate demand for metalworking inputs and services have stimulated the development of a local metalworking sector despite high local operating costs (given poor infrastructure) and the ease of imports? This section explores this question.
Table 1.2. Ciudad Guayana’s Large Firms

<table>
<thead>
<tr>
<th>Firm</th>
<th>Sector</th>
<th>Capacity</th>
<th>Start of operations</th>
</tr>
</thead>
<tbody>
<tr>
<td>CVG Edelca</td>
<td>Hydroelectric Power Generation</td>
<td>Macagua I: 3,000 GWH/year</td>
<td>1960</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Guri (I and II): 50,000 GWH/year</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Macagua II: 12,167 GWH/year</td>
<td></td>
</tr>
<tr>
<td>CVG SIDOR</td>
<td>Steel mill</td>
<td>6.2 million tons/year</td>
<td>1962, expanded</td>
</tr>
<tr>
<td></td>
<td>Pellets</td>
<td>532,000 tons/year</td>
<td>fourfold between</td>
</tr>
<tr>
<td></td>
<td>Direct reduction steel</td>
<td>3.6 million tons/year</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Steel lingots and coils</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CVG Alcasa</td>
<td>Aluminum smelter</td>
<td>200,000 tons/year</td>
<td>1967</td>
</tr>
<tr>
<td>CVG Ferrominera</td>
<td>Iron ore mining</td>
<td>19.5 million tons/year</td>
<td>197438</td>
</tr>
<tr>
<td>Orinoco</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CVG Venalum</td>
<td>Aluminum smelter</td>
<td>430,000 tons/year</td>
<td>1978</td>
</tr>
<tr>
<td>CVG Bauxilum</td>
<td>Bauxite mining, Alumina production</td>
<td>5 million tons/year</td>
<td>1989</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.6 million tons/year</td>
<td>1983</td>
</tr>
<tr>
<td>CVG Carbonorca</td>
<td>Green anodes, cooked anodes (for the</td>
<td>196,000 tons/year</td>
<td>1978</td>
</tr>
<tr>
<td></td>
<td>production of primary aluminum)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CVG Minorca</td>
<td>Iron ore brickets, Pellets</td>
<td>1 million tons/year</td>
<td>1977</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3.3 million tons/year</td>
<td></td>
</tr>
<tr>
<td>CVG Fesilven</td>
<td>Produces Ferrosilicate</td>
<td>80,000 tons/year</td>
<td></td>
</tr>
<tr>
<td>CVG Minerven</td>
<td>Gold extraction</td>
<td>3000 kg/year</td>
<td></td>
</tr>
<tr>
<td>CVG Conacal</td>
<td>Lime production</td>
<td>384,000 tons/year</td>
<td></td>
</tr>
<tr>
<td>CVG Proforca</td>
<td>Pine plantations</td>
<td>460,000 planted hectares</td>
<td></td>
</tr>
</tbody>
</table>


Note: This table only includes firms that belonged to the CVG in 1996 and of which I had data on capacity. The cluster of large, mineral processing firms operating in Ciudad Guayana is larger than this, and includes such joint private-public ventures as Posven and Comsigua (both established in the 1990s to manufacture iron ore brickets) and Cementos Guayana.

Technical characteristics of process based industries work against backward linkages

Despite the number and size of Ciudad Guayana’s large firms, the technical nature of these industries inhibits localized backward linkages. Raw material processing

38 Within a wave of nationalizations in 1974, the CVG created a company called Ferrominera Orinoco to take over the operations of Bethlehem Steel and US Steel, which had been mining and exporting iron ore from Ciudad Guayana since the 1950s.
industries such as those in Ciudad Guayana demand much less inputs than other types of industries. Steel and aluminum industries need inputs to run their plants but not to incorporate into their final product. That is, the steel slabs, aluminum lingots, and iron ore bricks that these industries manufacture do not incorporate any type of components. In this sense, raw material processing firms differ from assembly-based industries like automobiles and consumer electronics, where components constitute more than 70% and 40% of the sales value respectively (Battat, Frank and Shen 1996). In effect, one finds many more stories about successful backward linkage development in automobiles than in steel\(^\text{39}\).

Ciudad Guayana’s industries also belong to technologically mature sectors. In rapidly evolving sectors like electronics, customers benefit from having suppliers located close by, as physical proximity facilitates the kind of interaction that leads to product innovation. Indeed, this kind of thinking backs the literature on clusters, on learning regions, and on the geography of innovation (Polenske 2001). In sectors such as steel and aluminum, however, where neither the production processes nor the products themselves are rapidly evolving, this type of spatial logic does not apply. For example, as I explained in the previous section, as long as steel firms have adequate inventories and can import the inputs they need, they function well.

Finally, operations managers in continuous process industries such as steel and aluminum usually seek to minimize costly stops in production by acquiring the most durable equipment and parts. But how do they decide which manufacturer offers the most durable parts? Since plant managers themselves do not know the technology to produce

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\(^{39}\) Addis (1999) for example describes how domestically owned automobile suppliers in Brazil developed to supply the transnational assemblers that arrived to that country in the 1960s.
such parts and equipment, they often decide at the outset to only buy replacement parts from the original equipment manufacturers. As will become clearer in Chapter 2, managers’ need to trust manufacturers before they can place orders created an invisible barrier to the manufacturing of parts and equipment in Ciudad Guayana.

**Why then did metalworking firms arise?**

Herein lies the first mystery of the backward linkages in Ciudad Guayana. If technical conditions make steel and aluminum firms weak candidates to stimulate localized backward linkages, and if the CVG companies had developed other ways of providing for the needed metalworking inputs, why did local metalworking firms arise?

**1.2. How growth discontinuities provide opportunities for “easy” backward linkage in the metalworking sector, even in continuous process industries**

In the previous section I discussed how the technical nature of steel and aluminum manufacturing makes it unlikely that these industries will induce localized backward linkages. Managers’ emphasis on continuous production in a literal sense –i.e. not allowing the plant to stop—creates market barriers for first-time manufacturers of metalworking parts and equipment. Moreover, in the particular case of Ciudad Guayana, the immediate metalworking service and input requirements of SIDOR and the other CVG holdings led these firms to find other paths to provision aside from local procurement. Vertical integration of metalworking non-tradables involved sunk costs that made it particularly difficult for these firms to be interested in external sourcing, even if local metalworking maintenance suppliers had been available.

In this section however I will use steel and aluminum industries’ technical characteristics to make the converse argument: continuous process industries often do
induce an “easy” backward linkage into metalworking services precisely because of how the sequence of technical needs in the customer industry match the technical learning trajectory of the metalworking sector. More specifically, all continuous processing industries undergo a short period of hectic plant construction before the start of operations, or to undertake expansion. Under the right conditions –when the demand for plant construction outpaces supply, and construction deadlines are tight – new construction firms will surge to meet this demand and be given the opportunity to participate in plant construction. Thereafter, when construction ends and the large continuous processing firm starts operations, these newer suppliers will have the technical expertise and the marketing networks to provide the plant with metalworking maintenance and repair services.

Note that the ability to transfer the skills used in plant construction to the task of metalworking maintenance lies at the core of this “easy” backward linkage sequence of events. The notion that transferable skills can ease the development of backward linkages is not new to the literature. Hirschman (1971) believed that a given industrialist would be more likely to enter a backward linked industry when it used a technology familiar to him, than when the two industries were technological strangers. Yet here I am not talking about transfer of skills from the customer industry to the supplier industry, but rather about how the customer’s project sequence creates the opportunity for suppliers to develop skills that they can then transfer to satisfy customers’ needs at the next stage of the sequence. More specifically, I am talking about the sequence from plant construction to metalworking repairs and maintenance. The story of how many of Ciudad Guayana’s
metalworking firms initially surged to become SIDOR’s suppliers illustrates this sequence.

**SIDOR’s fourfold expansion allows many local metalworking firms to enter the market**

The 1970s brought significant expansion for Venezuela and particularly for Ciudad Guayana. While the 1974 boom in oil prices spelled crisis for most countries, oil producers like Venezuela became rich overnight. Thanks to the crisis, Venezuela’s fiscal budget nearly *tripled* from 1973 to 1974 – from Bs. 14,000 million to Bs. 40,000 million (Martínez Guarda 1996)⁴⁰. The quick rise in fiscal revenues gave the Venezuelan government an unprecedented opportunity to push forward ambitious industrial projects.

“In 1974 great changes become manifest at different levels of functioning of the country. Not only does a new government take power, but it counts with an extraordinary level of income without precedents, derived from the increase in oil prices. Large projects of all kinds look feasible in the light of the great mass of available resources, and of the great expectations for economic development” (Martínez Guarda 1996, p. 148, my translation).

SIDOR’s expansion immediately became a hot topic on the government’s agenda. Prior to 1974 plans already existed to quadruple SIDOR’s production from 1.2 million tons/year to 5 million tons/year over the next 10 years. The national government, then led by charismatic Acción Democrática’s president Carlos Andrés Pérez (CAP), decided that SIDOR’s fourfold expansion had to be completed by 1978 so that he could inaugurated the new plants during his Acción Democrática government⁴¹ (FIV president of the time (SI 1/00), Plan IV de la Nación, Cordiplan). A newspaper article from El Nacional (March 1976) illustrates the industrial development importance ascribed to SIDOR’s expansion:

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⁴⁰ From US$ 3.2 billion to US $ 9.3 billion.
⁴¹ Acción Democrática (AD) was the more popular of the two left of center political parties that dominated the Venezuelan political landscape from the fall of the Pérez Jiménez dictatorship in 1958 to the Chávez government in 1999. Ciudad Guayana’s evolution is closely linked to the AD political party, as the city started during the first AD government with Rómulo Betancourt (1958-1963) and got tremendous impulse from Carlos Andres Pérez’ first government (1974-1979) and then Lusinchi’s (1984-1989).
"The Democratic Government Advances in Guayana the Largest Work in Industrial Development of All Latin America: SIDOR’s Plan IV. Increase of installed steel production capacity from one million to five million tons per year. More than 15,000 million Bolívares of investment\textsuperscript{42}. Will generate 8,000 new jobs and 5,000 million [Bolívares] annual income\textsuperscript{43}. Will have the largest Direct Reduction plant and group of Electrical Ovens in the world. A port of 730 meters, 85 km. of internal and 25 km. of external railways controlled by computers. The SIDOR plant in Matanzas will consume more water and electricity than the city of Caracas and will have a food factory to serve more than 8,000 people" (cited by Martínez Guarda, 1996, p. 149, my translation)\textsuperscript{44}.

SIDOR acquired most of the engineering and construction work required to quadruple capacity from other regions in Venezuela and from abroad. This corresponded with the objective reality of Ciudad Guayana of 1974, which continued to have very little infrastructure. Engineering companies such as the German DSD and the engineering branches of steel makers Techint (Argentina), Hylsamex (Mexico), among others, arrived to Ciudad Guayana to sell equipment, provide technology, and supervise the construction of the four foundries that SIDOR’s quadruplication required. These firms needed a lot of simpler metalworking tasks that they subcontracted to the small and medium workshops that firms from other regions in Venezuela or of Ciudad Guayana itself set up locally. These smaller and less complex jobs consisted mostly of “metal carpentry”: building structures out of steel and metal support. Many of the firms and/or the entrepreneurs doing this type of work were involved in the construction industry or had had experience in construction\textsuperscript{45}.

Aside from SIDOR’s expansion, between 1974 and 1980 opportunities abounded for new firms to enter Ciudad Guayana’s busy plant construction scene. As Table 1.3 on

\begin{itemize}
\item \textsuperscript{42} US$ 3488 million
\item \textsuperscript{43} US$ 1163 million
\item \textsuperscript{44} Eventually SIDOR’s fourfold expansion cost more than Bs. 23,000 million (US $5348 million) (Martínez Guarda 1996, dollar conversion mine).
\item \textsuperscript{45} SIDOR’s expansion also helped Venezuelan engineering companies such as OTEPI develop. Today OTEPI is based in Caracas, employs more than 400 engineers and provides consultancy services to firms in Colombia and in other Andean countries (OTEFI director (03/99)).
\end{itemize}
the next page shows, other CVG firms in Ciudad Guayana were being built or expanded in parallel to SIDOR’s Plan IV. This frantic construction activity, all at the same time, in a city that was still quite precarious and could not satisfy this construction demand created a glut which allowed many firms to enter the plant construction market.

From plant construction to maintenance and repairs: an easy transition

“I came to [Ciudad] Guayana through the “Consorcio Guayana”, which was a contractor for Plan IV. This consortium was made up of 4 very strong associated firms: Barsanti, Dell’Acqua (both in construction), Montobras (plant construction), Atesca. They’re still in Guayana, they built Macagua II recently. This consortium started to subcontract us, and that’s how I started my firm” (Metalworking entrepreneur, ex-director of AIMM-Guayana and CIMG, (FR 8/98)).

“I installed the plant in Puerto Ordaz during SIDOR’s Plan IV. My father, a Dutch man, had founded a metalworking firm 50 years earlier in Caracas. The greatest boom of the Van Dam enterprises was from 1975 to 1978. We employed 1200 people then.” (Metalworking entrepreneur (LVD 2/00))

“The greatest boom in Guayana for metalworking firms was during SIDOR’s Plan IV. That’s when most firms emerged” (Metalworking entrepreneur and ex-CIMG director (LB 11/99)).

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46 This firm in particular had participated (from Caracas) in the construction of the floating port in San Félix, and the construction of Alcasa’s metal structures in 1965, yet only moved to Ciudad Guayana once SIDOR’s expansion started in 1974 (CVG 1962, CVG 1965, CVG 1974).
Table 1.3. Construction activity in Ciudad Guayana between 1974 and 1980

<table>
<thead>
<tr>
<th>Firm</th>
<th>Installation</th>
<th>Year start of operation</th>
<th>Capacity (tons/year)</th>
<th>Product</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SIDOR Plan IV</strong></td>
<td>Pelletizing Plant</td>
<td>1978</td>
<td>6.2 million</td>
<td>Pellets</td>
</tr>
<tr>
<td></td>
<td>Reduction Plant</td>
<td>1976-1979</td>
<td>3.34 million</td>
<td>Sponge Iron</td>
</tr>
<tr>
<td>Acería Palanquillas</td>
<td>1979</td>
<td>1.2 million</td>
<td>Palanquillas</td>
<td></td>
</tr>
<tr>
<td>Colada continua</td>
<td>1979</td>
<td>1.35 million</td>
<td>Palanquillas</td>
<td></td>
</tr>
<tr>
<td>Palanquillas</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acería Planchones</td>
<td>1978</td>
<td>2.4 million</td>
<td>Planchones</td>
<td></td>
</tr>
<tr>
<td>Colada Contínua</td>
<td>1978</td>
<td>2.35 million</td>
<td>Planchones</td>
<td></td>
</tr>
<tr>
<td>Planchones</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tren Contínuo Alambrón</td>
<td>1979</td>
<td>450,000</td>
<td>Alambresón</td>
<td></td>
</tr>
<tr>
<td>Tren Contínuo Barras</td>
<td>1979</td>
<td>619,000</td>
<td>Cabillas</td>
<td></td>
</tr>
<tr>
<td>Planta Cal Viva</td>
<td>1980</td>
<td>500,000</td>
<td>Lime</td>
<td></td>
</tr>
<tr>
<td>Briquetas</td>
<td>1980</td>
<td>300,000</td>
<td>Briquetas</td>
<td></td>
</tr>
<tr>
<td><strong>Alcasa</strong></td>
<td>Linea III</td>
<td>1978</td>
<td>70,000</td>
<td>Primary Aluminum</td>
</tr>
<tr>
<td><strong>Venalum</strong></td>
<td>Carbon Plant</td>
<td>1978</td>
<td>704,304</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Carbon cooking plant</td>
<td>1978</td>
<td>281,415</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Anode preparation</td>
<td>1978</td>
<td>657,000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cathode paste plant</td>
<td>1978</td>
<td>18,250</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Foundry room</td>
<td>1978</td>
<td>778,502</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Lingots 22 kg.</td>
<td>1978</td>
<td>512,406</td>
<td></td>
</tr>
<tr>
<td></td>
<td>“Pailas” 545 Kg.</td>
<td>1978</td>
<td>83,220</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cilinders</td>
<td>1978</td>
<td>72,876</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Liquid Metal</td>
<td>1978</td>
<td>110,000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cell room</td>
<td>1978 – 1980</td>
<td>414,598</td>
<td></td>
</tr>
<tr>
<td><strong>Fior de Venezuela</strong></td>
<td>Reduction plant</td>
<td>1976</td>
<td>367,024</td>
<td>Bricks</td>
</tr>
<tr>
<td><strong>Fesilven</strong></td>
<td></td>
<td>1977</td>
<td>80,000</td>
<td>Ferrosilicate</td>
</tr>
</tbody>
</table>

Source: CVG Estadísticas de la Región Guayana 1997

SIDOR’s expansion gave many metalworking firms the opportunity to set workshops, for the volume of work then was enough to amortize the investment in basic, multipurpose metalworking machinery. As a result, the Guayanese metalworking sector tripled between 1975 and 1979. From 33 metalworking firms in 1975 employing 523 formal workers, the sector grew to 89 firms and 2999 formal workers in 1978, the peak year in construction. 1979 however marked the end of SIDOR’s expansion program, and both the number of firms in the metalworking sector and the workers employed dropped...
to 54 and 1074 respectively by 1980 (CVG 1978, 1982). The following graphs show how the local metalworking sector grew as a result of SIDOR’s expansion, only to drop again after the expansion had ended in 1980.

Figure 1.1: Evolution of the Guayanese Metalworking sector between 1970 and 1980, several indicators.

Even though by 1980 SIDOR’s expansion had ended, there remained in Ciudad Guayana twice the number of local metalworking firms that had existed prior to the
expansion, some 54 firms (CVG 1982). This group of metalworking firms wanted to continue existing and to that end, set about finding a market niche within SIDOR. Given that steel mills suffer substantial wear and tear of their plants because of the tremendous physical pressures involved in transforming iron ore to steel, an obvious niche was repairing parts, manufacturing replacements, and helping to maintain the different plants that composed SIDOR’s complex.

The experience and the contacts that metalworking firms obtained by participating in SIDOR’s Plan IV helped them put their foot in the door as subsequent long-term metalworking suppliers. For example, of 52 firms appearing in a 2000 catalogue featuring Ciudad Guayana’s metalworking industry, almost half (23) set up operations between 1974 and 1980, the years of SIDOR’s expansion (AIMM-Guayana 2000). Up to SIDOR’s privatization, most of these firms had SIDOR as a main client (Tizamo 1999).

Where did the firms arising during SIDOR’s Plan IV get the skills needed to market themselves as metalworking suppliers? Two complementary technical paths interact here. First, most of the metalworking entrepreneurs who set up their own firms during Plan IV had some previous training in a technical field. Of the 23 firms cited above, for example, 8 are owned and headed by engineers and 14 by artisans with formal technical training (Interviews). 47

Although all these entrepreneurs had some level of formal training, for most, the experience with plant construction during SIDOR’s Plan IV allowed them to master the skills of industrial maintenance. For evidence, Table 1.4 lists 26 of the metalworking firms that existed in Ciudad Guayana during the 1970s with the services these firms offer

47 Interestingly, the 8 engineers are all Latin American, while 12 of the 14 artisan/technicians were recent immigrants from Spain or Italy. Yet this difference in formal training has not correlated to greater or lesser success in their businesses. Today, success and failure has visited both types of entrepreneurs equally.
today, ordered left to right from easy to more difficult. The table shows that: a) most firms in the table offer metal construction services (21 from 26), which reveals their origins in SIDOR’s Plan IV; b) there is a very big overlap between metal construction and industrial maintenance (15 firms offer both). Interestingly, the 5 firms that do not offer either metal construction or industrial maintenance services belong to engineers, while most of the firms offering construction and maintenance belong to technicians and artisans.

Table 1.4. Overlapping competencies in Ciudad Guayana’s metalworking firms of the 1970s

<table>
<thead>
<tr>
<th>Firm</th>
<th>Metal Construction</th>
<th>General metalworking maintenance</th>
<th>Manufacturing of parts</th>
<th>Assembly and disassembly of mechanical equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tamoí</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Taller Sebema</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Técnica del Acero</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Typeca</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Taller Morgran</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Geasa</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>COMONTA</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DSD</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HECA</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corpometal</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Surimex</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tecnobras</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Montameca</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fyavenca</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TAMCA</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tomi</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Taller Fadri</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Servemo</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CMP de Venezuela</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Van Dam</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rafeca</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meinsur</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indorca</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bepreca</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hidroatomas</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Tameca</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: AIMM-Guayana 1996, AIMM-Guayana 2000, interviews
These data, plus my interviews, indicate that the differences among the firms with respect to the offered services imply a different trajectory for the two skill groups observed here. Entrepreneurs with technical or artisan skills required a technological progression from metal construction to maintenance to parts to repairs. In contrast, entrepreneurs with an engineering background were able to jump into parts production and repairs immediately. For the category with less formal training, SIDOR's Plan IV served as an on-the-job training ground, giving them important skills like mounting, machining, milling, bending, and cutting, which form the core of metalworking maintenance. Not surprisingly, this skill trajectory coincides with the narrative associated to the development of Ciudad Guayana's metalworking sector. Indeed, my interviewees described metalworking firms as initially doing construction and maintenance, and later, during the last half of the 1980s, developing skills to manufacture and repair parts and equipment.\textsuperscript{48}

**SIDOR's expansion forces the company to choose between "make" or "buy"**

Once SIDOR's expansion ended in 1980, the existing metalworking firms vied to become steady suppliers. Their task turned out to be more difficult than they expected. During the construction boom SIDOR had worked with local metalworking firms and could attest to their good or bad quality. Yet the sunk costs of building the company's Central Workshop, and SIDOR's long-standing practice of vertically integrating repairs and maintenance produced little interest in outsourcing tasks to local suppliers. In other

\textsuperscript{48} I want to however qualify that not all artisans/technicians need this on-the-job training. Of the firms in the table, there are two founded by Spanish technicians who at the outset already had the skills to build parts and mount and dismount complex equipment. In fact, these Spanish entrepreneurs first came to Ciudad Guayana as instructors for the government run regional metalworking vocational training center INCE. Once in Ciudad Guayana they realized the immense business opportunity offered by SIDOR's expansion and decided to set up their own firms.
words, SIDOR’s process of adapting to the initial absence of metalworking suppliers in Ciudad Guayana worked in a path dependent way against local procurement, even when the objective conditions leading to the first decision had changed.

Yet SIDOR’s fourfold expansion not only allowed local metalworking firms to develop, but also altered SIDOR’s path dependency with respect to local procurement. In particular, the end of SIDOR’s Plan IV brought circumstances that forced the company to choose between “make” or “buy”. In the measure that SIDOR’s new plants reached the production capacity of 5 million tons, the company would need approximately four times as many repairs and maintenance as it had in 1974. SIDOR’s Central Workshop, however, had been designed for SIDOR’s initial production capacity of 1 million tons and soon would not have enough capacity to keep up with the needed repairs. SIDOR needed to decide whether to expand the capacity of its central workshop to match its new demand for spare parts, repairs and maintenance, or whether to take a step in fostering an external local supplier sector (Ex-state-owned SIDOR Purchase Manager (OM 10/2001)).

Local metalworking firms took advantage of SIDOR’s “make” or “buy” dilemma to put pressure on SIDOR to increase local procurement. Although local metalworking firms were not yet organized into any association, and they lacked a formal organization that represented their collective interest, they gathered strength from the networks they had already built with SIDOR’s purchase managers during SIDOR’s expansion. These networks were not lost at the end of the expansion because the purchase managers supervising Plan IV were transferred to SIDOR’s central purchasing office. Moreover, Ciudad Guayana’s small dimensions facilitated contact outside the workplace.

“In those times metalworking firms did not exert a formalized pressure as such, because they still weren’t organized and none of the industrial chambers existed.
Yet one would encounter the entrepreneurs by chance in the bakery or on the streets and in these chance encounters they would put pressure for local procurement” (Ex state-owned SIDOR purchase manager (OM 3/2002)).

Through the social/physical proximity that Ciudad Guayana afforded, metalworking entrepreneurs pressured SIDOR’s Central Workshop managers to support the development of a metalworking infrastructure in the region. Their demands got strength from the policy ideology that had created the Guayanese project and SIDOR in the first place – that of generating a development pole in the hinterland (Ex state-owned SIDOR Purchase Manager (OM 10/2001)).

Several factors still influenced SIDOR’s final “make” or “buy” decision. On the one hand, and in favor of internal sourcing were concerns about local suppliers’ quality and timeliness. On the other hand and in favor of external sourcing were the potential lower costs, since external firms would not be subject to the weighty collective contract negotiations that benefited workers throughout the steel industry. However, within SIDOR nobody really knew whether outsourcing to local metalworking suppliers would really constitute a cost saving. In theory outsourcing should be cheaper, but if local suppliers did not deliver on time or their product was faulty, this could increment SIDOR’s cost. Another reason for possible cost increments was the fear that once SIDOR became “dependent” on a local supplier for a given spare part, the supplier could benefit from its monopolistic (or oligopolistic) position vis-à-vis SIDOR and charge higher prices (Ex state-owned SIDOR managers (GM 7/2001), (JO 12/99)).

What at the end tipped the balance towards outsourcing was the national government’s decision to severely cut the budget for the Ciudad Guayana project in 1980. Using “fast-track” financing available during the AD period (1974 – 1979), SIDOR had indebted itself heavily in short-term, high interest loans with foreign banks to complete
its expansion. However, following opposition party COPEI’s success in the 1980 presidential elections, the national government declined to follow up on its promise to assume SIDOR’s short-term debt, and left the company to assume it on its own (Ex state-owned SIDOR managers (JO 12/1999, IS 7/2001, NN 7/2001)).

The 1980 reversal of the previous policy of lavish funding meant that although SIDOR was inaugurating a new factory, financially it was practically bankrupt. Within purchases, the shortage of money made the “buy” choice inevitable, for there was no money to acquire needed equipment to expand SIDOR’s Central Workshop and continue being self-sufficient. SIDOR accepted to outsource the manufacturing of spare parts, repairs and maintenance within a system called “Ordenes de Compra Abiertas”, or “Open Purchase Order” (from here on referred to as the “Open PO system”). In this “Open PO system” SIDOR informally guaranteed a group of metalworking firms a certain amount of purchases during a given year, with the tacit commitment to renew it and increase it the following year subject to performance 49. This system provided local metalworking firms with their first opportunity to develop as long-term suppliers.

AS soon as SIDOR decided to outsource repairs and maintenance, it suffered from a process of internal deskilling of its Central Workshop. In effect, the people who had manned SIDOR’s internal workshop saw in the outsourcing decision their opportunity to become independent and left to set up their own firms (Metalworking entrepreneur (OM 7/2001)). SIDOR’s internal deskilling process further corroborated the

49 The system functioned like a checkbook, in which SIDOR’s purchase department would say: Company Alpha has been assigned X man/hours and Y machine/hours for this year. During the year, the Central Workshop would assign the pieces and repairs that SIDOR needed to Alpha until the full amount of the man/hours and machine/hours allotted to that firm had been used. SIDOR’s purchase department set the price at which it paid each man/hour or machine/hour through a closed bidding process to selected firms—after receiving the bids the purchase department averaged the proposed prices (Metalworking Entrepreneur (NG 3/2002), Ex state-owned SIDOR Purchase Manager (OM 3/2002)). Each participating supplier owned a “mailbox” in SIDOR’s purchasing department and invitations to bid would be placed there.
company’s decision to outsource. In fact, since the shortage of skilled workers in Ciudad Guayana made hiring new personnel difficult, SIDOR ended up selling some of its Central Workshop equipment to these newly independent firms (Ex-state-owned SIDOR purchase manager (OM 3/2002)).

Was the decision to outsource metalworking repairs and maintenance a common industrial practice within steel firms of the time?

As I explained previously, state-owned SIDOR’s decision to outsource metalworking repairs and maintenance was not the standard practice of the 1970s. Rather, most steel firms, especially those located in lagging regions like Ciudad Guayana, had internal maintenance and repair workshops just like SIDOR’s before the outsourcing decision.

A decade later, in the late 1980s and early 1990s, as steel firms around the world restructured, the industry’s standard practice with respect to maintenance changed. Many European and Latin American steel firms then outsourced metalworking repairs and maintenance to relocate employees displaced by these firm’s restructuring. In these schemes, the steel firms helped workers targeted for layoffs organize their own firms and become metalworking maintenance and repair suppliers. SIDERAR adopted this strategy in the late 1980s and state-owned SIDOR also did some of this in a restructuring program the company conducted in the early 1990s (Techint Manager (PM 11/01), Ex-state-owned SIDOR managers (GM 7/01, OM 3/02)). Yet as I just described, SIDOR’s first backward link to metalworking maintenance occurred in 1980, a decade before these restructuring programs.

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50 In a sense this first backward link emerged from restructuring in that it provided SIDOR with a way to deal with the cash constraints that limited expansion of the Central Workshop.
How the initial development of a metalworking sector at Taranto mirrors that of Ciudad Guayana

The argument that in steel, plant expansions can create the discontinuities needed for a metalworking maintenance sector to develop gains sustenance from a similar sequence of events at Taranto, Italy. In 1960, the Italian government initiated construction of its fourth steel center, Italsider\(^{51}\), at Taranto, a city in the Southern part of Italy. Italsider’s location at Taranto obeyed to the very Italian project of helping to develop the Italian South by implanting large-scale industrial enterprises there\(^{52}\). As in the case of SIDOR and Ciudad Guayana, the location of Italsider at Taranto was thought of in growth pole terms. Similar to SIDOR, Italsider triggered around it a group of metalworking firms that manufacture replacement parts and provide industrial construction services and maintenance. That is, Italsider \textit{did} create localized backward linkages (Capriati 1991).

Yet like SIDOR, Italsider did not initially outsource metalworking maintenance. Rather, similar to Ciudad Guayana, the development of Taranto’s local metalworking sector followed Italsider’s expansion. In effect, from 1970 to 1977, Italsider doubled its capacity from 5 million to 10.5 million tons/year. Even though Northern Italian firms undertook most of the expansion work, the sheer amount of work involved gave local Tarantine firms the opportunity to work as subcontractors, even if their jobs were restricted to generic, less qualified functions. This segmentation of work between northern and southern Italian firms resulted partly out of the lack of skilled workers at

\(^{51}\) Italsider had different names during its history (Capriati 1991). However, here I will refer to it as Italsider throughout.

\(^{52}\) Italsider’s location in the Italian South responded to the extraordinary legislation to develop the “Mezzogiorno”, which provided incentives to industries that located in the South (Capriati 1991).
Taranto, which forced the local firms to hire peasants or small artisans without industrial experience\(^5\) (Capriati 1991).

Following the end of the expansion project, local firms sought to continue their relationship with Italsider, yet like SIDOR, Italsider's tradition of self-sufficiency in maintenance and repairs made it disinterested in local procurement. Local Tarantine metalworking firms reacted by using the "Vertenza Taranto"—a wave of protests triggered by Italsider's lay-off of 5,000 workers that had participated in the expansion work—to press for, and obtain, increased local procurement from Italsider. While initially Tarantine trade unions led the protests, other organized actors soon joined. Aspiring metalworking suppliers in particular demanded Italsider to select local firms on the basis of their respect for national labor laws, and to start large infrastructure projects that were not even within the competencies of Italsider\(^5\) (Capriati 1991, Piattoni 1999).

The "Vertenza Taranto" ended when Italsider committed to have stable relations with 17 Tarantine metalworking firms and to provide them with technical assistance. In return, Tarantine metalworking firms committed to absorb 1110 of the displaced workers\(^5\). The national government promised to carry out extraordinary construction plans to absorb the rest of the unemployed workers. In return for local metalworking

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\(^5\) The lack of skilled workers is interesting to note here because between the two World Wars, Taranto had been a very important shipbuilding center. Even though this shipbuilding industry had closed down by the mid 1950s, we would think that a legacy of metalworking skills remained. Apparently, skilled workers left Taranto following the demise of the shipbuilding industry (Capriati 1991).

\(^5\) Apparently, all throughout their history, metalworking firms at Taranto have accused Italsider of dealing with firms from outside Taranto that did not comply with labor laws. Non-compliance allowed these extra-local firms to offer prices below those of metalworking firms at Taranto.

\(^5\) A study about the result of this agreement reveals that only 13 of the 17 firms that agreed to the proposal really followed up on additional hires. These firms absorbed 626 additional workers (between them), yet only 175 of these belonged to the 1100 in question, since most of the workers unemployed at the end of Italsider's expansion did not have the technical profile that these firms wanted. However, the firms had entered into the agreement to benefit from the stable and guaranteed relation with Italsider (Capriati 1991).
firm’s increased employment, Italsider increased its local purchases (excluding raw materials) from 54% to 67% (Capriati 1991).

To sum up, this section presented the facts behind the first development of Ciudad Guayana’s metalworking sector to build a picture of how discontinuities play a crucial role in backward linkages. Specifically, SIDOR’s Plan IV provided both the opportunity for metalworking firms to emerge and created the dynamics that forced the company to outsource metalworking maintenance. A similar sequence of events in the city of Taranto, Italy, provides sustenance to this argument.

1.3. Why CVG SIDOR and not the CVG aluminum firms

Of Ciudad Guayana’s large firms, SIDOR had the greatest impact on the development of a local metalworking sector. A 1998 survey of a sub sample of local metalworking firms revealed that up to SIDOR’s privatization in 1997, half of these firms relied on SIDOR for over 80% of their sales, and nearly a quarter more sold over 60% to SIDOR (Tizamo 1999). What can explain SIDOR’s extraordinary influence on metalworking firms, considering the presence of other large firms in Ciudad Guayana?

As metalworking firms explained, SIDOR had a much larger demand for metalworking services and inputs than other firms in Ciudad Guayana. This difference in demand stemmed from SIDOR’s larger size. For example, SIDOR’s production of 2.2 million tons in 1995—to take a given year—was over five times the production of the next largest complex in Ciudad Guayana, Venalum (414.000 tons), and over ten times the production of the third largest complex, Alcasa (193.875 tons) (CVG n.d., 1996). SIDOR’s higher capacity translated into a higher demand for metalworking maintenance, repairs, and spare parts and equipment. The following quote about the intra-firm politics
of creating **CVG Internacional**, the CVG’s international purchasing organization, gives a more exact idea of the differences in the magnitude of demand between SIDOR and the other CVG holdings (including aluminum):

“SIDOR had its own purchase department and did not want to delegate much to CVG Internacional. At the end SIDOR delegated only 10% of its portfolio of purchases to CVG Internacional, some $100 million, which however constituted 80% of CVG Internacional’s activity.” (Ex-SIDOR manager and Ex-CVG Internacional director (IS 7/2001)).

Moreover, and interestingly for the argument about discontinuity that I am developing here, the CVG aluminum firms did not undergo the same type of discontinuity that affected state-owned SIDOR. Not that they did not make plant expansions. In fact, the CVG aluminum firms, like SIDOR, undertook significant expansions over their history. For example, CVG Alcasa’s expansion in 1978 doubled the firm’s capacity from that of 1973, and CVG Venalum, constructed in 1978, became the largest aluminum-producing firm in the world at 400,000 metric tons per year (Martinez Guarda 1996). Yet these plant constructions and expansions did not provide the same kind of opportunity for metalworking firms to become long-term suppliers because from the very start, these aluminum firms married into long term maintenance, repairs, engineering and parts contracts with their foreign partners.

In effect, the CVG aluminum firms’ divergent behavior with respect to SIDOR in what respects metalworking maintenance responded to their different composition of ownership. While SIDOR up to its privatization in 1997 had been solely owned by the CVG, Ciudad Guayana’s three aluminum-processing firms started out as joint partnerships between the CVG and foreign firms. In all three cases, the foreign partner provided much of the initial metalworking construction and subsequent maintenance and repair services, leaving little room for any domestic activity in that regard. For example,
Alcasa started as a 50-50 joint partnership between the CVG and Reynolds. Aside from its ownership in the complex, Reynolds provided Alcasa with technical assistance, inputs and construction through its subsidiaries Reynolds Metal Co., Reynolds International Inc., Reynolds Engineering, and Montaplan. Montaplan (Reynolds) subsequently constructed Venalum, the CVG’s second aluminum smelter. Reynolds also maintained Venalum’s aluminum cells. The third aluminum firm CVG Interalúmina, which transforms bauxite into aluminum, started out as an 80-20 joint venture between the CVG and Alusuisse. Alusuisse provided managerial and technical assistance during the plant’s construction. Subsequently, Alusuisse subsidiary Alesa aided Interalúmina with project management and equipment and machinery acquisition outside Venezuela (Martínez Guarda 1996).

In sum, discontinuities matter if they affect procurement patterns in a way that creates opportunities for local firms. In the case of SIDOR, plant expansion and the cash constraints that followed it opened the door to local suppliers, as the steel firm did not have other ready ways to arrange for non-tradables. The CVG aluminum firm’s construction and expansion did not have the same effect of broadening local supplier’s opportunities because of pre-existing arrangements with foreign firms.

1.4. Conclusion

This chapter illustrated how backward linked development in Ciudad Guayana did not occur automatically. In fact, the technical nature of Ciudad Guayana’s large industries

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56 By 1983 however Reynolds participation in Alcasa’s shares had reduced to 15% (Martinez Guarda 1996).
57 Venalum started out (and remains) an 80-20 partnership between the CVG and Japanese firms Showa Denko, Kobe Steel, Mitsubishi Chemical Industries, Mitsubishi Metal Corporation and Sumitomo Chemical (Martinez Guarda 1996, OAEF 2002).
58 Interalúmina later merged with Bauxiven to form Bauxilum.
and their initial practice of vertically integrating metalworking maintenance services conspired against the development of the local metalworking sector. Had SIDOR grown smoothly over time, its path dependent trajectory of self-sufficiency would have probably inhibited the development of backward linkages. Indeed, metalworking firms in Ciudad Guayana first obtained an opportunity to both develop skills and pitch themselves as stable maintenance suppliers following SIDOR’s sudden fourfold expansion.

Which characteristics of SIDOR’s expansion provided local firms the opportunity to acquire skills and develop networks? First, for local supplying firms to enter the market, the demand for local inputs must consistently outpace supply over a period of time. In effect, in Ciudad Guayana the demand for plant construction services outpaced supply during the six years of SIDOR’s expansion. This sustained imbalance between demand and supply gave SIDOR reason to hire local firms, giving them the opportunity and the time to become effective suppliers of the demanded services. Second, the nature of the service demanded plays a role. In this case, SIDOR’s expansion demanded construction services, which is inherently a non-tradable. Therefore, it provided opportunities for local firms. Moreover, Ciudad Guayana’s remoteness probably reduced competition in the provision of this non-tradable.

