



Recovery of a Mexican Cluster: Devaluation Bonanza or Collective Efficiency?

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Summary. — Mexico, as many other developing countries in Latin America and elsewhere, has been moving in the 1980s toward a liberalized trade regime after a long period of import substitution. This paper analyzes the impact of trade liberalization on the cooperative behavior of shoe firms located in a cluster in Guadalajara. The empirical evidence shows that cooperation has increased. It also suggests that cooperation positively influences firms' performance and together with a favorable market environment contributes to the cluster's recovery. The study is based on fieldwork carried out in Guadalajara in 1996. Qualitative information was collected through in-depth interviews and quantified responses came from a questionnaire survey covering a sample of 63 shoe manufacturing enterprises. © 1999 Published by Elsevier Science Ltd. All rights reserved.

1. INTRODUCTION

The literature on industrial districts in advanced and less developed countries has shown that clustering helps local enterprises overcome growth constraints and compete in distant markets.¹ In this paper we explore the question of whether firms derive some advantages from clustering to face turning points.² More precisely, we investigate the ability of clustered firms to shift gears in the face of the challenges posed by trade liberalization. Our research proposition is that (raising) cooperation among firms belonging to a cluster is essential for them to be able to compete in the new market environment. This hypothesis is investigated in the Mexican footwear cluster of Guadalajara.

Mexico, as many other developing countries in Latin America and elsewhere, has been moving in the 1980s toward a liberalized trade regime after a long period of import-substituting industrialization. The first stage in import liberalization came in July 1985 when licenses were eliminated for almost 3,600 items. In 1986, with Mexico's accession to the GATT, the country committed itself to eliminate all official import prices by the end of 1987. In December 1987 the Economic Solidarity Pact was launched bringing government, entrepreneurial organizations and labor unions to an agreed

position to accelerate trade reforms. The result was a tariff structure with five levels of 0-20% *ad valorem* taxes. With these tariff reductions, the Mexican trade reform was completed (Ten Kate, 1992).

This reform had a significant impact on Mexico's footwear sector. From June 1985 to December 1988 the value of domestic production covered by import licensing fell from 99.1 to 0% and the average tariff decreased from 46.8 to 18.1%. In response, imports grew from 0.2 million pairs in 1987 to 107 million pairs in 1991. This dramatic increase in imports was accompanied by a contraction in domestic production from 245.2 to 199.6 million pairs. In this new competition, Mexican shoe manufac-

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turers were initially ill-equipped to compete with imports on price, quality and fashion content.

A recovery from the crisis in the shoe sector came in 1993 when tariffs on imports from China were increased. The footwear industry also took advantage of the 1994 peso devaluation, boosting exports and increasing import prices. Finally, in 1995 the government increased tariffs on imported shoes from the rest of the world.

The return of (at least partial) import protection, together with the peso devaluation, are commonly seen as the basis of recovery for the Mexican shoe industry. Can this recovery be entirely explained as a windfall gain from changes in the trade regime? Or are there structural changes in the footwear industry which have enhanced the ability of domestic producers to compete? Is the industry's recovery the outcome of a process of restructuring or the result of devaluation and return to protection?

This paper addresses these questions focusing on structural changes in vertical and horizontal relationships between Mexican shoe firms and their suppliers, subcontractors, buyers, competitors and supporting institutions. These relationships are investigated in the footwear cluster of Guadalajara. Our objective is to assess if trade liberalization induces greater cooperation in vertical and horizontal linkages. Our empirical evidence shows that cooperation has indeed increased. We also suggest that cooperation positively influences firms' performance and together with a favorable market environment contributes to the cluster's recovery. Furthermore, within the cluster heterogeneity is also increasing because only some of the firms enter into cooperative actions.

The study is based on the findings of field work carried out in Guadalajara, one of the two main Mexican shoe clusters³, in August and September 1996. Qualitative information was collected through in-depth interviews with shoe entrepreneurs, suppliers, buyers, trade organizations and other key informants, and a quantitative survey conducted covering a sample of 63 shoe manufacturing enterprises.⁴ Furthermore, the study also draws on primary field data from 30 firms collected in 1991, prior to the results of the liberalization program materializing⁵ (Rabellotti, 1997).

