

Global Standards and the dynamics of environmental compliance in India's leather industry

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Abstract:

Under what conditions can small suppliers and small firm dominated industries comply with stringent standards without compromising their trade competitiveness? This question is at the heart a controversial debate about the emergence of environmental standards as a new variable in global trade and market access. There are few documented cases of success and the literature remains skeptical about the ability of small supplier firms to comply with stringent environmental regulations. This paper draws on the Indian leather industry's relatively effective compliance with two German bans on Azo dyes and PCPs to argue that the supposed trade-off between environmental compliance and export competitiveness is not inevitable. Critical to this compliance was not merely a model of private governance mediated by lead firms and global buyers but the institutionalization of compliance by the Indian state which became deeply involved in diffusing the new standards. The paper examines how and why the state got involved in ways that generated – and sustained – a process of negotiated collective action and broad-based environmental compliance by a small-firm dominated sector.

Key Words: Global standards, environmental standards, mall firms, leather industry, India, globalization, business associations, state

Introduction

The rise of global standards has emerged as a controversial new theme in the literature on trade and the environment in recent years. This paper makes an empirical contribution to the emerging literature on global standards and export competitiveness by analyzing how a labor-intensive developing-country industry (Indian leather goods) complied with a developed-country environmental standard that affected trade and market access (German regulations banning two commonly used leather chemicals, PCPs and Azo dyes in the 1990s).

The paper's key empirical finding is that while the stringent standards did add to firm costs, the widely presumed trade-off between compliance and export competitiveness did not materialize. In the ten years since Germany imposed the regulations in the 1990s, compliance has been widespread even among the industry's small firms and overall exports to demanding industrial markets have increased -- as have the margins that PCP and Azo dye free exports fetch. There is general agreement that "India has taken care of its PCP and Azo dye problem" (Indo-German Export Promotion Project, Interview, New Delhi, April 2003), and India has emerged as something of a model in international circles, and competitor countries, such as China, have published case studies on India's successful adjustment to the PCP and Azo dyes ban (Fengzhong 1999, Abdel-Latif and Nugent 1999, Jordon policy reports n.d., UNIDO 1996, Jha 1999, German market research organization). Most importantly the adjustment process resulted in significant technical transfer from the standard-imposing country (Germany) to India and led to the creation of new, internationally certified testing capabilities in India that did not exist before. The creation in India of Asia's first German-funded ISO 17025-certified leather testing and certification laboratories in 2002 constitutes important spillovers for the industry as a whole that go well beyond the segments of the industry originally affected by the regulations.

The paper's central argument is that this adjustment occurred in part due to three reasons: the unusual way in which the state got involved in the institutionalization of the global standard domestically; the prior existence of a rich base of public and private support institutions in the

leather sector that were critical to diffusing the new standards in ways that kept costs low; and the sequence in which adjustment occurred that contributed significantly to learning among the key players – exporters, suppliers, their associations and government agencies – about how to cope with stringent trade-related environmental (safety) standards.

The rest of the paper explores these themes. Section two frames the debates about the dilemmas of environmental compliance. Section three examines the crisis and the institutional response of the Indian leather sector and the state to it. Section four examines issues of institutional porosity and the institutional linkages that led to surprisingly effective compliance, and the final section concludes.

II. Competitiveness and environmental compliance: The assumed tradeoffs in the literature

In recent years global standards and other forms of private governance, such as codes of conduct, have emerged as a major issue in the literature on trade and development. Even as tariff barriers have fallen and trade has become more open worldwide, access to key industrial markets seems increasingly tied to the ability of suppliers to comply with a variety of international standards (e.g., labor, environmental, and quality standards) that their buyers demand. On the one hand, the general intent behind these stringent standards which emanate mostly from global buyers in advanced industrial countries is to improve working conditions in supplier countries, or ensure a threshold level of quality, health, safety and environmental compliance. On the other hand, supplier countries often view the proliferation of global standards, especially of environmental and technical standards, as non-tariff barriers (NTB) to trade (see the excellent recent review on global standards by Nadvi and Wältring 2004). This proliferation of global standards and the controversies surrounding them has unleashed a debate around the question of how and under what conditions can supplier firms in developing countries, especially firms in polluting industries such as leather and textile processing, dyes and chemicals—which

are also large employers—comply with the increasingly stringent environmental standards imposed by global buyers without compromising their export and cost competitiveness.

While a small, growing literature has begun to critically examine how local firms cope with global standards, and the effects of these standards on local institutions and production networks (see for example Nadvi 1999, 2004, Kennedy 1999 and forthcoming, O'Rourke 2000, even Pargal and Wheeler 1996), much of the existing research on trade and the environment remains at an aggregate level, focused on questions of 'pollution havens' and whether openness intensifies trade in 'dirty' industries (see Copeland and Taylor 2004 for a review). This literature continues to assume a tradeoff between environmental compliance and export competitiveness.

This literature portrays three factors that make it difficult for firms to comply with stringent environmental standards without comprising their competitiveness. The first and most widely held factor relates to the high costs of compliance. The argument, often cast in a transactions costs framework, is that mandatory environmental regulations impose economic costs on firms that can undermine industrial competitiveness and reduce net exports by raising production costs in a global environment where low costs continue to carry an advantage, both for firms seeking export access and governments competing for FDI shares (See Jaffe et. al., 1995, for a review of the first generation literature, and Xu 1999 and Copeland and Taylor 2004 for a recent review).

The emerging literature on non-tariff-barriers reinforces this view of an apparent trade-off between environmental compliance and economic competitiveness. Expressing the concerns of developing country firms and policy makers, this literature argues that the imposition of external standards that are 'non-equivalent' or vastly more stringent than existing norms and practices in developing countries, impede trade because developing countries generally lack the scientific expertise and technical infrastructure to comply with tough new standards (Chaturvedi and Nagpal 2003, Gopalan 2002, Fengzhong 1999, Abdel-Latif and Nugent 1999, Anderson 1996).¹ Differences between domestic and international regulations only place additional

institutional demands on local institutions that often lack the resources and capacity to enforce stringent new standards (Keesing and Lall 1992).

The second reason for skepticism about environmental compliance by suppliers relates to debates over the “conflicted motivations” of the state to act on environment problems (O’Rourke 2002). According to this view, even if a subset of individual firms are willing to comply with costly environmental standards, the state, especially in developing countries, faces too many conflicting pressures to push for broader compliance; indeed, under conditions of global competition and freer trade, the incentives it faces are to do just the opposite. Wary of discouraging likely investors by ‘over-regulating’ (or compromising the competitiveness of domestic firms by raising production costs), developing country governments are, in this view, likely to hesitate ratcheting up regulations and environmental norms. In some cases this may push states in the direction of deliberately keeping environmental standards lax to attract FDI, thus fueling a regulatory ‘race to the bottom’ (Oliver and Basak 2002, Levinson and Keller 2001; for a wider debate see Bhagwati and Hudec 1996).