Backward linkage logic inherently rests on the dynamics triggered by the same kind of demand imbalances caused by SIDOR’s expansion. In its classical conception, large-scale investment creates a new demand for inputs, which in turn induces its own supply response (Hirschman 1958). Yet what backward linkage logic lacks is a discussion of how local suppliers in lagging regions can break with the path-dependent outcomes that usually surround initial procurement decisions. The Ciudad Guayana case
suggests a sequence: discontinuity in a technically related service. In effect, metalworking firms were able to use their plant construction skills (and networks) to subsequently offer metalworking maintenance.

Yet SIDOR’s plant expansion alone cannot account for the development of Ciudad Guayana’s metalworking sector. SIDOR’s plant construction allowed local firms to enter metalworking maintenance provision, but what about metalworking inputs? For these, SIDOR continued to rely on imports, as SIDOR’s plant managers distrusted locally manufactured inputs. How then were metalworking firms able to take the next technological step into input provision? The next chapter delves into this question.
Chapter 2: Backward linkages, state-led development, and politics

While in the previous chapter I discussed how structural variables affected the development of a metalworking sector in Ciudad Guayana, this chapter delves into political explanations. In Chapter 1, I presented state-owned SIDOR as the firm that most influenced the development of Ciudad Guayana’s local metalworking sector. SIDOR’s characteristic as a state-owned enterprise meant that apart from being an economic actor, it fulfilled a government role, and therefore operated in the arena of politics.

On the surface, the political dynamics bearing on SIDOR as a state-owned enterprise seem to easily explain the development Ciudad Guayana’s metalworking sector. I focus on two different uses of the word “politics” here: first, politics in the sense of government directives (i.e. industrial policy), and second, politics as in pressure by organized groups (lobbying). As a state-owned enterprise, SIDOR was in theory subject to both types of political pressure (Lioukas, Bourantas and Papadakis 1993). In effect, SIDOR at certain times came under pressure by the CVG to increase local procurement\(^59\). In turn, the CVG exerted this pressure both to comply with national government directives and to accommodate local metalworking supplier’s interests. Both types of pressures bearing on SIDOR would seem to provide an easy explanation of how backward linkages developed in Ciudad Guayana.

This interpretation however, does not capture the complexity of backward linkage formation. If it were really true that SIDOR engaged local metalworking firms as suppliers only in response to either the CVG’s or to these suppliers’ pressure, would the

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\(^59\) The CVG’s behavior in this regard is not anomalous. National governments tend to use their state-owned enterprises to execute industrial policy, requiring them to purchase from local suppliers and subsidize national customers for the sake of development (Vernon 1985).
metalworking sector have acquired the technical dexterities that allowed it to survive SIDOR’s privatization? Would they have been able to evolve from maintenance suppliers to the production of metalworking parts and equipment?

On the contrary, this “easy” political explanation hides two facts about the process of backward linkages that the Ciudad Guayana story illuminates. First, despite the favorable conditions for linkages, in that both the CVG and local suppliers exerted pressure on SIDOR for local procurement, local firm’s links to SIDOR were not easy. In fact, notwithstanding political pressure, SIDOR resisted local procurement out of distrust of local metalworking firm’s technical capabilities. Second, even when SIDOR relented to this political pressure and established local supplier development programs, these programs were not really effective in developing local suppliers because they did not offer local firms long-term commitment.

This chapter shows that politics—both in the sense of government and interest-group pressure—is necessary to forge the initial link between customer and local suppliers. However, that first connection is not enough. The process of developing suppliers requires attention to how the customer-supplier relationship affects their investment in upgrading. These findings have important implications for how we think of backward linkages.

2.1. Backward linkages in Ciudad Guayana: did they result from SIDOR’s mandate to develop the region?

A common interpretation of why and how Ciudad Guayana’s metalworking sector developed is that it mushroomed under the shade of state-owned SIDOR. This description paints a picture of first, easy growth, as mushrooms need little care. Second, this metaphor depicts SIDOR as protective of metalworking firms.
Two different currents of thinking stressing the weaknesses of the CVG firms to outside pressure strengthen this interpretation. The first derives from the CVG's mandate to promote industrial development in Guayana. In a pattern common to the relationship between government and state-owned enterprises (SOEs) elsewhere—a pattern that later fueled the anti-SOE critique in the literature—this mandate implies that the CVG enterprises should have procured from even costly or inefficient local suppliers for the sake of regional development (Vernon 1985). The second thinking backing the interpretation of “easy” backward linkages stems from the widespread perception of the CVG and its state-owned enterprises as corrupt and inefficient. This perception spread from a corruption scandal involving Leopoldo Sucre Figarella, who presided the CVG from 1984 to 1992. Even though these corruption charges were later dismissed, they marred the public image of Ciudad Guayana. In the Venezuelan public’s eyes, rampant corruption existed within the CVG enterprises, which made it easy for greedy, rent-seeking suppliers to install themselves as parasites to these firms. I myself arrived to Ciudad Guayana with this preconception.

In contrast to the above perception, the development trajectory of Guayanese metalworking firms was not easy, as state-owned SIDOR did not fulfill the role of protective shade depicted by the mushroom-tree metaphor. First, despite national discourse assigning state-owned SIDOR a regional development role, SIDOR employed minimum effort in developing a local backward linked metalworking sector. On the contrary, SIDOR resisted local procurement even during the times that the national

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60 Ever since the CVG’s creation in 1960, corruption accusations have been common; however, a famous 1988 report called “Informe Espinoza” exacerbated the wave of criticism against the CVG. The Venezuelan media played a role in projecting a bad image for the CVG because it picked upon the corruption accusations, yet it never informed the public that those implicated by the report were later exonerated from the corruption charges against them (Sweeney 1990).
government exerted most pressure, as for example during the national import-substitution drive. This section recounts the story

**Despite the discourse of regional development, SIDOR lacked a corporate policy to promote backward linkages**

The only time that the CVG directly pressured state-owned SIDOR to increase the amount of local procurement was during a national import-substitution drive that lasted from 1984 to 1989. For a variety of reasons that I will explain in the next section, at other times the CVG was both uninterested and/or unable to exert pressure on its holding firms for local procurement. SIDOR complied with this external pressure and implemented an internal import-substitution drive during this period. Yet outside this period of government pressure, SIDOR did not have a coherent policy to develop local suppliers. For example, a highly respected man who spent his professional life making career at state-owned SIDOR and occupied all its high-level managerial positions (except the presidency), recounted SIDOR’s policy with respect to metalworking firms before the import-substitution drive:

“SIDOR made an inventory of the replacement parts that could stop the plant and maintained a stock of these. The majority of these parts were very specialized and therefore manufactured by the original equipment manufacturers, but some of them were made in Venezuela” (IS 7/01).

As this and other interviews with top state-owned SIDOR managers emphasized, SIDOR’s policy before the import-substitution period was to have *no* policy for the development of metalworking firms (Ex-president of state-owned SIDOR (1973-1979) (AG 01/00)).

SIDOR’s scant concern with local supplier development contradicts the development behavior assumed of state-owned enterprises. Moreover, SIDOR’s lack of
supplier development programs even contradicted the company’s own developmental discourse. Paradoxically, despite the lack of a concrete corporate policy to stimulate local suppliers, SIDOR often expressed the goal of regional development in mission statements and other company material. Yet SIDOR’s intentions never coalesced into a specific policy because, as I will explain later, SIDOR’s focus on its own operations and concern about costs made the company uninterested in surmounting the obstacles inherent to the development of a local backward linked metalworking sector.

In state-owned SIDOR “a lot was said and written about the importance of helping to develop local firms, but very little was done in practice. If we classify the types of aid from 1 to 4, where in 1 SIDOR expresses the intention to do something for local firms, in 2 SIDOR establishes procedures to develop local firms, in 3 SIDOR selects certain departments to implement these procedures, and in 4 SIDOR puts money behind all this, public SIDOR did not go beyond 1, maybe 2.” (Engineer and long-time consultant to both state-owned SIDOR and AIMM-Guayana (EY 01/01)).

Despite the absence of a corporate policy towards the development of a local supplier industry, SIDOR’s discourse of promoting regional development resonated with those middle level managers who in the course of their work had contact with local suppliers. Note in the following excerpts how the discourse of SIDOR as having a role in regional development helps shape somewhat the actions of different departments in some cases, while in others it gives these mid-level managers a sense of pride:

“Within our Quality Control department we had a person working as a ‘Maintenance Metallurgist’, who received parts and pieces from local suppliers. When a piece failed, this person diagnosed the failure and gave it to the supplier. Because there weren’t that many local suppliers (in the early 1970s), we tried to make them correct their defects, not to discontinue them.” (Ex-manager of Quality Control department at state-owned SIDOR (JJ 7/01)).

“In 1984 – 1985 we started to make an evaluation of suppliers which had nothing to do with the import-substitution program. It started with a period where SIDOR wanted to be normalized within the Covenin – ISO9001 norms, where the certified firm needs to have a process to select, evaluate and qualify suppliers. We started to audit metalworking firms on an annual basis, looking at their quality
systems, first in Guayana and then at a national level (...) I liked the job, I saw it as a way to help local suppliers, even though they saw it as a way to erect obstacles.” (Ex-employee of Quality Control department at state-owned SIDOR (AP 8/01)).

The lack of a corporate policy towards the development of local metalworking supplier sector probably explains why many of the local metalworking firms reacted angrily to my question of whether state-owned SIDOR had helped them develop.

“Public SIDOR didn’t help me at all. Instead of helping local suppliers, public SIDOR would visit us to see how they could take us out of their system.” (Metalworking entrepreneur, winner of the “Venezuela Competitiva” award in 1997 (AI 7/01)).

Yet the discourse about state-owned SIDOR’s expected impact on regional development did serve to add legitimacy (e.g. good press) to decisions taken for other reasons. For example, as I recounted in Chapter 1, a cash crisis following SIDOR’s expansion made it impossible for the company to keep its Central Workshop functioning. SIDOR then decided to outsource metalworking repairs and maintenance to local suppliers. This decision, while taken primarily on economic grounds, served to project the image that SIDOR was promoting regional development.

“The main reason for which the Central Workshop decided to outsource repairs and maintenance attended to a strategy of the firm, which on the one hand wanted to reduce personnel and transform fixed costs into variable ones, and on the other, needed external options because of the expansion of Plan IV. But don’t forget that SIDOR belonging to the state had to promote the development of the region and this was a way to do it.” (Ex-purchase manager for state-owned SIDOR (OM 4/02)).

**During the import-substitution period, SIDOR developed its first corporate effort at local procurement**

In 1983, balance of payments problems prompted the Venezuelan government to on the one hand devalue the national currency, and on the other to start an import-substitution drive within its state-owned enterprises. Through legal decree, the national
government ordered the CVG to execute this import-substitution mandate (Resolución Ministerial 78, 17/9/85). The CVG complied by creating a committee to supervise import-substitution among its state-owned enterprises.\(^{61}\)

The CVG’s import-substitution committee aimed to foster import-substitution in Guayana’s state-owned enterprises. Its main work involved identifying those raw materials, equipment, parts and maintenance services susceptible to local and national production, and then aggregating each individual state-owned enterprise’s demand in order to make the project more attractive to would-be investors. The committee also analyzed the existent supply in terms of national and regional firms, and matched it with the existing demand (CVG 1985b, CVG 1986).

In response to the import-substitution drive, SIDOR produced its first corporate attempt to stimulate the development of a backward linked metalworking sector. In effect, the company organized an internal import-substitution department with 5 engineers and analysts to analyze what kinds of inputs could be substituted and who in Guayana or in Venezuela could manufacture them.\(^{62}\) These engineers worked with a registry of suppliers that Condibieca, a national government agency fostering capital goods manufacturing, compiled.\(^{63}\)

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\(^{61}\) The following CVG enterprises participated in this committee: Edelca, Ferrominera Orinoco, SIDOR, Fesilven, Bauxiven, Interalúmina, Alcasa, Venalum, Tecmin, Minerven, and Conacal (CVG 1985b).

\(^{62}\) The import-substitution program required the other CVG enterprises to also organize internal import-substitution departments (SIDOR import-substitution department director (NN 7/2001)). However, there’s a widespread consensus that SIDOR’s import-substitution department was the only one to achieve some level of results. This may have been due to SIDOR’s larger size with respect to the other CVG enterprises, which meant a larger demand for all kinds of inputs. Moreover, SIDOR’s larger size may have attracted more government attention and intervention (Lioukas, Bourantas and Papadakis 1993).

\(^{63}\) The government had created this “Consejo de Desarrollo de la Industria de Bienes de Capital” (Condibieca) in 1984 to coordinate the import-substitution process in Venezuela. This agency focused its work on firms that bought large volumes of inputs, which in Venezuela happened to be within the government sector (SIDOR Import Substitution Department Director (NN 7/2001)).
SIDOR’s efforts at import substitution succumb to internal resistance

In contrast to views of state-owned enterprises as easily susceptible to government pressure for local procurement, SIDOR’s efforts at import-substitution met with internal resistance. On the one hand, operations’ personnel resisted the import-substitution process based on fear that the locally manufactured parts and equipment would prove defective, stop the plant, and possibly damage other equipment. On the other, higher level managers concerned with cost-management worried that the process of helping local suppliers develop was too expensive for the firm. In hindsight, noting these two sources of resistance helps me understand why state-owned SIDOR never had a corporate policy towards the development of local suppliers.

Protecting the integrity of production: resistance at the level of operations

As the erstwhile Director of SIDOR’s Import-Substitution Department reported, import-substitution efforts faced tremendous resistance from SIDOR’s operations’ managers, who perceived the task of import-substitution as something opposed to the firm’s mission. Specifically, these managers opposed to have SIDOR serve as a laboratory for spare parts and pieces that had never been tried before, with the costly stoppages that such pieces could cause. The risk for stoppages was great, given that there were no laboratories in Guayana that could subject these replacement parts to the pressures that they would have to withstand once installed in SIDOR’s production lines. In fact, a CVG (1986) report discussing the limitations of the process of import substitution refers to this resistance by operations’ personnel to accept products that were not “original” as one of the important obstacles.

“The import-substitution program comes from an imposition of the central government. However, it generates rejection within SIDOR because it was
something different from the mission of the plant, which required investment in human resources, and which in the past had resulted in bad experiences (...). The people inside SIDOR felt that the complex was not a laboratory in which to make trials (...) SIDOR was a very costly laboratory for the process of import-substitution, because trials were made with unfamiliar parts in processes that were extremely delicate. If the parts failed, they would cause extremely costly plant stoppages. There weren’t laboratories in the region that could subject these replacement parts to the pressures to which they would become subject once installed in SIDOR’s production lines.” (Ex-director of SIDOR’s import substitution department (NN 7/01)).

“Import substitution was a stress for those who operated the plant because the plants used imported equipment and sophisticated technology, while import-substitution was a trial and error process. The users of the plant could not give themselves the luxury of having the parts fail, because the cost for stopping the plant was too high and one couldn’t penalize suppliers for this. In addition, giving technical assistance to suppliers was very difficult, because managers knew about steel making, but not how to manufacture metalworking products. They could give suppliers the specifications and they [the suppliers] had to meet them, but SIDOR didn’t necessarily know how to help them” (Ex-SIDOR purchase manager, now manager for private SIDOR (GM 7/01)).

Some suppliers who experienced this resistance to local procurement interpreted it as a sort of “discrimination against the local”.

“I had to lie to get SIDOR to first buy my products, I had to tell them that they had been manufactured in Spain because if they had known they were locally made, they would not have purchased them… the problem is that people look down on what is nationally made, they think that all national things are bad without trying them, in that sense they are very unpatriotic” (AI 8/2001).

But why would SIDOR’s managers be so concerned about bad performance?

After all, today’s critique of state-owned enterprises argues that public managers’ tend to be unconcerned about performance. Their disinterest stems from the soft budgets, fuzzy property rights and susceptibility to outside pressure ascribed to state-owned firms (Adam, Cavendish and Mistry 1992, Perkins 1991). In contrast to this literature, state-owned SIDOR’s reaction to import-substitution efforts resembled more what we would expect of private enterprise.
Stringent monitoring systems and long-term career prospects made SIDOR’s managers concerned about how the import-substitution process could affect plants’ performance. In effect, each individual working at SIDOR was responsible for certain indicators of personal and departmental performance. These indicators were set yearly, yet evaluated on a weekly and quarterly basis. For operations managers, the most important indicators related to plant output. Any plant stoppage meant lost output for a given time period (week/month), and this lost output could not be recovered even once the plant restarted operation. Manager’s salaries and long-term career prospects within SIDOR’s meritocratic ascension system depended on the fulfillment of these indicators.\(^\text{64}\) (Director of SIDOR’s Import Substitution Department (NN 7/2001)). By 1987, three years after the start of the import-substitution program, operations managers’ resistance to the import-substitution drive was still so strong that SIDOR decided to appoint an import-substitution coordinator in each operations department, and asked its operations personnel to give this coordinator their support (García 1987).

**Protecting costs: resistance from higher level managers**

While SIDOR’s operation managers resisted the import-substitution drive out of concern about how it could affect the plant’s integrity, SIDOR’s higher level managers resisted the import-substitution drive out of concern about cost. First, as managers quickly found out, local suppliers could not always match the price of imported products. Local suppliers faced high raw materials costs.\(^\text{65}\), limited markets, scarce specialized

\(^{64}\) During the 1990s this monitoring system was computerized to the point where managers working anywhere in SIDOR (not only in Ciudad Guayana, but also in Bogotá or Caracas) could consult the maintenance, productivity and finance status of the firm on a daily basis (Ex-director of SIDOR’s import-substitution department (NN 7/01)).

\(^{65}\) The special alloy steels used for many of the metalworking parts have to be imported. There’s a commercial oligopoly around imports, and local metalworking firms buy in quantities too small to merit
personnel and equipment, and they lacked information on the technical specifications on the products to be substituted in the first place (CVG 1986).

Second, SIDOR found out that to aid local suppliers’ development the company needed to make costly investment in research and human resources. Some of the parts targeted for import-substitution were standard enough that local firms could get the technical specifications on their own. However, for many of the other parts, aspiring suppliers needed to obtain from SIDOR the part’s technical specifications (García 1987). However, SIDOR had know-how in steel-making, but not in metalworking. How then could SIDOR help local firms gain technical and design information about products that SIDOR itself did not manufacture?

SIDOR solved the technical specification problem by coordinating the action of its internal Purchases, Research Center, Quality Control, and Productions Departments. Working together, these departments both researched the capacity of existing local (and national) metalworking firms, and developed the technology to manufacture each piece in particular. This last step was neither simple nor costless. First, developing the metalworking manufacturing technology for each piece involved lengthy research and development. Second, it often required hiring specialized personnel. Third, after SIDOR developed the production technology, there was still the troublesome issue of how to transfer this technology to local suppliers. The following quote taken from the import-substitution endeavors of SIDOR’s oil pipe production plant illustrates this complexity:

“In order to carry forward this program, we had to contract the services of a modeler that would build each model that we designed, melt it, evaluate it, and correct any detail in the model, like draining channels, “mazarotas” or changes in

direct import. The result is that the domestic price on these special steels is sometimes as high as the price paid for the imported part in the first place.

66 Each of SIDOR’s different plants had its own production department.
the modeling system. (...) Every manufactured piece was broken into bits after its dimensional tests, to probe for the existence of pores, irregular melting, or any other defect not visible externally. Following this stage, the pieces were thermally treated, installed, and subjected to pressure. (...) After ending the evaluation, we designed the technology transfer format to those firms that have the adequate installations to manufacture them. Until now we have concluded 3 pieces and we are working simultaneously in developing 6 others for 1987.” (Ramos Lyon and Arismendi 1987, p. 5).

Aside from the internal product development efforts that each Production Plant coordinated, SIDOR’s import-substitution department hired a local engineering (and metalworking) company to draw the design and technical specifications of the products to be substituted. Eventually, this engineering company also evaluated local suppliers, gave them technical assistance, and became the import-substitution’s department executive arm. This company worked exclusively for SIDOR over the entire duration of the import-substitution program. Yet this firm had to invest in developing technology transfer abilities. As expected, SIDOR paid for this investment (Ex-director of Import Substitution Department (NN 07/01)).

“When SIDOR invited me to assist them in doing the parts engineering for the import-substitution department, I asked for a year to prepare myself well for this task. During that year, I evaluated VersaCAD and AutoCAD and the best computing packages available at the time, I prepared 11 mechanical, metallurgical and electronic engineers in the task of ‘stealing technology’, which is basically reverse engineering. I gave these engineering classes on educational methodology and technology transference. I bought an office and equipped it with the latest market technologies: plotter, IBM Microcanal, etc.

Once ready, SIDOR’s import-substitution department hired us for the reverse engineering. We designed the parts, specified the method of fabrication, and made a list of indicators so that SIDOR could know whether the piece was well done. We evaluated suppliers and gave them technical assistance. We also advised SIDOR on what products to try to manufacture here, and which not, because the required machinery was not available, for example.” (Engineer and metalworking entrepreneur (JU 8/01)).

While SIDOR’s arrangement with this engineering company work helped the local metalworking industry, which could not have manufactured these pieces if it
weren’t for these plans, it constituted a large expense for SIDOR. Ironically, even though the program’s ultimate objective was to save foreign exchange, during the first years it ended costing more than the amount saved.

“In what refers to the economic impact of substitution, an analysis of the substituted items in 1985 determined that, on average, costs were 39% higher than their value of imports, which meant an additional outflow of Bs. 19 million. In 1986, the cost is equivalent to 50% of the imported value, which represents an outflow of Bs. 31 million.” (García 1987, p. 11)

“SIDOR gave metalworking firms the design and technical specifications of the pieces and the firms would make them. This implied that SIDOR had contracted engineering firms to make these designs and specifications full time. Hiring these firms was very costly for SIDOR, suppliers did not pay for this” (Ex-director of SIDOR’s import substitution department (NN 7/01).

Higher managers’ resistance to the import-substitution program based on cost reasons should strike us as surprising. Here is state-owned SIDOR behaving just like a private firm. But aren’t state-owned enterprises supposed to have soft-budgets, and therefore to be willing to engage in this type of supplier development?

As it turns out, SIDOR operated under hard, rather than soft budget constraints. As Table 2.1. shows, during SIDOR’s fourfold expansion in 1974-1980, the company acquired a monumental debt, most of it in short-term loans. This heavy debt burden, combined with an increase in the price of inputs (due to inflation) and a cap on the prices at which SIDOR could sell steel domestically, made SIDOR start losing money in 1977 (see Table 2.2 below).

While the national government helped SIDOR avoid severe cash flow problems, it did not provide an effective solution to the debt problem. SIDOR’s shareholders, the

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67 In part, SIDOR’s huge debt resulted from delays in executive approval of the public credit mechanisms that would enable SIDOR to finance its expansion. These delays caused SIDOR to obtain short-term financing at a high cost (16%, vs. 8% for long-term financing). Short-term credit increased the cost of SIDOR’s expansion program from Bs. 15,170 million to Bs. 22,565 million (Martínez Guarda 1996).
CVG and the Fondo de Inversiones de Venezuela (FIV), disputed control over the enterprise yet at the same time never established a clear solution to SIDOR’s debt problems. It was only in 1993 that the Venezuelan national government assumed 60% of SIDOR’s debt (Martinez Guarda 1996).

Table 2.1. SIDOR’s debt burden

<table>
<thead>
<tr>
<th>Year</th>
<th>Amount</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1980</td>
<td>US $3,702 MM (Bs. 15,918 MM)</td>
<td>In 1980, SIDOR’s paid capital was US $1893 MM, which meant that the debt/capital ratio was 66/34</td>
</tr>
<tr>
<td></td>
<td>Of which 46% held as short-term loans (16% interest)</td>
<td></td>
</tr>
<tr>
<td>1985</td>
<td>US $2,367 MM (Bs. 10,176 MM)</td>
<td></td>
</tr>
<tr>
<td>1987</td>
<td>US $1,617.5 MM (Bs. 21,284 MM)</td>
<td>75% held in short-term loans</td>
</tr>
</tbody>
</table>

Source: Martinez Guarda 1996. Note that while the US$ amount of the debt decreased from 1980 to 1987, the amount in Bolivares increased because of the Bolivar’s devaluation in 1983.

Table 2.2. SIDOR operative results 1964 – 1980, (‘000 Bs.)

<table>
<thead>
<tr>
<th>Year</th>
<th>Net Sales</th>
<th>Net Utility (Losses)</th>
<th>Subscribed Capital</th>
<th>Long-term obligations</th>
</tr>
</thead>
<tbody>
<tr>
<td>1964</td>
<td>190,131</td>
<td>(9,705)</td>
<td>200,000</td>
<td>16,525</td>
</tr>
<tr>
<td>1965</td>
<td>275,911</td>
<td>(67,710)</td>
<td>200,000</td>
<td>9,378</td>
</tr>
<tr>
<td>1966</td>
<td>191,052</td>
<td>(59,584)</td>
<td>200,000</td>
<td>9,378</td>
</tr>
<tr>
<td>1967</td>
<td>343,425</td>
<td>(34,534)</td>
<td>1,647,790</td>
<td>4,276</td>
</tr>
<tr>
<td>1968</td>
<td>418,110</td>
<td>15,523</td>
<td>1,647,790</td>
<td>4,276</td>
</tr>
<tr>
<td>1969</td>
<td>480,083</td>
<td>23,778</td>
<td>1,647,790</td>
<td></td>
</tr>
<tr>
<td>1970</td>
<td>548,336</td>
<td>46,872</td>
<td>1,647,790</td>
<td>16,525</td>
</tr>
<tr>
<td>1971</td>
<td>521,812</td>
<td>13,401</td>
<td>1,647,790</td>
<td>315,365</td>
</tr>
<tr>
<td>1972</td>
<td>580,171</td>
<td>10,242</td>
<td>1,647,790</td>
<td>740,359</td>
</tr>
<tr>
<td>1973</td>
<td>667,637</td>
<td>10,489</td>
<td>1,647,790</td>
<td>929,467</td>
</tr>
<tr>
<td>1974</td>
<td>958,058</td>
<td>130,406</td>
<td>1,647,790</td>
<td>890,959</td>
</tr>
<tr>
<td>1975</td>
<td>1,546,324</td>
<td>109,557</td>
<td>1,647,790</td>
<td>1,681,870</td>
</tr>
<tr>
<td>1976</td>
<td>1,814,141</td>
<td>79,302</td>
<td>9,350,000</td>
<td>2,984,416</td>
</tr>
<tr>
<td>1977</td>
<td>2,285,899</td>
<td>(265,473)</td>
<td>9,350,000</td>
<td>5,564,292</td>
</tr>
<tr>
<td>1978</td>
<td>2,499,356</td>
<td>3,689</td>
<td>9,350,000</td>
<td>7,602,797</td>
</tr>
<tr>
<td>1979</td>
<td>2,955,182</td>
<td>(430,175)</td>
<td>9,350,000</td>
<td>7,602,797</td>
</tr>
<tr>
<td>1980</td>
<td>3,432,273</td>
<td>(1,279,836)</td>
<td>9,350,000</td>
<td>8,481,915</td>
</tr>
<tr>
<td>1981</td>
<td>(2,179,000)</td>
<td></td>
<td>12,350,000</td>
<td></td>
</tr>
<tr>
<td>1982</td>
<td>(800,000)</td>
<td></td>
<td>15,608,300</td>
<td></td>
</tr>
</tbody>
</table>

Source: Martinez Guarda 1996. SIDOR’s debt obligations were even larger than those showed in the far-right column, which only captures long-term debt but not short-term. For example, SIDOR’s total debt in 1980 (including short-term) amounted to Bs. 15,918 MM.
SIDOR’s continuous negative results generated a big public discussion about the firm’s management. Critics questioned the amount of money invested in expanding a losing firm. Consequently, SIDOR managers came under strong public pressure to improve operative results. Indeed, starting in 1981, SIDOR undertook a restructuring program aimed to “diminish operative costs, increase the productivity of its workers, diminish the rotation of qualified personnel and reduce general expenses” (Martinez Guarda 1996:150). As part of this restructuring program, SIDOR shut some of its older and less productive production lines, and ceased manufacturing products for which there was a low domestic demand or low prices. As Table 2.2. shows, by 1982 these actions allowed SIDOR to reduce its losses by 64%. It is under this context of financial pressure that SIDOR’s managers resisted the CVG import-substitution drive.

Results of the import-substitution drive

SIDOR ended up complying to the import-substitution mandate within the limitations imposed by its internal resistance. One way that SIDOR’s import-substitution department worked around this resistance was by deciding to substitute minor equipment that did not risk the functioning of the different plants. These minor equipments consisted of mechanical pieces like “ejes, bocinas, rodillos, acoples”. Some local metalworking firms did manage to produce much more complicated pieces, like “reductores”. These were the engineering firms that SIDOR had hired as consultants in the import-substitution process (Director of SIDOR’s Import Substitution Department (NN, 7/2001).

However, the decision to substitute simpler parts and pieces does not mean that they were irrelevant to SIDOR’s functioning, or that their volume was insignificant. For

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68 Production lines affected: Planta de sínter, Tren 300, Fábrica de Tubos Centrifugados, Trefilería (Martínez Guarda 1996).
example, by 1986 SIDOR’s reduction plants (Midrex I, Midrex II, HylI, HylII, Briquets and Scrap) had substituted 112 different products, which corresponded to 34.67% of the number of items previously imported for these plants, and had committed to substitute 30 items more for an additional 26% savings in the money value of imports (DelValle and Martinez 1987). In particular, the metalworking “ejes, bocinas, acoples, rodillos” referred to above ranked third in terms of economic impact among a list of 18 categories of products that SIDOR substituted (García 1987). Most of these contracts went to the local metalworking sector (Director of SIDOR’s Import Substitution Department (NN 7/2001)). Table 2.3. shows the results of the import-substitution drive within the CVG enterprises for 1985. Note that SIDOR import-substituted the largest amount of all the firms, and the largest amount in terms of regional purchases of metalworking products.
Table 2.3. The 15 largest items import-substituted in 1985

<table>
<thead>
<tr>
<th>Firm</th>
<th>Type of development</th>
<th>Item</th>
<th>Amount substituted (000 Bs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sidor</td>
<td>Regional</td>
<td><em>Lanza de argón monolítica</em></td>
<td>5,820</td>
</tr>
<tr>
<td></td>
<td></td>
<td><em>Rodillos colada continua</em></td>
<td>1,410</td>
</tr>
<tr>
<td></td>
<td></td>
<td><em>Grasa Coplattyn KG-10</em></td>
<td>1,204</td>
</tr>
<tr>
<td></td>
<td></td>
<td><em>Tubo liso sin costuras para precalentadores de agua</em></td>
<td>438</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Regional Sidor</strong></td>
<td></td>
</tr>
<tr>
<td>Alcasa</td>
<td>Regional</td>
<td>Guantes anticalóricos de tela de algodón</td>
<td>1,500</td>
</tr>
<tr>
<td></td>
<td>Outside region</td>
<td><em>Tela de fibra de vidrio para filtros fundición de aluminio</em></td>
<td>162</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Coque metalúrgico</td>
<td>1,950</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fusibles baja tensión</td>
<td>432</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Outside region Alcasa</strong></td>
<td>2,544</td>
</tr>
<tr>
<td>Venalum/Alcasa</td>
<td>Regional</td>
<td><em>Marcos refrigerados para puertas hornos de retención en fundición</em></td>
<td>940</td>
</tr>
<tr>
<td>Venalum/Interalúmina</td>
<td>Outside region</td>
<td>Forros para molino de bolas</td>
<td>3,500</td>
</tr>
<tr>
<td>Interalúmina</td>
<td>Outside Region</td>
<td>Antiespumante</td>
<td>493</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Polímeros fluoculantes</td>
<td>2,207</td>
</tr>
<tr>
<td></td>
<td></td>
<td><em>Bolas de molino forjado</em></td>
<td>932</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Outside region total</strong></td>
<td>3,632</td>
</tr>
<tr>
<td>Venalum</td>
<td>Regional</td>
<td>Elementos depuradores para filtros</td>
<td>201</td>
</tr>
<tr>
<td></td>
<td>Outside region</td>
<td>Solvente para refractarios</td>
<td>563</td>
</tr>
</tbody>
</table>

Source: CVG (1986). Metalworking products are placed in italics. Unfortunately the CVG had no historical series of the results of the import-substitution effort.

Despite its limitations, SIDOR's import-substitution drive did enable metalworking firms to develop manufacturing and even some design capabilities. For example, one metalworking participant of the program developed its own "brazos de mezcladores". The engineering company assisting SIDOR's import-substitution department taught this firm how to copy and improve the technology used in similar
American and Canadian products. In 2000, the metalworking firm marketed its “brazos de mezcladores” in Brazil (Vitória) (Metalworking entrepreneur (AH 3/00)). In addition, firms participating in the import-substitution drive eventually manufactured products of a similar or higher quality than the imported ones they substituted. In effect, reports documenting the impact of the import-substitution drive within SIDOR compliment the performance of local and national metalworking firms.

“We substituted the “juegos de engranaje de los compresores de proceso” [of the plant Midrex-I], equipment considered essential to keep production at this plant (...) with the metalworking firms Meinsa, radicated in the region (...) Meinsa manufactured the part to the satisfaction of SIDOR” (DelValle and Martínez 1987, p. 2).

“Venezuelan foundry firms were able to, in this case, compete, in quality as well as in costs and delivery times, with international suppliers like Midrex-Corporation, Centracero, Mitsui, etc.” (DelValle and Martínez 1987, p. 6).

“Within the results that we can cite is the case of the “mandriles del tren medio”, whose manufacturing was imitated by the firm ACEREX, obtaining better quality than the imported material. We have also obtained good results with “cabezas de punzón, expulsores, puntas de barra, etc.” (Ramos Lyon and Arismendi 1987, p. 7).

Aside the technical reasons for resistance explained above, rules governing state-owned enterprises’ purchase procedures eventually limited import-substitution’s potential of developing local metalworking firms. A “Ley de Licitaciones” approved in 1990 forced state-owned enterprises to open bidding process for inputs to all firms. This meant that local suppliers that had just developed a part or machinery during the import-substitution program had to compete against other, sometimes foreign suppliers, even when they had not yet progressed down the learning curve. Often they lost due to higher prices.

“The import-substitution process was tied up by the “Ley de Licitaciones”, where you had to invite everybody, you couldn’t work with the suppliers you wanted to. You could ask for an exception for the suppliers you were working with, but just
for that moment. When they had manufactured the product once they competed with everybody else and generally lost. You have to remember that representatives of foreign firms also participated in these general bidding processes.” (Ex-director of Import-Substitution department (NN 7/01)).

“The quality of the products that firms were able to manufacture in the region was the same or better than the imported ones, and the prices were equal or slightly higher, and when that was the case, you could trace it to the higher cost of raw material. The firms lost enthusiasm however when their development didn’t secure them stable contracts for these products, but were given to somebody else” (Engineer and consultant to the metalworking sector (JAM 8/01)).

This section showed how state-owned SIDOR resisted local procurement out of concerns for cost and quality. Hirschman (1971) also wrote about this kind of resistance. A current literature on backward linkages confirms that foreign firms arriving to developing countries also resist local procurement on cost and quality grounds. In particular, these studies recommend supply-side interventions to aid local firms solve their cost and quality problems (Battat, Frank and Shen 1996, UNCTAD 2001). Yet SIDOR’s resistance to local procurement and its effects on supplier development illustrate a dynamic that this literature does not recognize. Namely, resistance to local procurement curtails suppliers’ opportunity to develop, which warrants demand-side intervention.

In the case of SIDOR, pressure from the CVG forced the company to confront its resistance to local procurement. Hirschman (1971) also argued for government pressure.

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69 Hirschman argued that the established industrialist may exhibit resistance towards domestic supplying industries because of a) fear that the domestic product will be inferior to the imported one, b) fear of becoming dependent on a local supplier when previously he/she could shop around the world, c) tariff on his/her product, yet previously no tariff on inputs, d) fear that domestic competition will become stronger once the basic input is locally produced, e) fear that his/her location may be wrong if suppliers locate somewhere else (Hirschman 1971). The last two obviously do not apply to the relationship between two firms where the customer is the more powerful partner, as in the case of SIDOR’s relationship with local metalworking firms.
as one way to overcome this resistance\textsuperscript{70}. Yet the current literature interested in fostering backward linkages argues that demand-side interventions help inefficient suppliers thrive, as they supposedly did in most countries during import-substituting industrialization (Battat, Frank and Shen 1996). Rather, this literature prefers government matchmaking programs that will solve for market failures, such as providing information on local suppliers’ capabilities (Battat, Frank and Shen 1996, UNCTAD 2001).

While I agree that demand-side programs could create distortions that do not encourage suppliers to upgrade, discarding them altogether throws the baby out with the bathwater. As the case of SIDOR illustrates, some kind of demand-side intervention is required to initially link local suppliers to their potential customers. Once linked, the focus should then fall on the type of customer-supplier relations that incorporates incentives for upgrading, a topic I engage in Chapter 3. Abandoning demand-side approaches fails to capture the lessons from what the “supply-side” literature exemplifies as successful cases of backward linkages, namely the experiences of Taiwan and Singapore. In these countries, government development agencies engaged foreign firms in actively increasing their local purchases and providing technical assistance to local suppliers (Battat, Frank and Shen 1996). Why would these foreign firms engage in these supplier development programs? Unfortunately, these studies do not explain this. Yet one

\textsuperscript{70} “It has been in fact due to the regulations issued by the técnicos of the Kubitschek administration that backward linkage was enforced rapidly in the Brazilian automotive industry in the late fifties. IN Mexico, on the other hand, assembly plants existed for decades without any progress being made toward the local manufacture of motors and parts until measures similar to those in Brazil were adopted in the sixties” (Hirschman 1971: 108). Hirschman thought that other than government pressure, another way of diminishing established industrialists’ resistance to local procurement was if their inputs “occasionally experience curtailments, due to foreign exchange shortages” (p. 109). Since at the same time investment in backward linked industry required foreign exchange, Hirschman argued that periods of scarce foreign exchange followed by periods of abundance was the best way to provide both the motivation and the means with which to invest in backward linked industry (1971).
suspects government intervention, as both the Taiwanese and Singapore governments are renown for exerting a soft, yet firm hand in shaping the decisions of private firms.