The following section discusses the impact of trade policy reform in clusters. Then, in a brief historical overview of the Guadalajara cluster,

its main turning points and its recent growth record are presented. The changes that have occurred in backward, forward and horizontal linkages are discussed in Section 4. Section 5 uses regression analysis to test the relationships between firm performance and cooperation and Section 6 investigates if size plays a role in the cooperation behavior of the sample firms. The final section summarizes the main findings.

2. TRADE LIBERALIZATION AND CLUSTERS

Trade policy has long been acknowledged as having a major influence on the process of industrialization in developing countries. The case for trade policy reform is extensively discussed in the economic literature.⁶ Here we need only to recall that according to orthodox neoclassical theory trade liberalization is expected to produce both static and dynamic benefits. The static argument refers to the reduction of inefficiencies arising from resource misallocation. The dynamic efficiency gains are expected to come from greater capacity utilization, greater specialization, enhanced technological capabilities, greater learning by doing, higher process and product innovation. A representative statement can be taken from Balassa (1988, p. 45):

The carrot and stick of competition gives inducement for technological change. For one thing, in creating competition for domestic products in home markets, imports provide incentives for firms to improve their operations. For another thing, in response to competition in foreign markets, exporting firms try to keep up with modern technology in order to maintain or improve their market position.

Although this view became conventional wisdom, the empirical foundations of such arguments regarding the dynamic benefits of liberalization are not very clear. Rodrick (1995) presents a survey of empirical studies at firm, industry and country level, emphasizing that there are problems of measurement and direction of causality.⁷

On the contrary, a case in which trade liberalization generates unambiguous positive dynamic benefits is in presence of excess demand, when firms have no need to increase demand for their product by improving it. This is what happened in the Mexican shoe industry. Before trade policy reform, for many decades the footwear manufacturers took advantage of

a captive market where there was excess demand; making money in the sector was easy because every kind of product was sold, no matter what its quality, design and cost. Trade liberalization increased the incentive for introducing product and process innovation, improving quality, increasing productivity and lowering costs (Rabellotti, 1997; Woodruff, 1997).

In this paper, we test the hypothesis that in the Guadalajara cluster trade policy reform has also had the effect of increasing cooperation among shoe manufacturers, with their suppliers, subcontractors and buyers. How is this increase in cooperation related with the dynamic effects of liberalization, predicted by orthodox economic theory?

In the small but growing literature on industrial clusters in developing countries, cooperation, together with external economies,⁸ represent those collective effects whose interplay is supposed to bring about efficiency gains for firms in the cluster and to increase their capability to innovate and grow (Rabellotti, 1997).

As regards trade liberalization and its dynamic benefits, we saw that in presence of excess demand the opening up of the market increases the incentive for innovating, improving quality, reducing costs. Furthermore, we know that in a cluster cooperation among firms can induce innovation and growth. Therefore, this paper provides an empirical test, for the case of a Mexican cluster, of the hypothesis that trade policy reform brings about more cooperation among firms and that this produces dynamic efficiency gains.

3. THE SHOE CLUSTER OF GUADALAJARA

(a) *A brief historical overview*

Guadalajara, capital of the state of Jalisco, located north-west of Mexico City, is the second largest city in the country⁹ and the third most important industrial center after Mexico City and Monterrey. The economy of Guadalajara is traditionally characterized by a high presence of small firms in sectors such as food, textiles and shoes (Arias, 1985). Since the last century, there has been a local tradition of shoe production in small workshops to satisfy local demand. According to Arias (1992), in the 1920s the footwear industry was the most

important industrial sector in Guadalajara: there were 34 plants producing shoes, one making lasts, one tannery and about 100 small shoe workshops. From the 1930s, the footwear industry began to develop rapidly helped by the presence of a US enterprise, United Shoe Machinery, which lent machinery to local firms and contributed in spreading technical know-how within the cluster. During the 1940s the shoe sector continued to expand, generating also a considerable increase in the number of local suppliers. At that time, Guadalajara was already well known in the rest of the country for being one of the main centers for shoe production.