Finally, the literature on environmental institutions and implementation repeatedly cites how fragmented capacity and a complex array of factors that plague most environmental bureaucracies ranging from poor lines of funding, to weak technical capacity, limited autonomy and a variety of jurisdictional battles often complicate the effective implementation and enforcement of even existing environmental standards. The argument here is that even if the state were to act environmentally, the political weakness of the typical environmental agency and its limited administrative and technical capacity would hinder the effective diffusion of new environmental norms and standards (see Dasgupta 2000, O’Rourke 2002 and the citations therein). In sectors dominated by small firms, the high costs of ‘coordination’ and of monitoring scores of small enterprises would make enforcement even more unsustainable, especially for cash-strapped implementation agencies in many developing countries (Sapru 1998).

The dominant theme in the literature thus is that the imposition of global standards can make it difficult for firms, especially small firms, to compete in global markets. Taken together these writings appear to lend support to the idea of a voluntary private sector model of compliance whereby individual firms that participate in particular global value chains create their own voluntary compliance mechanisms and peer monitoring systems, including by non-governmental monitors, based on civic pressure to elicit greater corporate social responsibility via private codes of conduct and global certification systems (see Gereffi and Mayer 2004 for a careful review of this literature, also O'Rourke 2002).

This paper draws on field work carried out in the Indian leather industry in 1999, 2000, 2001 and 2003 (involving over 60 in-depth interviews with firms in Tamil Nadu, India's leading leather cluster, government officials at the state and central levels, industry associations, suppliers, traders and exporters, German representatives and research and testing agencies), to present evidence that is at odds with the dominant view of environmental compliance and small firms. It presents evidence of a case where a small-firm dominated, price-sensitive sector responded quite effectively to stringent trade-related standards, and where, in contrast to a private sector model of governance, the state was crucially involved, both in imposing the environmental standard, and collaborating with industry to help diffuse broad-based compliance.

The paper analyzes the Indian leather industry's relatively successful compliance with two trade-related environmental regulations imposed on it by Germany, India's largest buyer of leather goods, when it abruptly banned PCPs (pentachlorophenol) and Azo dyes in the 1990s. Compared to the early 1990s when more than half of all samples failed PCP and Azo tests in Germany, by the end of 1998, the failure rate on PCP tests was less than 7% and less than 1% for Azo dyes (only 1 in 129 samples tested positive) (CLRI, Muralidharan 1998 cf. Pillai 2000). In an interview in 2003, officials of the German export promotion office in India agreed that "India has generally taken care of the PCP and Azo dye problem" (Interview, Indo-German Export Promotion Project, New Delhi, 2003).

The paper's central argument is that critical to this compliance was not merely a model of private governance, but rather the institutionalization of compliance by the Indian state which became critically and deeply involved in diffusing the standards set by Germany. Not only did the government become involved, but it became involved in a way that engendered a process of what we call 'negotiated' collective action among a variety of public and private actors (government agencies, exporters, firms across the value chain, the sector's key business associations, R&D institutes and regionally embedded environmental agencies) who did not necessarily share a history of collaboration, but now became engaged in a process of repeated and ongoing participation involving negotiations around various aspects of policy and implementation. In enforcing the new environmental standards the state thus collaborated with the very groups that it regulated (Tendler 2001, Tallberg 2002).

Central to the broad-based diffusion of the new environmental norms was a particularly creative use of legislation by the Indian state that departed from traditional models of environmental enforcement. In contrast to standard approaches to enforcement based on command and control mechanisms or monitoring and sanctioning end-users, (the small leather processing firms and small textile dyeing firms in this case), the Indian government targeted a much narrower and more visible segment of the supply chain—the leather chemical input industry that *produced* the notified chemicals. By passing a law to ban the import and production of PCPs and Azo dyes in India, the government effectively, though inadvertently, turned an input industry (the leather chemical companies) into *de facto* diffusers of environmental compliance among a sprawling network of small-scale end-users of their products.² Forced to shift to safer dyes, the chemical companies, who initially vigorously opposed the government's ban, began experimenting with the development of substitutes and then launched efforts to market them broadly to their primary clients—the small leather tanning and textile processing firms, just the firms that needed to comply with the German legislation and which the state's enforcement apparatus would have found difficult to individually monitor.³

This creative targeting of an input industry by the state indirectly shifted the impetus of enforcement from government agencies to a segment of private industry. The effort was effective in part because it was embedded within an already existing network of numerous research, development and leather support institutions at the regional level that were critical in diffusing concrete information about the bans, alternatives available, and the processes of adoption to the smallest local dye-makers and tanneries. This network of sometimes defunct or mediocre agencies set up in an earlier period, for a different purpose (inspections of leather goods exported by India to the Soviet Union), now restructured itself to adopt a new mandate of “diffusing quality and environmental standards” to the leather and textile industry (Interview, Dr. Nadigar, Mumbai, 2003). With the demise of mandatory inspections after the opening up of the economy in 1991 and the collapse of the Soviet Union, many of the inspection agencies that had struggled to redefine their rationale for existence, now grasped the unexpected environmental crises of the 1990s as an opportunity to redefine their mission and *raison d’être*.

The government’s targeting of the input industry worked, most importantly, because it helped lower the costs of compliance. The fact that nearly half the output of leather chemicals in India comes from multinational subsidiaries of American and European chemical companies, a good share of them German, certainly aided the development of safer alternatives. Not only do the largest firms (and traders) have greater access to an array of safer base chemicals than would small local chemical companies, but innovations by the chemical companies in the course of developing alternative dyes also helped lower the costs of compliance (see Pillai 2000). These costs were lowered further by the slashing of import tariffs on safer substitutes of the banned chemicals by the Indian government—(an act that predominantly benefited *small* chemical companies), and its successful bilateral negotiations with Germany that resulted in the extensive upgrading of India’s key R&D agencies in each of the clusters where leather processing is concentrated, including CLRI, the country’s premier, publicly-funded leather-research institution. By 2002, the German government had funded, via its development agency, GTZ, the

establishment in India of a state-of-the-art leather testing and certification lab⁴ which became the first ISO 17205 certified leather-testing laboratory in Asia in 2002 (Indo-German Export Promotion Project, interview, New Delhi 2003). Any firm, exporter or not, now has local access to a world-class leather testing infrastructure, as well as new certification technologies specified under the ISO and DIN systems that were not locally available before. In terms of this improved access to new internationally certified testing systems, then, the results of compliance have spilled over more broadly across the leather sector, beyond the exporters originally affected by the German bans.