The process of SIDOR’s import-substitution described above illustrates a second obstacle to backward linkages: supplier development is costly. Who pays for this? SIDOR assumed the greatest cost under pressure from the CVG. Local metalworking firms assumed the part of the cost involved in acquiring machinery and hiring or training personnel, yet lamented it once this investment did not guarantee further contracts from SIDOR. Supplier’s “loss” stemmed from a lack of articulation in SIDOR’s import-substitution program. SIDOR should have established a system in which to give local firms time to progress down the learning curve and amortize their investment. Namely, suppliers should have been given a time period in which to gradually reduce their price. The limitations of SIDOR’s import-substitution program illustrate a more general point: suppliers are less likely to make asset-specific investments when they have no security about the length of the relationship. While the customer-supplier literature already makes this point (e.g. Helper 1991), the backward linkage literature does not, partly because it does not grapple with the problem of who will pay for the costs of development.

Finally, that a state-owned enterprise assigned the role of regional development like SIDOR would evidence such resistance despite political pressure to increase local procurement underscores the strong nature of this resistance. In SIDOR’s case, meritocratic ascension systems, the visibility of plant failures, and hard budget constraints explain its behavior. IN particular, SIDOR’s resistance to local procurement shows that the development of a local metalworking sector in Ciudad Guayana cannot be dismissed as the automatic result of the development mandate of its state-owned firms.
2.2. How did the CVG in its role as a regional development body help promote localized backward linkages?

What about the CVG? In theory, the CVG had tremendous power to shape the regional form of backward linkages. As the ‘parent’ firm for all Ciudad Guayana’s state-owned enterprises, the CVG had ample room to influence these firms’ demand for local inputs. Indeed, the CVG’s role as intermediary between the national government and each of its holding firms gave it instruments to establish “quid pro quos” – much as development banks or other government agencies involved in financing development have the means to exact conditions from their creditor firms. The CVG could also have directed its supply-side investment promotion efforts at filling in the links – forward as well as backward—of the supply chains in which its holding enterprises participated. For example, in places noted for their success at creating backward linkages like Ireland, regional development agencies helped engineer this outcome through their role in coordinating investment (Görg and Ruane 1999).

In line with these predictions, the CVG at different points in time adopted both demand-side and supply-side policies to aid the development of a local metalworking supplier sector. However, I must add several caveats to the CVG’s role. First, the CVG only demanded its holding firms to increase local procurement when pressured to do so by either national government or local supplier firms. As this section will illustrate, at all other times the CVG tended to be unconcerned for the development of small-scale industry. Second, the CVG was able to break the resistance of its holding firms with respect to local procurement only during those years that the corporation had true control over Ciudad Guayana’s SOEs. In effect, the extent of the CVG’s control over its holding enterprises fluctuated over time, and depended on the percentage of shares the CVG
owned and its political positioning vis-à-vis other national government development agencies.

From a supply-side standpoint, the CVG’s action was more consistent over time. For example, throughout most of its existence, the CVG Industrial Promotion’s department focused on filling information gaps about promising metalworking investments in the region. However, this intervention did not have much of a role in aiding local metalworking firms.

The CVG has traditionally been uninterested in small-scale industry

Despite its role as a regional development corporation, the CVG has traditionally shown remarkable disinterest in small and medium enterprise development. Strangely enough, given that unemployment levels in Ciudad Guayana usually surpassed that of other regions in Venezuela, the CVG’s industrial promotion department emphasized very large, capital intensive, natural resource based industries. For example, Tables 2.4. and 2.5 show the CVG’s portfolio of investment projects at two different points in time: 1989 and 1999. The CVG conceptualized the two projects a decade apart, and within different contexts of national industrial policy. While the CVG conceived its 1989 projects within a policy regime of import-substitution, the 1999 projects occurred during a regime of open trade, decentralization and privatization. Remarkably, both kinds of investment portfolios are essentially the same in terms of the bias towards large-scale, capital intensive and resource-using industries. The nature of capital has changed, for the CVG now seeks private partners for each of these projects, but the development strategy

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71 A high level manager in the CVG’s early projects (like the Guri dam), and later director of the Fondo de Inversiones de Venezuela at the time of SIDOR’s Plan IV explained to me that the every democratic government following the fall of the last dictatorship in 1958 wanted to inaugurate large projects. This made development agencies like the CVG care little for smaller details (SI 01/00).
privileging large-scale enterprise has not. The CVG’s focus on natural resource-intensive industries seems to confirm theories of development that portray resource rich countries as prisoners of their own abundance (Karl 1997).

The CVG’s predominantly large-scale, resource and capital-intensive development strategy left little room for policy oriented towards smaller, labor intensive industries like metalworking. In fact, the CVG never had a policy towards the development of a metalworking sector.

“The development of metalworking service industries occurred spontaneously, according to the needs of SIDOR. But neither the CVG nor the state-owned enterprises ever had a real plan for the development of this sector.” (Ex-president of state-owned SIDOR (1973-1979), of the CVG (1979-1983), and of Venalum (AG 1/00)).

“Neither the CVG nor any other government body had a policy that specifically addressed the development of the metalworking sector” (Ex-vice president of state-owned SIDOR (IS 7/01)).

“In spite of what there is on paper, there was never a policy (understood as a set of actions) on the part of the CVG to develop the local metalworking sector” (Consultant to the metalworking sector (EY 11/99)).
Table 2.4. CVG: New projects and firms, 1984-1989

<table>
<thead>
<tr>
<th>NEW FIRMS CREATED</th>
<th>FIRMS IN PROMOTION</th>
<th>FIRMS IN PROCESS OF INTERNATIONALIZING</th>
<th>PROJECTS IN EXECUTION</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Aluminum Sector</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alamsa-Alloyven</td>
<td>Aluguay</td>
<td>Aleurope</td>
<td>Venalum expansion</td>
</tr>
<tr>
<td>Aluyana-Alumen</td>
<td>Subestraos de Aluminio</td>
<td>Wells Aluminum</td>
<td>Alcas expansion</td>
</tr>
<tr>
<td>Alusur-Rualca</td>
<td>Planta Cloro Soda</td>
<td>Alunasa</td>
<td>Interálumina expansion</td>
</tr>
<tr>
<td>Aldanca-Alisa</td>
<td>Acido Sulfúrico</td>
<td>Alruss</td>
<td></td>
</tr>
<tr>
<td>Vexxal</td>
<td>Valsa</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CVG Carbonorca</td>
<td>Tevenca</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BWA de Venezuela</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FOMA de Venezuela</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Western Wheel de</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Venezuela</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sulfato Orinoco</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Energy Sector</strong></td>
<td></td>
<td></td>
<td>Macagua II</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Caruachi</td>
</tr>
<tr>
<td><strong>Steel Sector</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Briquetas del Caroní</td>
<td></td>
<td>Comsigua</td>
<td>Ferrominera expansion</td>
</tr>
<tr>
<td>Briquetas Guayana</td>
<td></td>
<td>Italmagnesio</td>
<td>Pelletizing plant</td>
</tr>
<tr>
<td>Cilindros de Acero</td>
<td></td>
<td>Oxido de Hierro de alta pureza</td>
<td>Ferrominera</td>
</tr>
<tr>
<td>Guayasil</td>
<td></td>
<td>Acido Clorhídrico</td>
<td>Expansion SIDOR pipe</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>factory</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Fesilven expansion</td>
</tr>
<tr>
<td><strong>Mining Sector</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tecmin</td>
<td>Caolin por vía húmeda</td>
<td></td>
<td>Gold refinery</td>
</tr>
<tr>
<td>Revemin II</td>
<td></td>
<td></td>
<td>Venorca expansion</td>
</tr>
<tr>
<td>Protemin</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Industrial Sector</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pulpa Orinoco</td>
<td>Engranajes Helicoidales</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Peróxido de Hidrógeno</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Agro Sector</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proforca</td>
<td>Crab processing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Complejo Guayana</td>
<td>Complex to process and market cattle</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agroindustrial Guayana</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Service Sector</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ferrocasa</td>
<td>Industrial port</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Concregua</td>
<td>Executive Hotel</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ferrosur</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Others</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cilorca</td>
<td>Center for termic treatment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Capimet</td>
<td>Center for quality control</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inlubrica</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Instaelectric Guayana</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Table 2.5. CVG: Investment Portfolio, 1999

<table>
<thead>
<tr>
<th>Sector</th>
<th>Projects</th>
<th>US$</th>
<th>Direct</th>
<th>Ind.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminum</td>
<td>Columbia Al., Alisa Al.</td>
<td>1,200</td>
<td>2,000</td>
<td>1,200</td>
</tr>
<tr>
<td>Iron</td>
<td>Pellet Plant II, COMSIGUA, Orinoco Iron, POSVEN and others</td>
<td>2,914</td>
<td>1,590</td>
<td>15,900</td>
</tr>
<tr>
<td>Steel</td>
<td>New Pipes Plant, AREXVEN, Chlorine-Soda Plant and Processing of Effluents</td>
<td>593</td>
<td>791</td>
<td>2,320</td>
</tr>
<tr>
<td>Energy</td>
<td>Macagua II, Caruachi, Tocoma. Interconnection Venezuela-Brazil and Others</td>
<td>6,141</td>
<td>1,043</td>
<td>3,129</td>
</tr>
<tr>
<td>Services</td>
<td>Second Bridge over the Orinoco River, Railroad and net of associated roads, Deep water port (Sucre)</td>
<td>820</td>
<td>3,950</td>
<td>8,700</td>
</tr>
<tr>
<td>Agroindustrial</td>
<td>Complex of Nitrogen Fertilizers. Natural Rubber, Plantation of Eucalyptus</td>
<td>530</td>
<td>1,710</td>
<td>3,960</td>
</tr>
<tr>
<td>Forestry</td>
<td>Veneston, Ecopal, Terranova Group, Support doc in the Orinoco River</td>
<td>223</td>
<td>1,500</td>
<td>3,000</td>
</tr>
<tr>
<td>Gold-Diamond</td>
<td>Venezuela Goldfield, Canarc, Tumbston, Minca and Reminca, PMG and Investments in Diamonds</td>
<td>1,788</td>
<td>7,450</td>
<td>15,370</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>14,209</td>
<td>20,034</td>
<td>53,579</td>
</tr>
</tbody>
</table>

Source: CVG (1999, p. 10). Note that on average, for each US$700,000 of investment, these projects would create one direct job and 2.67 indirect jobs.

The CVG’s traditional disinterest for small scale, employment-generating industries makes this regional development agency different from others around the world. For example, the two regional development agencies fostering industrialization of the Brazilian Northeast—SUDENE and the BNB—typically selected projects according to their expected employment generation. Ciudad Guayana’s initial conditions may account for this difference in focus. In the Brazilian Northeast, the main motivation behind SUDENE and the BNB’s action was to solve acute problems of poverty. These problems did not initially exist in Ciudad Guayana, for the city materialized on empty land. Rather, the Ciudad Guayana project intended to exploit the fabulous hydroelectric power and mineral wealth of the Guayana region (CVG 1960, Martínez Guarda 1996).

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72 These acronyms stand for “Superintendencia para o Desenvolvimento do Nordeste” and “Banco do Nordeste do Brasil” respectively.
The CVG got involved in backward linkage inducing efforts when prompted by external (political) pressure

Perhaps because of the lack of interest in small firm development, the CVG only got involved in programs to increase the extent of backward linkages when prompted by political circumstances. In the first section of this chapter I explained one such circumstance: a balance of payment problem that prompted the national government to implement an import-substitution drive. The CVG, as holding body of the CVG enterprises, had no choice but to coordinate the program.

Another political circumstance concerned organized pressure from Ciudad Guayana’s interest groups. During the 1980s and parallel to the import-substitution drive, the local metalworking sector—organized through its business association, AIMM-Guayana—exerted pressure on the CVG to increase local procurement of its holding enterprises. Through this pressure, metalworking firms succeeded at getting the CVG president to directly exhort SIDOR’s president for increased purchases of the local metalworking sector (Ex-director of AIMM-Guayana (NG 03/02)). Some of metalworking firms’ pressure occurred within the normal parameters of lobbying. For example, several entrepreneurs recounted how an extremely respected member of the metalworking community used his personal friendship with the CVG president to convoke meetings with SIDOR’s president. At these meetings, metalworking representatives pressed for increased local procurement. The import-substituting context and the development role ascribed to Ciudad Guayana’s SOEs empowered the sector to make these demands (OM 7/01, NG 3/02). On-lookers to the sector however described this relationship in terms of machine building and patronage politics, where the CVG’s president supposedly accepted contributions for the “Acción Democrática” (AD) party in
exchange for the CVG’s role in increasing the extent of its holding’s local procurement (EY 07/01). From 1958 to 1998, the AD party had been the more popular of the two hegemonic political parties in Venezuela, winning the national government in 5 of the 8 elections carried out in those 40 years. AD was in power throughout the import-substitution drive recounted above, and naturally the CVG president, appointed by the government, was also an “adeco”.

The CVG did not always have power over the affairs of its holding enterprises

Even if the CVG had been interested in augmenting the backward linkages of its holding firms, the corporation did not always have enough legal, financial or political power to break the resistance of its holding enterprises to local procurement. In contrast to developing banks, which truly have instruments to exercise power over their creditors, the power that the CVG had over its holding enterprises varied over time. Specifically, the CVG only had real coercive power over its holding firms before 1974 and between 1984 and 1992.

The CVG lost control over Ciudad Guayana’s state-owned enterprises shortly after 1974. From the CVG’s creation in 1960 to the first oil crisis in 1974, the CVG truly funded SIDOR and the other state-owned enterprises in the sense that it channeled resources to these industries. However, once oil prices boomed in 1974, the national government decided to partly mitigate the distortive impact of the sudden, extraordinary increase in oil prices by depositing the “excess” revenue in a sterilization fund. A newly created government institute called “Fondo de Inversiones de Venezuela” (FIV) managed

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73 AD’s political support came from blue collar, labor union groups. AD has traditionally dominated the national confederation of unionized workers (Central de Trabajadores de Venezuela, CTV) and continues to do so during the Chávez government.

74 Any revenue above a certain price of oil (per barrel) would be deposited in this fund.
the fund and used part of it to finance Ciudad Guayana’s big expansion projects. By the early 1980s, the CVG found itself displaced by the FIV as principal owner of Ciudad Guayana’s large enterprises (see Figure 2.1 on the next page).

The CVG’s loss of power worsened once COPEI took over the national government in 1979 and heavily curtailed the CVG’s budget. COPEI was the less popular of the two hegemonic parties that dominated Venezuela’s political landscape until 1998. According to my interviewees, the entering COPEI government did not want to support a project that the public perceived as a “success” of its archrival AD (EY 01/01, OM 07/01). In effect, the major events in Ciudad Guayana’s history, like the founding of the city and of the CVG (1960), the inauguration of the Guri dam (1970), SIDOR’s Plan IV and Venalum’s construction (1974-1979) had all occurred during AD governments. In effect AD had strong voter support in the Guayana region. For all practical purposes, the CVG’s drop in budgetary allowance diminished its power over the region’s firms.

Figure 2.1. Distribution of shares of the CVG enterprises, early 1980s

![Chart: Distribution of shares of the CVG enterprises, early 1980s]

Source: Martinez Guarda 1996

75 This explanation however is overly simplistic. The new government faced a series of budgetary difficulties, which forced it to devaluate the national currency drastically in 1983, which in turn led it to lose the 1984 elections. It is very likely that the cut in the CVG’s budget and the government’s refusal to capitalize on the debt of the region’s state-owned enterprises obeyed partly to this financial crisis.
The CVG regained its lost power between 1984 and 1992. Two circumstances aided this turn of events. First, the AD party regained control of the national government in 1984 and kept in power until 1993. Immediately after regaining power, the party appointed the presidency of the CVG to a military man who believed in order, hierarchy, and a strong state role at the apex of economic development – Leopoldo Sucre Figarella. Sucre Figarella reconquered and solidified the CVG’s power by elevating the corporation to the rank of a ministry, which allowed him to sit on the Cabinet and directly report to the Venezuelan President. Furthermore, he made Congress approve a law that not only reestablished the tutelary role of the CVG on Ciudad Guayana’s enterprises, but gave the corporation widespread control of the enterprises’ affairs. In particular, the law required any public institution to intermediate with the CVG the public credit, exchange rate, planning and budget decisions affecting the CVG’s holding enterprises. Finally, the CVG took over the provision of some of Ciudad Guayana’s public services, such as street maintenance, water distribution and trash collection (CVG 1990, Pijiguaos 1989)76.

Starting in 1989 –and especially after Sucre Figarella left the CVG presidency in 1992—the CVG again lost power, this time permanently and due to a shift in national development ideology. Indeed, the structural adjustment program that Venezuela embarked on in 1989 brought with it pressure on the CVG to 1) privatize the region’s state-owned enterprises, and 2) decentralize the provision of public services (CVG 1990,

76 Leopoldo Sucre Figarella is remembered in Ciudad Guayana as the “Czar” of Guayana, implying that he run the region as his personal kingdom. The nickname has both positive and negative connotations. Positive, in that during his time in presidency the city was supposedly kept beautifully, public services worked well, and the region’s infrastructure heavily expanded. Under his direction, for example, the CVG built the road from Ciudad Guayana to Boa Vista, Brazil –the first and only road to communicate both countries—and the second, badly needed bridge over the Caroni River. Negative, in that he centralized under the CVG many of the functions that corresponded to the municipal government and therefore kept local administrative competencies from developing. Moreover, the nickname implies some level of personal graft. A co-AD member at one point formally accused him of corruption. As I mentioned earlier, an investigative committee later exonerated him from these charges.
Sucre Figarella’s prominent position in the AD party had helped him shield the CVG from this pressure. However, once he left the presidency of the CVG, the road opened for privatization and the CVG’s restructuring (Ex-director of FIV (1989-1993) (EJ 03/01)).

Twice, the CVG attempted to get its holding firms cooperate with the goal of backward linkages. The first time occurred during the import-substitution program of 1984-1989, when the CVG both aggregated its holding enterprises’ demand for goods and prodded them to carry out import-substitution. Given the CVG’s control of the enterprises at the time, the import-substitution drive was relatively successful – at least within the difficulties discussed above for SIDOR. In those days the CVG even got its holding firms to mount a physical display of the parts and equipment susceptible to import-substitution, and accompany this display with a computerized system where aspiring suppliers could find information on these enterprises’ demand for any one good. Metalworking firms benefited immensely from this exhibition gallery, for it gave them access to real samples of the parts and pieces they sought to design, and provided them with information on market size for each piece (Metalworking Entrepreneur (JR 2/00)).

In 1994, the CVG tried to implement a backward linkage program for the second time, yet this time around it was much less successful. The program attended to a confluence of reasons. First, the CVG enterprises had undergone restructuring programs in the early 1990s to prepare them for privatization. SIDOR in particular shut down 17 of its older plants, reduced the number of products it manufactured, and laid off 3500 workers (Ex VP of state-owned SIDOR (IS 07/01)). This restructuring severely reduced the demand for metalworking inputs, which created excess capacity in local
metalworking firms. The local metalworking sector turned to the CVG’s promotion department for some kind of policy response (AIMM-Guayana 1994, GIIG 1991). Meanwhile, the government foundation in charge of promoting the development of a capital goods industry (Condibieca) lost government funding. The personnel working at this organization wanted to keep it alive. For this they needed funding, so they created a new, non-profit organization (Fondibieca) and offered their consulting services to the CVG (Fondibieca director (SR 08/99)). At the same time, the CVG’s industrial promotion department, having lost its functions of the 1980s, was in the midst of reinventing its role and wanted to implement an initiative to develop small and medium enterprises (SMEs). The Fondibieca program of helping capital goods’ producers fit the department’s new role. At the same time, this initiative promised to quell the pressure of the local metalworking firms. Yet this time around, the CVG’s attempt to aggregate demand failed. In a blatant showdown of the loss of power of the CVG, its holding firms refused to divulge their purchase information (CVG Industrial Promotion directors (CR 11/99, CC 02/00)).

The above account tries to convey two points. First, given SIDOR’s resistance to import-substitution (surely present in the other CVG holdings as well), the process would not have happened without CVG pressure. Second, the CVG’s pressure in turn responded to both government and interest group pressure. Third, the CVG’s ability to impose this demand-side pressure for backward linkages hinged on the power it had at that time over its holding firms.
Supply side effects: spillovers from infrastructure, yet otherwise “hands off” attempts to improve the variables affecting metalworking firms’ performance

My general impression from perusing the CVG’s Industrial Promotion archives, from talking to the department’s personnel and from interviewing the owners of Ciudad Guayana’s metalworking firms, is that from a supply-side standpoint the CVG did little to alleviate different kinds of difficulties that severely affected suppliers.

First there is the issue with financing. The CVG never had any money to lend to small and medium firms (CVG Industrial Promotion director (JVG 02/00)). The CVG’s behavior in this regard responded not necessarily to a lack of financial means, but rather to the emphasis on large-scale, natural resource-intensive industries documented above. From reading the CVG annual reports that the corporation published from 1960 to 1990, it seems like the prevailing belief was that private capital would finance these projects.

For example, the following table that the CVG’s Planning Department elaborated in 1962 foreseeing employment trends and investment needs in the city shows how the CVG did not consider investing in smaller industry (not even metalworking). Interestingly, these were precisely the sectors that the CVG associated with greatest employment.

<table>
<thead>
<tr>
<th>Industry</th>
<th>Direct employment by 1977</th>
<th>Investment required 1963-1975 (Bs. MM)</th>
<th>CVG funding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iron and Steel</td>
<td>19,564</td>
<td>3,320</td>
<td>1,277</td>
</tr>
<tr>
<td>Aluminum and Manganese</td>
<td>990</td>
<td>328</td>
<td>81</td>
</tr>
<tr>
<td>Chemical Products</td>
<td>916</td>
<td>191</td>
<td>122</td>
</tr>
<tr>
<td>Heavy Machinery, Pulp and Paper, Construction Materials</td>
<td>43,118</td>
<td>742</td>
<td>--</td>
</tr>
<tr>
<td>Food and Beverages, Garments and Shoes, Furniture, Graphic arts</td>
<td>19,558</td>
<td>544</td>
<td>--</td>
</tr>
<tr>
<td>Electricity Generation</td>
<td>(no estimate)</td>
<td>1017</td>
<td>754</td>
</tr>
<tr>
<td>Electricity Transmission</td>
<td>(no estimate)</td>
<td>147</td>
<td>147</td>
</tr>
</tbody>
</table>

Source: CVG 1962.
The CVG did however at different points mediate between entrepreneurs and government financing institutions such as Foncrei and Corpoindustria. The supposed role of this mediation was to help local firms get badly needed credit (CVG 1985). Yet my interviewees expressed two different views about the effectiveness of this kind of intermediation: that it did help, and that it did not. A long-time consultant to the sector expressed:

“(…) however, the CVG was interested in creating an industrial park. Thus it gave land, constructed industrial buildings, helped firms get credit. The Italians and Spaniards with technical knowledge quickly became entrepreneurs.” (EY 11/99 – stress mine).

However, most of my interviewees expressed not having received any mediation assistance from the CVG. The owner of a relatively new firm even complained:

“I went to the CVG Industrial Promotion Department and asked them to help me request funding from a European institution. It was I who took them the information about this funding source, even though they should have known about it. They helped me put together a financial proposal, but it was a disaster, a loss of my time. In the end I couldn’t use it and had to hire somebody else” (JJL 02/00).

Whether the CVG effectively mediated metalworking firms’ rapport with financial institutions, lack of financing consistently figures as one of the problems that metalworking firms confront. During the 1980s, the CVG’s import-substitution committee identified lack of financing as one of the obstacles to the process (CVG 1986, CVG 1987). Of 17 metalworking firms surveyed in 1986, 12 needed credit, most of them to build industrial installations and purchase machinery and equipment. Of these seventeen firms, the majority (11) reported financing themselves with reinvestment of profits. Only six firms had credit with financial institutions (CVG 1986b). The funding problem persists in the 1990s (Long-time consultant to the sector (EY 11/99), Metalworking Entrepreneur and current owner of Banco Guayana (OJ 8/01)).

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Aside from the funding issue, the CVG’s industrial promotion department tried in other ways to intervene on the supply-side to help the local metalworking sector develop. Particularly, this department implemented a program similar to the backward linkage literature’s recommendations of matchmaking (Battat, Frank and Shen 1996, UNCTAD 2000). In this program, the CVG’s industrial promotion department hired consultants to analyze and document attractive market opportunities in Ciudad Guayana. These studies formed the core of the department’s “Servicio de Información para el Desarrollo Industrial (SIDI)” services: a library from which prospective investors could get ideas on worthwhile projects. Today, these carefully elaborated projects languish, dusty and outdated, in the CVG’s Industrial Promotion Department’s library. Not one of them was implemented. Why? One metalworking entrepreneur cites lack of funding (JR 03/00). The Ex-director for SIDOR’s import-substitution committee, who could cite most of these projects by heart (those pertaining to the metalworking sector), told me that those interested in the projects had no guarantee that Ciudad Guayana’s state-owned enterprises would buy from them (NN 07/01).

In fairness, once the CVG and its holding firms started restructuring at the beginning of the 1990s, the CVG’s Industrial Promotion Department started providing services more in tune with the metalworking sector’s needs. For example, the department sponsored some business and technology development courses that helped local metalworking firms prepare for SIDOR’s privatization. The department also funded the sector’s visits to trade fairs out of the country to help metalworking firms expand their

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77 These opportunities were gleaned from aggregating the demand of the CVG’s holding enterprises during the import-substitution program.
78 The most recent ones date 1988 and 1989.
79 Like the thermoelectric treatment plant, the lamination cylinder plant, the panel manufacture for tractors, etc.
market beyond Ciudad Guayana. Yet some of this action has in turn responded to the organized pressure exerted through AIMM-Guayana and the other two chambers representing the metalworking industry (CIMG and ASOPEMIA).

These comments are not meant to criticize the activities of the CVG’s Industrial Promotion Department. I truly believe that its directors operated with the best intentions. However, the failure of the SIDI system in particular points at two things. First, simple “matchmaking” information about market opportunities may not be enough for backward linked investment. Suppliers need to have some certainty about their market, particularly when their potential market is restricted to a few customers—like Ciudad Guayana’s state-owned enterprises in this case, or like the foreign firms depicted in the backward linkage literature. Certainty derives from some kind of commitment on the part of these customers to procure locally. This lesson is important given that the current policy advice on backward linkages recommends “matchmaking” programs, but does not address the issue of customer commitment (e.g. UNCTAD 2001, Battat, Frank and Shen 1996).

Second, the case above emphasizes that backward linkages requires special attention to the financial needs of small and medium enterprises. As the backward linkage literature recognizes—and the case of Ciudad Guayana illustrates—SMEs disproportionately lack the kinds of financial support available to large firms.

2.3. Politics helps forge initial links, but institutions governing customer-supplier relations determine their trajectory

On the surface, the deepening of backward linkages in Ciudad Guayana (in the sense of going beyond repairs and maintenance to manufacturing pieces and equipment) occurred due to political pressure. SIDOR, a state-owned enterprise, nevertheless behaved in some respects like a private firm and resisted backward linkages. The CVG,
concerned with regional development and under pressure from the national government and from local constituents, pushed SIDOR to import-substitute local metalworking parts and equipment within the limits of its resistance. Yet this explanation obviates one important fact: while import-substitution helped the metalworking sector consolidate links to SIDOR, it cannot account for the sector’s long-term upgrading.

When I asked metalworking entrepreneurs how the import-substitution process had helped them, most responded with a shrug. They remembered import-substitution as providing them with opportunities to develop new products, but also as having had disappointing results. These interviewees presented the problems already explained above, namely that the process did not guarantee metalworking firms a stable relationship in which to amortize investment in upgrading (OM 7/01, JAM 8/01, JU 7/01)\textsuperscript{80}. A CVG evaluation of 16 metalworking firms performed during the import-substitution period also registered this complaint (CVG 1986b). Indeed, as the next section will show, the institutional innovation that \textit{did} lead to long-term upgrading and backward linkage within the metalworking sector addressed this temporal aspect of the customer-supplier relation.

\textbf{Reducing transactions costs: import-substitution finds sympathizers within purchases}

Although many departments within SIDOR participated in the import-substitution effort, SIDOR’s purchase department eventually played an independent role. Within the import-substitution protocol, SIDOR’s Purchase department had the autonomy to purchase locally or nationally those materials and/or spare parts whose substitution was obvious – meaning that there was local/national capabilities to do them – and

\textsuperscript{80} One entrepreneur did not even concede any benefit to SIDOR’s import-substitution program, and angrily told me that it hadn’t helped him in \textit{anything} (AI 7/01, stress in the original).
subsequently inform SIDOR’s Import Substitution department of its choice (García 1987).

From my interviews, it would seem that SIDOR Purchase managers were particularly empathic to the idea of increasing local procurement. First, they believed that SIDOR should try to use its purchasing power to contribute to regional development (e.g. OM 8/01, RL 7/01). Their belief may have itself surged from the import-substitution drive, as SIDOR carried out a series of talks in the 1980s indoctrinating employees on the importance of import-substitution for national development (e.g. CVG 1987). In hindsight, this campaign probably aimed to subdue resistance from Operations Personnel. However, Purchase Managers’ sensitivity with issues of local development may have also come from frequent contact with local metalworking firms. After all, within SIDOR, Purchases was (and still is) the department that visited firms and gauged their installations, manufacturing processes, and production capacity. While for most other departments involved in import-substitution these firms existed in abstraction, for Purchases they existed in reality.

SIDOR Purchases, and specifically the division for repairs and maintenance that worked out of SIDOR’s Central Workshop\textsuperscript{81}, developed its own internal import-substitution drive (Purchase Manager (OM 11/2001)). In coordination with AIMM-Guayana—the business association representing metalworking firms in Ciudad Guayana—this Purchase Department set up an “Open Purchase Order” (Open PO) system for recurrent buying. The system aimed to help local metalworking firms develop the capacity to manufacture and repair more complex products over time. To achieve this, Purchase Managers built long-term commitment, transparency, and monitoring within the

\textsuperscript{81} At the time each plant had its own Purchase division.
Open PO. The resulting governance structure guaranteed local metalworking firms with long-term commitment on the part of SIDOR in exchange for upgrading.

This Open PO system—and not the import-substitution process—constituted the angular stone that supported the upgrading and specialization of Ciudad Guayana’s metalworking firms. Its origins, as that of import-substitution, lay in the national government pressure to increase procurement of domestic Venezuelan products. However, the secret of its success at upgrading local metalworking firms lies in how it replied to this government mandate, that is, the elements of its institutional design. Chapter 3 will explain in detail how this system worked, and how it evolved from the lessons of a previous failed attempt, as well as from the import-substitution program.

2.4 Conclusion

The first conclusion of this chapter is that politics, understood as the pressure from both above and below is a necessary element to forge backward linkages. In the case of the development of Ciudad Guayana’s metalworking sector, the CVG exerted pressure from above towards SIDOR for an increase in local procurement. The CVG’s pressure in turn stemmed from central government mandate and from lobbying activities on the part of affected metalworking firms.

Politics is necessary because the prospect of local procurement often elicits resistance from potential customer firms. In SIDOR, this resistance stemmed from concerns about suppliers’ quality and consequent harm to the plant, and from the high costs of developing local suppliers’ capabilities. The strength of this resistance within a firm charged with regional development starkly underlines the difficulty of eliciting backward linkages. Left on its own, the resistance would have caused a situation of
“shallow” local procurement – that is, of metalworking services of lesser difficulty like maintenance. At the same time, supporting the technological development of local suppliers carries with it a tremendous cost. The current literature on backward linkage recognizes a similar type of resistance – one based on prices and quality – but neither acknowledges its Catch 22 nature nor pays attention to who bears the cost of supplier upgrading.

The role of the CVG in putting pressure against this resistance also gives us two lessons. First, the CVG could only use demand-side pressure on its holding firms when it had real power over them. Partial ownership alone did not confer enough power – rather, a situation where the CVG mediated (or vetoed) all contact between its holding enterprises and the rest of the Venezuelan government finally gave it power. The finding underscores Vernon’s argument of how state-ownership does not necessarily give government a better control of these enterprises than private ownership.

Second, bottom-up pressure also worked as a mechanism to interest the CVG in a cause for which it traditionally had little interest: the development of local SMEs. This lobbying/patronage channel may in part have worked as an information mechanism in that it opened the CVG’s eyes to the existence of a local sector. National government rules of import-substitution also empowered local suppliers to impose their demands for local procurement on the CVG.

Finally, politics, while important to break the resistance that inhibit backward linkages in the first place, is not a sufficient condition to elicit the upgrading of a backward linked sector. In the case of SIDOR, the import-substitution program, despite all its political backing, could not devise an institutional format in which to support the
investment process of metalworking firms. Namely, it lacked the long-term commitment mechanisms that suppliers anywhere require to make asset-specific investment. In contrast, another governance system that surged at the same time as the ISI drive and for similar reasons did manage to elicit supplier upgrading. The next chapter reveals the how, why, and consequences of this governance system in terms of the development of the metalworking sector.
Chapter 3: Inter-industry governance systems, upgrading, and collective action

The preceding chapter described how SIDOR’s import-substitution drive did not lead to sustained investment in upgrading among Ciudad Guayana’s metalworking firms. Yet the second “Open PO” system that SIDOR’s Central Workshop developed with local metalworking suppliers did encourage their investment in upgrading, and even in specialization. What can account for these systems’ different impact on the development of Ciudad Guayana’s metalworking sector?

In this chapter I focus on how customer-supplier relations shape the development of a backward linked, local supplier sector in lagging regions. Specifically, I study how the different kinds of customer-supplier relations that SIDOR developed with different sub sectors of local metalworking firms led to differences in these firms’ upgrading.

Initially, my focus on customer-supplier relations may seem unusual. After all, the backward linkage literature tends to focus on the supply-side deficiencies that undermine supplier capabilities, such as lack of access to financial markets, good vocational schools, training institutes, technology support services, R&D centers and laboratories (Battat, Frank and Shen 1996, UNCTAD 2001). Truly, the absence of the above-mentioned support structures often curtails suppliers’ potential development. Yet attention to supply-side variables may not be enough to elicit supplier upgrading. Rather, as the case of SIDOR will show, both the structure and governance of the customer-supplier relationship affect incentives for upgrading on the demand-side. Moreover, they can also impact the ability of suppliers to act collectively to overcome supply-side deficiencies.

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82 See Kelegama and Foley (1999) for a description of how lack of financing, an adverse tax structure and poor infrastructure inhibited a local textile industry from developing in Sri Lanka, despite the very high demand for cloth posed by Sri Lanka’s booming garment industry.
This chapter argues that suppliers' investment in upgrading depends on the expectations of long-term commitment they have from their customers. Yet in buyer-driven relationships such as that between SIDOR and its local metalworking suppliers, tensions inherent to the relationship tend to inhibit long-term commitment. In Ciudad Guayana, a system of collective mediation surged to negotiate these tensions in a way that encouraged the development of the metalworking sector. As an added, unforeseen effect, this system enhanced local metalworking firms' abilities to act collectively. These findings have important implications for the backward linkage literature, the industrial relations literature, and the industrial cluster literature.

3.1. Developing local suppliers requires attention to customer-supplier relations

Long-term commitment from SIDOR to local metalworking firms encouraged their upgrading. As this section will show, the second Open PO system that evolved between SIDOR and Guayanese metalworking firms built long-term commitment into the governance of the customer-supplier relationship. In contrast, as the last chapter explained, SIDOR's import-substitution drive did not achieve its expected results of supplier upgrading because it lacked a way to ensure this long-term commitment.

The notion that long-term commitment aids supplier upgrading is not new. This finding first emerged from a literature studying the divergent customer-supplier relations in the Japanese and US automobile industries. This literature characterized two types of customer-supplier relations. At one extreme lie "arms-length" relationships. Arms-length relationships are marked by short-term or no commitment to suppliers, and very little exchange of information aside from price. In arms-length relationships the incentive to upgrade comes from competition. The customer allocates orders through a competitive
bidding process, and changes supplier often to maintain the threat of exit alive. This is the stereotypical characterization of customer-supplier relations in the US automobile industry (Richardson 1993).³

At the other extreme of the customer-supplier continuum lie “relational” or sole sourcing relationships. In sole-sourcing relations, customers commit to their suppliers for the long-term, exchange significant information, and solve problems jointly. Customers lose bargaining power because long-term commitment reduces their ability to exit. Yet long-term commitment encourages supplier investment by giving them time and security in which to amortize it. Relational contracting practices characterize the Japanese auto industry. According to many studies, Japanese auto assemblers’ relational contracting systems have enabled them to out compete their US counterparts in product innovation, quality and costs (Helper 1991, Richardson 1993, De Jong and Nooteboom 2000).

This customer-supplier relation’s literature portrays the customer as deciding ex-ante the terms of the relationship, according to its own needs. For example, if the customer needs to invest a given amount in working with a given supplier (e.g. joint design of a product, or implementing quality systems), a more relational outcome tends to emerge. Yet if the supplied input is more standardized and requires less information exchange, an arms-length relationship emerges. Often, cultural patterns imprint themselves on the customer-supplier relation, which would explain why the Japanese and the Americans engaged in diametrically different styles within the same industry (Sako and Helper 1996, Bidault, Despres and Butler 1998, De Jong and Nooteboom 2000).

³ Customer-supplier relations in the US started to become more “relational” at the end of the 1980s due to increased Japanese competition (Helper 1991).
In terms of industrial development in lagging regions, customers’ power to impose the terms of the relationship becomes problematic, as it may not incorporate suppliers’ needs. For example, incipient local suppliers in developing regions may need long-term contracting to make the investments that will render them competitive. Yet their need for long-term commitment may not be generic to the industry, but rather hinge on asset-specificities derived from these suppliers’ isolation from other potential customers, or to their lower initial capabilities. The customer’s ability to decide for an arms-length relationship in this case necessarily inhibits supplier development.

The interesting finding that emerges from the case of SIDOR is how collective mediation of the customer-supplier relation can solve this conflict between the parties. This lesson arises from comparing SIDOR’s first Open PO system, which operated between 1980 and 1987, with SIDOR’s second Open PO system. While the first Open PO system aimed for long-term commitment, the system never solved conflicts inherent to the customer-supplier relationship. In contrast, SIDOR’s second Open PO system solved conflict by inviting a business association representing metalworking firms in Ciudad Guayana to mediate the customer-supplier relationship.

**The first Open PO system: individually negotiated customer-supplier relations**

The first “Open Purchase Order” system surged in 1980 when SIDOR found itself cash-strapped after completing its fourfold expansion. This meant that the company could not invest in expanding its Central Workshop and consequently had to start relying on the maintenance and repair services of local metalworking firms. The term “Open PO” described the contractual relationship that SIDOR’s Central Workshop then developed

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84 I describe this system’s origins in Chapter 1.
with metalworking suppliers. Specifically, it refers to SIDOR’s practice of, at the
beginning of each year, assigning each participating supplier a certain amount of demand
based on the Central Workshop’s predictions of the services it would need. As the year
progressed, SIDOR would order services from each participating firm until the assigned
money value for that firm had been used85.