In the 1950s the industry experienced a boom with continuous expansion in the domestic market and some occasional export initiatives, mainly to the United States. In 1959, the local *Camara del Calzado* created a National Footwear Trade Fair in Guadalajara, contributing to the sector's growth. Growth accelerated during the 1960s and the 1970s, thanks to rising domestic purchasing power, fast population increase and protection of the domestic market.

During the 1980s, the industry began to suffer from the decline of domestic purchasing power, but the main negative shock came from the opening up of the market in 1988 when tariffs on imports were cut and all import licenses eliminated (Dominguez-Villalobos and Grossman, 1992). Imports, which accounted for less than 0.1% of the domestic market in 1987, increased substantially and by 1991 accounted for nearly a third of domestic sales. The flood of imports caused a profound crisis in the cluster: many firms went bankrupt, others drastically reduced production.

Following a series of events there have recently been some signs of recovery from import liberalization. In 1993 the Mexican government placed anti-dumping tariffs (varying from 160 to 1000%, according to the type of shoes) on imports from China. In 1994 the peso was devalued. Finally in 1995 the tariff on shoes imported from the rest of the world was put back at 35% for a period of five years. This combination of events seems to have provided the breathing space and time for Mexican shoe firms to restructure.

(b) *Performance and economic structure of the cluster*

This section analyzes the most recent years, with a particular emphasis on changes since the

turning point, that is, the 1988 liberalization of the domestic market. Because some of the changes are not unique to Guadalajara, we present some empirical evidence on the Mexican shoe industry in general as well as some specific data on the cluster under analysis.

In Table 1 we find confirmation of the major turning point that occurred in 1988, indicated by a huge increase in imports during 1988–92 and by a decrease in the total number of pairs produced. This table also shows a substantial increase in exports in the 1990s, with the exception of 1993 and 1994 which were the most severe years of crisis for the industry and for the Mexican economy as a whole. Exports again accelerated after the devaluation in 1994. On the import side, there was a continuous decline since 1993 when tariffs on Chinese shoes went up.

While the impact of the 1988 turning point is very evident from the data presented, the more recent recovery, facilitated by the increase in tariffs and the peso devaluation, is less clearly detectable from aggregated data. There is an increase in exports, but the decrease in output seems to continue, although at a decreasing rate. This may be due to time lags between the change in external circumstances and the reaction of local producers. Furthermore, the decreasing number of pairs could be compensated by an increase in value added.

As regards the structure of the Mexican footwear industry, according to the 1994 Industrial Census the sector is composed of 4,981 enterprises with a total employment of 80,971 people. Of this total 82% of firms are small, employing fewer than 15 persons. In

Guadalajara, according to estimates by the local trade association, the number of footwear firms in 1993 was about 1,100 with 25,000-odd employees, producing 27% of all footwear made in Mexico (ITESM, 1995). Unfortunately more recent data are not available, but according to the director of the local Camara del Calzado there has been a substantial decrease in the number of firms over 1993–95 (interview with Ricardo Orta, September 1996). Other informants confirmed the declining number of firms, stressing that small and micro firms as a size group were most severely hit by the crisis. Considering only the members of the Camara, in Guadalajara the member firms went down from more than 500 to 315.

The rest of the paper concentrates on Guadalajara and analyzes changes in backward, forward and horizontal linkages as a consequence of the turning point.

4. LIBERALIZATION AND COLLECTIVE EFFICIENCY

This and the next two sections are based on the fieldwork carried out in Guadalajara. Information was collected through in-depth network case studies, interviews with key informants and a questionnaire survey covering a sample of 63 shoe firms.