These findings suggest that the involvement of the state at both ends of the process—in Germany and India—made a major difference to the extent and speed of environmental compliance compared to what might have been possible if the bans had been instituted by individual corporate buyers via codes of conduct or systems of corporate responsibility. It was also critical that Germany did not single out any particular country on which to impose the new standards, nor cast the bans as bilateral trade related measures.⁵ Germany, by contrast, passed the new standards as domestic legislation aimed at protecting the health of its own citizens, an option clearly allowed under Article 20 of GATT/WTO rules. The product-related bans affected all those who exported to Germany, and in the Indian case, given the large market that Germany represented for Indian leather and textile exports (22% of all Indian leather exports go to Germany as does a significant share of textile exports), a political space was created for the Indian government to become involved.

It is most significant that the segment of the Indian state that was at the center of this story of successful environmental compliance was *not* the Environmental Ministry, but rather the Ministry of Commerce—just the agency that has traditionally *opposed* tough environmental regulation. It acted this time to enforce and implement higher environmental standards because its core mission, of promoting trade, was at stake. It was in its own political interest to help induce widespread adoption of the new environmental standards, and at the same time, do so in a

way that lowered the costs of compliance. This interest on the part of a key segment of the state converged with the interests of leather firms, particularly the major exporters who were directly impacted by the German bans. Yet, without the prior presence of extensive linkages between the industry and government (via associations), and the presence of regionally embedded leather-support institutions that helped diffuse the safer chemicals widely, compliance may have remained much more fragmented. The strategies and political choices of local actors and domestic institutions therefore interacted powerfully with the economic pressures generated by the global standards imposed by Germany to jointly shape local outcomes and the mechanisms of compliance.

The rest of the paper develops this argument further by examining the institutional linkages between leather firms, segments of the Indian state, and the buyer government (Germany), as well as the political processes at the local level that helped firms achieve this compliance.

III. The crises and the institutional embedding of the initial response

Between 1989 and 1995 Germany, a major buyer of Indian leather goods passed two legislations banning the import and sale of goods containing two commonly used leather chemicals -- pentachlorophenol (PCP), a class of 22 Azo amines -- that the German Health Ministry said were carcinogenic. The PCP ban was passed in late 1989, the Azo dye ban came five years later, in 1994-5. PCPs and Azo dyes, both of which are cheap and easy to produce chemicals were at that time widely used in the tanning and dyeing of leather (The Hindu 1995, Fenzhong 1999, Pillai 2000). These trade related regulations arrived at the same time as the leather industry was coping with a domestic crisis triggered by the Indian Supreme Court's ruling against effluent discharge by tanneries. In 1995 the Supreme court had ordered nearly 37% of India's leather tanneries shut for their failure to treat effluent discharge as required by law (Kennedy 1999).

Both these regulations had the potential to seriously disrupt the leather industry. With an estimated 4000 registered firms (and many more informal and unregistered firms), the Indian leather sector is a major employer and a leading exporter (see table 1). The industry employs 2.5 million people directly or indirectly in mainly small firms in clusters spread across nine states.⁶ Together, these firms produce over US\$ 4billion in total output, half of which is exported (CLE 2004, Indo-German Export Project 2004, Dutta 2004). About 60-65% of this output takes place in the small scale sector, and nearly 75% of India's leather tanneries are small in scale (CLE website 2004, Dutta 2004, Central Pollution Control Board, 1995). Both regulations thus threatened to ripple through a sector of predominantly small firms, threatening output and employment in a segment of the industry that the literature argues is least prepared, economically and institutionally to cope with the costs of stringent environmental compliance.

Most centrally, the bans threatened to undermine exports. At the time of the bans, the leather industry was India's fourth largest foreign exchange earner, and Germany was India's largest export market, purchasing 22% of India's total leather exports. Germany's ban on Azo dyes in 1994 affected an additional 36% of India's exports to Germany because it applied to textiles and garments that also used azo dyes (Indian Textile Journal 1996, cf. Pillai 2000). Furthermore, several European countries soon announced their own decision to follow Germany's lead,⁷ effectively spreading the PCP and Azo-dye bans across Europe. Europe is a key destination for Indian leather exports, and nearly 70% of the sector's export revenues come from just four European countries -- and the US (see table 2). Unless the leather industry complied with the new environmental regulations quickly exports to several of India's most important industrial markets in Europe could be jeopardized, and the livelihoods of many who depended on the sector disrupted.

These potential losses had an important spatial dimension that made a quick response politically even more important. The bulk of the export and employment disruption was likely to be concentrated in the southern state of Tamil Nadu where most of the nation's leather tanning

capacity and export-oriented manufacturing is clustered. Tamil Nadu accounts for nearly 70% of the nation's leather tanning capacity and over 65% of the nation's total exports of leather and leather goods originate from this region (CII-PriceWaterhouse 2000, Council for leather Exports, 2000, 2004). Over half (52%) of the country's registered tanneries are located in Tamil, as are many of the leading leather exporters (UNDP 1999, Kennedy 1999). The spatial concentration of a large share of leather production and exports in one prominent region made the need for quick adjustment even more politically pressing.

Given the relative importance of exports to India's leather sector, and of Germany and the EU as leading export markets for Indian leather goods, down-shifting exports to less stringent markets, or switching away from Germany to other countries where the bans did not apply was not a serious option for Indian producers - unlike in countries where the German or EU market accounted for a small share of exports.⁸ In the Indian case this would have meant the loss of some of its largest and most lucrative markets. From the start therefore, there was awareness among firms and government officials that adjustment – or engagement – with the new environmental bans was critical for the survival and growth of the Indian leather industry.

But this did not mean that firms or government agencies immediately knew what to do to respond. As we see next, a considerable amount of learning, political positioning and experimentation was involved in forging a response that eventually enabled, on balance, major segments of the industry to comply with the new regulations. The fact that the PCP ban, a narrower product-related ban⁹ that involved the elimination of a single chemical for which substitutes *were* locally available (albeit at higher cost), came fully five years before the broader and more devastating Azo dye ban—for which substitutes were not readily available and which affected multiple sectors – was critical to the ability of firms and government agencies to learn how to deal with the two crises and to mitigate losses with some success.¹⁰

IV. Getting the State involved

After announcing the bans Germany gave all parties a year to adjust to the new regulations; but to speed up compliance German port authorities soon began randomly testing consignments (of leather and textiles), rejecting any that tested positive for PCPs (in 1990) and later for Azo dyes in 1995-6. As the losses faced by Indian exporters began to mount, and as it became clear that the new regulations could not be “lobbied away” or sat out, “fear set in the minds of the exporters,” and the leather exporters turned to their apex association, the Council for Leather Exports (CLE) to formulate a response to the crisis. A key piece of CLE’s response was to bring pressure to bear on the state to become involved.