This contractual system had two intentions. First, minimize SIDOR’s transactions
costs of going through a bidding process for even small repairs. Second, to help
metalworking suppliers specialize by giving the same type of repairs to the same firms –
i.e. long-term commitment (Ex state-owned SIDOR Purchase Managers (OM 8/01, OV
8/01)).

This first Open PO system tried to balance long-term commitment with
competition. Using standard procurement practice, it incorporated competition by making
the yearly assignation of Open Purchases subject to an individualized, closed bidding
process, where price was the deciding variable. In theory, this bidding system impeded
metalworking firms from knowing what price the others offered for their services, and
hence encouraged each to bid at the lowest possible price. Surprisingly, the structural
elements supposed to sustain the probity of the system ended up corroding it. In effect,
the closed and individualized nature of this Open PO system did not solve problems of
pricing, diminished transparency in the allocation of purchases, and created the
perception of rent-seeking, making the system lose credibility.

85 The Open PO system functioned like a checkbook, in which SIDOR’s purchase department would say:
Company Alpha has been assigned X man/hours and Y machine/hours for this year. During the year, the
Central Workshop would assign the pieces and repairs that SIDOR needed to Alpha until the full amount of
the man/hours and machine/hours allotted to that firm had been used. SIDOR’s purchase department set the
price at which it paid each man/hour or machine/hour through a closed bidding process to selected firms –
after receiving the bids the purchase department averaged the proposed prices (Metalworking Entrepreneur
(NG 3/2002), SIDOR Purchase Manager (OM 3/2002)). Each participating supplier owned a “mailbox” in
SIDOR’s purchasing department and invitations to bid would be placed there.
It all started with conflicts about price. The closed nature of the bidding process meant that it lacked transparency in pricing. In theory, this bidding system impeded metalworking firms from knowing what price the others offered for their services, and hence encouraged each to bid at the lowest possible price. In practice, prior to each bidding cycle metalworking firms discussed between them what each firm would offer and set the minimum price they would all bid at. One reason they did this is because their cost structure, meaning the rate they could charge for man/hour and machine/hour, was not uniform among the firms. Firms that had invested in advanced machinery, for example, needed to bid at a higher machine/hour rate than firms that had not. In truth, they needed less machine hours to produce the same output than a less modernized firm. However, the bidding process was based on machine/hour and man/hour prices only, and did not take into account these differences in quality (Ex-purchase manager for state-owned SIDOR (OV 8/01))

Interestingly, this kind of collusion did not lead to higher prices. SIDOR was aware that firms inflated their prices, and therefore used its buyer power to set them by fiat. Usually the price set was an average of the bid prices (Ex-purchase manager for state-owned SIDOR (OM 3/02)).

This first Open PO system also lacked transparency in the bidding and awarding of contracts. In theory, contracts should have rewarded firms who made upgrading investment. In practice, such investment did not even secure participation into the system. For example, parallel to this first Open PO system there was another system to

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86 Apparently, at these meetings the firms would even decide how to distribute the contracts between them in “this time I win it, next time you win it” fashion (many interviews). Collusiveness was easy given that to find out which firms had been invited to a given bidding process, a firm only had to look inside the open mailboxes that each supplier had at SIDOR’s purchasing office. A brief glance sufficed to know with whom a particular supplier had to negotiate this time around.
incorporate new firms to the bidding process. The requirement to participate was
investment in some installed capacity (e.g. workshop, machinery). Often, firms making
this investment became abandoned brides, as purchase managers tended to only solicit
bids from those firms they already knew (SIDOR Purchase Manager (OM 3/2002)).

SIDOR’s purchase managers wanted to work only with familiar firms because of
the system’s weakness at monitoring. In effect, SIDOR did not put in place a mechanism
through which to centrally screen the delivered spare parts and pieces (before
installation). The result is that pieces often broke after they had been installed, causing
costly interruptions of the steel-making process and sometimes even damaging other
equipment. However, it became difficult for SIDOR to hold metalworking suppliers
accountable for such bad performance because these firms often claimed that the pieces
had been damaged during installation. Although SIDOR did have the power to discipline
suppliers, this disciplining process was extremely slow. Purchase managers therefore
wanted to work only with “proved” suppliers – for example, those they had worked with
during SIDOR’s expansion – because they knew that these suppliers could fulfill the
required tasks (SIDOR Purchase Manager (OM 3/2002)). Yet their selectivity within a
theoretically “open” system fueled complaints of collusion on the part of excluded local
metalworking firms (Metalworking Entrepreneurs (HR, AS, 11/99)). Moreover, from an
economic standpoint, not allowing contending suppliers to enter the system diminished

\[87\] These monitoring problems seem to have been partly due to lack of coordination between the entity
making the purchase decision – SIDOR’s central workshop – and the plant technicians that received and
installed the delivered pieces. While purchase was being made in a centralized manner, reception was
decentralized, and there was no standardized reception process among the different plants to screen pieces
for defects.
the healthy competition between local suppliers that the system was supposed to encourage.

**Lack of transparency leads to suspicions of rent-seeking, loss of credibility**

Lack of transparency in the Open PO system led to metalworking firms’ perception that an investment in bribing, rather than upgrading, led to contracts with state-owned SIDOR. This perception stemmed partly from firms’ inability to scrutinize the decision-making criteria that state-owned SIDOR followed in its procurement process. As illustrated above, while SIDOR purchase managers behaved rationally in limiting access to the bidding process, their behavior violated an implicit norm of open entry. On the other hand, firms’ suspicions of rent seeking stemmed from a cultural disposition to view state bureaucrats as opportunistic and susceptible to bribes. This perception had a true ring, for along with the cases of solid, reputable firms performing work for state-owned SIDOR there were others of phantom firms that only existed on paper.

In the end, all the characteristics weakening the first Open PO system derived from the circumstances governing its birth. The system was not meant to develop a local metalworking sector in its grander, industrial development sense. Rather, the system surged from a practical need of compensating for the limitations of SIDOR’s Central Workshop. Its “rules” in any case were not explicitly formulated but implicit and informal, and evolved over time.

**The second Open PO system: using collective mediation to build transparency**

The second Open PO system initiated within the context of SIDOR’s import-substitution drive, which assigned SIDOR’s Purchase Offices the task of increasing local
procurement in those inputs where there was easy local or national availability. The local metalworking sector was an easy choice. It already existed, it was already involved in a procurement relation with the Purchase Office (e.g. first Open PO), and it was a pretty vocal constituency.

The Purchasing division of SIDOR’s Central Workshop sought to fulfill the import-substitution mandate by improving on the existing Open PO system. Specifically, it targeted the problems of commitment, transparency and monitoring of the first Open PO agreement by turning it from an individual to a collectively mediated process. To accomplish collective mediation, SIDOR’s purchasing division required local suppliers to organize into a business association. As a director of this division told me, they felt that to strengthen the metalworking sector’s development they needed a collective body to bargain with, rather than individual interlocutors. Hence in 1987, local metalworking firms contacted the national business chamber representing the metalworking industry (Asociación de Industriales Metalúrgicos y de Minería, AIMM) and created a regional chapter that would represent metalworking firms in Ciudad Guayana (AIMM-Guayana) (Ex-directors of AIMM-Guayana (NG 3/2002, OM 8/2001)). Starting in 1987, Purchase Managers no longer assigned yearly open purchases based on individualized, closed bidding. Rather, the Purchase Office discussed SIDOR’s predicted demands for spare parts and repairs with AIMM-Guayana. With the participation of the

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88 I describe the second Open PO system’s origins in Chapter 2.
89 Partly, this decision stemmed from the complementarity of the Open PO system with the import-substitution process. Even though the two things were different – one an effort to produce locally things that had always been imported, the other a way to distribute commonplace repairs between the Central Workshop and local firms – in the end they were complementary because once a local firm had manufactured a given piece within the import-substitution program, the piece came within the domain of the “Open PO” system for recurrent buying (Ex state-owned SIDOR purchase manager (OM 3/02)).
association, SIDOR would then allocate this demand among AIMM-Guayana’s member firms.

“AIMM-Guayana became the intermediary for open purchases because we wanted a strong interlocutor for the import-substitution process and a stronger organized sector. Therefore, we asked all firms that wanted to participate in the import-substitution process to enroll in AIMM-Guayana (…) This requirement was kept in place during the entire duration of the Open PO system.” (Ex-state-owned SIDOR Purchase Manager (OM 3/02)).

Apart from introducing collective mediation, Purchase Managers worked on improving the existing monitoring systems. For the first time ever, SIDOR centralized the reception of spare parts and pieces manufactured by the local metalworking firms. This centralized inspection office worked out of the Central Workshop, and allowed SIDOR to quickly reject defective pieces before they had been installed. The Central Workshop kept records of the percentage of rejected pieces and the delays in delivery for each firm and fed these statistics into the next yearly Open PO negotiation process.

**AIMM-Guayana’s impact on competition and commitment in the relationship with SIDOR**

Collective mediation of the Open PO system solved customer-supplier conflict by allowing suppliers to influence contract allocation and pricing. For the first time, collective mediation allowed firms to witness the contract allocation process and verify that it occurred according to mutually agreed criteria. These criteria corresponded to the performance indicators that the Central Workshop had gathered during the previous year. Over the year, SIDOR’s purchase office supplied AIMM-Guayana with these records so that each local metalworking firm could become aware of how it stood compared to the rest for the following year’s negotiations.

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Transparency in allocation criteria worked with collective mediation to increase metalworking firm’s abilities to demand from SIDOR long-term commitment towards local firms. In contrast to the first Open PO system, SIDOR could not allocate the parts and pieces that a given firm had repaired or manufactured reliably to another firm just to maintain competition (or because of bribes). Rather, AIMM-Guayana monitored that SIDOR allocated contracts that would reward supplier performance and upgrading. The resulting long-term commitment allowed firms to make further investment in upgrading.

“In the mid 1980s, AIMM negotiates open purchase orders with SIDOR. The intention was that if a firm, through the open purchase order, specialized in repairing certain parts, there were benefits to all, because it allowed the firms to invest in specialization and at the same time offer SIDOR reasonable prices. This was convenient for SIDOR because it reduced its cost of bidding, and because by not having to go through the bidding process, it received the repair or piece much quicker. (...) At the same time, the firm had the security of a given volume of sales that allowed it to invest in things that they couldn’t invest before. In fact, after the open purchase order system firms proliferated and those that already existed could invest in things that previously they couldn’t (Ex-director for AIMM-Guayana, (NG 02/02)).

Even though collective mediation would seem incompatible with competition, AIMM-Guayana’s participation did not eliminate competition over the allocation of contracts. First, as the previous quote affirms, AIMM-Guayana’s involvement in the “Open PO” system increased competition by opening participation to all the firms belonging to the association. Firms needed only to prove that they had invested in certain minimum equipment to ask SIDOR to be included as suppliers for a given type of repair or manufacture. If SIDOR denied the new entrant’s request it would typically be besieged by the association, which backed its member and asked SIDOR to at least try the firm out. This contrasted to the previous system, where firms had no security of even being

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91 Typically SIDOR would then give the new entrant a small “try out” task, and depending on the delivery it would increase (or decrease) the amount to the firm yearly (many interviews).
invited to the bidding process. In effect, Figure 3.2. and Figure 3.3. show how the number of metalworking firms in Ciudad Guayana rises starting in 1986. Although SIDOR’s volume of output rose between 1983 and 1990, which obviously demanded more metalworking services, from 1987 the number of metalworking firms rises faster than SIDOR’s output. This is the same year that AIMM-Guayana starts mediating the Open PO system.

Figure 3.2. Number of firms in the Guayanese Metalworking Sector against SIDOR’s Volume of Output, 1970-1997

"AIMM brought entrepreneurs from other regions of the country, like for example Tanques Guacara and Fundición Lemos, from Valencia. Therefore the growth in the number of participating firms." (Ex Purchase Manager for SIDOR (OM 04/02)).
At the same time, AIMM-Guayana regulated the content of this competition by monitoring that SIDOR only engaged with firms that had a physical structure to back them. In particular, AIMM-Guayana effectively excluded participation to contenders with no physical infrastructure ("briefcase firms"). While this behavior diminished competition, it also legitimized the system by strengthening the link between upgrading (understood here as investment in physical capital) and contracts.

“AIMM-Guayana was always “mosca”\textsuperscript{92} to avoid that public SIDOR would put the medium metalworking firms to compete with firms that did not have an administrative function or a quality systems infrastructure in place. The problem was not that these firms were informal, because all firms had to be formal at the hour of participating in a bid, but firms with a certain industrial infrastructure – buildings, administration, etc. – thought that competing against firms without this infrastructure was disloyal (...) AIMM Guayana demanded from SIDOR that it work only with well constituted firms, in other words, not briefcase firms” (Ex director of AIMM-Guayana (OM 07/01)).

\textsuperscript{92}“Mosca” literally translates as fly (the insect). In Venezuela the expression is used to describe a state of hyper-alertness.
Within this restricted structure, SIDOR every year allocated contracts to the best performing firms. Moreover, SIDOR also kept purchasing imported parts, until suppliers had reduced their costs.

“To the firm that gave us best results in terms of quantity, cost, quality and opportunity of delivery we assigned more pieces during the next year. (...) At the same time that the import-substitution process was going on we kept importing pieces from abroad. In the measure that the local producer progressed down the learning curve and lowered its costs in consequence, then we bought more from the local [firm] until we achieved the desired price.” (Ex SIDOR purchase manager (OM 04/02))

Surprisingly, the collective mediation system that SIDOR arrived at with local metalworking firms balanced competition and commitment in a manner similar to a system of “parallel sourcing” that Richardson observed within the Japanese automobile sector (1993). In parallel sourcing, the customer maintains a threat of exit by allocating contracts competitively at the start of each project. Yet during the length of the project—in the Japanese case four years—the customer maintains a sole-sourcing relation with that supplier. Similar to this system, SIDOR every year allocated contracts according to competition—the performance records of the firms. In this competition, SIDOR increased contracts to performing suppliers, and distributed non-performing suppliers’ contracts among the remaining performing firms. As in the parallel sourcing system described above, the mixture of competition and sole sourcing encouraged supplier investment while protecting SIDOR against the risk of committing long-term to suppliers who failed to upgrade.

Consistent with the customer-supplier relations’ literature, the balance between long-term commitment and competition built into the Open PO system promoted upgrading. Many firms participating in the system invested resources in personnel and machinery and eventually specialized.
“The idea of marrying the local firms—in the sense of always assigning a given product or part manufactures to a given firm—was that they would improve the quality of their process. Since the firms were always doing the same they could learn how to do it better and invest money in improving. And they did. For example, Tamoi sent a group of people to Germany to train in the type of repairs it made for SIDOR, which were the molds and segments for the continuous casting of planks. Tamoi also sent people to Spain for the same thing, and they built an installation to do specifically that. Today, Tamoi is doing this same work for private SIDOR.” (Ex-purchase manager for state-owned SIDOR (OV 8/01)).

“The Open PO system was the largest part of the sales of metalworking firms, around 80% (...) its advantage was that it allowed firms to undertake the necessary learning to do the work right. For example, sometimes new, recently created firms would win bids [outside the Open PO system] because they offered a lower price. At the end they weren’t able to deliver because they didn’t have the learning curve of the other firms who participated in the system (...) With the Open PO system firms were able to specialize to some degree. For example, Fundimarca always repaired “ruedas de grúa”, and the “rodillos de discos para ruedas de planchones”. Tamoi specialized in repairing “moldes de segmento” and even designed a “molde de segmentos”; today they have an open purchase order with private SIDOR for “moldes and segmentos”. Morgran in “mesas oscilantes para la acería de palanquillas”. IMO, Fadri and TOMI specialized in the “rodillos para la colada continua de planchones” and “rectificación de los cilindros de laminación”. AP Asociados, Chirica and Servemo repaired the segments of refrigerated panels. Servemo today manufactures SIDETUR’s refrigerated panels and is fighting for private SIDOR to place them an order.” (Metalworking entrepreneur and ex-director of AIMM-Guayana (OM 7/01)).

Figure 3.3. shows quantitative evidence for this upgrading by capturing how towards the late 1980s local metalworking firms started manufacturing electrical machinery and equipment. Moreover, the productivity of the sector, measured by value added/employees, rises in those years (Figure 3.4.).
Figure 3.3. Value Added in Ciudad Guayana’s Metalworking Sector, 1980s

![Graph showing value added in Ciudad Guayana's metalworking sector, 1980s. The graph displays the percentage contributions of different sectors to the value added over the years 1980 to 1988.]


Figure 3.4. Productivity of the Guayanese Metalworking Sector 1971-1988 (Value Added/Employees), 1984 Constant Bolívares

![Graph showing productivity of the Guayanese metalworking sector from 1971 to 1988. The graph indicates the value added per employee over the years, with values in 1984 constant Bolívares.]

AIMM-Guayana’s impact on price

AIMM-Guayana’s mediation also reduced customer-supplier conflicts by opening price setting to the scrutiny of the firms. In the new system, SIDOR proposed certain prices for man/hour and machine/hour and AIMM-Guayana counterproposed. Often, both parties hired independent consultants who recommended fair prices by examining the man/hour and machine/hour composition of the required replacement parts, and the technologies that firms used. Collective mediation of price helped local metalworking firms obtain rules with which prices would adjust automatically to cope with inflation.\(^{93}\)

Inflation started to become a problem in Venezuela around the time of the second Open PO system. In effect, Figure 3.5. shows how the costs of industrial production start rising steeply in 1986, one year before AIMM-Guayana’s mediation of the “Open PO” process.

**Figure 3.5. Producer’s Price Index, all industries, excluding Petroleum refining**

![Producer's Price Index Graph](image)


\(^{93}\) Prices were actualized according to the index of price increase in certain imports that the metalworking industry used as inputs, as for example blades, special electrodes, disks for metal grinders, plaques, etc. To prove that there had been an increase in the prices of these goods, AIMM-Guayana had to collect purchase receipts from different metalworking firms and with them in hand renegotiate prices with SIDOR. Whenever the national government raised the base salary, AIMM-Guayana would also renegotiate the price of man/hour and machine/hour with SIDOR (Ex-director of AIMM Guayana (NG, 3/26/2002)).
“Starting with AIMM’s participation [in the Open PO system] we created polynomic formulas that would capture the cost elements that affected firms’ costs, as for example machinery, labor, parity with the dollar, import content. Every 3 months we checked the variation. If it was less than 5%, the firm would absorb it, if it arrived to 10%, then SIDOR would absorb it. This initiative parted from the working tables with AIMM-Guayana and then became a practice that SIDOR extended to other non metalworking suppliers” (Ex Purchase Manager for SIDOR (OM 04/02)).

Other benefits of collective mediation

Moreover, AIMM-Guayana’s participation in the Open PO system helped the sector gather benchmarks that allowed individual firms to learn from each other, and the sector to progress collectively. Performance indicators such as the index of devolutions with which SIDOR and AIMM-Guayana allocated contracts provided one example of a benchmark. The operating cost structure of the best-performing firms was another benchmark. SIDOR in particular used this last benchmark to assist weaker (higher cost) firms in improving their costs.

“AIMM’s participation in price negotiation was positive because it helped us know the structure of costs of each particular firm better. Every firm had to show their cost structure [to verify increase in prices]. Some firms differed from others in machine/hour costs, for example, and we would inquire why, and suggest how to reduce it. Of course we knew that larger firms had higher fixed costs than smaller ones, but we evaluated each one within its range. For this evaluation we had to keep a structure of cost engineering within the purchase department” (Ex-purchase manager for SIDOR (OM 04/02)).

The price of machine/hour and man/hour was another collective benchmark. It allowed all firms involved to compare each year’s real prices to the previous year, and note whether there had been improvements in the productivity of the local metalworking firms (both over time and amongst them).

“The intention [of the Open PO system] was that over time the prices would reflect efficiency improvements in the firm’s production processes. Ideally, as

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94 Sabel talks about the importance of benchmarking in learning processes.
firms specialized, they would do things faster. The objective was ‘fair time at a fair price’.” (Ex-director of AIMM-Guayana (NG 02/02)).

Finally, AIMM-Guayana’s participation in the Open PO system enabled SIDOR to allocate contracts in a way that optimized the production capacity of the sector. For example, when SIDOR had projects too large for a single firm, AIMM-Guayana coordinated the work among the remaining ones. This resembles the flexible specialization accounts of small firm clusters in Italy. However, while in those accounts such work-sharing arrangements tend to informally occur within a subset of cooperating firms, in this case it became formal practice.

“After AIMM-Guayana’s participation in the Open PO system, the association helped the process a lot because it provided information with which to coordinate the work well. For example, if we wanted to assign 50 pieces to some firm and this firm could not make but 30, AIMM-Guayana would say, ‘don’t worry, this other firm is available and can do the 20 remaining ones’. If we took a firm out of the Open PO system because of bad performance, AIMM knew which firm or set of firms was available.” (Ex-purchase manager for SIDOR, (OM 04/02)).

**Long-term commitment impacts upgrading: the difference between having and not having an Open PO system**

The effect of the second Open PO system on supplier upgrading stands out better if we compare participating firms’ long-term achievements with those that did not participate in a similar system. In effect, the Open PO system only included those metalworking firms manufacturing and repairing parts and equipment. No similar system existed for metalworking firms dedicated to industrial maintenance, where bidding preceded every project and SIDOR awarded contracts to the lowest bidder. That is, SIDOR did not “marry” maintenance firms like it had married the rest of the metalworking sector.
Maintenance firms’ lack of security in long-term contracts dampened their investment in upgrading, in this case training of their employees. In effect, lack of upgrading within these metalworking maintenance firms led private-foreign SIDOR to cut ties with them following privatization. For example, from the 110 metalworking maintenance firms hiring 3500 employees that state-owned SIDOR had employed in 1997, by 2000 private-foreign SIDOR had only kept 27 firms employing 694 workers. A report documenting these changes cites the low technical level of these firms’ personnel as one of the reasons for this reduction (Merino 2000).

State-owned SIDOR’s lack of commitment to industrial maintenance firms partly resulted from the technical characteristics inherent to the maintenance sector. Industrial maintenance is very labor-intensive work, which means that maintenance firms’ assets reside not in fixed capital, but in the skills of their employees. At the same time, industrial maintenance activity fluctuates tremendously over a given year. For example, at times of scheduled “paradas”, or plant stops, a firm like SIDOR may require up to 300 workers during a short period (e.g. 30 days), while in periods of regular maintenance SIDOR may only require 50. Maintenance firms in Ciudad Guayana managed this fluctuation by functioning as “jobbers”: they only sustained short-time contracts with their employees (three months) and only recruited personnel when they won contracts95. During the bidding process for the allocation of contracts, and due to the shortage of skilled personnel in Ciudad Guayana, each competing maintenance firm offered the same workers —meaning the same people—at different prices. In other words, all firms offered the same quality except at different prices. State-owned SIDOR was cognizant of this and

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95 The Venezuelan Labor Legislation encourages this pattern of keeping workers for only three months (Ex state-owned SIDOR Purchase Manager (OM 11/02), Private-foreign SIDOR Plant Manager (PM 11/02)).
picked the firm offering the lowest price, which meant a constant rotation of the firms. Uncertainty in contracting curtailed firms’ willingness to invest in training. Moreover, since the price differential resulted from the willingness of each firm to reduce its profits, the lowest priced firm had the lowest margins, giving it less ability still to invest in training.

“In maintenance there was five firms that all offered the same workers. SIDOR was interested in hiring x or y worker, and the firm that offered these people and the lowest prices, which meant lowest margins, got the job and hired those people. The firms could have done something to have the personnel work exclusively for them, but then they would have had a very high fixed cost that made them uncompetitive with respect to the other firms. The firms didn’t make investments in training because they never knew whether they would win the next contract.

The process of [hiring external] maintenance responded to emergencies, and there SIDOR wanted people with experience, the company couldn’t be selecting X or Y thinking of developing suppliers at that moment, while with the manufacturing firms we could foresee more or less how many hours/machine we would need every year, how many pieces we would need, and moreover we kept a stock of pieces, which allowed us to use this stock while we had the piece repaired or manufactured. This made it easier to structure stable relations open purchase orders than with the maintenance firms, because with these last ones we couldn’t foresee when we would use them and how much.” (Ex state-owned SIDOR purchase manager (OM 11/01)).

IN the early 1990s, state-owned SIDOR tried to migrate to a long-term commitment system with maintenance firms. The idea was to select a few firms and guarantee them contracts for two or three years, so that they could have a fixed payroll and invest in training. However, by that time a “Ley de Licitaciones” affecting state-owned enterprises’ ability to engage in long-term procurement affected SIDOR’s ability to implement this system. This law required that state-owned enterprises make a bid for every purchase. The Purchase Manager who tried to devise a way to skirt the law in order to implement such a long-term procurement system desisted after several people on
SIDOR’s Board of Directors implied his motivation came out of graft (Ex state-owned SIDOR purchase manager (OM 3/02)).

Why mediation? Discussing the conflicts inherent to the customer-supplier relation

AIMM-Guayana’s mediation in the Open PO purchase system helped overcome the conflict inherent in customer-supplier relations. These conflicts typically arise with respect to price and to the continuity of the relationship in sectors where, as in automobiles, customers have an asymmetric power over their suppliers. In these sectors, customers depend less on suppliers than suppliers depend on them. Usually, customers can easily switch among suppliers, but suppliers cannot switch customers so easily, as they need to make “asset-specific” investments – investments that they cannot easily transfer to a relationship with another customer. For example, a stamped body supplier for Toyota cannot easily switch its investment in molds and stamps to Ford.

In “buyer-driven” customer-supplier relations, conflict emerges from each partner’s divergent interests, and their asymmetric power. Suppliers usually need some assurance of long-term commitment to invest in upgrading (Helper 1991). On the other hand, customers offering long-term commitment to a given supplier risk bad performance (Richardson 1993). Moreover, if as typical of buyer-driven relationships, there are many firms in the supplier sector competing for the customer’s contracts, it is unlikely that the customer will maintain this long-term commitment. Establishing a win-win relationship then becomes difficult given customers’ superior bargaining power to establish the rules of the relationship.

AIMM-Guayana’s mediation of the Open PO system provided a way out of these conflicts by allowing a governance system that balanced competition with commitment.
On the one hand, AIMM-Guayana secured SIDOR’s commitment to the metalworking sector by ensuring that performing firms would be reallocated contracts. On the other, AIMM-Guayana did not block competition. Moreover, AIMM-Guayana’s participation helped suppliers counteract some of SIDOR’s asymmetric bargaining power.

In other situations involving groups with opposing interests, the outcome has also depended on whether there were institutions of mediation that could help sort these conflicts (Tendler and Schmitz 1999). For example, in Brazil, the mediation of automobile trade associations helped small suppliers adjust to trade liberalization. These trade associations established governance systems that transformed the relationship between the large multinational assemblers and their smaller domestic auto parts suppliers from one of antagonism—where the assemblers used the smaller suppliers only in periods of high market demand, and transferred little knowledge to them—to another of high cooperation and commitment (Addis 1995). Another example, this time of failure, comes from the Sinos Valley, also in Brazil. Shoe producers there lost secure supplies of their raw material when local tanneries preferred to export their semi-processed hides to Europe. A change in import tariffs there favored the exporting of semi-processed as vs. the fully processed hides. Leather producers’ decision reduced regional output and employment in the regional economy, once noted for its growth and level of local integration. Observers noted that a third party able to mediate the tension between these divergent interests could have helped find alternative solutions (Tendler and Schmitz 1999).
Could the first Open PO system have achieved the same?

In theory, the first Open PO system incorporated balance between competition and long-term commitment as the second Open PO system. Why then did it fail? The answer is lack of transparency. Unfortunately, given the suspicions of corruption that abound in Venezuela, particularly within the relationship between firms and the state, firms’ inability to actually watch the contract allocation process diminished the credibility of this first system.

Long-term commitment without collective mediation: the case of Taranto

We can build a better appreciation of AIMM-Guayana’s role in mediating the relationship between state-owned SIDOR and Ciudad Guayana’s metalworking firms by comparing it to the absence of such mediation in the case of Taranto, Italy. At Taranto, as in Ciudad Guayana, local metalworking firms initially used political pressure to extract long-term commitment from their main client, steel producer Italsider96. These long-term relationships enabled many of them to leap from artisan firms to industrial ones. As in Ciudad Guayana, many Tarantine metalworking firms that had started doing maintenance only, performing work within Italsider’s plant with recruited workers but owning no installations began manufacturing some things independently and looking for other clients in the area, mainly state-owned enterprises (Capriati 1991).

However, Italsider never committed to local suppliers. Apparently, the company remained reluctant to depend too much on any supplier, preferring to segment contracts amongst them to maintain competition. This posture did not allow Tarantine firms to get

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96 This political pressure occurred within the context of a social movement protesting the huge layoffs following the end of Italsider’s expansion. Local metalworking firms that had surged to aid the plant’s construction used this social movement to press for long-term contracts with Italsider (Capriati 1991, Piattoni 1999).
from Italsider the sales volume necessary to invest in specialization. At the same time, their weak capabilities made it difficult for them to gain more commitment from Italsider. This Catch 22 situation resulted in a lack of upgrading of the local metalworking sector. For example, from the 50 firms that had stable relations with Italsider in the late 1980s, only 10 had been able to diversify product and clientele (Capriati 1991).

“Italsider purchases rarely and with great difficulty machinery and replacement parts from Tarantine firms because among these – except for some praiseworthy yet isolated cases – there aren’t technical capabilities that could respond to the needs of a highly qualified demand. Vice versa, the tarantine firms do not benefit from a highly qualified demand on the part of the establishment (Italsider) because this [firm] will not consider them until they reach the level of specialization required. It’s a vicious cycle whose logic, as we have underlined in paragraph 1.1, persists from the beginning of the century and has accompanied the industrial history of Taranto from its origins and therefore before the arrival of the steel center.” (Capriati 1991, p. 216, my translation)

IN my opinion, Tarantine metalworking firms’ position was rendered weak because they were never able to establish a collective system of negotiation with Italsider. In the arrangement they arrived at with Italsider after the “Vertenza Taranto”, contracts were individually specified. In these individualized contracts, Italsider had the upper hand, and from Capriati’s account, it seems that Italsider used its upper hand to change suppliers often. What lacked in my opinion was a sector-wide (rather than individual) agreement with Italsider that would create the kind of discussion about upgrading and rules to reward performance that existed between state-owned SIDOR and Ciudad Guayana’s metalworking firms. In “buyer-driven” sectors, when backward linked, small and medium firms can negotiate collectively like this, they take some control over the direction of their development. In these collective negotiations suppliers can decide with their large customer how to allocate specialized functions between them, and negotiate prices to mutually acceptable terms, as the metalworking firms in Ciudad Guayana did
with state-owned SIDOR. However, it is unlikely that such a collective bargaining agreement could have occurred in Taranto, given the scarce cooperation and associationalism that Capriati documents there.

“A decisive element for the future of any service initiative for the large enterprises is local [metalworking] firms’ tendency to avoid collective initiatives. The habit of holding relationships with the public and private macro-structures based on demands and passive inactivity determined in firm owners – in Taranto as well as in the rest of the Mezzogiorno – a scarce interest in common initiatives, a weak confidence in the possibility of solving – by putting together even modest resources – problems that concern the whole sector, a tendency to reciprocal mistrust and in general a tenuous tendency to cooperation. The result of all this is that, in an area that has the highest concentration of metalworking firms in the Mezzogiorno, metalworking business associations have very few members” (Capriati 1991, p. 220, my translation).

To sum up, local metalworking firms in Ciudad Guayana upgraded following a particular governance system. This governance system balanced competition and commitment such that it provided firms with the incentive and means to upgrade. Key to the functioning of the system was AIMM-Guayana’s mediation. AIMM-Guayana allowed suppliers to influence the customer-supplier relation, and increased the transparency (and credibility) of the system. Yet where does collective action in Ciudad Guayana come from? The next section will describe how customer-supplier relations themselves can influence a sector’s capability for collective action.

3.2. Forms of procurement, collective action, and feedback effects into backward linkages

Collective mediation strengthens collective action

One of the important legacies of the second Open PO system, apart from stimulating the upgrading of Ciudad Guayana’s metalworking sector, is the impact it had on collective action. When SIDOR’s purchase division required producers to organize in order to deal with them collectively, it meant to institutionalize a communications
channel within which import-substitution could take place, and to reduce transactions costs by dealing with only one interlocutor rather than many firms. To achieve these goals, SIDOR required aspiring suppliers to join AIMM-Guayana, which soon grew to encompass more than 90% of Ciudad Guayana’s main metalworking firms97. This encompassingness allowed AIMM-Guayana to easily gather information on the main problems affecting Ciudad Guayana’s metalworking sector, and gave it the means (from members’ dues) to address them. In essence, the Open PO system strengthened AIMM-Guayana’s ability for collective action.

Like a virtuous cycle, strong collective action on the part of AIMM-Guayana sustained the second Open PO system in two ways. First, AIMM-Guayana acted to solve the supply-side problems that affected the metalworking sector. Second, AIMM-Guayana worked on demand-side variables by exerting pressure on the CVG and its holding enterprises to expand the level of local procurement. This section treats these two topics in turn.

**Collective action to overcome supply-side deficiencies98**

From its foundation in 1987, AIMM-Guayana undertook many initiatives to address the collective problems affecting its members. These activities fall into the following categories: market opening, technological/upgrading, mediation of customer-supplier relations, infrastructure, government policy, and community service. Of these, some of AIMM-Guayana’s interventions benefited only metalworking firms, while others

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97 Note that industrial associations in Ciudad Guayana typically represent direct suppliers only. Those smaller workshops that these suppliers in turn sometimes outsource normally do not belong to any industrial association.
98 The data for this section come from a series of bulletins reporting AIMM-Guayana’s activities, as well as newspaper articles and interviews.
had spillover effects to the rest of the metalworking sector and even to other industrial sectors in Ciudad Guayana.

**AIMM-Guayana’s role in the provision of private and collective goods:**

Particularly in the two years before privatization, AIMM-Guayana carried out a number of programs designed to strengthen the technical core of the sector’s firms. For example, in 1996 AIMM-Guayana initiated DECATEC, a program that lasted four years and that worked both at the individual firm and collective level to augment the technical and technological capabilities of the sector. Stimulated by DECATEC, AIMM-Guayana developed a “Technological Information Center” – a networked computing system that provided firms with information about technical norms and development of new markets. To further help affiliated firms develop products, improve production lines, workstations, manufacturing processes, equipment and machinery, AIMM-Guayana enlisted the technical services of universities in Ciudad Guayana and in Caracas. Finally, AIMM-Guayana helped its member firms comply with ISO9000 quality control standards in a two-year program destined to help firms supply the petroleum sector.

DECATEC has had an enormous influence on the ability of the metalworking sector to survive after SIDOR’s privatization. Most firms that participated in the program subsequently increased their investment in human capital and identified niche product

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99 Programa de Desarrollo de Capacidades Tecnológicas. AIMM-Guayana co-financed DECATEC (40%), with the local branch of the national government agency in charge of technological development, Conicit-FUNDACITE (60%). Forma, a consulting firm specialized in technological development executed the program. DECATEC initiated in 1996 and lasted until 2000.

100 The universities are: the Universidad Experimental Politénica de Oriente (UNEXPO) in Ciudad Guayana, and the Engineering Institute of the Universidad Simón Bolívar in Caracas.

101 AIMM-Guayana conducted this program jointly with CIMG – another industrial chamber in Ciudad Guayana whose membership has substantial overlap with AIMM-Guayana’s. These chambers hired three full time quality consultants to diagnose individual firms, recommend changes in procedures to comply with ISO9000 quality norms, and follow-up each firm’s implementation. The program also included a series of courses on quality management systems, and lasted a year and a half.
markets in which they specialized. For example, one participant firm specialized in speed reducers, while another specialized in refrigeration panels. Today, as a result of this investment and specialization, both firms have been able to strike long-term contracts with private-foreign SIDOR, and expand their markets away from private-foreign SIDOR and Ciudad Guayana (Metalworking entrepreneurs (JM 03/00, VG 08/01)).

As I explained in Chapter 2, AIMM-Guayana traditionally sought to increase members’ markets by exerting political pressure on the CVG and its holding enterprises to expand local procurement. However, during the mid 1990s, AIMM-Guayana turned to more modern and less politically laden marketing devices to extend the geographic market of Ciudad Guayana’s metalworking sector. For example, in 1996 the association printed a very nice catalogue promoting its affiliated members. The catalogue – with text in both Spanish and English – first overviewed the sector and then described each members’ profile, machinery, installed capacity, and products. Armed with this catalogue, AIMM-Guayana visited large prospective clients outside Guayana and mounted exhibits in industrial trade fairs outside the region. In these visits, AIMM-Guayana posed as a representative of all the Guayanese metalworking sector, rather than of a few firms. The catalogue itself was such a huge success that a second issue followed in 2000. AIMM-Guayana also signed an agreement with the foreign purchasing arm of the CVG (CVG-Internacional) so that this organization would market the sector’s products abroad (Diario del Caron)103.

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102 Fairs in which AIMM-Guayana participated in representation of the sector: Trinidad (funded by the government of the state of Bolivar), Petroequip (Caracas), Manaus (funded by the CVG), and Argentina.

103 However, the agreement lasted only briefly, for the CVG almost immediately removed the CVG-Internacional director who had signed the accord with the local metalworking firms from office (Ex-director of CVG-Internacional (IS 7/2001)).
AIMM-Guayana also intervened in at least two infrastructure problems that affect the metalworking sector: electricity and land. Even though the Guayana region generates 70% of Venezuela’s electricity, the local electricity distribution company does not work well. Irregular peaks in voltage routinely damage local firms’ production equipment, and electricity blackouts are very common in the area. To address this problem, AIMM-Guayana met with Eleoriente (electricity distributor) and CVG Edelca (electricity generator) to design a scheme where AIMM-Guayana could purchase electricity directly from Edelca and distribute it to its members. Having no success in this endeavor, AIMM-Guayana launched efforts with other business and commerce associations to propose that an autonomous, regional distribution company arise (Eleoriente is a state monopoly).

Land is another problem in Guayana. The original legal decree founding Ciudad Guayana assigned all the region’s land to the CVG (Martínez Guarda 1996). The corporation’s cumbersome procedures to allocate land, coupled with inefficiency in titling affects many sectors in Ciudad Guayana gravely. For example, observers blame titling problems for the failure of a pulp and paper industry to develop in Guayana, despite the private sector’s repeated interest and ideal climate and soil conditions (Enright, Francés and Saavedra 1996). For metalworking firms wanting to diversify into other promising activities, such as tourism, access to land has been a constraint104. These metalworking firms have used the AIMM-Guayana to mediate with the CVG the allotment of land for these projects (AIMM-Guayana communication, 1996).

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104 As one local entrepreneur trying to purchase land recounted, nowadays it is difficult to know who is the owner of much of the urban land in Ciudad Guayana, whether the CVG, one of its holding firms, or someone else (IG 08/01).
AIMM-Guayana’s role in providing public goods

In addition to providing services for its own member firms, AIMM-Guayana addressed problems that affected all the metalworking sector, including those smaller firms typically not belonging to any industrial association. For example, AIMM-Guayana addressed the absence of two particular types of skilled metalworkers: “torneros” and “fresadores”. Scarcity in these skills stemmed from the local training institute’s practice of focusing on the competencies that Ciudad Guayana’s large, mineral processing firms required. These skills are different from those needed to work at the region’s smaller metalworking firms. To solve this market failure, AIMM-Guayana worked with the local training institute (INCE-Metalminero) over a period of three years to review the curricula imparted to apprentices and revamp the training institute as a whole.\(^\text{105}\) AIMM-Guayana’s intervention also helped solve the same type of market failure at the level of university training. AIMM-Guayana worked with Unexpo—a local university—in modifying their curriculum for metallurgic engineers so that these future professionals could have more appropriate skills to work in the local metalworking firms. In particular, the sector aspires that the new professionals will have the competency to design metalworking goods that could be mass-produced in the region’s firms.

Another program that evidences AIMM-Guayana’s public-minded vocation concerns that of workers’ health. AIMM-Guayana, along with the other associations of business and commerce in the region and with local labor unions, founded Fundasalud. Fundasalud is a non-profit association providing preventative medical care to workers.

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\(^{105}\) One of the innovations that AIMM-Guayana put in motion within the center was an annual contest of apprentices held at the local metalworking firms, with local metalworking entrepreneurs as judges. This contest fostered enthusiasm from local metalworking firms for the project, and helped place the recently trained apprentices (Metalworking entrepreneur (NG 3/2002)).
and their families. The program responded to the poor quality of publicly provided medical care in Ciudad Guayana, and according to friends that have used it, works very well. This concern for workers may seem atypical in a sector composed of medium and small firms, which the literature typically depicts as exploitative of labor.\footnote{Indeed, adding to the mystery, AIMM-Guayana has often worked with other business and commerce organizations in the area to appeal for national government mediation of local labor strife. Why? Increased combativeness lately between unions and aluminum state-owned firms, as well as within private SIDOR has caused strikes and slack work in metalworking firms’ clients, which in turn means less work for the metalworking sector.}

AIMM-Guayana, like other interest group associations in Guayana and Venezuela, periodically emits statements expressing affiliates’ opinion on certain aspects of government policy. The majority of these statements appear in the local press – a medium with which AIMM-Guayana’s directors seem to have a good relation. For example, at different times AIMM-Guayana protested a proposed tax on industrial machinery, a change in labor laws that made employment rigid and increased benefits to labor, the national government’s policy to keep an overvalued currency, and differences in the price of money for importing machinery vs. manufacturing locally.\footnote{At times of exchange controls.} In line with this activity, AIMM-Guayana also ran press releases voicing the organization’s opinion of how the government should conduct SIDOR’s privatization.\footnote{Like most Guayanese people, including professionals working within state-owned SIDOR, AIMM-Guayana preferred privatization of SIDOR by parts (different plants sold separately). In the end, the national government opted for selling it as a package. Chapter 5 recounts this story.}

Finally, AIMM-Guayana’s activities have helped increase the range of financial options for all of the region’s SMEs. Two interventions come to mind. In the first, AIMM-Guayana director Victor García worked on the state legislature to create a fund to finance all small and medium enterprises in the state of Bolívar. In the second, AIMM-Guayana published an open letter to the national government exhorting approval for the
“Fondo Guayana”, a fund created from a percentage of the proceeds of SIDOR’s sales and allotted to the reconversion of Ciudad Guayana’s SMEs.

**Collective action to overcome demand-side resistance**

Ever since its creation AIMM-Guayana also worked on increasing local demand for metalworking goods and services. First, during the 1980s, AIMM-Guayana pushed the CVG to deepen its import-substitution drive. State-owned enterprises had to disaggregate their budgetary information and stipulate what they planned to buy domestically and what they planned to import. This information, while not public, was also not private. AIMM-Guayana availed itself of this information to exert pressure over the Ministry of Industry and Commerce over the CVG to increase the budget for local purchases, particularly of those items they felt could be made locally (Director of SIDOR’s Import Substitution Department (NN 7/2001), SIDOR Purchase Managers (OM 11/2001 and 3/2002, EG 7/2001)). Through these activities, AIMM-Guayana came to develop a close link with the CVG’s president and with its industrial promotion department (Ex-directors of AIMM-Guayana (NG 3/2002, OM 7/2001)). Even after the import-substitution program officially ended in 1988, AIMM-Guayana used these connections to gain access to new investments in the region.

Political pressure on the CVG and its holding firms took many forms, of which the most visible was bad press on the local media. First, AIMM-Guayana’s directors would try to meet with the presidents of the CVG, of SIDOR and of the other CVG holding enterprises to expound their concerns about local procurement. If the local metalworking businessmen did not get an appointment to discuss the matter, or if they were unsatisfied with the results of the reunion, they would publish articles in the press...
criticizing the CVG and its holding enterprises about not doing enough to develop the region\textsuperscript{109}

"The director of AIMM-Guayana constantly pressured both the CVG and SIDOR’s president to buy more in the region. The association became an element of regional opinion. Specifically, if the CVG president did not attend our requests, we would publish press releases saying that the CVG was not interested in meeting with us, and in that way we put pressure." (Ex-director of AIMM-Guayana (OM 7/2001)).

Most importantly, AIMM-Guayana’s political pressure helped the metalworking sector maintain the Open PO system up to SIDOR’s privatization. In 1990, the national government passed a law that threatened to topple the existing Open PO system. This “Ley de Licitaciones”, or law governing government procurement, intended to stem corruption within government purchases by forcing bureaucrats to make closed bids for even very small purchases\textsuperscript{110}. This law applied not only to the activities of government ministries, but also to state owned firms like SIDOR and to the national oil company PDVSA. The Ley de Licitaciones affected Guayana’s metalworking sector directly because the law’s content did not allow SIDOR to continue the collectively negotiated, long-term commitment “Open PO” system. Rather, the law threatened to turn it into the individualized bidding process in place before.

\textsuperscript{109} When the firm involved belonged not to the CVG but to a private concern, then the appeals in the press would be made directly to the national government. For example, a mid 1999 article in the largest local newspaper “Correo del Caroni”, lamented that foreign firm Fibranova (which came to exploit forestry products) had brought a foreign supplier to build the metallic structures, equipment and ducts for their new plant. The article exhorted President Chávez to intervene in order to give priority to the region’s metalworking firms. Ironically, the “Correo del Caroni” circulates only in Guayana and therefore it is hard to imagine that the news could have woken the attention of Mr. Chávez. (More likely that it was meant for the CVG).

\textsuperscript{110} In 1989, Carlos Andrés Pérez started a second term in presidency (first term: 1974-1979). In contrast to his posture in the first term, where he had single-handedly overseen the expansion of the national bureaucratic apparatus, this time he intended to restructure both the economy and the government. Because 80% of Venezuela’s revenue accrues to the government sector through the sale of the production of state-owned enterprises such as PDVSA, most of the purchases made within the Venezuelan economy originate within the government. This structural characteristic of the economy—state-centered, because of the state’s huge economic power—makes all private activity in a certain way hinge on the contracts obtained from government. According to popular view, this type of dependence promotes rent seeking.
Luckily, the experience of collective negotiation that AIMM-Guayana had built from mediating the Open PO system helped the sector overcome this difficult circumstance. AIMM-Guayana allied with SIDOR’s purchase managers to continue with the system. Open PO negotiations continued as before, with the mediation of AIMM-Guayana, with the difference that the result of each year’s negotiation had to be approved directly by SIDOR’s Board of Directors (SIDOR Purchase Manager, (OM 3/02)).

AIMM-Guayana met directly with the CVG and SIDOR’s president and got approval for this strategy (AIMM-Guayana’s founder (NG 3/02)). As Chapter 5 will illustrate, following SIDOR’s privatization, AIMM-Guayana used the same mechanism of exerting political pressure to turn around private-foreign SIDOR’s initial antagonistic relation to the local metalworking sector.

**Final remarks: on how organizational characteristics on each side helped support the Open PO system**

Many studies of the relationship between business associations and governments in developing countries portray their business chambers as existing mainly to wrest rents (Haggard, Maxfield and Ross 1997, Evans 1997)\(^{111}\). On the surface, it would appear that AIMM-Guayana fulfilled exactly this role through its lobbying of the government for local procurement. After all, neither government nor business associations in Venezuela have a reputation for strong internal monitoring (Thorp and Durand 1997). Ross and Maxfield (1997) argue that internal monitoring is crucial to check rent seeking in the relationship between both entities. So if AIMM-Guayana was so involved in lobbying the CVG and SIDOR for a greater share of the local procurement pie, what reined in

\(^{111}\) This view in turn has origins in Mancur Olson’s (1965) “The logic of collective action”, which pessimistically concluded that the objective of any organized group was to extract rents.
potential rent-seeking behavior and allowed metalworking firms’ upgrading to take place?

Interestingly, the second Open PO system between state-owned SIDOR and AIMM-Guayana incorporated the mechanisms through which to rein in rent seeking. First, transparency in bargaining – each firm knew the technical reasons for which the others were allotted certain contracts – made the negotiation about local purchases a discussion of technical performance rather than an exercise in rent-seeking\textsuperscript{112}. Second, AIMM’s intermediation in the allocation of SIDOR’s Open PO system also helped make the business chamber the kind of encompassing association providing selective benefits that Maxfield and Schneider believe to be better equipped to discipline its members.

According to Olsonian logic, AIMM-Guayana could have reserved the privilege of negotiating directly with state-owned SIDOR for a club of selected firms, thus reaping the “spoils” of preferential access to the state. However, my research indicates that this did not happen. On the one hand, to comply with the import-substitution mandate, SIDOR had to develop the metalworking sector in a broad based manner, and therefore demanded that AIMM-Guayana to include as many firms as possible. On the other, AIMM-Guayana competed in membership against another prior business chamber to which many metalworking firms were affiliated, the “Cámara de Industriales y Mineros de Guayana” (CIMG). This competition gave AIMM-Guayana an incentive to expand its membership to as many firms as possible. As I documented earlier, following the

\textsuperscript{112} A study of business associations in Turkey, for example, also found that the transparent way in which the garment producers’ associations brokered production incentives to member firms based on performance reined in the rent seeking that normally pervades business-state relations in Turkey. The same study found that a cause and consequence of the failure of automobile assembler’s business association to do the same resided in the lack of similar transparency. Major automobile firms in Turkey did not know what subsidies their rivals got, and presumed that at least part of their success was based on rent-seeking skills. This gave them an incentive to engage in rent-seeking as well (Biddle and Milor, 1997).
formalization of the Open PO system, the number of metalworking firms in Guayana grew, which seems to evidence the non-exclusionary characteristic of AIMM-Guayana.

Yet another evidence of AIMM-Guayana’s openness to participation is the frequency with which the chamber’s direction has changed hands, and the inclusiveness of its board of directors. In effect, 7 different presidents have directed AIMM-Guayana since its inception in 1987, from 9 elections. This means that only two presidents carried their position a second time – a rare event when I compare it to other associations I researched in Brazil, whose presidents tended to hold their positions life-long. Moreover, the composition of AIMM-Guayana’s board of directors was always inclusive of the ethnic heterogeneity within the metalworking sector. For example, despite the existence of close-knit groups of Spanish, Italian and Venezuelan entrepreneurs in Ciudad Guayana, the AIMM-Guayana’s board of directors always mixed representatives from each of the different communities. When I asked the first director of AIMM-Guayana (a Spaniard) how he could explain this inter-ethnic cooperation, he remarked:

“If I needed to convoke an emergency meeting right now, I would have 15 entrepreneurs here in less than two hours. Our cooperation is good because we all had to fight together to go upwards. We were born together.” (NG 02/02)

Finally, the resistance to local procurement elicited by the Weberian organizational principles by which state-owned SIDOR functioned counterbalanced rent-seeking pressures on the part of local firms\textsuperscript{113}. As I described in Chapter 2, state-owned SIDOR had the meritocratic advancement systems and long-term career perspectives linked with good benefits and prestige that characterizes Weberian bureaucracies.

\textsuperscript{113} State-owned SIDOR was however not completely immune to clientelistic pressures existing within the Venezuelan government. For example, by 1989, the firm employed more than 18,000 workers, many of whom the CVG had pressured state-owned SIDOR to hire as a way of easing the unemployment problem in Guayana (Ex-Director of state-owned SIDOR (IS 7/2001)).
Managers had weekly, monthly and quarterly review of their performance indicators, and these reviews determined their future salary and career options. Research in other developing countries indicates that Weberian bureaucracies can stem rent seeking on the part of organized interest groups (Ross and Maxfield 1997).

Where did collective action come from?

Before AIMM-Guayana, two other industrial associations existed: ASOPEMIA and CIMG. ASOPEMIA\textsuperscript{114} was founded in the 1970s and initially represented all small firms in Ciudad Guayana, including metalworking firms. CIMG\textsuperscript{115} was founded in 1986 – one year prior to AIMM-Guayana – and included metalworking firms as well as larger-sized firms from different types of industries.

CIMG and AIMM-Guayana had some overlapping membership. For example, in 1995, CIMG had 66 members and AIMM-Guayana had 71\textsuperscript{116}. Of these, 19 belonged to both associations –14 if we exclude the CVG enterprises, including SIDOR, which belonged to both chambers. CIMG offered the same type of collective good programs described above for AIMM-Guayana. For example, from 1996 to 1997 these two chambers even co-financed the program to get their members selling to the petroleum sector.

However, AIMM became the association which best served the interest of metalworking firms. For one, it mediated the relationship with these firms’ largest customer, SIDOR. AIMM-Guayana’s intercession for contracts, late payments and other aspects of the relation with SIDOR may have been its greatest service to the community.

\textsuperscript{114} Asociación de Pequeña y Mediana Industria y Artesania
\textsuperscript{115} Cámara de Industriales Mineros de Guayana
\textsuperscript{116} From a roster of members drawn from each association’s archives.
of entrepreneurs. Yet AIMM-Guayana’s sectoral focus also enabled the association to provide the most concrete and far-reaching interventions, such as the four-year long DECATEC. In contrast, the CIMG had so many different kinds of industries as members that it was more difficult to elicit backing for a sector-specific intervention such as DECATEC. Indeed, a survey of 16 firms that undergraduate students conducted of the metalworking sector in Guayana revealed that most firms considered AIMM to have been the only association that really provided them with a valuable service (Tizamo 1999).

The preceding account about the existence of prior interest group organizations illustrates that AIMM-Guayana’s collective action did not emerge in a vacuum. Indeed, Ciudad Guayana’s small dimensions, the extra-business ties among subsectors of the metalworking sector, and the close physical location among subsets of firms probably promoted cooperation in any case. For example, 18 of the 26 firms I visited formed two clusters of physically close firms (See Figure 3.6). In the literature, physical proximity has been linked to cooperation (Sengenberger and Pyke 1992, Polenske 2001). Moreover, aside from their physical proximity, these firms had a number of extra-business links to one another (See Table 3.1). Yet despite these favorable conditions, had AIMM-Guayana not mediated the relationship between SIDOR and the metalworking firms, the association may never have developed the strength it subsequently had at collective action. In effect, Chapter 5 will show how AIMM-Guayana’s loss of its mediation function within procurement after SIDOR’s privatization has debilitated the association.

Summing up, AIMM-Guayana’s mediation of the second Open PO system made it an encompassing association. This encompassingness gave it the legitimacy and resources to deliver collective goods. Its collective action served two purposes: one, to
supplement supply-side deficiencies that affected suppliers’ competitiveness. Two, to continue exerting pressure on the CVG for increased local procurement from its holding enterprises. AIMM-Guayana’s collective action capabilities gained strength from an environment of pre-existing social capital. Yet the association’s role as mediator between SIDOR and the local metalworking firms played a determining role.

**Figure 3.6. Physical proximity among metalworking firms in Ciudad Guayana**

The continuous line denotes back-to-back location. The dotted line delimits two industrial parks, UD321 and Unare, where many metalworking firms are located. These industrial parks are however quite distant from one another (10 miles). Back to back location however does not necessarily only promote cooperation. For example, Fundimarcia and Talleres Morgran are next to each other, yet compete fiercely. The same for Rica and Servemo.
Table 3.1. Business and non-business relationships among metalworking firms

<table>
<thead>
<tr>
<th>Dyad/Group</th>
<th>Relationship</th>
<th>Nationalities</th>
</tr>
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<tbody>
<tr>
<td>Fundimarca and Geasa</td>
<td>Compadres</td>
<td>Venezuelan</td>
</tr>
<tr>
<td>Fundimarca and ISI</td>
<td>Friends from university</td>
<td>Venezuelan</td>
</tr>
<tr>
<td>Fundimarca and Geasa</td>
<td>Business partners in tourism venture</td>
<td>Venezuelan</td>
</tr>
<tr>
<td>Geasa and Servemo</td>
<td>Compadres</td>
<td>Venezuelan</td>
</tr>
<tr>
<td>Servemo and Tornoven</td>
<td>Compadres</td>
<td>Venezuelan</td>
</tr>
<tr>
<td>Tomi and IMO</td>
<td>Compadres</td>
<td>Italian</td>
</tr>
<tr>
<td>Talleres Morgran and TDA</td>
<td>Cooperation</td>
<td>Venezuelan/Spanish</td>
</tr>
<tr>
<td>Talleres Morgran and Tecnobras</td>
<td>Cooperation</td>
<td>Venezuelan/Spanish</td>
</tr>
<tr>
<td>Metalmeg and ISI</td>
<td>Friends, Partners in some business ventures</td>
<td>Venezuelan</td>
</tr>
<tr>
<td>Metalmeg and Indorca</td>
<td>Partners in business ventures</td>
<td>Venezuelan/Argentinean</td>
</tr>
<tr>
<td>Sebema, Tecnobras, Tamoï, Heca, Tipasa, Indorca</td>
<td>Partners to build wagons for Ferrominera</td>
<td>Spanish, Italian, Argentinean</td>
</tr>
</tbody>
</table>

Source: Interviews. “Compadres” means that one entrepreneur is the godfather of another entrepreneur’s son or daughter.

3.3. Conclusion

This chapter illustrated how the process of developing suppliers in lagging regions requires special attention to the customer-supplier relation. First, the case of both SIDOR and Italsider showed that local suppliers in lagging regions need sustained commitment from their customers in order to upgrade. Yet suppliers’ needs of long-term commitment may clash with their customer’s interests, particularly when the need is not generic to the industry. For example, in both Ciudad Guayana and Taranto, metalworking firms’ need for long-term commitment derived largely from the asset-specificity linked to those cities’ relatively undeveloped markets for metalworking products. At the same time, supplier’s incipient abilities ruled out markets in other regions, which could have diminished this asset-specificity. If we are interested in building localized backward linkages in this situation, how do we diffuse the tension between customers and suppliers’ divergent interests?
The development of local metalworking firms in Ciudad Guayana suggests that organizations that can mediate the customer-supplier relationship can diffuse this tension. Interestingly, current studies on backward linkages describe programs where such organizations have played a mediating role, yet have failed to recognize their significance. For example, in the most successful matchmaking cases that this literature describes – e.g. Taiwan and Singapore– government organizations carefully intermediated backward linkages by bringing foreign firms and their potential local suppliers to work together. In the case of Taiwan, its Industrial Development Board (IDB) persuaded particular factories to establish a local network of suppliers. At the same time, the IDB worked with supplier firms to interest them in joining the network. The IDB then worked with the customer to help suppliers improve their operations and meet annual production plans. That is, Taiwan’s IDB elicited both commitment from customers towards local suppliers and worked to improve suppliers’ operations at the same time. In Singapore we witness the same dynamic. Singapore’s Economic Development Board (EDB) persuaded potential foreign customers to work for two to three years with local suppliers. During this time, customers provided suppliers with focused assistance, designing courses and workshops to address their general technical, managerial and/or operational issues. Subsequently, the customer conducted joint research with these suppliers. During this time, Singapore’s Economic Development Board coordinated the work and paid the salary of those foreign managers involved in the project (Battat, Frank and Shen 1996).

The impact that business associations like AIMM-Guayana can have on the structure of customer-supplier relations further informs the literature on the relationship
between automobile assemblers and their suppliers. In particular, this literature is given to examine the conditions that determine supplier investment. This examination has yielded an important list of circumstances that foster supplier investment, such as long-term commitment, trust, and so on (e.g. Sako and Helper 1996, Richardson 1993). Yet this literature does not adequately deal with the tension inherent in the customer-supplier relationship. This tension is implicit in descriptions of how US automobile assemblers adopted “exit-based” relations with their suppliers, despite the fact that these relationships did not encourage supplier investment and ultimately made US automobile firms lose their competitive edge (Helper 1991, De Jong and Nooteboom 2000). Yet the literature does not present an examination of how the tension can be resolved.

AIMM-Guayana’s mediation is one example of the resolution of this tension. Other similar examples come to mind. In Brazil, local auto parts suppliers used their business associations to forge cooperative, rather than arms-length relations with the incoming multinational assemblers (Addis 1999). In Japan, business organizations recognize the need for inter-industry governance systems that protect the relations between small and medium and their larger, more powerful customers. In the textile industry, a business organization called “Association for the Promotion of the Modernization of Trading Relations in the Textile Industry” oversees written contracts between large spinners and their subcontractors. This organization supervises that price and quantity get negotiated on the basis of “sharing the losses of the bad times and the gains from the good times”. Moreover, those with an “upper hand” in the bargaining table (like the spinners) cannot use their power to force the others into bankruptcy (Dore 1986).
How AIMM-Guayana’s mediation of the customer-supplier relationship strengthened the business association’s ability for collective action brings lessons for the industrial cluster literature. In effect, this literature poses that collective action and cooperation underlie the success of small firm, industrial clusters (Sengenberger and Pyke 1992, Schmitz and Musyck 1993). Yet the origin of collective action tends to be difficult to explain. At times, collective action seems to have surged from an intangible, pre-existing tendency towards associationalism (Putnam 1993). At others, it can be traced back to ethnic ties. For example, Brazilian shoemakers in the Sinos Valley cooperated partly because they all had the same shared German origin (Schmitz 1993). Yet in these stories there are hardly ever accounts of how cooperation may have surged from successful resolution of conflicts. Indeed, the absence of such a discussion is surprising, given that some successful industrial clusters—like those in the Third Italy—lie in regions that at one time faced severe industrial relations conflict (Tendler and Schmitz 1999).

The story about AIMM-Guayana’s mediation in the customer-supplier relationship affected the development of the local metalworking supplier sector does not end here. The close ties that AIMM-Guayana cultivated with SIDOR and with other institutions in Ciudad Guayana as metalworking firms strived to build backward linkages worked in unforeseen ways. Namely, AIMM-Guayana’s embeddedness within other groups in Ciudad Guayana helped the sector obtain the vision and the resources to restructure before privatization. The next chapter recounts this story.
Chapter 4: Embeddedness within a rapidly modernizing web of actors leads to restructuring before privatization

As the next chapter will show, SIDOR’s privatization in December 1997 brought with it a drastic change in customer-supplier relations. In particular, private-foreign SIDOR replaced the collectively mediated Open PO system with individualized bargaining, and subsequently severed ties to most local metalworking suppliers. Yet despite these changes, most local metalworking firms were able to survive privatization. In part, their survival hinged on reestablishing a relationship with private-foreign SIDOR, a subject I treat in the next chapter. Yet in part, metalworking firms quickly developed customers outside SIDOR. While prior to privatization most metalworking firms depended on state-owned SIDOR for over 80% of their sales, a year later most had diversified their markets to clients outside Ciudad Guayana. What can explain their quick restructuring?

The literature’s answer to this question would hinge on SIDOR’s privatization. In theory, privatization eliminated the pressures bearing on the former state-owned enterprise to act developmentally. Moreover, privatization subjected SIDOR to hard budget constraints. Both changes increased pressures on local suppliers to become competitive. Local suppliers either had to fit private-foreign SIDOR’s more demanding standards or scramble to look for other markets.

Yet as this chapter illustrates, the metalworking sector’s restructuring in terms of looking for other markets and becoming more competitive began before SIDOR’s privatization. In particular, AIMM-Guayana’s efforts to build backward linkages had implications beyond those of collective action discussed in the previous chapter. Namely,
these efforts slowly embedded the metalworking sector within the political superstructure of Ciudad Guayana. The close ties that AIMM-Guayana developed with the CVG, with SIDOR, and with other political actors in Ciudad Guayana allowed the metalworking sector to both preview the likely consequence of privatization, and obtain the resources to restructure.

4.1. The local metalworking sector prepares for privatization

That metalworking firms in Ciudad Guayana internalized a need to restructure before privatization is apparent in their actions. By restructuring I mean efforts to both increase their technological abilities and diversify to other product and regional markets. Indeed, prior to privatization, AIMM-Guayana led a host of initiatives meant to achieve both these goals. Foremost in terms of their length and impact on the sector are first, a program to develop metalworking firms’ technological capabilities, second, a program to help local metalworking firms become suppliers to the petroleum industry, and third, collective marketing of local metalworking firms’ services outside Guayana. In this section I describe each in turn.

“Programa de Desarrollo de Capacidades Tecnológicas” (DECATEC)

DECATEC, as its name in Spanish implies, was a program to develop the technological capabilities of the metalworking sector. DECATEC initiated its work with Ciudad Guayana’s metalworking firms in 1996 and ended in 2000. AIMM-Guayana funded 40% of the costs of the program, with the remaining 60% complemented by FUNDACITE-Guayana, the local government agency fostering technological development. FORMA, an engineering consulting firm specialized in technological
DECADET’s mission speaks for itself about the upgrading goals that local metalworking firms assigned to it:

“Secure the survival of firms, consolidate the change in business culture that has already started and protect the advances already achieved in pro of the increased competitiveness and patrimonial valorization of the small and medium metalworking industry in Guayana, through the development of technological capabilities oriented to achieve greater productivity, specialization, and profitability” (FORMA 1999, i.).

To achieve these goals, DECADET involved several phases. In the first, FORMA developed a “map” of the technological strengths and weaknesses of the sector as a whole. This diagnostic drew a fine-grained picture of metalworking firms’ position with respect to world-class metalworking firms along different axis of business practice. For example, the diagnostic evaluated metalworking firms’ business ethic, responsibility and discipline, attention to quality and service, human resource practices, and conscience of profitability. The diagnostic further focused on specific aspects of metalworking firms’ management, such as planning and marketing, production, information, organization, and training. FORMA elaborated this diagnostic from survey responses from 59 of the 78 firms who belonged to AIMM-Guayana in 1995, a response rate that underscores metalworking firms’ enthusiasm for the program. The resulting “map” of the sector—which AIMM-Guayana displayed on its walls—determined the areas in which firms had to concentrate. In broad terms, metalworking firms had relative strengths in organization, programming and control, leadership, and communication and participation. Their main weakness was planning and marketing. As expected, those firms manufacturing and repairing parts and equipment—the sub sector participating in SIDOR’s Open PO system—had greater capabilities than those manufacturing metal structures, or those performing industrial maintenance (FORMA 1999).
The second phase of DECATEC involved a series of courses on marketing, information management, and investment in skills and technology. Throughout this second phase FORMA stressed the importance of technological specialization as a tool to conquer markets. Concurrent to these courses, firms could individually hire FORMA to examine their assets in terms of skill and fixed capital, and locate promising areas of specialization. A subset of participating firms did indeed perform this introspection with positive results. For example, as a result of their work within DECATEC and with FORMA, Talleres Morgran specialized in “reductores de velocidad”, Servemo in “intercambiadores de calor”, and Metalúrgica Chirica in “tanques a presión”. Following privatization, all these metalworking firms used their specialized niches to conquer both private-foreign SIDOR and other wider markets. Talleres Morgran, for example, has “more work than ever” following SIDOR’s privatization. Moreover, the firm’s technological efforts have enabled it to strike a joint technology partnership with a firm in Germany, and gain clients in the Venezuelan Central region. Both Servemo and Metalúrgica Chirica have also made inroads to other clients. (Metalworking entrepreneurs (JM 3/1999, JI 2/2000, VG 8/2001)).

An added benefit of DECATEC was to boost firms’ investment in training. One of the downsides of the Open PO system was that state-owned SIDOR measured metalworking firms’ investment in tangible assets like machinery before allocating purchase orders. This emphasis on the tangible produced a behavior of privileging investment in machinery over that of intangibles. Moreover, it strengthened the market failure inherent to small-firm training in any case. In effect, small firms tend to under invest in training because the high worker rotation intrinsic to firms of this size makes it

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117 Firms had to pay for this individualized attention separately.
difficult to capture returns on this investment (Osterman and Batt 1993). Following DECATEC, many firms changed their longtime practice of not investing in training themselves. Most firms participating in DECATEC developed internal worker training programs and increased their investment in skill development, up to 5% of gross sales in the case of some firms (e.g. Metalurgica Chirica). (Consultants for DECATEC (EY 11/99, JAM 11/99), Metalworking entrepreneurs (JM 3/00, JI 2/00, AH 3/00, JT 2/00, NG 3/02)).

Finally, DECATEC opened firms’ eyes to the importance of complementary initiatives to strengthen firms’ technology development efforts and marketing. Triggered by the business “vision” that DECATEC opened for them, AIMM-Guayana engaged two universities to help metalworking firms develop new products and initiated the collective marketing efforts detailed below.

“FORMA got us thinking. For example, we started doing strategic plans, which nobody did before, not even of a year. With this strategic plan I in particular realized that with the consumption of gas oil that I had my costs would rise a lot in the future, but if I convinced PDVSA to put a gas oil line to my shop (there was one nearby) I could reduce my costs. I did so, and today I save a lot in combustible, if I had to buy it by the liter it would be much more expensive.” (Metalworking Entrepreneur and ex-director of AIMM-Guayana (OM 08/01)).

“Self-development of trustworthy suppliers for the petroleum industry”\textsuperscript{118}

In January 1996, two years prior to SIDOR’s change of ownership from state-owned to foreign, metalworking firms initiated a collective attempt to become suppliers of the petroleum industry. This time around, AIMM-Guayana co financed the project with its rival business association, CIMG. The program worked at two different levels. First, it aimed to place local firms’ quality processes in line with ISO9000 standards.

\textsuperscript{118} The information for this section comes from a series of letters, fax transmissions, bulletins, reports and firm-specific evaluations carried out during the implementation of the program.
Second, the program strived to help local metalworking firms make contact with potential clients in the oil industry. CIMG and AIMM-Guayana hired a team of 4 quality consultant engineers to implement the program.

To make metalworking firms’ production processes adequate to ISO9000 standards, this program worked at both the individual and collective level. At the collective level, the implementation team organized a series of workshops on ISO9000 standards, machine calibration, and statistic process control, among others. Training organizations like Fundametal (public-private, specializes in metalworking trade) and CIED-Intevep (training arm of national petroleum company PDVSA) dictated these courses. At the individual level, the implementation team visited each firm repeatedly, diagnosing their quality control systems according to ISO9000 standards and monitoring the pace of change that firms needed to make. At every visit, the targeted question would commit to implement certain changes by the next visit. In one particular extreme situation the quality implementation team visited the same firm 17 times.

With respect to market contacts, the program implementation team organized visits to petroleum firms, their suppliers and their subsidiaries in Venezuela. For example, in July 1997 the team took a group of firms to visit petroleum production and refinery sites in the nearby states of Anzoátegui, Monagas, and Delta Amacuro. Another round of visits targeted petroleum suppliers in Maracaibo, and petroleum engineering consulting firms in Caracas. The implementation team also contacted the local firms with national oil company’s purchasing arm INTEVEP.

Many metalworking firms participated in this program. By the end of the program, 46 firms had taken part in the ISO9001 workshops and 36 had had individual
diagnostics. Four of the participating firms had achieved INTEVEP qualification by the end of the intervention. This certification is the first step for any supplier wanting to sell to PDVSA.

**Collective marketing**

Aside from the petroleum program, firms undertook other collective initiatives to gain a foothold in distant markets. The most notable interventions were AIMM-Guayana’s edition of a collective catalogue, and the sector’s participation in trade fairs outside Ciudad Guayana.

In 1996, a year before privatization, and for the first time ever, AIMM-Guayana published a catalogue of the metalworking sector. This catalogue described first the general characteristics of Ciudad Guayana and then delved in detail into the production capabilities, skills and experience of each of its member firms. Full color, with texts in both English and Spanish, and pictures of each firm’s installations, machinery, and or products, it is a very nice brochure indeed. The catalogue was so successful among the association’s members that AIMM-Guayana published an actualized version in 2000.

In 1996, AIMM-Guayana also started to participate in trade fairs. Between 1996 and 1997, AIMM-Guayana installed booths at trade fairs in Ciudad Guayana, Caracas (petroleum fair and metalworking products fair), Manaus (Brazil), Maracaibo, and Maturín. At these fairs, AIMM-Guayana represented the sector, rather than individual firms, and used the catalogue as part of its marketing material.

After privatization, AIMM-Guayana’s marketing efforts have paid off. For example, Tramet and ISI have opened offices in El Tigre, near new and expanding petroleum operations. TDA won bids to build the plants of several private firms arriving
to Guayana, among them a forestry products firm. This company also built a plant for a small refinery in El Tigre. Both Metalúrgica Chirica and Bepreca have started supplying to the petroleum sector (Metalworking entrepreneurs (MB 2/2000, HR 11/1999 and 7/2002, OM 7/2001), Consultant to the sector (EY 7/2001)).

In sum, prior to privatization, AIMM-Guayana undertook a series of initiatives to increase the technological capabilities and diversify the markets of Ciudad Guayana’s metalworking sector. In contrast to the literature equating privatization with industrial restructuring, these efforts were well under way before SIDOR’s privatization. Yet where did the motivation for restructuring come from? As the next section will illustrate, metalworking firms partly reacted to changes in their markets as state-owned SIDOR itself sought to restructure. Therefore, to some degree the metalworking firms’ restructuring responded to economic considerations. However, economic variables alone cannot explain metalworking sectors’ restructuring. Rather, as the next section will illustrate, the metalworking sector’s close ties to political actors in Ciudad Guayana helped them internalize the vision and resources required to restructure.

4.2. Embeddedness, paradigm shifts, and restructuring

AIMM-Guayana’s restructuring impulse prior to privatization responds partly to economic shifts in the metalworking sector’s market. In particular, in the early 1990s state-owned SIDOR initiated an “industrial reconversion” program that laid off 3500 workers and shut down many of its older plants. SIDOR’s restructuring diminished its need for the services of the local metalworking firms.

However, SIDOR’s restructuring, while important, cannot alone account for the sector’s turnaround. The restructuring activities that Guayanese metalworking firms
embarked on before privatization also responded to their embeddedness in a network of political actors who were themselves restructuring. These actors are the national government—represented in Ciudad Guayana by state-owned SIDOR, by the CVG, and by the local branch of the national technology development government agency, FUNDACITE-Guayana—and the existence of a contending political party based in Guayana called the Causa R. In turn, local metalworking firms’ embeddedness resulted precisely from their political activity of building backward linkages.

In what remains, I will first show how the political actors in Ciudad Guayana were changing their roles in fundamental ways. Then, I will show how changes within these actors in turn triggered metalworking firms to diversify their markets away from the state-owned enterprises. Moreover, in each case I illustrate the process through which metalworking firms developed close ties to each actor in the first place. With this analysis, I mean to put politics at center stage, not as reinforcing economic, social and cultural variables, but rather as “having an autonomous influence over economic development” (Piattoni 1999, p. 118).

**State-owned SIDOR**

In 1991, six years before privatization, state-owned SIDOR carried out an industrial reconversion program to improve its financial performance. This program sought to increase SIDOR’s flexibility and competitiveness by reducing the costs that came with its functions as a state-owned enterprise. In particular, SIDOR’s reconversion program involved shutting down 17 of the complex’ plants, reducing its workforce by 3,500 workers (20%), and increasing prices in the domestic market, among other controversial measures.
This conversion program responded mainly to economic considerations. Although SIDOR had reduced costs in 1982 by laying off workers and shutting obsolete plants, by 1990 the firm still tended to have negative operative results. For example, in the 1980s, SIDOR only yielded profits from 1986 to 1989, and then only because the company defaulted on some of its debt obligations. By 1990, SIDOR was once again in the red. SIDOR’s managers came under strong pressure to yield positive gains. Still, any cost-cutting and market reorientation decision hinged on the approval of the CVG (Martinez Guarda 1996).

A change in political ideology made the industrial reconversion program possible. In particular, SIDOR’s industrial reconversion program surged out of a compromise between its two different owners, the Fondo de Inversiones de Venezuela (FIV), and the CVG. In 1989 the Venezuelan government initiated a structural adjustment program that involved trade liberalization and the restructuring of the state. This government placed Chicago-trained technocrats to run the Fondo de Inversiones de Venezuela (FIV), SIDOR’s financial owner (75% shares). FIV wanted to privatize SIDOR, yet faced a losing battle against SIDOR’s political owner, the CVG (25% shares), which opposed privatization. Namely, the CVG’s erstwhile president believed in state-led industrialization. After a series of negotiations with the FIV to restructure SIDOR’s debt, the CVG committed to SIDOR’s industrial reconversion program (Martinez Guarda 1996, Ex-president of the FIV (EJ 03/01)).

SIDOR’s industrial reconversion program had ample support from SIDOR top managers. Namely, they perceived the cost-cutting moves as necessary to compete with other steel mills in Latin America, which by then had already privatized.
“In 1990 all throughout the world steel firms were privatizing: in Italy, Latin America, etc. SIDOR kept belonging to the state, and tied by all the laws I described earlier, how could it compete? There starts arising an incredible pressure for privatization, but Sucre Figarella [president of the CVG] opposed it. (...) In the ILAFA [Latin-American institute for iron and steel] conventions of the seventies all the participants worked in public enterprises. By 1988 all those firms were private except the ones in Brazil and Venezuela, which the rest perceived as dinosaurs. By 1992 the ILAFA congress happens in Caracas, and the only state-owned enterprise remaining was SIDOR, the others, including the Brazilian ones, had been privatized. The SIDOR managers that went to that meeting felt very badly and generated the process of change. (...) Angel Barreto, who was the president of SIDOR, made a plan to reconvert the plant. The idea was to make SIDOR more efficient while waiting for privatization, which we didn’t see coming because of the obstacles put by the CVG. Angel Barreto met with CAP [the Venezuelan President], who supported the project, even though it would generate many layoffs and probably discontent in Guayana.” (Ex VP of state-owned SIDOR (IS 07/01)).