CLE is one of the most powerful lobbies in the leather sector, not the least because its members generate nearly US \$2 billion in export revenues annually. CLE also has special access to the central government – it is constituted as a statutory public-private export promotion council, supported in part by project-based funding from the Ministry of Commerce. CLE has a joint directorship where the Chairman is an industrialist elected by members of the industry, and a member of the civil service is appointed as the association’s Executive Director by the Ministry of Commerce at the request of industry. This boundary-spanning organization dominated by leading exporters but anchored within a quasi-public institutional structure provided leather exporters with tremendous reach within government. Thus, even as CLE began intense deliberations among its own members in the wake of the bans, as well as with members of the tanner’s association, AISHTMA (the All India Skin, Hides, Tanning and Merchants Association) with whom they had to collaborate, CLE also began to put pressure on the government to get involved in helping the industry adjust. The state agreed to become involved for several reasons. The institutional ties between CLE and the government certainly played a role in getting the government’s ear, but more importantly, the state’s own central mission was affected by the bans -- With export revenues currently touching US\$2 billion, a major export market and a key source of foreign exchange was at stake, and the cascading effect of the bans on employment in this

labor-intensive sector could potentially destabilize an important segment of the economy. The central government thus became readily involved.

Two ministries of the Central government, the Ministry of Commerce (charged with promoting trade and industry) and the Ministry of Environment and Forests (responsible for environmental policy) became most centrally involved. Ironically, it was the Ministry of Commerce, which has no environmental mandate, and not the Ministry of Environment and Forests (which is traditionally responsible for environmental compliance, regulation and environmental policy issues), that took the lead in coordinating the government -- and industry's - - joint response to the German environmental bans.

At first, after the bans were announced, the focus of the government of India and of industry was on managing a domestic response. The government's first action was to form a collaborative forum – an 'expert committee' involving all the key players involved in the leather sector – to find ways to move forward in adjusting to the bans. The committee brought together the leather exporters and their premier association (Council for Leather Exports-CLE), the tanner's lead association, the All India Skin, Hides and Merchants Association (AISHTMA), the leather sector's key R&D and testing institution, the Central Leather Research Institute (CLRI), and NEERI, the National Environmental Engineering and Research Institute, in addition to the Ministry of Commerce, the Ministry of Forests and Environment, and the Central Pollution Control Board, among others.

The initial emphasis of the group was on disseminating whatever information was available about the bans as widely and as quickly as possible. With the best information they had available, CLE, AISTHMA, CLRI and the Ministry of Commerce (through its extensive network of regional level leather support and extension agencies) launched a "national campaign in all leather clusters" soon after Germany announced its (PCP) ban in 1990 to diffuse information about the new regulations, and how local firms could get assistance from institutions like CLRI and other agencies in switching to alternative chemicals (Dr. Nadigar interview, Mumbai, 2003).

Though few good alternatives existed locally at the start of the adjustment process, and the substitutes that were available were generally more expensive than PCPs and Azo dyes,¹¹ the main goal of the information campaign was to impress upon tanneries and smaller producers that a failure to switch away from PCPs and Azo dyes, would mean that “the whole industry would lose business” (CLE Interview, Mumbai, 2003).

The government’s second set of actions focused on lowering the costs of compliance that firms faced in switching to substitute chemicals -- in the short run through diplomatic negotiations with Germany, and in the longer term through technology transfer and technical assistance. (1) At the outset, the Ministry of Commerce negotiated a longer window of compliance with Germany for each of the bans. In the case of each of the bans Germany had given all parties a year’s adjustment time, the Indian government bilaterally negotiated an additional year of transition time with the assurance that efforts would commence immediately to phase out the use of the banned chemicals. This eased some of the initial losses of the exporters – by reinstating rejected shipments – and gave the government and industry more time to organize and implement a response (2) At the same time, the government slashed import duties on safer dyes and chemicals, allowing dye-makers, especially small and medium dye makers and traders to import safer dyes at a low cost. The Ministry of Commerce reduced import duties on dyes and chemicals from a high of 150-200% to a base rate of 20% (See figure 2). Simultaneously, CLE worked with Indian consulates in Europe (especially Germany) to prepare a list of international chemical companies—dominated by a dozen German firms, many with subsidiaries in India—whose products were PCP and Azo-dye free.¹² With the help of the government’s vast local network of agencies, and the help of the chemical companies themselves, CLE disseminated this information across the industry to local dye makers and tanneries (CLE files 1991, Mumbai interview 2003). (3) Third, the government negotiated extensive technology transfer from Germany, to upgrade the domestic leather testing and certification institutions where the Indian leather sector was weakest. A point we return to a little later.

In the early stages of adjustment, therefore, the emphasis of the government and various segments of the leather industry was on efforts that could elicit widespread voluntary compliance to the bans. The “stick” for getting small tanneries to comply came entirely from the demand side: the financial and reputational loss from supplying non-compliant leather to their buyers (the exporters and manufactures). At the same time, a substantial network of support and research agencies in the public and private sector, coordinated loosely by the Ministry of Commerce and CLE through the collaborative forum that the government had set up tried to make it easier – to the extent possible – for exporters to work with their tanneries to be able to switch to the alternatives that were available.

This need for exporters at the head of the leather value chain to collaborate with tanners in order to adjust to the German bans was reinforced by an artifact of government policy that for decades had shaped the structure of the Indian leather industry. Since the 1950s the Indian government has reserved tanning, the most labor-intensive portion of the leather value chain, and where PCPs and Azo dyes are actually used (see figure 1), exclusively for the small scale sector.¹³ Though many manufacturers and exporters (nearly 40%) have a former base in tanning, or have dedicated and longstanding ties with particular tanneries, only a handful of export-oriented manufacturers—between 1-2%-- have their own tanneries in-house. A vast majority of exporters, thus, rely on an extensive network of small inter-linked tanneries for their leather input. In the wake of the German bans, this splitting of the value chain meant that in order for the exporters to comply with the new regulations, they had to get their upstream tanneries to comply first. Policy protection precluded vertical integration as a response to the crisis. The literature on small firms and collective action suggests that pressures like these, which bind a cluster’s large buyers (exporters) and small suppliers around a common problem are just the conditions that foster collective action and collaboration (Nadvi 1999, Kennedy 1999). And indeed, except for the 1-2% of exporters who had in-house tanneries and dedicated ties with large German buyers from whom they directly got information about the bans and available alternatives (via imports); the

majority of exporters (large, medium and small) actively sought the help of CLE, of the tanner's association, AISTHMA, and of various government agencies to work with their suppliers—the myriad small tanneries on whom they relied for finished leather, to switch away from the banned chemicals.