As a result of SIDOR’s industrial reconversion program, the demand for metalworking firms’ products declined drastically. Apart from shutting down its obsolete plants, SIDOR reduced the variety of products previously manufactured. Both things together translated into a 43% reduction in output between 1990 and 1994. SIDOR’s lower volume of production meant less requirements for metalworking manufacturing and maintenance. Figure 4.1. shows how Ciudad Guayana’s metalworking employment declines by 57% between 1990 and 1994, following SIDOR’s decline in output. The picture illustrates the huge dependence that the local metalworking sector had on SIDOR during the beginning of the 1990s. As a metalworking entrepreneur told me “whenever SIDOR had a cold, the local metalworking sector got tosferina” (OM 07/01).
Figure 4.1. Formal Employment in Ciudad Guayana’s Metalworking sector and SIDOR’s output, 1980 - 1997


State-owned SIDOR’s industrial reconversion program affected local metalworking firms beyond its reduction in demand for metalworking services. In 1994, state-owned SIDOR attempted to get ISO9000 certified. Yet ISO9000 certification requires that suppliers also be ISO9000 certified. Therefore SIDOR started to demand of metalworking firms that they follow quality procedures in line with ISO9000 practice. Through the close ties that state-owned SIDOR had developed with the metalworking sector, SIDOR provided firms with technical assistance to meet these standards.

“IN 1994 SIDOR wanted to comply with ISO norms and starts demanding quality manuals from suppliers. SIDOR also told us that by 1996, whoever did not get an A or B rating [in SIDOR’s evaluation system] would not get purchase orders. We convinced ourselves of the need to improve quality because SIDOR demanded it from us. If it had been the aluminum firms, we wouldn’t have paid that much attention. SIDOR was 80% of our market. (Metalworking entrepreneur and ex-director of AIMM-Guayana (OM 07/01)).

Finally, just prior to privatization, state-owned SIDOR worked to increase local metalworking firms’ awareness of the need to diversify markets. The interaction between
state-owned SIDOR and local metalworking firms at this point illustrates the strong ties between the two entities. State-owned SIDOR’s president himself met monthly with local metalworking firms at AIMM-Guayana’s headquarters and painted pictures of all that could happen after privatization. Particularly, state-owned SIDOR’s president made firms aware that privatization could spell the elimination of Open PO system, and encouraged local firms to seek markets outside SIDOR and the other state-owned enterprises. At this stage, state-owned SIDOR even financed AIMM-Guayana’s attendance to the fairs outside Ciudad Guayana that I described above (Last president of state-owned SIDOR (ARL 7/2001)).

**The CVG**

Up to 1990, the CVG had never really been directly involved with the fate of small and medium firms in the region. After managing its large steel, iron ore, aluminum and forestry investments, and administering municipal services like water, schools and sewage, the CVG had no resources to dedicate to Ciudad Guayana’s small and medium enterprises, including metalworking (Rakowski 2000).

The CVG’s lack of policies directed to small and medium firms throughout the 70s and 80s did not mean, however, that the corporation did not interact with local SMEs. As I described in the previous two chapters, local metalworking firms –acting through AIMM-Guayana—frequently visited both the CVG president and the CVG’s industrial promotion department to find out about upcoming investments and lobby for increased local procurement. Through this lobbying activity the metalworking sector developed close ties to the CVG’s industrial promotion department.
During the mid 1990s, as the prospect of privatizing the CVG’s state-owned enterprises drew nearer, and as Venezuela undertook efforts for political decentralization, the CVG “reinvented” a new role for itself: become a steward for the whole region (Rakowski 2000). Instead of directly managing Ciudad Guayana’s state-owned enterprises—which were scheduled for privatization anyway—and directly managing the city’s services (e.g. water distribution, trash collection) —which were to be transferred to municipal authorities—, the CVG would take on a “lighter”, mediating role. This mediating role for the first time cast the CVG’s eyes on the wider landscape of industries within Guayana. This included not only Ciudad Guayana’s metalworking firms—which were the more powerful SMEs in Guayana—but also clusters of small and medium artisan firms lost in the vast geographical expanse of this immense region. For the first time, the CVG realized that within Guayana’s interior there were clusters of firms in traditional sectors like Casabe, gold (jewelry), fresh cheese, and tourism that with a little help could increase the value-added of their product and their exports outside the region (Ex-directors of the CVG’s Industrial Promotion Department (OM 8/01, EVM 8/99)).

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119 A cynical interpretation of this move is that it is the CVG bureaucrat’s way of holding on to power. Both business people and politicians in Ciudad Guayana believe that the agency’s role of building the city has long been fulfilled and that it is time for it to pass on its responsibilities (and resources) to local government and disappear (Ex-president of the CVG and ex-mayor of Ciudad Guayana (CS 8/2001), Ex-manager of CVG and metalworking entrepreneur (OM 8/2001), metalworking entrepreneur and La Causa R politician (JR 8/2001), Independent analyst, consultant to the local municipality under Pastora Medina government (GS 11/2000)).

120 A cracker made with the fibrous part of the cassava tuber.

121 Queso guayanes and queso telita are the two typical (delicious) fresh cheeses produced in this region.

122 Guayana encompasses two fantastic national parks: Canaima, which is set in the Amazon and includes the Angel Falls (highest waterfall in the world), and La Gran Sabana, which houses the Tepuis, the oldest mountains on earth. (The Angel Falls cascade out of the top of a massive Tepui). However, tourist facilities at both parks are quite limited. Ciudad Guayana itself boasts the amazing waterfalls of La Llovizna, which are comparable in my perspective to the Niagara Falls. (In fact, much more beautiful because they are still in their natural setting).
The local metalworking sector’s close ties to the CVG paid off once the corporation became interested in small and medium firm development. Within this new role, the CVG industrial promotion department brought courses about competitiveness to Ciudad Guayana’s metalworking firms. For example, in 1994 the CVG engaged Fondibieca, a national government agency in charge of developing capital goods, to deliver a two month course to raise firms’ awareness of the importance of investment in human capital, technology, information, strategic planning and marketing. Metalworking firms who assisted to this course stated that it was like a mini-DECATEC, a first eye-opener to the importance of investing in technology (e.g. JT 02/00). Later that year, the CVG brought technology policy experts like Carlota Pérez to reinforce the importance of technology investment in increasing competitiveness (Metalworking entrepreneur (JU 08/01)).

Within its new role, the CVG also helped local metalworking firms penetrate other markets. For example, the CVG helped finance the petroleum program. Indeed, the CVG used its political weight to bring purchase officers of the national oil company PDVSA to dictate forums about the market potential inherent in the opening of the oil sector. Lacking the convocatory power of the CVG, AIMM-Guayana and CIMG may have not been able to do this on their own. Moreover, in 1996, and at the behest of AIMM-Guayana, the CVG helped fund the metalworking catalogue, and also financed the association’s attendance to some fairs (Ex-director for Industrial Promotion Department (EVM 8/1999)).

Yet the CVG’s largest impact on the local metalworking sector’s motivation for upgrading and market diversification came through a trip that the CVG funded to the
Basque country in Spain. There, the metalworking firms were able to themselves experience the likely impact of privatization on the local metalworking sector.

“The local metalworking sector had an excellent relation to the CVG, so the business chamber [AIMM-Guayana] accompanied them [the CVG] to international events. The CVG was the antenna of the Bolívar Program [a Spanish program to fund SME development in Latin America], so we went to Spain with them. There, we developed a good relationship with other business associations. In the Basque country and in Catalonia we saw that the privatization of the steel sector had been an atomic bomb for local metalworking firms. Immediately we realized the need to improve our quality systems and look for other markets.” (Metalworking entrepreneur and Ex-director for AIMM-Guayana (OM 07/01)).

La Causa R

In 1990, at the same time that the CVG was soul-searching, a new political party called La Causa R, born from the steelworkers’ union at SIDOR, won landslide victories for the governorship of the state of Bolívar and mayorship of the city of Ciudad Guayana. These had been Venezuela’s first direct elections for local government. The Causa R’s victory came as a shock to Acción Democrática, the party that had had a stronghold in Guayana ever since Ciudad Guayana’s foundation. Like the Brazilian worker-based party PT, the Causa R continued to make inroads into national politics. In 1992 Causa R cast off its regional identity by winning the mayorship and city council of Caracas, and in 1993 the party won the fourth largest bloc of seats in Congress, displacing the MAS (Movement towards Socialism) as Venezuela’s largest leftist party. From 1989 to 2000, the Causa R dominated the municipal government in Ciudad Guayana (Hellinger 1996, Ellner 1995).

For Ciudad Guayana, more significant than Causa R’s challenge to the traditional hegemony of Acción Democrática was the style of political leadership that La Causa R brought with it. Acción Democrática, like its archrival Copei, had a top-down, hierarchical governance style. The group at the apex typically defined party directives...
and disciplined dissenting members with expulsion (Coppedge 1995). In contrast, the
Causa R did not have members commit to a party line, but rather to the accurate
representation of the people that elected them (Hellinger 1996). This philosophy had first
gained La Causa R its leadership of SUTISS, SIDOR’s worker’s union. In representing
SIDOR’s workers, the Causa R had not imposed party directives from outside, as the
Acción Democrática’s union leadership was used to doing, but really tried to get workers’
voices heard. The Acción Democrática leadership, in contrast, had worked to repress
and control workers in order to avoid labor conflict (Ellner 1995b).

Once the Causa R won the municipal government for Ciudad Guayana, it
implemented this same philosophy of representativeness and opened policy-making to
community participation (Angotti 2001). For example, the mayor’s office convoked
neighborhood municipal meetings to develop local budget priorities (Hellinger 1996).
The city government also furnished an immense room in City Hall with tables, chairs and
bulletin boards to allow community groups to meet both formally and informally (Ellner
1995).

“An innovation that we introduced, and that continued with Pastora [the next
mayor], was to incorporate all actors in discussions about the administration. I
made open consultations with business associations, as well as with other
organized actors, and accounted to them over what happened in the city. We also
organized Local Economic councils. All this had continuity during the last 10
years. The idea was to search for a shared vision of how and in which direction to
build the state of Bolívar” (First Causa R mayor of the Caroni Municipality,
subsequently reelected for a second period (CS 08/01)).

123 This philosophy resulted from the Causa R’s goal of instituting a “worker democracy” or “government
of workers”, instead of the socialist goals that other leftist parties in Venezuela typically espoused. An early
leader of SUTISS’ union put this philosophy into practice by convening mass meetings of SIDOR workers
outside the factory gates. “Fifteen years later, after his victory in gubernatorial elections, Velásquez would
convene similar meetings in public squares throughout the state [of Bolívar] to formulate a budget, to
repulse an attempt by an adecó-dominated state legislature to impeach him, and to attempt to inject a spirit
of civic responsibility in a public unaccustomed to participatory democracy” (Hellinger 1996, p. 120).
The Causa R’s rise to Ciudad Guayana’s municipal government helped the local metalworking sector restructure in two ways. First, in contrast to its AD predecessor, the Causa R brought with it a political ideology of “emphasizing individual responsibility and problem solving by individual, families and communities – not by the state” (Rakowski 2000, p. 14). In Ciudad Guayana, this political ideology translated into a firm belief that the CVG should give up its control over municipal matters and delegate them to the city government. For example, once the Causa R took over city government, it fought a formidable battle against the CVG for control over city planning, eventually negotiating to work on jointly with the CVG on the 1994 Urban Plan (Angotti 2001).

“I came to the Mayor’s office with the idea of de-CVGizing Ciudad Guayana. Up to then the CVG had been the major force in the region, everything belonged to it, lands, resources, and it provided all services in the region. But at the end of the 1980s the corporation had weakened: it continued being strong in power but could no longer cope with all its responsibilities.

The culture of the corporation was really vertical. From its beginning its vision and mission had been to squash local leadership to substitute it for a national vision with international outlook. This created an “aplastante” development vision, where the national, international and large had prevalence over the local and small.

The first thing I did upon my arrival to the municipality was to change its name to ALMACARONI to make it evident that the city had a soul, that it was a space where one lived. The participation spaces we opened were very different from the corporate style of the CVG. Moreover little by little we started to wrest competencies from the CVG. For example, one of them was the power to make the Urban Plan, which had always belonged to the CVG. At the end we did it with them because the CVG got furious and we had to negotiate a joint participation” (First Causa R mayor of municipality of Caroni, (CS 08/01)).

On an economic front, the Causa R’s philosophy of individual responsibility agreed with the paradigm of diversifying economic activity away from the state-owned enterprises that both the CVG and state-owned SIDOR expounded to the metalworking firms. The mayorship desired “a city free of dependence on the troubled CVG industries,
a city with an economy controlled by and “on the scale of” the people.” (Rakowski 2000, p. 15). From their proximity to the Causa R, metalworking entrepreneurs leading AIMM-Guayana’s DECATEC programs absorbed these ideals of economic independence.

“Many of the entrepreneurs that participated in AIMM-Guayana’s transformation were intimately involved or close to the Causa, like Jorge Uzcátegui, Alberto Iguaro, Omar Martínez, Victor García.” (Consultant to the sector, former Causa R (YB 08/01)).

The rise to power of the Causa R and its unique political philosophy aided local metalworking firms’ restructuring in practical ways as well. Specifically, it gave them access to positions of political power from which they bargained resources that would help finance their restructuring. Given that the Causa R strongly believed in its role as a channel/medium of expression of common feelings, it allowed anyone convinced of these same ideals to participate124 (Hellinger 1996). Many of AIMM-Guayana’s directive members sympathized with the Causa R ideals and used the opportunity to run with the Causa R to get legislative victories at the regional and national government level.

From these legislative positions, metalworking firms negotiated instruments to help not only Guayanese metalworking firms, but also all private firms face an era with less government intervention. For example, Victor García from Servemo became a regional legislator and negotiated Fonfi-Bolivar, a fund from which to subsidize credit for Guayanese small and medium firms125. Jorge Roig from Metalmeg got a seat in the National Congress with the Causa R and negotiated Fondo Guayana, a US$70 million fund resulting from the proceeds of privatization to finance small and medium firms’ restructuring in Ciudad Guayana. The Causa R connection also brought Omar Martínez, a

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124 Hellinger (1996) says that in this sense the Causa R is really not a party, but rather a medium to represent workers (at the union level) and communities (at the local government level).

125 The Bolivar state government deposited a percentage of the state’s tax collection in this fund.
forward thinking metalworking entrepreneur, to direct the CVG’s industrial promotion
department. The Casabe, jewelry and cheese producing initiated mentioned above parted
from his initiative (OM 7/01, 8/01).

Finally, the Causa R municipal government financially contributed to the
metalworking sector’s diversification. Ciudad Guayana’s city government gave AIMM-
Guayana money to establish an “information center” – computers with centralized
information about business opportunities outside Ciudad Guayana that all metalworking
firms could access at the business association. This money would also finance a website
advertising members’ services (Correo del Caroní).

**FUNDACITE-Guayana**

Aside from state-owned SIDOR, the CVG, and La Causa R, the local chapter of
the national center for technology and science development (FUNDACITE-Guayana)
also helped local metalworking firms internalize the need for restructuring and get the
practical tools to achieve it. This effort responded to a shift in direction of its national
coordinating body, CONICIT. Starting in 1994, CONICIT shifted its role towards more
applied technology and less pure scientific research, which had been the tradition up to
the time. In addition, CONICIT changed its focus from funding individual university
researchers to working with clusters of firms or social groups wanting change. At the
same time, CONICIT decentralized and opened offices in several of the nation’s
important cities, including Ciudad Guayana, and FUNDACITE-Guayana was a result of
it (Ex-president of CONICIT (IA 7/98)).

FUNDACITE-Guayana sought to get involved with problems of regional
technological development. This agency coordinated and partly funded DECATEC, the
program for development of technological capabilities among Ciudad Guayana’s metalworking firms. This program became CONICIT’s first effort to work with a group of SMEs and instill in them the need for technological change. The initiative did not part from the firm’s themselves, but rather from an engineering consultant with longstanding ties to Guayana and with technological development visions in his heart. However, local metalworking firms became sufficiently committed to the program that they paid for part of its execution. As hinted earlier in the chapter, this program triggered technological and marketing initiatives that sustain the firms today.

4.3. The limits that the nature of the industrial sector imposes on restructuring

Despite the metalworking sector’s attempt to restructure described in the previous section, soon it became painfully clear to Guayanese metalworking firms that these efforts could only help them so much. In particular, as my interviews and participant observation of AIMM-Guayana’s meetings made clear, these programs made metalworking firms realize that their source of instability was inherent to the type of market they attended. Of the more than 70 firms belonging to AIMM-Guayana, only four firms produced standardized metalworking parts on a given scale. The rest of the firms manufactured pieces, equipment, and built plants based on the requirements of SIDOR, the aluminum firms, and more recently other private firms in Ciudad Guayana and the petroleum industry. The nature of their work made them dependent on the fluctuations affecting the activity of these larger firms, which themselves responded to changes in international commodity markets. At the same time, to specialize in manufacturing a given equipment for steel plants, for example, and overcome the uncertainty posed by
SIDOR’s fluctuations by exporting seemed very difficult. As experts in the steel industry told me, there is room for so many international suppliers of such equipment.

“If local suppliers think with their pockets, then it might not be a business to specialize in a given equipment, because the investment would be too large and the returns uncertain. Many times they would enter the terrain of patented technologies” (Manager at Techint Corporation (EB 02/02)).

How to change this situation?

For metalworking firms in Ciudad Guayana, the answer became increasingly clear: they needed to “reconvert”. That is, they needed to use the fixed capital and equipment they had to enter product niches with a larger market. Consumer goods loomed particularly attractive. The US $70 million from the proceeds of privatization that one of Ciudad Guayana’s metalworking entrepreneurs achieved in Congress (through the Causa R) meant to finance these reconversion efforts.

Metalworking firms’ reconversion has been an uphill struggle, yet has yielded some scattered successes. For example, in 1994, a consortium of 6 firms (HECA, Sebema, Tamoi, Tomi, Tipesa, Tecnobras) successfully won a bid to jointly manufacture 100 train wagons for Ferrominera, the CVG’s iron ore extracting company. This contract had a great meaning for the metalworking sector because it demonstrated its ability to undertake very large, standardized products. Yet the consortium quickly lost spirits. For reasons that apparently do not have to do with metalworking competitiveness, Ferrominera subsequently purchased wagons elsewhere.126

“The reivindication of the local metalworking sector comes with the manufacturing of local wagons. A local consortium convinced Ferrominera to give local metalworking firms a contract for the manufacture of 200 wagons. These wagons came to have a greater quality than the imported ones. The respect

126 The project hinged on the market created by Ferrominera, as there is just one other short railroad in Venezuela. This railroad is also government owned, yet lies in the Central Northern region.
for AIMM-Guayana and the CIMG comes from succeeding in this contract.” (Ex-director of AIMM-Guayana (OM 8/01)).

“There existed a Guayanese consortium for wagon manufacturing called CONFEROVEN. This consortium went bankrupt, recently the owners got together to sell CONFEROVEN’s industrial installations. We made 200 wagons in that opportunity, we repaired old ones, and then the government let the consortium die, it didn’t give us any more wagons to manufacture or repair. (…) In those days [buyers at Ferrominera] tried to knock down Venezuela for competitors [to supply wagons]. They were looking to get commissions [corruption] from other countries, like Rumania, where [Ferrominera] sent them two boats loaded with iron ore, but the wagons never arrived because it turned out that Rumania was not in capacity to make them. (…) Six of us manufactured the wagons, we in particular manufactured 54 of them super cheap, at Bs. 10 million each for each wagon of 17 tons, which were furthermore quite complicated. Our firm lost Bs. 150 million in that project. We had to reduce the price substantially to compete against Brazil.” (Metalworking entrepreneur, manager of one of the 6 firms involved in the wagon project).

Despite the failed experience of CONFEROVEN, local metalworking firms still attempt reconversion, and some have been successful at this endeavor. For example, Geasa “reconverted” its metalworking facilities to manufacture leisure boats to be used on the Caroní river. Through a contact facilitated by AIMM-Guayana, a local metalworking firm “reconverted” its installations to manufacture pasteurizing stations for small milk producers in the Venezuelan Andean region. AIMM-Guayana also prepared a proposal to replace destroyed bridges in Venezuela’s coastal region, following the tragic flooding events of December 1999. Guayanese firms were in fact strong contenders for this project. (Metalworking entrepreneurs (AI 11/1999, OM 7/2001, IG 8/2001, MT 8/1999, NM 2/2000, GM 3/2000), Participant observation at AIMM-Guayana meetings in 1999, 2000 and 2001).

In essence, the aspirations, struggles and setbacks of Ciudad Guayana’s metalworking sector’s restructuring and reconversion illustrate the difficulties that backward linked industries face in growing beyond the large-scale industries that
originated them. In Ciudad Guayana, these difficulties are exacerbated by the nature of
the sector (custom-designed rather than mass-products), Venezuela’s relatively small
markets, and the difficulties of exporting\textsuperscript{127}. Yet as this chapter illustrated, any
achievements of the sector in this regard have been led by AIMM-Guayana and the CIMG. Not surprisingly, the difficulties that the sector continues to face have triggered
discussions within AIMM-Guayana that indicate that at least part of the firms would
favor some sort of industrial policy [read protectionism] in their favor. Interestingly, and
evidencing how far the metalworking sector has progressed, AIMM-Guayana’s directors
have countered such insinuations by arguing that firms have to become self-sufficient
from government policy and bet on restructuring despite Venezuela’s uncertain economic
and political situation (Participant observation at AIMM-Guayana’s meetings).

4.4. Conclusion

In this chapter I illustrated how the close ties that the metalworking sector in
Ciudad Guayana cultivated with the political superstructure led to firms’ restructuring
prior to privatization. Metalworking firms’ embeddedness within these actors exposed
them both to the need for change and gave them the resources to accomplish it. This
finding agrees with a literature posing that embeddedness fosters fine-grained
information flows and allows actors to rapidly react to change (e.g. Uzzi 1997).

In terms of embeddedness and the state, this chapter suggests a curious lesson.
Evans (1995) argued that embedded, yet autonomous government structures could best
help industrialization. Yet where does embeddedness come from? In Ciudad Guayana,
metalworking firms’ embeddedness within the political superstructure resulted not from

\textsuperscript{127} Even if metalworking firms knew more about penetrating export markets, it would be difficult for them
to export non-standardized goods in any case.
the CVG or SIDOR’s ascribed role of developing the region. As I illustrated in Chapter 2, SIDOR resisted local procurement and the CVG did not really pay attention to small firm development. Rather, metalworking firms’ own lobbying during the 1980s in the process of building backward linkages developed the close ties that then helped them restructure in the 1990s.

Finally, the chapter speaks on the literature on privatization. Normally, privatizing state-owned enterprises appears as a solution to the performance disincentives inherent to state ownership. Yet as we witnessed in Ciudad Guayana, both state-owned SIDOR and the local metalworking firms were restructuring prior to privatization. Moreover, as the next chapter shows, metalworking firms’ embeddedness also helped them turn around the relationship with private-foreign SIDOR just after privatization.

Chapter 5
Chapter 5: On the surprising similarities between state-owned firms and private-foreign ones in terms of backward linkages

When a private, multinational firm acquires a state-owned enterprise in a developing country, what happens to existing local suppliers? The privatization and global commodity chains literatures together predict that these changes should help local suppliers become more competitive. First, privatization should introduce incentives to improve management, including the management of purchase decisions. At the same time, private ownership should free the client firm from pressure to develop local suppliers, a pressure that might have forced the firm’s previous public managers to procure locally. These more stringent criteria in purchases, plus private managers’ freedom to shop the world increase the market pressures bearing down on local suppliers, forcing them to become competitive. At the same time, by virtue of their experience at many locations, multinational managers usually dominate “world frontier knowledge” of how to make products better or how to make better things. Through the customer-supplier relation, this knowledge may pass on to local supplier firms. For example, the United Nations’ Council for Trade and Development 2001 World Investment Report advocates foreign direct investment for developing countries partly on the grounds that foreign firms will transfer knowledge to local suppliers.

However, in many such cases of privatization and denationalization, the change in ownership has had the opposite effect of discontinuing previously existing ties to local suppliers. For example, research on the impact of trade liberalization, deregulation and privatization on 15 industrial clusters throughout Brazil, Uruguay and Argentina found that incoming foreign firms tend to import inputs, isolate themselves from the domestic
system and show disinterest in establishing productive networks locally, even in the cases where these foreign firms acquired state-owned enterprises that had previously sourced from local suppliers (Cassiolato and Lastres 2000). Most damaging from the point of view of developing countries’ technological development, local engineering and machinery producers seem to be hardest hit. In Latin America, foreign firms – particularly those that acquired state-owned enterprises over the 1990s – have substituted local engineering and technical service firms with foreign subcontractors (Katz 2000). When foreign firms sever their relationship to local suppliers, the hoped-for benefits of local supplier upgrading do not occur.

Both these positive and negative scenarios of the possible effect of private-foreign ownership on supplier upgrading do not incorporate the possibility that suppliers themselves can help shape the customer-supplier relationship. Rather, they endow the new, incoming owner with an absolute power to decide the fate of its “dependent”, local suppliers. As I learned from the case of SIDOR, however, local suppliers often have room for maneuver beyond the initial procurement strategy of their large clients. They can both find ways to surmount the initial unwillingness of these foreign firms to buy from them, and make effective efforts to upgrade regardless of their connection to these large enterprises.

This chapter examines the relationship between private-foreign SIDOR and Guayanese metalworking suppliers and compares it to the state-owned SIDOR story to illustrate generic problems associated to the process of building backward linkages. In effect, similar to the negative scenario of privatization’s impact on local supplier development, private-foreign SIDOR initially severed ties to local metalworking firms.
However, metalworking firms turned the relationship around fairly quickly. With the mediation of AIMM-Guayana, local metalworking firms reconnected to private-foreign SIDOR in less than one year.

Private-foreign SIDOR’s resistance and subsequent reconnection to local suppliers has surprising commonalities with the story of backward linkage development in the public, state-owned period. Namely, both firms initially resisted using local suppliers, yet both firms eventually developed long-term customer-supplier relations with them. In both cases, AIMM-Guayana’s pressure and mediation was instrumental to turn around the relationship. These similarities are surprising because each firm behaved differently than theory would have expected it to with respect to backward linkages. Specifically, we would not have expected resistance to backward linkages in state-owned SIDOR, as the firm had a clear mandate to develop Guayana. Similarly, we would not expect a private, multinational firm to be vulnerable to the pressure of organized interest groups like AIMM-Guayana.

These surprising commonalities across the two cases illustrate what I believe to be generic features of the process of building localized backward linkages in lagging regions. First, customers tend to resist local procurement out of distrust of local suppliers and possibly incomplete knowledge about their capabilities. Because of this distrust, when they do procure locally they set up a competitive contract allocation system which does not provide suppliers with all the right incentives to upgrade. This strategy usually keeps suppliers at a low level of investment and development, which in turn reinforces customer’s low commitment. To overcome this seeming vicious cycle, we need a customer-relationship that incorporates more long-term commitment and therefore the
prospect of supplier development, while maintaining competition. Yet how to achieve this governance structure? The case of SIDOR in both the public as in the private periods points towards organizations that can mediate the conflict inherent to customer-supplier relations.

5.1. Setting the context: the polemic around SIDOR’s privatization

Two reasons led the Venezuelan national government to privatize the CVG enterprises\(^\text{128}\). First, recurrent fiscal deficits in the national budget forced the Venezuelan government to continuously resort to international debt. The sale of the CVG enterprises meant to alleviate this chronic situation by raising funds and reducing the size of the government. In addition, a 1994 credit agreement with the IMF required the Venezuelan government to restructure, and particularly to privatize its state-owned enterprises.

Second, privatization responded to Venezuelan analysts’ concern about the long-term viability of the CVG’s enterprises. The proximity to abundant and cheap energy, iron ore and bauxite gave firms like SIDOR and the CVG’s aluminum complex the potential to become the lowest cost producers in the world (HSBC 1997)\(^\text{129}\). However, these firms presented lags in productivity due to their inability to invest in the automation and control process technology that their international competitors used. For SIDOR in particular, experts estimated that this technological modernization would cost

\(^{128}\) The enterprises slated for privatization were the CVG’s aluminum firms and SIDOR. SIDOR’s privatization occurred in December of 1997. Twice the government attempted to privatize the CVG aluminum firms, yet both attempts failed.

\(^{129}\) These firms are close to proved iron ore reserves of 4,200 million metric tons with an installed iron ore extractive capacity of 20 MM t/year, which makes Venezuela the tenth largest producer of this mineral and the second in Latin America after Brazil. Guayana has natural gas reserves of 5 billion cubic meters with an installed capacity of 32 million cubic meters. The Caroní River has a hydroelectric potential of 35,000 megawatt, with 13,000 megawatt of installed capacity. Ciudad Guayana is close to bauxite reserves of 200 MM tm/year with 49.5% grade of purity, and there are other 490 MM t/year in other places of the state of Bolívar (APG 1997).
US$300MM (Gutiérrez 1997). Yet SIDOR’s US$600MM debt made it unable to undertake this investment (Arévalo-Parodi 1997).

Like all privatizations, SIDOR’s raised opposition from potentially affected groups. For example, organizations representing unionized workers in Ciudad Guayana worried about privatization’s effects on layoffs and worker’s ability to influence decisions in the new company. The “Causa R”, a political party based in Ciudad Guayana with strong labor backing, and in particular its union-organizing wing “Nuevo Sindicalismo” pressed the government for measures to relocate displaced workers. “Causa R” used its Congress representatives to work for these measures. APPSO, an association representing professionals working at SIDOR, pressed the CVG to clearly define a policy with respect to liquidation, retirement, retraining, and relocation of workers. In particular, the association wanted the privatization contract to clearly spell out worker benefits, and ensure that worker representatives could participate in the new firm’s Board of Directors (APPSO 1996).

These traditional detractors aside, a larger section of Venezuelan professionals opposed SIDOR’s privatization, even though they believed it necessary to infuse SIDOR with dynamism, because they had larger concerns with how the privatization process was being carried out. These professionals perceived a lack of preoccupation within the government agencies conducting the process—namely the Fondo de Inversiones de Venezuela (FIV) and the CVG— with how privatization could affect subsequent...
industrial development in Venezuela. Backed by their respective professional associations, these engineers, economists, and lawyers pressed the Venezuelan President and the National Congress to shape SIDOR’s privatization in a way that would “safeguard national interests”\textsuperscript{133}.

First, these professionals worried about SIDOR’s price. The FIV had hired Salomon Brothers to place a value on SIDOR’s assets, which they set at $1554MM (Arévalo-Parodi 1997). The professionals in question argued that Salomon Brother’s price only took into account SIDOR’s physical assets, but did not give any value to the significant intangibles in which SIDOR had invested over the years. They presented SIDOR’s modern information system (SICMA), direct reduction patents (AREX), human resource development system (SIDEP) and research and development, production, and project management experience as examples of these intangibles (APG 1997).

Second, these professionals opposed the FIV’s decision to sell SIDOR as a package, instead of implementing the original plan of privatizing each of its plants separately\textsuperscript{134}. They argued that a package transfer would convert the existing state-owned monopoly to a private monopoly, giving SIDOR’s new private and perhaps even international owners the power to affect the development of Venezuela’s forward linked, metal processing industries. For example, at what price would SIDOR’s new owners sell

\textsuperscript{133} Professional groups participating in this process: Colegio de Ingenieros de Venezuela, Colegio de Economistas del D.F. y del Estado Miranda, Colegio de Abogados del D.F. Federación de Contadores Públicos de Venezuela, Sociedad de Ingenieros de Minas y Metalúrgicos de Venezuela, Asociación de Profesionales de SIDOR, Asociación de Profesionales de Alcasa, Asociación de Profesionales de Interalúmina, Asociación de Profesionales de Venalum, Frente Pro-Defensa del Petróleo, Pro-Venezuela (Asociación Pro-Venezuela 1997).

\textsuperscript{134} The FIV had originally hired Arthur D’Little (ADL) to assist it in designing SIDOR’s privatization. ADL recommended selling SIDOR by bundles, conducting a privatization process for each plant. FIV later decided to implement Salomon Brother’s suggestion to sell it as a complete package because of its desire to expedite and simplify the process. FIV also defended the package option on the grounds that investors had no interest for some of the plants, an argument that these professionals challenged (Gutiérrez 1997, APG 1997)
steel to domestic users? Would they guarantee supplies to the domestic metal transforming sector? According to these professionals, if SIDOR were privatized by different plants, there would be more opportunities for competition within Venezuela’s steel making sector and these problems would not be so pressing (APG 1997).

Finally, these professionals worried about the new firm’s contribution to national and regional development. In particular, they wanted the FIV to pre-select potential bidders according to what these companies’ proposed to do in terms of R&D, technology transfer to local firms, and development of both suppliers and downstream industry (APG 1997).

Ciudad Guayana’s metalworking firms also participated in attempts to shape the privatization process. AIMM-Guayana met with state-owned SIDOR’s president of the time and proposed a clause that would ensure the sector secure relations with the new SIDOR. While AIMM-Guayana’s clause did not appear in the final privatization contract, it seems to at least have had the effect of eliminating another clause, which gave SIDOR the freedom to rescind existing contracts with suppliers (Ex-president of state-owned SIDOR (ARL 7/01), Ex-director of AIMM-Guayana (OM 7/01)).

In December 1997, the FIV sold 70% of SIDOR’s shares to Consorcio Amazonia, a consortia of Latin-American private steel enterprises, for US$2.3bn, 50% above the asking price. SIDOR’s privatization contract only addressed some of the above concerns. For example, the contract stipulated that Consorcio Amazonia would invest US$300MM over the three years following privatization in modernizing the direct reduction,

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135 The CVG retained 30% of the shares for a subsequent public offering to the company’s workers (did not happen). Initially 28% of the shares belonged to Grupo Techint (Argentina), 21% to Hylsa (Mexico), 14% to Sivensa (Venezuela) and 7% to Usiminas (Brazil) (INGBarings 1997). The CVG’s shares give it no voting rights.
pelletizing and hot lamination plants. In addition, it would secure domestic supply of steel for 5 years, maintain employment fixed among payroll groups “A” and “B”, and offer downsized workers an attractive retirement program (FIV, CVG 1997). As an engineer leading the above-mentioned professional opposition group told me, the contract did not stipulate SIDOR’s contribution to downstream or upstream industries because the FIV considered that imposing such obligations would make SIDOR’s privatization less attractive to potential buyers (EY, 11/1999).

Within Consorcio Amazonia, the Argentine steel maker Techint not only had the highest percentage of shares (40%), but also legally represented the Consorcio in the privatization contract. Moreover, despite the existence of other shareholders, Grupo Techint manages SIDOR’s day-to-day operations. Therefore, in the following I will use Consorcio Amazonia and Grupo Techint interchangeably.

5.2. Post-privatization: private-foreign SIDOR first severs ties to Guayanese metalworking firms, then reconnects following political pressure

Pre-privatization: great expectations for local supplier development

Initially, local metalworking firms were very worried about what SIDOR’s privatization would do to their relationship with SIDOR, which until then had constituted more than 80% of their sales (Ex-director of CIMG (LB 11/99)). Rumors in Ciudad Guayana had it that SIDOR’s new owner would stop purchasing from local suppliers and buy everything from abroad (Metalworking Entrepreneurs (PS 2/2000, JM 3/1999)). Metalworking firms indeed had reason to fear. Studies of industrial linkages find that following changes in a firm’s ownership, backward service links are usually “lost” to the suppliers of the new parent firm (Hoare 1985).
To hedge against the risk of losing 80% of their current market, local metalworking firms came up with an ambitious idea: to become shareholders of the new SIDOR and from a position of ownership control procurement practices. AIMM-Guayana’s members then founded a company called Grupo Metalúrgico Guayana and allied with Mexican firm Atisa Atkins, with a Colombian firm and with a Swiss firm with the idea of participating as prospective buyers in the privatization process. Unfortunately the man representing Atisa Atkins, who coordinated the venture and sought the foreign financing needed for the project, died in the midst of the process and put an end to it (Metalworking Entrepreneur (OM 8/2001)).

Once the prospect of controlling future procurement practices was out of the picture, local metalworking firms sought to prepare themselves for the change in SIDOR’s ownership. First, they needed information about what prospective buyers’ intentions were with local suppliers. To obtain this, AIMM-Guayana pressed the CVG’s Industrial Promotion department to schedule meetings with each of the prospective bidders. In these meetings, they learned that Consorcio Amazonia – who eventually became SIDOR’s new owner—intended to rigorously select the firms they worked with and initially reduce the number of local suppliers. They would retain only those suppliers that had quality systems in place and that could guarantee a longer life to their products.

[Private] SIDOR “will practice a process of reducing contracts at the beginning, which will generate an exemplifying process of prizes and punishments with the objective of selecting the Guayana’s most competitive suppliers” (AIMM-Guayana Information Bulletin).

Contrary to the literature’s position of suppliers resisting the higher pressures that assumedly accompany privatization (Aharoni 1991), this news did not discourage local suppliers. Rather, it encouraged them to work at becoming stronger and more
competitive. In effect, as Chapter 4 described, in preparation for privatization AIMM-Guayana implemented a host of programs to upgrade the technological capabilities of their members. A consultant to the sector who worked with local suppliers during the privatization process told me that local firms were enthusiastic about the possibilities that privatization could open for them (EY, 1/2001). The following testimonies shows how both the AIMM-Guayana and its members understood that SIDOR’s privatization would bring changes, yet at the same time that they were preparing to meet the challenge.

“AIMM has the commitment to consolidate itself, within a reasonable transition period, in the most trustworthy and secure provider of products and services” (AIMM-Guayana information bulletin, 1997).

“SIDOR’s privatization will make the demand for services more stringent because the new owners have to manage their costs rationally if they want to increase their productivity. We suppliers are forced to improve quality, service and price. If SIDOR’s production increases, the demand for our products will also increase. For the metalworking sector good times are coming. Now the goal is to produce capital goods, and for that we have to identify market needs. But the pessimism that exists today is totally unfounded” (JIL, AIMM-Guayana Information Bulletin, 1997).