However, the limits of collective action and voluntary compliance emerged quickly. Private efforts by exporters, tanneries and their associations notwithstanding, rejections still continued two years after the PCP ban was announced. In 1991 the failure rate for PCPs was 42%, down only slightly from the high of 46% immediately following the ban in 1989 (see Murlidharan et. al 1993 cf. Pillai 2000). Two key factors complicated private (buyer-supplier-based) adjustment efforts. The first and most important factor was the difficulty in detecting exactly where the banned chemicals actually entered the leather value chain. The structure of the leather industry is characterized by extreme decentralization and porosity. Even though exporters at the top of the chain worked closely with their suppliers (tanneries) and their powerful business association, CLE, to stop the use of the banned chemicals, the base of the value chain, where raw skins and hides are extracted, remained highly fluid, intractable and dispersed. Dominated by scores of small, informal traders whose inter-regional networks spanned the nation, this key segment of the supply chain proved virtually impossible to monitor. Thus, even when exporters put pressure on their tanneries to switch to safer substitutes the banned chemicals could always enter into the value chain through spatially fragmented upstream processes such as extraction (see Pillai 2000).

Second, the presence of an accessible, locally based testing and certification infrastructure that might have allowed tanneries and exporters to address the problem of a porous value chain by randomly testing raw hides before purchasing them to screen out non-compliant inputs, was lacking. The German bans demanded detection at levels so miniscule that adequate testing infrastructure did not exist in India, even in premier R&D institutions like CLRI, in the immediate wake of the bans that could detect the banned chemicals at the levels demanded by the

new standards.¹⁴ To complicate matters, Germany had not specified testing methods when announcing the bans, and there was no agreement even internationally over standardized procedures for detecting micro-quantities of PCPs and Azo dyes (Interview, CLE, Mumbai, 2003, Fengzhong 1999, Pillai 2000). It would take substantial international pressure on Germany -- including from Italy and Spain who are also substantial exporters of leather, and from international dyers associations such as the Ecological and Toxicological Association of Dyes and Organic pigment manufacturers (ETAD) whose members were also affected by the bans -- and several rounds of amendments by German lawmakers to make the bans, especially on azo dyes, operational¹⁵ (see Fengzhong 1999:6, 7 for a timeline of the amendments, and Pillai 2000). Meanwhile, tests carried out in Indian labs, such as at the premier Central Leather Research Institute (CLRI), and in German labs produced inconsistent results. Given the lack of standard protocols in the immediate aftermath of the bans, samples that tested negative of PCPs in India sometimes tested positive when sampled in Germany causing shipments to be rejected.

Under these circumstances, in the immediate term, exporters had few options other than to send samples to German labs for testing and certification. This proved to be costly. As one official noted, compared to the extremely low cost of the banned chemicals (Rs. 4 or 5 per kg in the case of PCPs) firms had to spend as much as Rs. 10,000 per sample to get the tests done in Germany, and each color counted as a separate sample (Dr. Nadigar interview, March 2003). Even when alternative chemicals were available, they are costlier than the banned chemicals, and according to various estimates, this raised the cost of leather anywhere from Rs. 2 per square meter (The Hindu 1995, Policy Brief n.d) to 10% of total cost (Dr. Nadigar, Interview, Mumbai, March 2003).¹⁶

In light of these difficulties, the Council for Leather Exports (CLE) and the tanners association, AISTHMA, in consultation with CLRI and members of the expert committee that the government had constituted, urgently called upon the Indian government to ban the two chemicals within India. They argued that “As long as the [banned] chemicals continue to be

available [in India], compliance will not be possible” (Mr. Jamati, CLE interview, 2003). The best way to achieve compliance was to ban the production of these chemicals. At the same time CLE and CLRI urged the government to seek clarity from Germany about the technical nature of the bans and assistance with testing protocols.

As a near consensus emerged among government circles and in various segments of the leather industry on the need to ban PCPs and Azo dyes in India, the government – specifically the Ministry of Commerce and the Ministry of Environment and Forests passed a ban on the production of PCPs in 1991 (two years after Germany passed its PCP ban), and on 112 Azo dyes that had the potential to generate the banned 22 dyes, in 1997 (three years after the German Azo ban).¹⁷ In the case of Azo dyes, the Indian ban was passed despite strong opposition from the Dye Manufacturers Association of India (DMAI), the apex industry association of the chemical companies that would be directly affected by the bans.

V. The domestic bans and upgrading: creative use of coercive regulation

The passing of the domestic bans by the Indian government was a critical turning point in the crisis of compliance and transformed the regulatory field within which adjustment occurred. These bans were different both from the German regulations on PCPs and Azo dyes, as well as from standard market-based or command and control approaches to environmental regulation that are usually followed. They were at once wider than the German bans – in that they banned not just products that used these chemicals, but their actual production – and at the same time more specific – by clarifying *what not to do*, they narrowed the sphere around which collective action had to occur. Unlike standard approaches where the focus of the ban is on regulating *use* by polluters through monitoring and sanctions, in this case, the government banned the *production* - (*i.e.*, all *handling* of PCPs and Azo dyes (Ministry of Commerce, Memo dtd 26.3.1997). By banning the overall handling of the notified chemicals, the government effectively redirected the way in which the pressure of adjustment flowed. The ‘burden’ of adjustment was now not only on the users of the banned chemicals, namely, the myriad small tanneries and traders of raw

hides, but most centrally on the producers of the banned chemicals, a small but visible segment of chemical input companies. By shifting accountability of compliance to the source of the problem – to the chemical companies that produced the banned PCPs and Azo dyes – the government implicitly targeted a segment of the leather supply chain—the preservative and dye-makers in the chemical industry—that was less dispersed and more circumscribed than the myriad small and informal tanneries that used the chemicals, and consequently easier to monitor.

But the chemical industry was hardly homogenous. With 60% of the industry’s output coming from large, primarily multinational firms (such as BASF, Clariant, Bayer, CIBA, Dupont and others), and 40% from small and medium firms, the chemical industry strenuously opposed the bans. The most vociferous opposition came from the small and medium dye-makers who dominated DMAI’s membership, and are spatially concentrated in the state of Gujarat. Despite their protests, however, the bans came into effect. But the government was not immune to these protests. To blunt the impact of the bans on the smallest dye makers the government, with CLE support, simultaneously reduced import duties on non-PCP and non-Azo dyes from 200% to base rates of 20%. In the short run therefore, while many large multinational companies could access safe chemicals from their existing global stocks, small dye-makers could begin to switch to safer substitutes through imports for the time being.

In the medium run, the government’s ban on the production of PCPs and Azo dyes put pressure on chemical companies to develop safer alternatives domestically. The large, mainly multinational leather chemical companies who had the resources and international reach to access substitutes, took the lead in developing safer alternatives.¹⁸ The government indirectly encouraged experimentation by only specifying what *not to* produce, not what *to* produce. This unleashed a vigorous process of innovation by chemical companies as they worked with their customers, the tanners, to try to achieve alternatives that would be affordable to their clients (Pillai 2000). Once alternative dyes came on line, it was in the chemical companies own interest to market them as widely as possible to their clients, the small tanneries. Thus, rather than the

state monitoring the use by tanneries of the banned chemicals, it was the chemical companies who marketed locally developed substitutes. To get firms to adopt their products, the chemical companies offered credit and technical assistance to small firms, and worked with them to get the correct colors and finishes (see Pillai 2000 for details).

Thus, although the chemical companies and dye-makers had initially protested the government's ban, at the end, they, rather than the state, became the biggest promoters of the substitute chemicals across the small tanneries and dyeing companies in the leather and textile sectors—their primary customer base. Rather than the state enforcing compliance, then, it was the chemical companies that became the chief “enforcers” of the bans, and the main disseminators of the alternative dyes and preservatives among the thousands of small tanneries and dyeing houses that were trying to phase out the use of PCPs and Azo dyes.

This highly effective outcome of a restrictive regulatory measure was not an automatic result of the state's use of its coercive power; the bans were effective because the state collaborated extensively with the same industry that it regulated (Tendler 2001). Unlike most bans which emerge as top-down fiat, in this case the domestic ban was born out a messy and uncertain process of participation and negotiation between various segments of the state, the key leather support institutions (such as CLRI, NEERI, CLE), and powerful exporters and tanners whom the bans directly affected. The domestic ban was effective also because it reinforced existing cooperative ties between the chemical companies and their small customers, as Pillai 2000 has documented extensively.¹⁹ These ties helped lower the cost to the small tanneries of adjustment, and the extensive technical assistance that small tanners received from the chemical companies helped *sustain* their switch to the substitutes.

However, even as chemical companies disseminated alternative chemicals widely, public sector intermediation was still crucial for extending the alternatives to the smallest firms. For example, many of the smallest tanneries and dye-makers remained excluded from the chemical companies' private sales blitz because small firms buy in much smaller volumes than the scale at

which chemical companies were marketing their new products. – e.g. packages of no less than 5 or more kilograms. This is where the local and regional agencies that the state had put in place during the sector’s prior period of growth under import substitution played a critical role. Acknowledging that small firms cannot afford to buy in large volumes, local support agencies bought the larger packets and re-packaged them into smaller volumes for distribution to the smallest tanneries and textile dyeing firms (Dr. Nadigar interview, Mumbai 2003). When the chemical companies learned of this approach, and saw the profitability of reaching a much wider market, they themselves adopted smaller-sized packaging to reach the smallest buyers (Dr. Nadigar interview, 2003). The state’s intermediation and anchoring of implementation within this extensive, pre-existing network of regionally embedded leather support agencies was critical to ensuring that adoption spread to the smallest firms. These institutions were created during a previous, pre-liberalization period, for a different regulatory purpose (inspecting exports destined to the Soviet Bloc). In the course of the current crisis not only was their prior existence important, but they upgraded themselves organizationally, and technically and transformed themselves to act in a different direction. Most centrally, they altered their very mission and re-shaped their linkages with their institutional environment to become one-stop sources of quality control and environmental compliance, and even new institutions geared toward diffusing international standards have emerged in the wake of these crises (Textile Committee 2003, Sahasranaman 2003 and interview, Chennai 2003, Pillai 2000)..

In sum then three points can be made about the unusual way in which the state structured its domestic response to the trade-related bans. First, in legislating its own domestic ban on PCPs and Azo dyes, the state did not merely respond to pressures from powerful segments of the leather industry, though the clout of the exporters was an important trigger. Rather the state acted deliberately and pragmatically, in part because its own mission was threatened. That it was the Ministry of Commerce (MoC), and not the Environmental ministry that was at the center of the government’s effort to achieve compliance with the German ban was most significant. Promoting

exports is the MoC's central mission, and the German bans directly threatened it – by placing at risk one of the country's most important export markets, and jeopardizing over a billion dollars in export revenues. Given the high stakes, including potential employment losses from a disrupted export sector, it was in the Ministry of Commerce's own interest to resolve the crisis as quickly and as effectively as possible.

Second, the way in which the government structured its bans did not burden its own agencies in the usual monitoring-intensive and institutionally demanding way that most punitive standards do. Because the emphasis was not on inspecting each small tannery and holding it to a standard at the threat of sanctions as is usually the case in coercive bans, but rather on ensuring that the larger and more easily identifiable chemical companies and traders did not produce the banned chemicals, the costs of implementing such a ban was lower than usual, both financially and institutionally. This is an important reason why the problems of weak institutional capacity that plague implementation in typically overextended environmental bureaucracies did not materialize in any significant way in the Indian response to the PCP and Azo bans.²⁰

A final way in which the state's involvement – and indeed the state's institutionalization of the environmental standards that Germany imposed – was crucial for long-run compliance, lay in the substantial positive externalities generated by the state's bilateral negotiations with Germany around the transfer of testing technology. These negotiations directly helped lower the cost of adjustment by helping upgrade India's key R&D agencies in each of the clusters where leather processing is concentrated, culminating in the establishment in 2002 of a state-of-the-art leather testing and certification lab in India, the first ISO 17205 certified lab of its kind in Asia, funded by the German government (Indo-German Export Promotion Project, interview, Delhi 2003).

As we saw at the outset, the German bans on PCPs and Azo dyes carried with them no clear standards, or protocols to detect micro-quantities of the chemicals that were being banned. This led to consistent inconsistencies between the results of tests undertaken by CLRI, the Indian

leather research institute, and German testing agencies, and rejections continued apace. At the behest of CLE and CLRI, the Ministry to Commerce entered into extensive negotiations with Germany and its technical agencies, specifically the premier chemical testing institute, PFI (Pruf- und Forschungsinstitut) to help resolve the problem in the mid 1990s. This ongoing relationship produced three key outcomes that have had a lasting impact on the upgrading of the Indian leather testing infrastructure. First, Germany channeled over Rs. 120 million to the Indian leather industry through the Indo-German Export promotion project (IGEP), a new trade-facilitating institute set up in 1988 in New Delhi as a partnership between the Indian Ministry of Commerce and the German Ministry of Economic Cooperation (BMZ).²¹ This funding, supplemented by funds from the Government of India, helped establish four testing labs for detecting PCPs in each of the country's major leather clusters. Second, Germany helped CLRI upgrade its testing equipment by donating key equipment and providing ongoing training (via IGEP) to set up an EXEL lab that used German certified DIN methodologies for the detection of toxic chemicals. The transfer of German-based DIN methods helped lower cross-national discrepancies in testing and reduced the ambiguities in the specifications of sensitive inputs (see Abdel-Latif and Nugent 1999). Later in 1996, after the Azo bans were announced, the Ministry of Commerce helped broker an ongoing collaboration between CLRI and the German Institute PFI, that led to the transfer of certification protocols (such as Eco-Tex) to CLRI and other laboratories in 1996-1997 (Ministry of Commerce interview, Delhi and MoC memo on Azo Dyes 2003). The local availability of internationally accepted testing and certification norms was crucial to helping lower the costs to exporters and tanners of testing for and switching to substitute chemicals, allowing them to forgo sending samples overseas for testing (Ministry of Commerce interview, and memo on Azo dyes 2003).²²

Finally, through bilateral negotiations Germany helped fund the establishment in India of Asia's first ISO 17025 certified chemical and physical testing lab in the newly established

Ministry of Commerce funded, Footwear Design and Development Institute (FDDI) near New Delhi that will provide internationally certified physical and chemical testing facilities for leather products. That Germany, the regulation-imposing country funded these technologies and testing infrastructures in India -- that are now available to all local firms, beyond the exporters originally affected by the bans -- reflects the importance of each market to the other: Germany is an important destination for Indian leather goods and textiles, as we saw earlier, but Indian leather goods are important to Germany as well – and constitute nearly a quarter of Germany’s leather goods imports (IGEP interview, April 2003). It is not surprising therefore that bilateral negotiations between India and Germany around the leather bans and compliance were a two-way process.