Local metalworking firms in the end also desired SIDOR’s privatization for another reason: it became increasingly clear to them that the survival of the company itself was at stake. For the nearly 37 years after its foundation in 1960, state-owned SIDOR had been a relatively well-managed company, where the internal organizational structure was based on principles of meritocracy and career building. However, in 1996, one year before privatization, SIDOR had the first president that did not rise from its own ranks, but rather politically appointed by the CVG. His appointment alarmed metalworking firms, for it mimicked what had up to then been standard practice in the

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136 Evidence that it had been relatively well run is that on the eve of privatization SIDOR was a fairly efficient company, with costs in line with other Latin-American firms (INGBarings 1997). This despite the fact that SIDOR remained the only state-owned company in the continent.
aluminum sector. They had seen how politicization had destroyed the aluminum sector and did not want that fate for SIDOR as well (Metalworking entrepreneur (OM 8/2001)).

**Post-privatization: from collective bargaining to individual bargaining: SIDOR capitalizes on excess supply to drive prices down and eliminate long-term commitment to local suppliers**

In consonance to the findings of a wider literature studying the effect of privatization in Latin America, once SIDOR’s ownership changed from state-owned to private, the company changed its relationship to local metalworking suppliers. However, this change involved two different things. Similar to other Latin-American cases of privatization, private-foreign SIDOR ceased buying from local suppliers the more technically demanding parts and services, transferring these purchases to traditional suppliers abroad (i.e. Cassiolato and Lastres 2000, Katz 2000)\(^{137}\). Yet this change in procurement perhaps affected local metalworking firms less than the change in customer-supplier relations. In particular, for those parts and services that private-foreign SIDOR did continue purchasing locally, the company replaced the collectively mediated, long-term commitment “Open PO” system with an individualized, “continuous bidding” system. AIMM-Guayana no longer functioned as a collective mediator in the allocation of contracts, but private-foreign SIDOR dealt with suppliers individually. Turning the customer-supplier relation from a collectively mediated to an individually competition process recreated the conflicts typical to buyer-driven customer-supplier relations, conflicts which tend to discourage supplier upgrading.

Private-foreign SIDOR’s continuous bidding system engaged local suppliers in a “bidding war” for every contract. That is, after the first round of bidding, private-foreign SIDOR consulted privately with every bidder to see if he/she was willing to lower the

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\(^{137}\) An example is all heat exchangers, including refrigeration panels.
price further than the winner of the first round. Given local suppliers’ dependency on SIDOR for sales, many gave in and reduced their prices further.

In customer-supplier management theory derived from studies of the automobile industry, this type of competition for contracts should have given local metalworking firms a high incentive to perform (Richardson 1993). Indeed, the first time that private-foreign SIDOR implemented this bidding system with local metalworking firms, the locals reduced their prices 20–25% from what they had been selling to state-owned SIDOR (Private-foreign SIDOR managers (RZ 8/01, MG 8/01), Metalworking entrepreneurs (OV 7/01, OM 7/01)). Private-foreign SIDOR interpreted this reduction in two ways: first, as an indicator that there might have been corruption previously, and that they could force prices down further; second, as a sign that the new bidding system could successfully achieve this price reduction (Ex private-foreign SIDOR plant manager (RZ 8/01)).

These bidding wars forced suppliers to reduce their prices, yet at the same time gave suppliers no guarantee of long-term commitment. The result of this unbridled competition without the reward of some type of commitment forced suppliers to reduce price at the level of costs and reduce or even dismantle previous investment in upgrading. For example, one of the two local metalworking firms to have achieved ISO9000 certification in preparation for SIDOR’s privatization is now dismantling this infrastructure because it increased his fixed costs and made it more difficult to compete in price with other firms that had not undertaken similar investment (AH 3/00). In other words, under private-foreign SIDOR’s initial structure of only privileging price, firms that had invested in upgrading were at a disadvantage with respect to other firms.
“The myopia of SIDOR was not making long-term contracts with its suppliers. This sows inefficiency on the long run because it creates a situation where it is impossible for the supplier to give you a good service, and makes low prices unsustainable. First, the process of continuously bidding is very costly. Second, when you force a supplier to offer his services at a very low cost, he cannot invest in development, equipment, etc. and therefore delivers a bad service. Third, when you open a new bidding process and a supplier that had perhaps survived without hiring people—a "briefcase" firm—bids at a lower price and you give it to that supplier, he will also give you a bad service, and it's possible that this change will make the previous supplier go bankrupt (…) Keeping short-term purchase orders is a mistaken strategy; that should only have happened in 1998, the first year after privatization, and perhaps not as intensely as it was used. The result [of having kept this policy] is that suppliers are not loyal to SIDOR.” (Ex-plant manager for private-foreign SIDOR (RZ 8/2001)).

In other words, private-foreign SIDOR’s continuous bidding system reinforced a conflict inherent to buyer-driven, customer-supplier relationships. Private-foreign SIDOR wanted the lowest deal, and continuous bidding allowed the company to get it, even if it meant wiping out some of the local firms. Turning SIDOR’s embedded relationship with local metalworking firms to arms-length ones dissolved the trust, information exchange, and joint problem solving that had characterized the previous relationship.

Why would private-foreign SIDOR buy from firms according to price only, and not care about firms’ bankruptcy or delivering bad services? First, as I indicated above, private-foreign SIDOR initially outsourced locally only repair and manufacture of simpler equipment – equipment that would be less likely to affect the plants. Second, private-foreign SIDOR perceived a high idle capacity in the local metalworking sector. Indeed, prior to privatization AIMM-Guayana reported high levels of idle capacity\(^{138}\) (Martinez 1997). Given this idle capacity, private-foreign SIDOR managers believed that even if some local metalworking firms went bankrupt, there would still be enough capacity to attend private-foreign SIDOR’s needs (EQ 7/01). Third, private-foreign

\(^{138}\) Unfortunately, there are no actual measurements.
SIDOR’s investments in plant modernization have increased the company’s operative productivity, hiding the possibly pernicious effects of continuous bidding.

“It’s very difficult to prove that plant stoppages and maintenance costs and requirements are due to these purchase policies [of rotating suppliers continuously], because they are linked to many other variables. For example, the same process of reengineering that occurred in the plants after privatization introduced so many gains in efficiency that they hide the losses caused by these procurement policies. I think that if the [procurement] policies were different there would be more gains in efficiency, but this is difficult to prove — nor can their inefficiency be demonstrated — because the plants are not yet stable” (Ex plant-manager for private-foreign SIDOR (RZ 8/01)).

Private-foreign SIDOR used the asymmetric power drawn from its position as Ciudad Guayana’s largest buyer to take other decisions that, while economically sound, conflicted with the development of local metalworking firms. For example, SIDOR attracted workers away from the local metalworking firms that had performed SIDOR’s internal maintenance for the previous 20 years and redirected them to two subsidiaries of the Grupo Techint that private-foreign SIDOR brought to Ciudad Guayana. This decision to insource maintenance responded to different economic rationales, all valid. First, while the maintenance workers involved in this transaction knew SIDOR’s plants intimately, including all its quirks, the metalworking firms that employed them suffered from poor supervision. Aside this important deficiency, the Grupo Techint strongly believed in insourcing maintenance. Finally, private-foreign SIDOR also wanted to give more business to the grupo Techint (Ex managers for private-foreign SIDOR (RZ 8/01, PM 11/01)).

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139 Around 300 workers that used to work for local metalworking maintenance firms were involved in this operation.
140 Aside from the problem of supervision, private-foreign SIDOR’s recruitment of these maintenance firm’s workers indicates that they had specialized skills/knowledge that private-foreign SIDOR needed.
141 The Grupo Techint’s philosophy of insourcing maintenance opposed that of some of the other groups in the Consorcio Amazonia, such as Sivensa and Hylsa. In fact, this decision to insource maintenance got somewhat delayed because of the opposition from these other owners (Ex-manager for maintenance, private-foreign SIDOR (PM 11/01)).
Private-foreign SIDOR had all the right to insource maintenance. However, I want to use this event—the decision to insource maintenance—to illustrate the structural conflict of interests inherent in the customer-supplier relationship. This decision, while good for private-foreign SIDOR, in practice eliminated the possibility for further development of local maintenance firms. Indeed, despite the fact that these maintenance firms had not participated in the same type of Open PO system that had led to the upgrading of other metalworking firms, some of them had invested in upgrading prior to privatization (Engineering Consultant to the Metalworking Sector (YB 8/2001)). Private-foreign SIDOR’s unilateral decision to insource—a decision that, as the customer, it was in all its right to make—cut short this other possible path to development.

Yet another evidence of the conflict of interests inherent to buyer-driven customer-supplier relations concerns payment practice. Private-foreign SIDOR, like large firms elsewhere (including state-owned SIDOR), often financed itself off its smaller suppliers (Battat, Frank and Shen 1996). Indeed, local metalworking firms often got paid 30 days after delivery in both state-owned and private-foreign SIDOR periods. Moreover, in December 1999 private-foreign SIDOR faced a severe cash crisis following a world slump in steel prices, and decided to stop payment to local suppliers for work that had already been performed. Payments got delayed from 30 days to 6 months in some instances, which meant that only those firms with a high self-financing capacity were able to weather the crisis (Metalworking entrepreneur (PS 2/2000)). Many local metalworking firms could not repay short-term loans that they had with banks and went bankrupt (Metalworking entrepreneurs (JU 03/00, PS 02/00)).
These conflicts in customer-supplier relations had also existed with state-owned SIDOR. Indeed, many large firms routinely finance themselves off local suppliers, and this is one of the impediments for backward linkages (Battat, Frank and Shen 1996). In Ciudad Guayana, the CVG’s aluminum smelters were also going through a crisis at the same time that SIDOR was, and failed to pay local metalworking firms on time. Yet while the CVG enterprises met with the metalworking business associations to find a solution to the conflict, private-foreign SIDOR simply withdrew contact with the local firms. In other words, what lacked in private-foreign SIDOR’s case was some kind of mediation to sort the conflict of interests.

As Chapter 3 explained, during the state-owned SIDOR period, AIMM-Guayana had mediated these conflicts in a way that supported local supplier development. A year after privatization, with AIMM-Guayana cut off from the customer-supplier relation, private-foreign SIDOR’s policy of continuous bidding and its use of asymmetric power had placed many local metalworking firms at the brink of bankruptcy. This reduced metalworking firms’ trust of SIDOR’s new owners. For example, while private-foreign SIDOR had told firms (before privatization) that it would value quality more than anything else, the company had afterwards made decisions only based on price. Ironically, those firms that had invested in machinery or quality compliance mechanisms responding to private-foreign SIDOR’s pre-privatization message found themselves at a disadvantage because other firms that had not made these investments could undercut them in price.
Reasons for change in customer-supplier relations

Why did private-foreign SIDOR change customer-supplier relations to local metalworking firms? The reasons behind this are important to understand the difficulties of building backward linkages.

First, corporate policy *internal* to the Grupo Techint to a large extent determined private-foreign SIDOR’s change in customer-supplier relations. Private-foreign SIDOR decided to insource maintenance because of the group’s philosophy that this was an integral function that should not be outsourced (Ex manager for private-foreign SIDOR (PM 11/01)). The company also instituted continuous bidding because of a corporate mandate to reduce costs. For example, the Grupo Techint expected its purchase managers to deliver cost reductions of 5-10% yearly (Ex-plant manager for private-foreign SIDOR (RZ 8/01)).

These decisions responded to metalworking firms’ capabilities only to a limited extent. Truly, maintenance firms’ poor supervision influenced the decision to insource, and the cash crisis that private-foreign SIDOR confronted just following privatization added to purchase managers’ pressure to reduce costs. However, we can imagine other possible outcomes even within the constraints posed by these external circumstances. For example, private-foreign SIDOR could still have set low prices to local metalworking firms, yet within a setting of long-term commitment. The company could have extended technical assistance to maintenance firms to improve their supervision. IN particular, my first suggestion (long-term commitment) could have even saved private-foreign SIDOR money by lowering the need to go through a bid for each transaction. The existence of these other possible paths strengthens the argument that corporate policy, rather than a reaction to external circumstances, led to many of private-foreign SIDOR’s decisions.
Those procurement decisions that private-foreign SIDOR did make based on the capabilities of local metalworking firms seemed to have occurred in an environment of incomplete information, and possibly distrust of local firms. For example, one plant manager recounted that private-foreign SIDOR did not have refrigeration panels made locally because there was no capacity to do them (RZ 8/01). However, a local metalworking firm has manufactured refrigeration panels for years (for another customer), and is currently working an agreement with private-foreign SIDOR for local sourcing (Metalworking entrepreneur VG 7/01).

“Many of Guayana’s metalworking firms are good. I myself was surprised when I arrived from Argentina to audit them. I thought they would be terrible and in fact I found out that they were much better than what I expected. The bad ones disappeared after privatization.” (Ex purchase manager for private-foreign SIDOR (MV 3/00)).

“It’s possible that initially the new managers bought everything outside [the region], but if it happened, it was from lack of knowledge and lack of trust of local firms. GC and MV little by little started visiting the local firms and seeing what could be locally manufactured” (Purchase manager for private-foreign SIDOR (EQ 7/01)).

Other studies also cite incomplete information on the part of new, foreign managers as a main factor for low localized linkages. Florio (1996) attributes the low level of regional purchases of Northern Italian firms located in the South to managers’ lack of familiarity and possibly even fear of the local environment. The question is what kind of intervention can motivate customers to get to know their environment. Studies concerned with stimulating localized backward linkages recommend government sponsored matchmaking programs to bridge this information gap (Battat, Frank and Shen 1996, UNCTAD 2001). Further below, the evolution of the private-foreign SIDOR story presents another alternative: mediation by organizations of collective interests.
The metalworking sector enters a crisis

Building tension between private SIDOR and local metalworking firms burst the relationship between them when in December 1998, as a result of a sharp decrease in world steel prices\textsuperscript{142}, private-foreign SIDOR found itself cash-strapped and was unable to pay pending contracts with local metalworking suppliers. Already that year private SIDOR had been paying the local metalworking firms 30-day contracts with more than a month’s delay. By November, the local metalworking firms were finding the financial burden unsustainable, for they had debts with their own workers and with the banks (at interest rates of more than 50\%) that they had to pay immediately\textsuperscript{143}. In December the situation exploded when private SIDOR abruptly decided not to receive any merchandise from local producers for 45 days as part of a slowdown in plant production designed to help the steel firm weather the crisis. This caused the paralysis of 60 metalworking firms in Ciudad Guayana\textsuperscript{144}.

Since no institutionalized conflict-mediation system existed between local metalworking firms and private-foreign SIDOR, the former had no alternative but to mobilize. Using their connections to the local business sector and to the local media, local metalworking firms organized a campaign to discredit SIDOR and even called for government revision of the privatization contract, on the grounds that SIDOR was destroying local industry.

“Faced with the situation of private-foreign SIDOR not paying suppliers, AIMM-Guayana starts a series of public collective accusations against SIDOR. This participation of the business association as a denouncing entity partly happened because none of the metalworking firms dared to sue SIDOR with a lawyer on an individual basis, as I suggested, because they were scared to “quedar en las

\textsuperscript{142} World steel prices plunged between 30 and 40\% from 1997 to 1998 (BNDES 1999).
\textsuperscript{143} El Universal, 27 de noviembre 1998.
\textsuperscript{144} El Universal, 10 de diciembre y 18 de diciembre 1998.
malas” with private SIDOR and lose their main market.” (Consultant to AIMM-Guayana (YB 08/01)).

5.3. External crisis, politics, and the reestablishment of relations between private-foreign SIDOR and local metalworking firms

By December 1998, relations between private-foreign SIDOR and local metalworking firms had reached a standoff. However, three months later (February 1999) both parties had signed into a “Steel Alliance” ("Alianza de Cooperación Empresarial Siderúrgica", or ACES), an intersectoral agreement to cooperate for the development of the region and of all of Guayana’s firms (including non-metalworking). The agreement specifically addressed the grievances of Ciudad Guayana’s local suppliers. It committed private-foreign SIDOR to give preference to local metalworking firms when purchasing goods and services and to implement a supplier development program (ACES 1999). We can understand local suppliers’ interest in such an agreement, but what about foreign-private SIDOR? What could explain SIDOR’s willingness to sign an agreement that committed the company to supplier development, when three months earlier it had been content to finance itself off these same suppliers?

This section tells the story of SIDOR to illustrate that a) private firms frequently need government intervention to get beyond certain crisis as did their state-owned counterparts of the past; b) government is less likely to aid private firms if at the same time these firms are perceived to be destroying an existing industrial fabric; c) local suppliers can capitalize on governments’ squeamishness about aiding private firms to get their large, private customers to change their behavior.
Private-foreign SIDOR needs local metalworking firms as allies in the quest for antidumping, improved labor relations, and a better corporate image

Private-foreign SIDOR signed into the Steel Alliance primarily because it needed Guayanese business chambers’ support in requesting the Venezuelan government to protect it from imports. Indeed, the low steel prices of 1998 had eroded SIDOR’s sales in the domestic Venezuelan market, which had traditionally accounted for over 50% of SIDOR’s sales (see Figure 5.1.). At the same time, the oversupply in international markets gave SIDOR no prospect of compensating the loss in domestic market by exporting, which caused the company’s total production to decline by nearly 11% in 1998. For Consorcio Amazonia, more serious than private-foreign SIDOR’s drop in production was the company’s inability to meet the investment goals established in the privatization contract (SIDOR 1999).

**Figure 5.1. SIDOR’s Volume of Domestic, International, and Total Sales**

Apart from antidumping, private-foreign SIDOR wanted other assistance from the Venezuelan national government. The company wanted drawback systems similar to those in place in Brazil and Argentina, soft financing for the steel industry, higher steel tariffs to match the levels of Argentina and Brazil, reduced fees for transport through the Orinoco river, a bridge and a railway to facilitate access to a deep seawater port on the Atlantic Ocean, and a policy to reintegrate exporting firms with the value added tax they paid\(^\text{145}\) (ACES 1999). In sum, SIDOR wanted from the government a whole package of government aids and protections – the same package that state-owned enterprises were often criticized for in the past\(^\text{146}\).

However, during its first year in operation private-foreign SIDOR had created so many opponents in Ciudad Guayana that the prospects of getting the national government to assist them were very dim. First, there was the afore-mentioned conflict with local metalworking firms, who claimed that private-foreign SIDOR was destroying local industry.

Second, SIDOR had an acute conflict with its own union. SIDOR’s workers were extremely irritated by the company’s failure to comply with the early retirement package that it had promised workers. Because of SIDOR’s precarious cash situation, SIDOR had

\(^\text{145}\) AT the time of signing the ACES agreement, the national government handled exporting firms’ value added tax payments as credits against future taxes, yet did not reintegrate them in cash to the firms.

\(^\text{146}\) A newspaper article analyzing both the Venezuelan government’s and private-foreign SIDOR’s behavior following the increase in steel tariffs that Bush approved in early 2002 draws a caricature of private-foreign SIDOR’s tendency to recur to government aid. On the one hand, the article criticizes the Venezuelan government for making anti-imperialist remarks against the US on the same day that Bush approved the steel tariffs. The article contrasts the Venezuelan government’s behavior to that of Brazil, which astutely negotiated exceptions for its own steel industry. On the other hand, “to the weakness and external isolation that the country suffers on account of its revolutionary government, we add the reproachable position of SIDOR’s private owners. Instead of demanding diplomatic support before Washington, this firm is asking the government to increase local tariffs to impede Venezuelans to access the low international prices for steel. The Bolivarians [referring to the Chávez government] are all excited to demonstrate that there are still entrepreneurs seduced by the old protectionism.” (Otlívora, El Universal 10/4/2002).
decided that some of the workers who had signed up to leave enticed by the retirement package would no longer be receiving it, or would receive it in installments without compensation for interests, the Bolivar’s depreciation, or inflation (Ex-SIDOR president (ARL 8/2001)). Politically, workers’ discontent was no small matter, as SIDOR union was then (and still is) the largest in Venezuela. Moreover, its leaders belonged to the “Causa R” political party, which had strong ties to Ciudad Guayana’s local and regional governments.

Third, the CVG and the national planning ministry Cordiplan, while understanding private-foreign SIDOR’s cash troubles, did not condone its failure to execute the worker’s compensation package. In the opinion of these powerful government agencies, private-foreign SIDOR had not been able to comply with the package because the company had bet on the Bolivar’s devaluation to finance this endeavor. Since the Chávez government had decided not to devalue the Bolívar, the company had run into trouble. The following citation from an interview with the CVG president of the time resumes the government’s position towards private-foreign SIDOR.

“Private-foreign SIDOR started to mistreat clients, suppliers, professionals and workers, this bothered us a lot within the CVG. Private-foreign SIDOR even lost SIDOR’s traditional clients in Colombia because of this mistreatment (...). Once private-foreign SIDOR enters into crisis and has to renegotiate the debt – partly because they bought the company betting on the Bolivar’s devaluation, which didn’t happen – the CVG helps them but on the condition that they remove the current president of private-foreign SIDOR. The reason is that we thought he took a more political than technical approach to private-foreign SIDOR’s problems. Instead of increasing productivity, private-foreign SIDOR’s way of getting out of the crisis was to negotiate with the national government antidumping, drawback, and demand devaluation. For example, we saw as a waste of money the way that they liquidated workers at the beginning of privatization, which indebted them greatly, and the way that they brought their international managers all at the same time and with huge salaries. CVG gave them a lot of support at that moment because SIDOR’s bankruptcy would represent for Venezuela a big blow in terms of image. People could interpret it as a product of the Chávez regime instead of
what we perceived as bad management of the company. CVG helped them by condoning the debt that private-foreign SIDOR had with Ferrominera [iron-ore supplier] and Edelca [electricity supplier]”. (CS 08/01).

From these public agencies’ power within the government, they could influence the national government’s approval of private-foreign SIDOR’s antidumping requests. The national government itself was likely to be against SIDOR’s requests, as president Chávez had called for the revision of all privatization contracts (including SIDOR’s) during his electoral 1998 campaign.

To reinforce the CVG’s negative opinion, private-foreign SIDOR also had a bad public image in Ciudad Guayana. First, the company had stopped providing some social services that the former state-owned enterprise had provided to the community, such as health care for workers, financial assistance for city-wide sports and cultural activities, and the maintenance of the mile-long stretch of bougainvilleas on the main highway leading into Ciudad Guayana. One particular event that deeply hurt the community was private-foreign SIDOR’s decision to forbid its firemen from helping to put fires that occurred in the city. In the first such fire after privatization, a long-established discount store called “La Equitativa” burnt to the ground. The absence of SIDOR’s firemen at the site of the incident enraged city-dwellers, long accustomed to have state-owned SIDOR’s fire workers work in tandem with other firemen from the CVG-owned enterprises and from the city. SIDOR’s firemen themselves resented not being able to cooperate with the city any longer (Ex-president of state-owned SIDOR (ARL 7/2001)).

Private-foreign SIDOR’s decision to discontinue public services probably followed sound managerial and economic principles. After all, private firms have no business providing public services. If anything, private-foreign SIDOR’s negative public image resulted from the perhaps distorted expectations that its state-owned predecessor
had cultivated in the community. Still, irrespective of whether the community was right or wrong at being displeased with private-foreign SIDOR’s actions, its displeasure created negative publicity and reduced the chances to obtain government assistance.

Finally, private-foreign SIDOR also anticipated that its petition for antidumping would meet resistance from the national chapter of the metalworking business’ association, AIMM. The national chapter of AIMM grouped all metalworking firms in Venezuela, including auto parts suppliers, oil pipe and valve manufacturers, and metal construction firms, many of which use steel as an input. These firms benefited from the decline in world steel prices, and did not want to see private-foreign SIDOR get antidumping protection and increased steel tariffs. In effect, they too staged a campaign against private-foreign SIDOR’s antidumping request.

Private-foreign SIDOR used the partnership gained over the Steel Alliance to gain allies for their unpopular antidumping request. In December 1999, private-foreign SIDOR submitted a formal request to the Venezuelan National government for the antidumping measure. To enlist government on their side, they submitted a document citing the importance that the company’s economic activity had on indirect jobs in Guayana. According to the document, private-foreign SIDOR had purchased more than US$300 million from more than 800 Guayanese companies in 1999. According to this document, private-foreign SIDOR had made efforts to import less and buy more from local metalworking firms, and had intensified these efforts after signing the “Steel Alliance” in February 1999 (SIDOR 1999). Private-foreign SIDOR then got signatures

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147 The conflict of interest was not direct, however, because many of these metalworking firms (including those in Ciudad Guayana) work with special alloy steels that SIDOR does not manufacture.

148 Private-foreign SIDOR’s 1999 antidumping requests were leveraged against imports of Ukrainian and Brazilian steel. Similarly, that year the US had also initiated antidumping investigations against these countries.
from the main business chambers in Guayana to endorse the contents of the antidumping request.

IN January 2000, the Venezuelan government approved the anti-dumping measure out of a desire to maintain SIDOR’s international image of a successful case of privatization. According to the CVG’s president of the time, the Venezuelan government elected to help private-foreign SIDOR out at this time of crisis because it wanted the company to succeed. The CVG was about to put its aluminum holdings for sale and it didn’t want the spectre of a failed privatization to damage the prospects of succeeding in that endeavor (CS 8/01). A top manager of private-foreign SIDOR confirmed that the Chávez government, despite its anti-privatization discourse, did all it could to help SIDOR (DF 12/99). Yet supposedly, during the national government’s restructuring of private-foreign SIDOR’s debt, the CVG introduced a clause that asked foreign-private SIDOR to increase local purchases.

This section described private-foreign SIDOR’s needs at the time of signing the Steel Alliance, the political antagonism that private-foreign SIDOR had created in Ciudad Guayana, and private-foreign SIDOR’s use of the Steel Alliance to gain political backing for antidumping. Yet who is manipulating whom? Is the Steel Alliance a big stage setting on the part of private-foreign SIDOR, designed to give political palatability to their protection requests, as some people think? Are the local metalworking firms gaining from the Alliance? Did they play any part in it?

149 However, the same ex-CVG president – now linked to Venezuela’s central planning office – told me that the national government was only inclined to help private-foreign SIDOR once (CS 8/2001). In fact, three years later, when SIDOR’s workers decided to halt SIDOR’s operations for a full month (May 2001) because of private-foreign SIDOR’s unwillingness to negotiate a long overdue collective contract, the national government did not help the company out (SIDOR manager (JJ 7/2001)).

150 Different metalworking firms claimed this but I was not able to find solid evidence that this was indeed the case.
Metalworking firms acted collectively to capitalize on external crisis

Metalworking firms played their part in creating the Steel Alliance; in fact they acted collectively to propose it. In order to convince SIDOR to enter it, local metalworking firms presented themselves as able to give SIDOR certain political benefits that transcended their work as suppliers.

Working collectively under the aegis of AIMM-Guayana, metalworking firms triggered the events that led to the Steel Alliance. One February morning in 1999, all the business chambers in Ciudad Guayana requested to meet with private-foreign SIDOR’s president. Present were the industrial associations representing metalworking firms (CIMG, AIMM-Guayana and ASOPEMIA) and the two local chambers of commerce. AIMM-Guayana led the committee of visiting entrepreneurs, and lay down the purpose of the visit: strike a win-win relationship with private-foreign SIDOR.

From metalworking firms’ standpoint, the Steel Alliance was an attempt to regain control of the sector’s customer-supplier relation to private-foreign SIDOR. In the past, local metalworking firms had used AIMM-Guayana and the Open PO system – the long-term, collectively bargained system that local metalworking firms had worked out with state-owned SIDOR—to influence some of the terms of the customer-supplier relation. However, private-foreign SIDOR had eliminated this system and thus shut local metalworking firms out of having a say into the shape of customer-supplier relations. With the Steel Alliance, local metalworking firms sought to rebuild an institutional channel through which to influence SIDOR’s relation to them.

“Local entrepreneurs felt unprotected against private SIDOR. The industrial chambers (and I in particular) proposed the Steel Alliance to build a relationship with private SIDOR. Now, the idea was not only to have a relationship with private SIDOR, but also with the other firms in the region’s heavy industry, and with the other chambers. We proposed mutual assistance: for example, the
chambers have helped SIDOR solve the problems with their union, have used their voice to explain to public opinion that a strike puts the city in crisis [so that public opinion would cease supporting SIDOR union’s strike], has given SIDOR support for drawback and antidumping. In turn, the chamber demands fair rules of the game: we want SIDOR to discuss prices with people, instead of imposing them, and to have long-term purchase orders that will help the local firms specialize, prepare, and invest to have better prices in the future” (Metalworking entrepreneur, ex-director of AIMM-Guayana and ex-director of CIMG (OJ 8/01)).

To entice private-foreign SIDOR to join the kind of interinstitutional governance system that local metalworking firms envisioned, Guayana’s business chambers presented themselves as useful political allies. In particular, Ciudad Guayana’s business chambers knew of private-foreign SIDOR’s troubles with its labor union and of the anti-private-foreign SIDOR sentiments spreading in Guayana. They proposed to act as intermediaries between private-foreign SIDOR and other entities – like labor and public opinion. In return, they demanded “fair treatment” for suppliers and long-term purchase orders (Metalworking entrepreneur and ex-director of AIMM-Guayana (OJ 8/2001)).

During my first fieldwork in Ciudad Guayana, I had a chance to see this exchange system at work. At the time (November 1999), private-foreign SIDOR was trying to get its labor union to accept a correction in the index it used to calculate workers’ salaries. Apparently, SIDOR’s new personnel manager had made a mistake in calculating the index, and as a result workers were earning more than what private-foreign SIDOR had intended to pay them (Ex-director of CIMG (LB 11/1999)). Private-foreign SIDOR was having a tough time negotiating with the union, which threatened to strike. Local metalworking entrepreneurs met separately with union leaders and convinced them not to strike. They then revealed the results of these negotiations at a sector-wide meeting of the Steel Alliance. At the meeting, private-foreign SIDOR did its part by presenting figures that indicated that the company had increased its share of regional purchases with respect
to the previous year, and by discussing specific products that they planned to start purchasing locally.

Were Ciudad Guayana’s metalworking firms aware that private-foreign SIDOR planned to use the alliance to request antidumping? Probably. The legal agreement that all parties signed to constitute the Steel Alliance mentions antidumping, increased steel tariffs, tax exemptions and the like as necessary to revive SIDOR and its chain of linked industries (ACES 1999). My interviews reveal that metalworking firms probably backed protectionist measures for steel in the understanding—correct or not—that the Steel Alliance would extend this protection to its suppliers. That is, if private-foreign SIDOR got a tariff increase of 10%, for example, it would also allow local metalworking firms belonging to the alliance a 10% leeway in price with respect to competing firms (Metalworking Entrepreneur (JP 3/2000)). Unlike other metalworking firms in Venezuela, metalworking firms in Ciudad Guayana would not be affected by the private-foreign SIDOR’s antidumping and increased tariff petition because they used special steels that SIDOR did not manufacture.

Metalworking firms reaped gains from the Steel Alliance. First, according to private-foreign SIDOR, immediately following the signing of the Steel Alliance the company increased its amount of locally purchased goods. By August 1999, the percentage of goods purchased in the region had risen to 46% (by value), a 27% increase from the 36% of the previous year. In the period May to October 1999, private-foreign SIDOR bought US$307,000 of inputs specifically from local metalworking firms—these inputs had previously been imported (ACES 1999b).
Second, for the first time since SIDOR’s privatization, local metalworking firms were able to structure a mechanism with which to have frequent contact with private-foreign SIDOR purchase managers. The Steel Alliance designated committees with representatives of both private-foreign SIDOR and the industrial chambers to work with specific areas of concern. These committees met with a given frequency to establish work plans and follow them up. Most important for the local metalworking firms were the import-substitution committee and the market relations committee. The import-substitution committee met every two weeks and aimed to promote the local manufacturing of parts, pieces and components that had previously been imported. The market relations committee had in turn, two subcommittees. The payment subcommittee aimed to solve the payment problems that SIDOR had been having with the local firms. The customer-supplier relations subcommittee sought channels through which to make the relationship “fair” for supplier firms. By December 1999, the import-substitution committee had met 20 times (ACES 1999b). When I returned to Ciudad Guayana in July 2001, the import-substitution committee was still meeting punctually every two weeks, yet now the meetings were held at AIMM-Guayana (rather than at SIDOR, as it had been at the beginning), thus increasing the number of firms who could participate.

Frequent contact eliminated the information problem that had probably led private-foreign SIDOR to cut procurement short initially after privatization. By December 1999, private-foreign SIDOR had purchased “elementos de juntas de carros portabarrotes, ejes escalonados, ejes cardánicos, trasladador de vibraciones, anillos”, from local metalworking firms. All these parts had been imported the previous year.

151 I translate “comercialización” as market relations because these are the words that best capture the original title of the committee and its work of improving the relationship between private-foreign SIDOR and its suppliers.
Moreover, private-foreign SIDOR was considering to procure “páneles refrigerados”, and help a local supplier develop “regeneración de rodillos para la máquina de colada continua de planchones”. In addition, private-foreign SIDOR had started placing some long-term Open Purchase orders to local firms. From the payment standpoint, private-foreign SIDOR had reduced its debt to local firms by 72% (ACES 1999b). In July 2001, private-foreign SIDOR had advanced its work in assembling a roster of metalworking firms from which it was making long-term purchases (Private-foreign SIDOR manager (EG 7/2001)).

While the above statistics on the Steel Alliance’s results in terms of import-substitution are SIDOR’s, my interviews corroborated this picture in part. Some of the metalworking firms I interviewed – particularly those that had made upgrading into niche markets prior to privatization – reported that private-foreign SIDOR was giving them so much work that they almost could not cope. One of these firms had specialized in “reductores de velocidad”, another in “cromado and tratamiento eléctrico”. (JM 3/2001, MB 11/1999)

In sum, immediately following privatization, private-foreign SIDOR turned customer-supplier relations from the kind of relational contracting that metalworking firms had had with state-owned SIDOR to arms-length. In the new relationship, firms lost the institutional means through which they had previously negotiated long-term commitment. The loss of this institution of collective mediation boosted private-foreign SIDOR’s bargaining power with respect to local metalworking firms and recreated the price and payment conflicts inherent to any buyer-driven customer-supplier relation. Metalworking firms reacted to their loss of power by trying to rebuild a conflict-
mediation institution similar to that in place during state-owned SIDOR. As a private firm, private-foreign SIDOR has no obligation to make supplier development efforts. Therefore, metalworking firms presented themselves as useful allies in the resolution of some of private-foreign SIDOR’s pressing problems, namely the loss of the domestic market and conflict with labor. Within the new institution of conflict-mediation, metalworking firms hope to bargain for long-term commitment, supplier development programs, and participate in the negotiation of prices.

5.4. Surprising similarities between state-owned SIDOR and private-foreign SIDOR, and what they tell us about building backward linkages.

SIDOR’s behavior with respect to local metalworking firms before and after privatization presents surprising similarities. In this section I delve on these similarities for two reasons. First, they present interesting departures from what the literature expects of either state-owned or private firms. Yet most importantly, these similarities between firms with diametrically different objective functions tell us something about the generic problem of building localized backward linkages.

Both firms initially resisted local procurement

Interestingly, both state-owned SIDOR and private-foreign SIDOR initially resisted local procurement. State-owned SIDOR’s initial resistance derived from the lack of infrastructure in Ciudad Guayana, to which the company reacted by importing metalworking inputs and vertically integrating non-tradables like metalworking repairs and maintenance. Yet state-owned SIDOR’s resistance to local procurement continued. The import-substitution drive that the CVG implemented among its holding firms did not achieve its expected results partly because the company’s Operations’ Personnel and
higher managers subtly opposed it. Their resistance emerged out of both a distrust of the capabilities of local metalworking firms and the costs of developing and transferring technology to them. State-owned SIDOR’s resistance to local procurement is particularly surprising given that, like other state-owned enterprises, SIDOR had the mandate to help develop the city.

Private-foreign SIDOR’s reasons for resistance differ slightly from state-owned SIDOR’s, yet still have the element of distrust in common. Private-foreign SIDOR’s initial posture of internalizing what used to be outsourced (such as metalworking maintenance) partly responded to corporate philosophy. The Grupo Techint believed that maintenance was part of the “brain and soul” of a steel enterprise and as such, should not be outsourced. Moreover, the organization wanted to give more business to its subsidiaries. On the other hand, private-foreign SIDOR’s decisions also responded to distrust of the local firms. This distrust emerged both from Ciudad Guayana’s reputation for corruption—confirmed in their eyes by firm’s willingness to reduce their prices by 20-25% in the first bidding process—and by incomplete information of the local environment.

Both state-owned SIDOR and private-foreign SIDOR initially forged customer-supplier relations based on the principle of competition for every purchase. State-owned SIDOR did this during import-substitution and the first Open PO system, private-foreign SIDOR during its continuous bidding system. These competitive systems provided incentives to reduce suppliers’ prices, yet at the same time erected a barrier to supplier’s development. Namely, the practice of switching supplier to the lowest bidder at every round did not permit suppliers the long-term commitment in which to make asset-specific
investments required for upgrading\textsuperscript{152}. In turn, their lack of upgrading—particularly during the early state-owned SIDOR period—furthered distrust and short-term commitment. These initial customer-supplier relations were not conducive to the development of local suppliers.

\textbf{Relationship with metalworking firms forged through politics (of similar and different kinds)}

Interestingly, in both cases, the turn-around in supplier relations came through a combination of external constraints and politics. In the case of state-owned SIDOR, hard budget constraints following the firm’s expansion in 1980 forced it to search for external metalworking suppliers, breaking a tradition of vertical integration. Concurrently, metalworking firms used the connections they had forged to state-owned SIDOR during its expansion to informally press for an increase in local procurement. Once again, in the mid-1980s, a balance of payments crisis led the national government to implement an import-substitution drive. The CVG implemented this mandate by putting pressure on state-owned SIDOR (and the other CVG holdings) to increase their levels of local procurement. Both then and subsequently thereafter, Ciudad Guayana’s metalworking firms lobbied the CVG through media campaigns and contributions to the AD party to keep exerting this pressure on its holding firms. This pressure led state-owned SIDOR to implement an internal import-substitution effort although it did not want to. It opened the terrain for the second Open PO system, which turned customer-supplier relations from arms-length to relational, appointed AIMM-Guayana to mediate conflicts among the parties, and led to the upgrading of the local metalworking firms.