Although several problems continue to plague the Indian leather sector, such as low wages, poor working conditions and lagging technology, there is widespread agreement that India’s leather industry has generally dealt with the PCP and Azo dye problem (Indo German Export Promotion Project interview, New Delhi, April 2003). By the late 1990s, less than 1% of the samples tested show any signs of Azo dyes and less than 7% test positive for Azo dyes (CLRI cf. Pillai 2000 - See tables 3 and 4). Indeed, in the past five years tanners and exporters who have adopted safer chemicals have made an environmentally conscious brand image for themselves, boldly labeling their leather and leather goods PCP- and-Azo-free at trade fairs and in their sales literature. As one official noted, “it has become a fashion to show that your leather is PCP and Azo-dye free” (Interview, CLE, Mr. Jamati, Mumbai, 2003), because it signals better quality and fetches higher prices. Though precise estimates of this market-broadening effect of environmental compliance in the leather sector are yet to be measured, some analysts have documented a market expansion effect of nearly 10% for large exporters who adopted Azo-free chemicals in the textile industry (e.g., Century Mills, see Fengzhong 1999, Robins and Roberts 1997). Though more research needs to be done, this telling marketing detail suggests that the possible spread effects of environmental compliance can be positive and that in world where

global standards are becoming more, not less important, environmental compliance and environmental upgrading, under certain conditions, can be trade-enhancing rather than trade-diminishing, as is currently assumed.

VI. Conclusions

Going beyond standard portrayals of the assumed trade-offs between environmental compliance and export competitiveness, the literature on global standards has recently begun to explore the political and institutional conditions under which small firms and suppliers can comply with the increasingly stringent global standards that are increasingly becoming associated with trade, without necessarily undermining their competitiveness. This study contributes to this emerging literature. A important theme that has emerged in the recent literature on standards is that effective compliance with the emerging standards calls for new institutional forms of governance or ‘policy networks’ that span or cut across local, micropolitical processes and wider global processes of which they are a part and which they simultaneously help constitute (see for example, Gereffi and Mayer 2004, Schmitz 2004 p 14-15 and Messner 2004). Empirically, this view has been illustrated by evidence drawn mainly from the important role that global buyers, or lead firms at the head of powerful global value chains, or key business associations play in organizing intricate policy networks that help supplier firms comply with global norms, including private codes of conduct and systems of social responsibility. This paper extends the debate by providing insights about how and under what conditions the state and its agencies can play a critical role in constituting the institutional networks that can help small suppliers comply with stringent global standards—in this instance by directly and indirectly helping to lower the cost of compliance.

The paper examined a case where a sprawling, labor intensive, and small-firm dominated sector (leather in India) succeeded in responding relatively effectively to two stringent trade-related bans on toxic chemicals (PCPs and Azo dyes) imposed on it by its

largest buyer – Germany. The paper found that broad-based compliance by India's leather industry to the bans was the result in part of a deep process of negotiated collective action in which the Indian state – and not just lead firms such as large Indian exporters and their global buyers – played a key role. In contrast to the ambiguities that often surround effective state action around the environment (e.g., see O'Rourke 2002), the state not only played a deliberative role in helping firms adjust to the crises but demonstrated relative autonomy by sometimes acting *against* the interest of powerful segments of the leather chain--specifically in this case, the large chemical input producers and manufacturers of the banned dyes and preservatives.

Two elements were critical to the processes of negotiation and collective action through which the leather industry successfully achieved compliance. First, a high degree of porosity and interaction between the government's key research institutes in the leather sector and the industry's most prominent export association, CLE, which was a quasi-public statutory body with special access to the state, helped anchor the central government's efforts within the pragmatic concerns of local firms. These institutions, CLE, CLRI and other support agencies had themselves been created during a prior period of rapid growth and policy-induced transformation of the leather industry into a value added exporter in the 1970s and 1980s (see Pillai 2000, UNDP 1999, Tewari 2001). These powerful quasi-civic and industry institutions that were also simultaneously part of the state, served as boundary-spanning organizations and 'distributed power centers' outside government that both, helped trigger state action, as well as provided important checks to it.

The second key decision by the government was to structure its enforcement of the new regulations differently from traditional approaches to monitoring and enforcement. By implicitly targeting large firms in the input industry (chemical and dye makers), rather than the many small firms in the user industry (tanneries), and by *banning the production* of the notified chemicals,

rather than merely monitoring their *usage* in the final goods sector, the state changed the dynamic of enforcement and implementation. Rather than the state's line agencies monitoring user firms, the input producers – the large and medium sized chemical companies who were now forced to develop alternative chemicals became the primary “enforcers” and diffusers of the bans. This changed the institutional demands on cash-strapped environmental agencies, and in both cases the structure of the industry, past policies of the government such as reservation, and the nature of the government's approach to the new standards imposed a set of pressures on the sector's lead input providers and exporters to upgrade and bring along the sector's many small tanners into compliance with the international and domestic standards.

But while the Indian government's regulatory actions (imposing the bans) were important in transforming the way in which the pressures of the German standards flowed across the leather value chain, the bans by themselves were insufficient to ensure broad-based compliance in a sprawling, small firm dominated sector. Without the prior existence of an extensive network of regionally embedded public and quasi-public support institutions and testing labs that helped diffuse the pressures of compliance to the smallest firms, the effect of these bans may likely have remained much more fragmented and partial.

Thus, the region's large exporters and small firms were successful in adjusting to trade-related environmental standards not due to any automatic result of the market discipline that the trade-related ban imposed on exporters, nor due to any traditional command and control apparatus of the state. They succeeded because the actions of the various actors and state institutions involved actually helped lower the cost of adjustment, generated ongoing learning, which the prior presence of a network of local and regional agencies – public and private – helped diffuse widely across the value chain.