\textsuperscript{152} In the case of Ciudad Guayana asset-specificity derives from local supplier’s lack of access to other markets.
External circumstances and politics also determined private-foreign SIDOR’s turn-around with respect to the relations it had with local metalworking firms. A slump in international steel prices and private-foreign SIDOR’s onerous worker retirement program left the company cash-constrained and unable to meet the investment goals stipulated in the privatization contract. Like many other steel firms of the time, private-foreign SIDOR solicited an anti-dumping request to get some respite from a flood of imports eroding their domestic market share. However, political circumstances made it unlikely that the Venezuelan government would approve the antidumping. In particular, private-foreign SIDOR’s cash difficulties had created opposition within organized business and labor groups in Ciudad Guayana. The national association for metalworking producers benefited from cheap imports and would fight against the anti-dumping petition. The CVG and CORDIPLAN disapproved of private-foreign SIDOR’s management of the worker retirement situation. Within this adverse political environment, private-foreign SIDOR needed allies. Ciudad Guayana’s metalworking firms capitalized on this opportunity by presenting themselves as being able to mediate some of these conflicts. Interestingly, the kind of protection from imports that private-foreign SIDOR sought is analogous to the subsidies that state-owned enterprises received during import-substituting industrialization, and for which the literature later criticized them.

Is the sequence of resistance followed by political pressure generic to the process of backward linkages? The unexpected commonalities in the cases of both state-owned SIDOR and private-foreign SIDOR would seem to indicate that it might. The following section presents what happened around Italsider at Taranto to strengthen the idea that this
sequence may be inherent to the process of building backward linkages in lagging regions.

At Taranto too: resistance and politics determined backward linkages

Similar to state-owned SIDOR and private-foreign SIDOR, Italsider initially procured very little from local suppliers. During the initial plant’s construction, Northern Italian firms got the greatest share of contracts and assumed the most qualified work. However, as during state-owned SIDOR’s expansion, the sheer amount of work involved in building Italsider (5 million tons/year) gave local Tarantine firms opportunities to work as subcontractors, yet their jobs were restricted to the generic, less qualified functions. This resulted partly out of the lack of skilled workers at Taranto, which forced the local firms to hire peasants or small artisans without industrial experience\textsuperscript{153}. Scarce local procurement continued to be the norm even after Italsider started operations. By 1968, for example, three years after the start of operations, local firms already complained that Italsider was not purchasing enough locally (Capriati 1991).

Italsider’s initial posture against local procurement changed following political pressure on the part of local metalworking firms after the end of a second stage of plant construction. Local Tarantine metalworking firms took advantage of the “Vertenza Taranto”—a wave of protests that engulfed the city in 1977 following the end of Italsider’s twofold expansion—to press for, and obtain, increased local procurement from Italsider. Italsider’s laying off of 5,000 workers that had participated in the plant’s expansion triggered the protests. Initially, Tarantine trade unions led the protests, but

\textsuperscript{153} The lack of skilled workers is interesting to note here because between the two World Wars, Taranto had been a very important shipbuilding center. Even though this shipbuilding industry had closed down by the mid 1950s, we would think that a legacy of metalworking skills remained. Apparently, skilled workers left Taranto following the demise of the shipbuilding industry (Capriati 1991).
other organized actors soon joined. These other groups added other demands to the trade unions’ demand for more employment. Aspiring suppliers in particular demanded Italsider to select local firms on the basis of their respect for national labor laws, and to start large infrastructure projects that were not even within the competencies of Italsider (Capriati 1991, Piattoni 1999).

Tarantine metalworking firms took advantage of this social movement against Italsider in the same way that local metalworking firms in Ciudad Guayana used the general anti-private-foreign SIDOR sentiment: to present themselves as being able to make the conflict worse, or help solve it. Indeed, the “Vertenza Taranto” ended when Italsider committed to have stable relations with 17 Tarantine metalworking firms and to provide them with technical assistance. In return, Tarantine metalworking firms committed to absorb 1110 of the displaced workers. The government would carry out extraordinary construction plans to absorb the rest of the unemployed workers. In return for local metalworking firm’s increased employment, Italsider increased its local purchases (excluding raw materials) from 54% to 67% (Capriati 1991).

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154 Soon the “Vertenza Taranto” became a social and political movement that demanded solutions to more general problems that affected the city, such as urban decongestion, infrastructure, and a reduction of the territorial imbalances in terms of social services that Italsider had caused in Taranto (Capriati 1991, Piattoni 1999).

155 Piattoni (1999) describes how metalworking maintenance firms working within Italsider initially agitated the conflict by turning off Italsider’s high ovens (where iron ore is turned into steel), thus helping block production. Apparently, these local suppliers were the greatest electoral constituency in Taranto, which led city authorities to abstain from mediating the conflict, and rather to side with the demonstrators. From this account it seems that Tarantine metalworking firms really had the power to worsen or solve the conflict.

156 A study about the result of this agreement reveals that only 13 of the 17 firms that agreed to the proposal really followed up on additional hires. These firms absorbed 626 additional workers (between them), yet only 175 of these belonged to the 1100 in question, since most of the workers unemployed at the end of Italsider’s expansion did not have the technical profile that these firms wanted. However, the firms had entered into the agreement to benefit from the stable and guaranteed relation with Italsider (Capriati 1991).
5.5. How changes in governance systems impact collective action: Private-foreign SIDOR’s preference for individual negotiations transforms associationalism in Ciudad Guayana

Local metalworking firms’ power in presenting themselves as conflict mediators to private-foreign SIDOR stemmed both from their ability to act collectively, and from their embedded relation to other groups in Ciudad Guayana. In path-dependent format, metalworking firms had developed both traits in their interaction with SIDOR as a state-owned enterprise. Through its mediation of the Open PO system, AIMM-Guayana surged as a powerful agglutinating actor. Moreover, AIMM-Guayana’s cultivation of ties other than with state-owned SIDOR to help the cause of backward linkage—ties with the CVG, with the local FUNDACITE, with the municipal government, with the political party that dominated SIDOR’s labor union—turned the association into an actor deeply embedded in the community.

Interestingly, just as the structure of customer-supplier relations that state-owned SIDOR built strengthened associationalism among metalworking firms, the current structure of supplier relations with private-foreign SIDOR is changing the landscape of collective action. The Open PO system that local metalworking firms had with state-owned SIDOR strengthened AIMM-Guayana because local metalworking firms had to belong to the association in order to work with SIDOR. After privatization, however, private-foreign SIDOR eliminated collective mediation, favoring individualized negotiation processes. In this new system, AIMM-Guayana has no direct role. Therefore, many of AIMM-Guayana’s previous members see no purpose in belonging to the association and have retired (AIMM-Guayana ex-director (AI 3/2000)). This phenomenon is affecting the other two industrial associations in Ciudad Guayana—CIMG and ASOPEMIA—who have traditionally had overlapping memberships to those of
AIMM (Ex-director of CIMG (LB 11/1999), Consultant to ASOPEMIA (LV 8/2001)).

Bluntly put, once metalworking firms saw no point in belonging to the association that offered them the most services – AIMM-Guayana – they lost interest in the others as well. Members’ abandonment has in turn diminished AIMM-Guayana’s legitimacy, resources, and ability to undertake initiatives that will benefit the sector.

Ciudad Guayana’s three industrial associations – AIMM-Guayana, CIMG and ASOPEMIA— are restructuring to meet this challenge. First, they are trying to blend into one single association. While this fusion has not been very easy because of entrenched leaderships within each, the three associations currently work out of one common office and share the administrative costs of running it. Moreover, the associations’ directors meet weekly to discuss common issues and ways of addressing them. Second, the associations are together revisiting their role. All three associations have reached the conclusion that the only way to retain membership is by continuing to offer services that members value.

Yet what type of services would members value? Given private-foreign SIDOR’s emphasis on price and the absence of long-term commitment, local metalworking firms have lost faith in the virtues of technological or quality investment. Therefore, the industrial associations’ pre-privatization practices of hiring consultants to help firms ISO9000 certify are not perceived as attractive – it’s not what the market (SIDOR) wants.

One service that metalworking firms do value is mediation, and in effect the three industrial chambers all participate in the Steel Alliance. However, they function as communication channels rather than as monitors of the process, which is a position of much less relevance than AIMM-Guayana’s mediation of the Open PO system. That is,
while these chambers help members in litigation against private-foreign SIDOR (for example, with payments) private-foreign SIDOR assigns contracts autonomously. Since SIDOR’s contract allocation process no longer occurs through AIMM-Guayana, metalworking firms do not clearly see the benefit of belonging to this chamber.

Other than technical improvement and conflicts with customers, the other traditional problem affecting Ciudad Guayana’s metalworking firms has been finance. Currently, the three industrial associations, together with Ciudad Guayana’s Chamber of Commerce and Industry, have thought of two ways to help their members in this regard. First, a local bank has agreed to give metalworking firms short-term credit with the backing of a purchase order from private-foreign SIDOR. To use this service, the firms must belong to any of the associations involved in the steel alliance. Second, the associations have constituted a “Society of Reciprocal Warrantees” (SGR) to review small firm’s loan applications and act as a guarantor for 80 – 100% of small firms’ credit requests to banks or government lending agencies (SGR 2001).

5.6. Conclusion

Following SIDOR’s privatization, private-foreign SIDOR drastically changed ties to local firms. Led by a mixture of corporate strategy and a distrust of local suppliers, private-foreign SIDOR reduced the level of local purchases, and engaged local firms in bidding wars for every contract. In addition, once the 1998 world slump in steel prices affected private-foreign SIDOR’s cash flow, the company unilaterally stopped payment to local firms. These radical changes in what had previously been a collectively mediated, long-term customer-supplier relationship led many local metalworking firms to the brink of bankruptcy.
Barely a year after privatization, local metalworking firms had reversed this initial antagonistic relationship. The industrial chambers representing these firms signed a pact with private-foreign SIDOR promising each party mutual benefits. This steel alliance, as the pact was called, exchanged greater local procurement on the part of private-foreign SIDOR for the business chambers’ support for antidumping. Preceding the alliance, local metalworking firms had mounted a series of campaigns in Ciudad Guayana accusing SIDOR’s new owners of destroying private industry.

The steel alliance has purportedly achieved results in terms of increased local procurement. More importantly, it has provided an institution through which local suppliers and private-foreign SIDOR can mediate the customer-supplier relation. In effect, the partners to the alliance meet monthly and biweekly to sort out technical, and payment problems, and to think of ways in which private-foreign SIDOR can purchase more locally.

There are surprising similarities between the evolution of the customer-supplier relationship between SIDOR and its local metalworking suppliers during both the state-owned enterprise and private-foreign periods. These commonalities suggest that there are generic problems associated with the process of building backward linkages. The following chapter delves into the lessons we can extract from these commonalities.
Chapter 6: Mediating regional development: How metalworking firms forged lasting linkages with steel in Ciudad Guayana

Backward linkage logic poses that large-scale investment in lagging regions automatically induces local supplier development. Namely, by providing a market for inputs, large firms arriving to developing countries and/or regions create opportunities for local suppliers to grow. In effect, ever since the late 1950s, this logic has underpinned both growth pole policy and foreign direct investment recommendations (Caves, Meier, Perroux, UNCTAD). However, in contrast to this compelling logic, many empirical studies show that large firms arriving in developing areas have not established the desired links to local suppliers. Often, these large firms import inputs from outside the region or coax foreign suppliers to relocate close to them there (Amin, Florio, Barnes and Kaplinsky, Saldanha Steel project, Carrillo). This contrast between the hoped for effects of large-scale investment and its weak reported results has already motivated research as to why backward linkages seldom occur. My study of the development of the metalworking sector in Ciudad Guayana aims to add to this understanding.

Current research on why large firms arriving to lagging regions seldom develop links to local suppliers focuses on supply-side deficiencies. This literature argues that suppliers in developing areas have scarce access to credit, R&D facilities, training, and infrastructure. These paucities render local suppliers uncompetitive and therefore unattractive in the eyes of large, incoming, potential customers. Allegedly, solving these deficiencies increases the likelihood that large firms arriving to developing countries or regions will develop the desired links to local suppliers (Battat, Frank and Shen 1996, UNCTAD 2001).
My case study of the development of Ciudad Guayana’s metalworking sector suggests a different response to why backward linkages seldom happen, and how they can. First, my research agrees with the current literature in placing local suppliers’ capabilities at the center of backward linkage development. Certainly, large firms’ local procurement behavior reacts in some measure to the capabilities of local suppliers. When these local suppliers are truly lacking—as they are wont to be in lagging regions—their links to incoming large customers depend on how far these suppliers are able to upgrade.

However, I find that these studies’ technocratic focus on a checklist of supply-side deficiencies does not correctly diagnose what keeps local suppliers from upgrading. In particular, as I found in Ciudad Guayana, large firms arriving to lagging regions tend to distrust local suppliers. This distrust fuels resistance towards local procurement. Rather than motivate local suppliers’ upgrading, this resistance produces the opposite effect of disinvestment amongst local suppliers. The case of Ciudad Guayana even suggests that in lagging regions, this interplay between demand-side variables and supply-side response turns into a Catch 22 cycle. In this cycle, customers’ resistance to local procurement inhibits local suppliers’ investment in upgrading, which in turn reinforces customers’ aversion to local suppliers. Contrary to these findings, the current literature on backward linkages does not even acknowledge the interdependence between demand-side and supply-side variables.

Second, in contrast to current research on backward linkages, the case of Ciudad Guayana suggests that local suppliers are not powerless with respect to the procurement behavior of large, incoming firms. Specifically, local suppliers can build links to the large customers that arrive to their lagging regions by working on both the demand-side and
supply-side aspects of local procurement simultaneously. To do this, local firms must be able to 1) convince large firms to provide opportunities to local suppliers, and 2) help local suppliers overcome the obstacles that render them uncompetitive. Yet working on both sides of the customer-supplier relationship is not easy. The case of Ciudad Guayana suggests that strong collective action abilities are necessary for local suppliers to effectively perform this dual role.

This focus on institution building is a radically different approach to backward linkage development from the supply-side checklists of today’s literature. In particular, it brings to the forefront questions about process and institutions that the backward linkage literature overlooks. For example, which tools can local suppliers use to build relationships with their initially resistant large customers? How do local suppliers develop the cooperation needed to provide demand-side and supply-side services in inclusive, developmental ways? This conclusion uses the case of Ciudad Guayana to elaborate on these two findings.

6.1. Arguing for a change of focus: from technocratic lists to institution-building

Currently, studies that research how to promote backward linkages between foreign firms in developing countries and local suppliers recommend government attention to the supply-side deficiencies that render local suppliers uncompetitive (Battat, Frank and Shen 1996, UNCTAD 2001). Truly, the supply-side difficulties that these studies flag, such as lack of access to credit, good infrastructure, and training and R&D facilities affects local firms’ ability to deliver good service. Yet the case of Ciudad Guayana suggests that these interventions alone will not elicit the desired backward linkages. In fact, in contrast to this literature, the case of Ciudad Guayana indicates that
the problem of backward linkages is not solely supply-side. Rather, in lagging regions, suppliers’ investment largely depends on the demand behavior of the incoming large firms.

Contrary to the compelling logic of backward linkages, the case of Ciudad Guayana shows that large firms arriving to lagging regions do not automatically create a demand for local inputs. On the contrary, these large firms tend to initially resist local procurement out of distrust of the locals. In Ciudad Guayana, both state-owned SIDOR and private-foreign SIDOR initially resisted interaction with local metalworking firms. State-owned SIDOR’s resistance emerged from a tendency towards vertical integration and a distrust of the capabilities of local metalworking firms. Private-foreign SIDOR’s resistance to local procurement also emerged out of distrust, yet this time based on incomplete information about local suppliers’ capabilities. State-owned SIDOR’s resistance to local procurement is particularly noteworthy because it contradicted the company’s mission of promoting Ciudad Guayana’s industrial development.

State-owned SIDOR’s and private-foreign SIDOR’s initial stance against local procurement despite their different ownership suggests that large firms’ resistance is a generalized problem that any analysis of backward linkages has to contend with. In effect, thirty years ago, Hirschman (1971) had already noted that established industrialists in developing countries resisted interacting with domestic suppliers partly out of concerns for quality. Hirschman considered this resistance as an obstacle to backward linkage

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157 Hirschman (1971) observed that established industrialists would exhibit resistance towards local supplying industries for the following reasons: fear that the domestic product will be inferior to the imported one, fear of being dependent on one supplier when he could previously shop the world, fear that the establishment of a local supplying industry will lead to an import tariff on inputs, fear that domestic competition will become stronger once the basic inputs are locally produced (e.g. automobiles resisting implantation of domestic steel industry), and fear that his location will be wrong once the place he gets his supplies changes.
development, and as I will explain later, discussed possible ways to overcome it. More recently, the current literature on backward linkages reports unwillingness towards local procurement on the part of large, modern firms arriving to lagging regions. For example, foreign firms investing in developing countries often decide at the outset to not engage with local suppliers for fear that these cannot deliver the price, quality and timeliness of international competitors (Battat, Frank and Shen 1996, UNCTAD 2001). However, these studies do not consider this demand-side behavior to be an obstacle to local supplier development. Rather, they imply that once local suppliers become competitive, large firms’ posture of unwillingness will automatically change.

Why would we care about large, incoming firms’ resistance towards local procurement? As I found out in Ciudad Guayana, large customers’ demand behavior significantly affects the investment strategies of local aspiring suppliers. For example, Ciudad Guayana’s metalworking sector grew in terms of the number of firms and investment in technology once state-owned SIDOR showed interest in local procurement. Only then were local firms willing to acquire the fixed assets to become larger and better suppliers. Conversely, when private-foreign SIDOR initially cut ties to local suppliers, many metalworking firms lamented their investment in ISO9000 certification and other upgrading during the period immediately preceding SIDOR’s privatization.

I believe that the interdependence I observed in Ciudad Guayana between demand-side behavior and supply-side response is especially strong in lagging regions. After all, lagging regions lack markets for intermediate inputs like capital goods or producer services\textsuperscript{158}. This lack of market alternatives implies that for local firms,

\textsuperscript{158} Precisely, backward linkage logic posits that large firms’ arrival to these regions will create these markets. In Ciudad Guayana, SIDOR and the CVG aluminum enterprises created local markets for
becoming the suppliers of incoming large firms is extremely asset-specific. In other words, any fixed investment that this supplier makes has a high risk of hold-up in the event that the large customer decides to withdraw. This high risk of hold-up arises not necessarily because these investments are particular to this customer. Even if local suppliers could use their investment (e.g. general purpose machinery) to work for other firms, there simply aren’t other prospective clients nearby. For example, in Ciudad Guayana, whenever SIDOR decided not to engage with a given supplier, the supplier practically lost his investment, for there were no other readily available clients nearby of SIDOR’s size and importance.

In lagging regions, asset-specificity on the supply-side, combined with incoming large firms’ resistance to local procurement tends to inhibit investment on the part of local suppliers, at least at the outset. This supply-side response in turn perpetuates a deadlock situation of absent backward linkages, forestalling large firms’ potential contribution to the local economy. In Catch 22 fashion, limited supplier development reinforces large firms’ unwillingness to interact with local suppliers, further discouraging local suppliers’ development. Figure 6.1. outlines this vicious cycle in schematic format.

Note however that the vicious cycle of resistance and disinvestment may be particular to lagging regions, for the lack of developed markets that characterizes them. In contrast, the backward linkage dynamics of more developed regions may be quite different. There, incoming firms add one more source of demand to a stock of existing demand for intermediate inputs. Therefore, supplier investment is less asset-specific and is less closely linked to the demand behavior of the incoming large firm.

metalworking parts and equipment. Still, aside from these incoming large firms, local aspiring metalworking suppliers had few market alternatives.
In sum, in lagging regions, there is a large interdependence between the shape and content of large firms’ demand, and local supplier investment. This interdependence indicates that attention to supply-side deficiencies is not enough to elicit the desired investment in upgrading on the part of local suppliers. On the contrary, a more effective approach should target both demand-side and supply-side issues in tandem. The next section illustrates how local metalworking firms in Ciudad Guayana built institutions to address both these problems.

6.2. Local suppliers’ role in building backward linkages

Local metalworking firms in Ciudad Guayana forged lasting links to SIDOR by addressing both demand-side and supply-side problems simultaneously, over the entire period of their existence. On the demand-side, local suppliers worked to diminish state-owned SIDOR’s and subsequently private-foreign SIDOR’s resistance to local procurement. In particular, local metalworking firms strived to develop long-term
relationships with SIDOR in both periods. These relationships gave local suppliers the security that encouraged their subsequent upgrading. On the supply-side, local metalworking firms collectively addressed problems with training, marketing, and more recently, financing that affected the sector.

Yet how did local suppliers convince state-owned SIDOR, and subsequently private-foreign SIDOR to commit to local procurement over the long-term? What tools did the sector have available to exert demand-side pressure? How did the local metalworking firms reach the levels of cooperation needed to address these supply-side problems? How was metalworking firms’ work similar or different to that of other organizations building backward linkages described in the literature? Since I have proposed that backward linkage development is about institution building, this section will attempt to answer these questions.

**Addressing the demand-side**

Ciudad Guayana’s metalworking firms used political tactics to overcome state-owned SIDOR’s and subsequently private-foreign SIDOR’s resistance to local procurement. In both periods, the tactic consisted in pressuring a government development agency – in this case the CVG – to ask large firms in Ciudad Guayana to increase local procurement, and in this way fulfill the agency’s role of regional development. For example, during the state-owned SIDOR period, local aspiring suppliers lobbied the CVG to make its holding enterprises increase and deepen the extent of local procurement. Because of the CVG’s role of regional development, local metalworking firms’ tactics struck a chord, despite the slight importance that this government agency accorded to small and medium firm development in Ciudad Guayana.
Accordingly, the CVG implemented ingenious ways to aid local procurement, such as the physical display of metalworking parts and pieces plus the information on its holding enterprises’ demand described in chapter 2. Following privatization, local metalworking firms presented themselves to the CVG and to public opinion as undergoing an acute crisis. This crisis allegedly derived from private-foreign SIDOR’s decision to cut relations to local suppliers and discontinue ongoing payments. Again, given the CVG’s role in regional development, metalworking firms’ troubles led the CVG to request supplier development programs from private-foreign SIDOR in exchange for import protection.

Noteworthy of the Ciudad Guayana case is how political tactics helped metalworking firms gain ground with both state-owned SIDOR and private-foreign SIDOR. Typically, we tend to think of state-owned enterprises as more vulnerable to political pressure than private, foreign-owned firms. Yet private-foreign SIDOR needed government assistance to overcome an impending crisis. Given the firm’s large visibility and economic impact on Guayana, private-foreign SIDOR’s ability to get government assistance partly depended on the firm’s record at helping develop local industry. Metalworking firms grasped this opportunity to present themselves as powerful allies or enemies to private-foreign SIDOR’s petition to government.

This kind of lobbying on the part of local suppliers has also played a determining role in other successful cases of backward linkages. For example, Addis (1999) traces the development of a domestic Brazilian autoparts’ sector to local suppliers’ ability to forge alliances with the national government conducive to backward linked development. As a result of this alliance, the Brazilian national government imposed local content legislation
on multinational car assemblers arriving to Brazil, de facto coercing assemblers to procure locally when the standard industrial practice of the time was vertical integration. Coming back to steel, metalworking firms at Taranto (Italy) used a wave of local political protests against steel giant Italsider to press for the case of increased local procurement. The resulting long-term relationships allowed the local metalworking sector to achieve some level of upgrading and specialization (Capriati 1991). In both these cases, political action by the local supplier sector forged links to potential large customers despite their resistance.

Despite the presence of politics in these cases of local supplier development, the current literature on backward linkages does not look at politics or worse, government regulation of demand with favorable eyes. This literature considers that such policies, which were typical of import-substitution industrialization, had the opposite effect of fostering inefficient local suppliers (Battat, Frank and Shen 1996). In this respect, the literature contrasts with Hirschman’s observation that government pressure in the form of import tariffs or local content requirements could overcome established industrialists’ resistance to local procurement.

Yet the government pressure for local procurement that ensued from Guayanese metalworking firms’ lobbying was more subtle and indirect than the traditional local content requirements and import tariffs used in import-substitution. In effect, the CVG never demanded that its holding enterprises procure locally at any cost. Rather, the CVG simply committed its holding enterprises to implement reasonable efforts to increase

159 With respect to the development of local autoparts’ suppliers in Brazil, Hirschman (1971) noted: “It has been in fact due to the regulations issued by the Kubitschek administration that backward linkage was enforced rapidly in the Brazilian automotive industry in the late fifties. In Mexico, on the other hand, assembly plants had existed for decades without any progress being made toward the local manufacture of motors and parts until measures similar to those in Brazil were adopted in the sixties” (p. 108).
local and national procurement of those inputs where local suppliers already existed or could easily develop. In practice, the CVG’s mandate gave aspiring metalworking firms in Ciudad Guayana a lever with which to build long-term customer-supplier relations with their main customer, SIDOR.

Moreover, lobbying only constituted one aspect of local firms’ demand-side activities. Once local firms elicited a certain level of motivation for local procurement from their large customers, the other, more crucial aspect of their demand-side work consisted in mediating customer-supplier relations. This mediation turned large customer’s tentative commitment towards local procurement into nurturing customer-supplier relations.

Why do we need mediation to build backward linkages? First, mediation solves problems that emerge from the opposing interests of both partners. As I described earlier, large firms arriving to lagging regions tend to distrust local suppliers. At the same time, local suppliers need a measure of long-term commitment to invest in the upgrading that will diminish this distrust. Yet why would incoming large customers offer long-term commitment to local firms? Long-term commitment decreases customers’ bargaining power and exposes them to opportunistic behavior on the part of suppliers (Richardson 1993). On the other hand, the customer-supplier relations’ literature tells us that in the absence of customer commitment, local firms are unlikely to undertake investment (Helper 1991, Helper 1997, De Jong, Nooteboom et. al. 2001).

In Ciudad Guayana, the local metalworking business’ association’s role in mediating customer-supplier relations solved this conflict by accommodating the interests of both trading partners. AIMM-Guayana’s function within the relationship was to first,
enforce long-term commitment by making sure that state-owned SIDOR reassigned contracts to good performers. Second, AIMM-Guayana negotiated prices yearly to protect local suppliers from inflation. This made it difficult for state-owned SIDOR to finance itself off the local firms – a frequent obstacle to backward linked development (Battat, Frank and Shen 1996). In both respects AIMM-Guayana represented the interests of local suppliers. Yet AIMM-Guayana mediated suppliers’ interest with state-owned SIDOR’s interests. For example, AIMM-Guayana did not limit competition between firms for contracts – on the contrary, its membership expanded during the time it directly participated in contract allocation. Moreover, AIMM-Guayana aided state-owned SIDOR in reallocating contracts from non-performing firms to good performers. Finally, within the yearly price negotiation, AIMM-Guayana accepted machine/hour and man/hour price reductions to force firms to increase their productivity.

In the private-foreign SIDOR period, AIMM-Guayana also played a mediating role. First, AIMM-Guayana helped the private-foreign company turn its eyes to the local metalworking sector when its path-dependent course was to buy from abroad. AIMM-Guayana also negotiated a “steel alliance” with private-foreign SIDOR. This alliance produced a communication channel through which to solve lags in payment that pushed many local metalworking firms to crisis. Moreover, through the “steel alliance”, AIMM-Guayana traded support for antidumping for private-foreign SIDOR’s commitment to institute customer-supplier relations that would promote local suppliers’ development.

In essence, AIMM-Guayana’s mediation of the customer-supplier relation transformed both state-owned SIDOR’s and private-foreign SIDOR’s loose motivation towards local commitment into an implicit contract about the ways in which this
commitment would work in practice. In both periods, this contract sought to balance long-term commitment with competition. Long-term commitment provided local metalworking firms with the security to invest in upgrading, and this is what AIMM-Guayana demanded. At the same time, competition amongst the firms did not hold either state-owned SIDOR or private-foreign SIDOR hostage to opportunistic behavior on the part of any local supplier\textsuperscript{160}. Indeed, both state-owned SIDOR and private-foreign SIDOR required that contracts be competitively allocated. This balance between long-term commitment and competition satisfied both parties—at least, during the state-owned SIDOR period—helped the local metalworking sector upgrade, and gave it strength to undertake the supply-side actions of both the pre-privatization and post-privatization periods.

**Addressing the supply-side**

Through AIMM-Guayana, local metalworking firms collectively addressed the training, financing, and marketing problems that affected the sector. Prior to privatization, local metalworking firms in Ciudad Guayana worked with the local training institute INCE to impart the skills that small and medium firms in Ciudad Guayana needed. AIMM-Guayana partly financed DECATEC, a program to deepen the technological development of metalworking firms in preparation for privatization. AIMM-Guayana also published catalogues of the sector’s firms, and attended a number of fairs outside Guayana to market metalworking products outside the region. Following privatization, AIMM-Guayana participates in coordinating a guarantee system to back up local metalworking firms’ requests for credit.

\footnote{\textsuperscript{160} Curiously, an analogous customer-supplier relation mixing competition with long-term commitment seems to permeate the Japanese automobile industry (Richardson 1993).}
On the surface, these supply-side actions seem to fulfill the recommendations of the current backward linkage literature. However, I want to note two caveats to this interpretation. First, these supply-side actions on the part of AIMM-Guayana took place only after local metalworking firms had successfully negotiated a long-term relationship to state-owned SIDOR. Indeed, this observation gives substance to my argument that suppliers respond to demand conditions. Second, AIMM-Guayana could have not been able to elicit the cooperation required to carry out these supply-side interventions (particularly that of financing) had it not built a reputation for fairness during its mediation of the customer-supplier relation.

**Developing cooperation and the ability to act collectively**

Some would argue that if we are concerned about development inclusive of a large number of firms, business organizations should not mediate customer-supplier relations. According to Olsonian logic, business organizations should have every incentive to limit membership and therefore increase the share of the pie going to every individual firm. Instead of cooperation, this interpretation predicts collusive, perhaps even rent-seeking outcomes. How did metalworking firms in Ciudad Guayana avoid this scenario?

In Ciudad Guayana, AIMM-Guayana’s role in mediating the customer-supplier relation to state-owned SIDOR ensured that the organization developed in an encompassing, cooperative way. First, state-owned SIDOR monitored that AIMM-Guayana remain open to outsiders by demanding that the association include new, aspiring suppliers. SIDOR monitored that this indeed took place, and thus boosted the association’s membership. Towards the end of the state-owned SIDOR period, the
association included all the firms directly supplying SIDOR. AIMM-Guayana’s encompassing membership not only boosted its legitimacy as representing metalworking firms, but also gave it the financial resources to address the training and financing problems collectively affecting the sector’s firms. In other cases in Europe and Brazil, the government has played this same inclusiveness-enforcing role (Locke 2001).

Second, transparent mediation of the customer-supplier relationship with state-owned SIDOR gained AIMM-Guayana respectability among its member firms. Indeed, as in the case of encompassingness, this transparency was not entirely of AIMM-Guayana’s doing. State-owned SIDOR made sure to allocate yearly contracts according to the performance of metalworking firms during the previous year. These performance standards were available to all, either at the association or upon request from state-owned SIDOR. Moreover, contract allocation generally occurred during public meetings that any supplier could attend.

Finally, AIMM-Guayana’s founder and leaders were among the most respected of Ciudad Guayana’s metalworking firms. These entrepreneurs profoundly believed in the association’s goal of promoting local industrial development. These leaders shared the ideals of nation-building and the strong work ethic that have characterized Ciudad Guayana’s inhabitants, particularly the mid-level managers at the CVG and its holding enterprises.

Other cases of building backward linkages

Similar to AIMM-Guayana, in other successful cases of backward linkages a third party representing collective interests also performed demand-side and supply-side functions simultaneously. For example, Taiwan’s Industrial Development Board (IDB)
persuaded selected large firms located in Taiwan to establish a satellite network. At the same time, the IDB worked with supplier firms to interest them in joining the network. The IDB then worked with the customer firm to help aspiring suppliers improve their operations and meet the annual production plans that the customer prepared for them. In Singapore, the government Economic Development Board (EDB) hired experienced managers from targeted customer firms to work full time for two to three years with selected local suppliers. During this time, these managers gave suppliers focused assistance, designing courses and workshops to address their general technical, managerial and/or operational issues. In a third phase of the program, the customer conducted joint research with these suppliers. Singapore’s EDB coordinated this work and paid for these managers’ salary (Battat, Frank and Shen 1996).

Taiwan’s IDB and Singapore’s EDB, like AIMM-Guayana, are institutions that represent collective interest. Of course, there is an important difference between them. Taiwan’s IDB and Singapore’s EDB are government organizations, while AIMM-Guayana represents a collective of private actors. An interesting question is to evaluate the extent to which government organizations are better or worse suited than private collective actors for the task of building backward linkages. For example, a puzzle to be resolved in the case of Ciudad Guayana is why the CVG was not able to play this role. Suffice it to note here that in these three cases of backward linkages, organizations of collective interest simultaneously addressed the demand-side and supply-side difficulties linked to local supplier development.

What would happen to backward linkages in lagging regions in the absence of such intervention? From my analysis of the Ciudad Guayana’s metalworking sector and
of other cases, I believe that lacking organizations that can mediate demand-side behavior with supply-side needs, large firms will tend to procure locally only those inputs that are fairly simple to produce and do not require significant investment. For these kinds of inputs, suppliers do not need long-term commitment to set up their firms. For example, before state-owned SIDOR's Open PO system with the local metalworking sector, SIDOR contracted local metalworking firms for industrial maintenance. Industrial maintenance did not require firms to invest in fixed capital, and it allowed them to use the client-specific skills they had acquired during SIDOR's plant expansion.

Naturally, when a large firm arriving to a lagging region needs sophisticated suppliers in that location, its procurement behavior might be completely different from this prediction. However, absent mediation, and given the cost of developing sophisticated local suppliers, large firms with these needs usually opt to relocate their traditional suppliers from abroad. The outcome then may seem like localized backward linkages, except that the "local" suppliers are recent transplants from abroad. For example, automobile firms wanting to implement just-in-time production need suppliers to locate close by. Consequently, multinational automobile assemblers in South Africa are coaxing foreign suppliers to relocate in South Africa (Barnes and Kaplinsky 2000). IN Mexico, recently passed NAFTA rules require transnational TV manufacturers to incorporate more locally manufactured inputs. These consumer electronics firms have reacted by bringing their foreign suppliers to Mexico (Carrillo 2001). In Ireland, the noted rise in domestic purchases of its electronics sector appears less successful as a case of backward linkages when Görg and Ruane note that many of these suppliers are foreign-owned (2000).
The technical nature of the industry also plays a role in influencing whether, absent an organization coordinating demand-side and supply-side functions, large firms will make an effort in developing local suppliers. At play here is the ease with which the firm can transfer knowledge about input production to local suppliers. The literature argues that localized backward linkages are more likely with industries that incorporate many components, such as automobiles (Battat, Frank and Shen 1996). Yet automobile multinationals investing in developing regions typically only locate assembly functions there, with research and development continuing to take place in these firms’ home countries. It is difficult to imagine that managers of these assembly lines will have the specialized knowledge to produce their required components. They may know the specifications of each input – e.g. the contour and material used in stamped body parts, the dimensions of the wheels – but do not necessarily know about the production process to achieve them. Similarly, state-owned SIDOR managers knew how to manufacture steel, but not how to produce metalworking parts and equipment. In contrast, in simpler manufacturing processes such as garments, design houses can easily transfer sewing and garment assembly skills to local firms. This may explain why the garment industry has provided a stepladder for firms in East Asia to evolve from garment assemblers to intermediate design and management functions (Gereffi 1999). We do not hear the same type of story in automobile firms.

The preceding paragraphs raised another issue of concern here: the cost of transferring technology to local suppliers. Who will assume it? In the case of Ciudad Guayana, state-owned SIDOR initially assumed the cost of developing and transferring input-production technology to local suppliers. This subsidization of local suppliers
occurred under government pressure and within the context of the import-substitution drive. In Taiwan and Singapore, government development organizations paid for the costs of technology transfer from foreign customer firms to local suppliers for a period of two to three years (Battat, Frank and Shen 1996). Obviously, if large firms arriving to lagging regions resist local procurement, they will be even less willing to pay for these costs. Could local business organizations do so? If member firms benefit equally from the technology development and transfer activities, they might be willing to do so, again, provided long-term commitment from their large potential customer. If not, like at Singapore and Taiwan, government may need to step in.

6.3. Backward linkages, embeddedness, and development paradigms

Development paradigms played a centerpiece in the development of Ciudad Guayana’s metalworking industry. Initially, this industry surged around state-owned SIDOR, which in turn was emblematic of Venezuela’s state-led industrial development. From 1989 onwards, the Venezuelan development paradigm shifted from state-led to private led industrial development. SIDOR’s privatization in 1997 resulted from this paradigm shift.

The paradigm shift from state-led to private-led industrialization had consequences for the development of the metalworking sector even prior to SIDOR’s privatization. Starting in the first half of the 1990s, Ciudad Guayana’s metalworking sector, led by AIMM-Guayana, undertook efforts to develop deeper technological dexterities and widen its markets outside of Ciudad Guayana. The sector’s efforts responded partly to objective economic considerations, as state-owned SIDOR itself undertook an industrial restructuring program and reduced demand for local
metalworking firms’ services. Yet partly, AIMM-Guayana’s efforts to specialize the sector and broaden its markets responded to the sector’s embeddedness within a network of political actors that had internalized the paradigm shift.

During the process of building backward linkages, local metalworking firms had developed close ties to the most important government presence in the region – the CVG. Throughout its history, AIMM-Guayana had constantly lobbied the CVG to put pressure on its holding firms to increase the levels of local procurement. At the same time, AIMM-Guayana’s search for resolution to collective technological and financing problems had helped the sector develop close ties to the decentralized government office for technological development (FUNDACITE), and to the city government, then run by the vanguard party Causa R.

The CVG, FUNDACITE and the Causa R all participated in the paradigm shift taking place in the early 1990s in Ciudad Guayana. The CVG sought to devolve municipal services to the city government, privatize its holding enterprises, and focus on small firm development. FUNDACITE itself resulted from a national policy shift from funding academic research to helping local economic actors increase technological investment. Causa R believed in a Ciudad Guayana with greater private, small and medium firm activity and less predominance of the CVG enterprises. With respect to the development of the metalworking sector, all three government and political actors behaved in line with the macro paradigm shifts. The CVG, FUNDACITE and the city government funded AIMM-Guayana’s technological development program DECATEC, the sector’s catalogue, and its participation to trade fairs outside Ciudad Guayana and even outside Venezuela.
AIMM-Guayana’s preparation to SIDOR’s privatization enabled metalworking firms to quickly tap into other markets following the change in customer-supplier relations with private-foreign SIDOR. A correct interpretation of the metalworking sector’s preparation for this crisis would need to include the resources and energy that the CVG, FUNDACITE and la Causa R, among other actors, injected to local metalworking firms. Yet this interpretation cannot leave out how metalworking firms themselves had forged these cooperative relations in their attempts to build backward linkages over the preceding 20 years.
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