Finally, the paper suggests that standard-setting by governments (nation states) generates quite different pressures and upgrading paths for supplier firms than when large global buyers or individual corporations set standards such as in private codes of conduct. Standard setting by

nation states offers greater political space for negotiation and assistance in ways that can spill over more widely beyond those originally impacted. Private codes of conduct are more firm-specific in terms of their upgrading effects, with their reach extending to the immediate supply chain of the exporters affected by the private codes or norms. In the case examined here, bilateral negotiations between the standard-imposing government and the buyer governments not only helped facilitate the transfer of critical technology, funds and infrastructure from the standard-setting country to the supplier country in ways that benefited the sector as a whole and helped defray some of the costs to the supplier country of compliance.

That it is was the Ministry of Commerce, which typically *opposes* stringent environmental legislation (and not primarily the environmental ministry) that played a central role in coordinating the Indian response to the German bans was critical to enabling this bilateral negotiation. The Ministry of Commerce's own central mission -- of promoting trade and exports -- was at stake, and enabling broad-based compliance became as much a part of safeguarding its own legitimacy as of responding to political pressures from powerful exporters at the top of the leather value chain. But compliance was not just state-driven; it was as a combination of collective action, public responsibilities, as well as market incentives, where the prior existence of a regionally embedded and diverse network of institutions was critical to translating the efforts of the state, segments of the industry and market pressures into a sometimes fractious, but pragmatic basis for dynamic collective action. Segments of the state, market and industry thus constantly redefined and absorbed key roles not usually associated with their standard mandates, in ways that effectively institutionalized the process of environmental compliance in this instance.

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¹ The lack of adequate testing and certification facilities in developing countries forces supplier firms to rely on costly testing procedures carried out in foreign labs. This imposes costs that are untenable for most developing country firms, especially small firms (see Anderson 1996, Chaturvedi and Nagpal 2003).

² This targeting of an input industry though unusual has parallels in other countries, most notably the ban on CFCs in the United States. We thank Robert Keohane for pointing out the similarities.

³ Detailed discussion of the role of the chemical industries and input producers in their innovative search for alternative dyes in collaboration with small firms is outside the scope of this paper. See Pillai 2000 for details. The focus of the current paper is on the role of the state in orchestrating this broader process of negotiated collective action.

⁴ The chemical testing lab is part of the newly established Footwear Design and Development Institute near Delhi.

⁵ This is in contrast to other efforts, such as by the US government to bilaterally force an increase in the Indonesian minimum wage in the 1990s via threats to withdraw preferential tariffs negotiated with Indonesia. These efforts by the US to bilaterally force wage increases led to widespread lack of compliance by firms and also to higher levels of unemployment according to some studies (Harrison and Scorse 2004).

⁶ The major leather producing centers in India are: Agra (footwear), and Kanpur (saddlery) in Uttar Pradesh, Delhi (garments and bags), Jullunder (garments, leather gloves, sports goods) in Punjab; Calcutta (wallets, bags, gloves, small leather goods) in West Bengal, Bangalore (garments, footwear) in Karnataka, Hyderabad (leather goods) in Andhra Pradesh. These clusters are dominated by the leather clusters in Tamil Nadu.

⁷ By 1996 the Netherlands had already passed legislation banning the import and sale of goods containing Azo dyes. By 1998, Sweden, France and Denmark were on their way to doing the same. (See Fengzhong 1999).

⁸ For example, in Egypt, where only 1% of exports were affected by the German bans, a number of firms simply switched exports to laxer non-European (but lower value) countries in response to the ban on PCPs and Azo dyes (see Abdel-Latif and Nugent 1999).

⁹ Both the PCP and Azo dye bans were product related regulations (as opposed to process related standards) and as such involved the substitution of specific inputs rather than changes in production processes. That they were product- rather than process related regulations is what allowed the German bans to stand under WTO's Article 20 which allows countries to enact legislation to protect the health of their citizens.

¹⁰ An analysis of the detailed learning effects of the sequencing of the bans is beyond the scope of this paper. It is the subject of a separate mimeo.

¹¹ Though estimates vary, respondents said that the available alternatives added anywhere from Rs2 per kg of chemical to 20-30% more in terms of overall production costs, to 2.5 times more expensive especially in the case of PCPs which were very cheap and easy to produce (Dr. Nadigar, interview 2003, Chaturvedi and Nagpal 2002, Gopalan 2003 presentation).

¹² In future research it would be worth investigating whether and to what extent environmentally-compliant German chemical companies brought direct and indirect political pressure to bear on the German government to institute the PCP and Azo dye bans.

¹³ This policy, aimed at preserving employment in the small scale sector, and protecting minority employment (a majority of the tanners are from the Muslim community, while exporters and manufacturers are more heterogeneous), was discontinued in 2002.

¹⁴ The PCP ban prohibited levels exceeding 5mg of PCP per kilogram of leather, compared to existing standards that allowed up to 1000 mg of PCP in a kilogram of leather. In the case of Azo dyes, whereas previously leather products had never been tested for azo content, now the regulations prohibited all traces of the chemicals that could potentially generate the 22 specific azo amines that Germany had declared carcinogenic.

¹⁵ The testing procedures were finally laid out by the German Health Ministry in the Fifth Amendment which took effect in 1997—three years after Germany first announced the ban on azo dyes (see Fengzhong 1999).

¹⁶ The absence of this testing and certification infrastructure was not just a matter of a lag between developed and developing countries in adopting costly best practices already available in the field—in this instance it also involved uncertainties among scientists in the international community over protocols for testing micro-quantities of PCPs and Azo dyes (Sahasranaman 2003, CLE interview 2003).

¹⁷ One government official noted that “The Indian government is not in the business of implementing domestic regulations of other countries. It acts to uphold its own rules...it is one thing for Germany to prevent the use of toxic chemicals in products sold in Germany; it is another thing preventing the spread of these chemicals in India” (Interview, Mumbai, 2003).

¹⁸ Many smaller firms and merchants, meanwhile, turned to the import of substitute dyes. But unlike countries like China where imports were the chief response of the leather sector to the German bans, in India the share of imports in the total quantity of leather chemicals consumed never exceeded 10% (Sahasranaman interview, Chennai, 2003).

¹⁹ Dye-makers and chemical companies routinely work closely with their clients, the users of their products—showing them samples, giving them chemicals on credit and offering technical assistance, all as a way to increase sales. In the wake of the bans, as they developed new chemicals, this collaboration only increased (see Pillai 2000).

²⁰ It also helped that the bans encompassed only a small segment of all Azo dyes. According to one official, “there are six classes of dyes. Of that one class is Azo dyes, of that 30% were banned” (Dr. Nadigar, Interview, Mumbai 2003).

²¹ The IGEP also became an important channel for the early dissemination of information about environmental standards coming out of Germany – providing “early warnings” as some have put it (Abdel-Latif and Nugent 1999).

²² Interviews with firms however revealed that some firms of high end leather products continue to send their samples to Germany for testing, “just to be on the safe side.”