For the network case studies, six enterprises of different size were selected (two with less than 20 employees, two with more than 20 and less than 70 and two with more than 70). For each size class, with the assistance of the local trade association,¹⁰ one enterprise known for

Table 1. *The Mexican footwear industry, 1970–96*^a

Years	Total n° of pairs produced (millions)	Exports (US\$m.)	Export year growth rate 1990–96 (%)	Imports (US\$m.)	Import year growth rate 1990–96 (%)
1970	n.a.	3.4		15.5	
1975	n.a.	1.1		20.8	
1980	n.a.	31.0		62.0	
1985	232.6	27.3		15.7	
1988	245.2	68.2		54.3	
1990	208.5	77.4		127.8	
1991	199.6	126.5	63.4	189.9	48.6
1992	193.3	160.6	26.9	213.5	12.4
1993	173.3	150.3	-6.4	172.7	-19.1
1994	172.4	156.4	4.0	145.2	-15.9
1995	167.0	201.9	34.8	87.4	-39.8
1996	n.a.	355.3	68.5	74.0	-15.3

^a Source: CANAICAL (1996).

being dynamic and innovative and the other more conservative were picked. Each of the enterprises selected was also asked for the names of their main suppliers and buyers, who were there interviewed to get their perspective on the vertical relationship.

As regards the sample survey, 63 enterprises were randomly taken from the registry of members of the local entrepreneurial association.¹¹ The sample is stratified by size: 20 enterprises employ 70 or more employees, 21 between 21 and 69 employees and the remaining 22 employ 20 or fewer employees.

In designing the questionnaire, the initial objective was to observe changes in cooperation over time.¹² A pre-test however, revealed this to be infeasible in Guadalajara. We, therefore, collected information about the extent of cooperative behavior after trade liberalization. This is compared with the evidence of cooperation today with cooperation before the turning point using qualitative data from the 1997 survey and findings from a previous survey carried out in 1991 (Rabellotti, 1997).

(a) *Backward linkages with suppliers*

In Guadalajara, clustering induced the concentration of a critical mass of suppliers. Shoe producers can therefore buy most of their inputs locally, saving on transportation costs. But, the long closure of the domestic market has not encouraged the growth of a competitive industry of suppliers, hampering price, quality and service. From the previous empirical investigation it appeared that before liberalization most of the relationships between shoe manufacturers and suppliers were market links, based purely on price with very little cooperation (Rabellotti, 1997).

Since the opening of the domestic market and the increase in imports of shoes and compo-

nents, the relationships between footwear producers and suppliers have been improving and becoming more collaborative. As can be seen from Table 2, the share of the sample firms which after liberalization cooperate intensively with their leather and sole or heel suppliers is high for each of the different specified forms of collaboration.

The information collected during the network case studies confirmed that the manufacturer-supplier relationship is undergoing a profound process of change. Suppliers, who were also hit by liberalization,¹³ reacted to the crisis increasing their attention to quality, variety of products and fashion content. For the first time, after many years of copying from European and North American journals, suppliers have regularly begun to visit international trade fairs. According to most of the suppliers and manufacturers interviewed, there is now much more information locally available, which circulates within the cluster more intensively than before liberalization.

Notwithstanding these positive changes, the empirical investigation suggests that the local supply of competitive raw materials and components is still inadequate to satisfy the needs of the footwear industry, because only some of the existing firms have adapted their supply to the requirements of the open market. Many suppliers, especially very small ones, have as yet introduced few improvements to their products.

According to our survey, 68 and 76% of the sample firms maintained the same leather and sole suppliers respectively since the liberalization. The large majority of the firms interviewed declared that in case of problems with their suppliers they always try to solve them. This high stability could have two explanations: lack of choice or strong cooperation and commitment. It is hard to say which of the two explanations prevails.

Table 2. *Post-liberalization cooperation with suppliers*^{a,b}

	Leather suppliers (%)	Sole or heel suppliers (%)
Information exchange	54.0	54.0
Negotiation of payment and delivery conditions	55.6	41.9
Joint product development	44.4	50.0
Quality improvement	46.0	52.4
Respect of delivering time	58.7	66.7

^a % of firms which cooperate a lot with their suppliers. The total number of firms is 63.

^b *Source:* author's survey.

Quality components and raw materials are scarce and often not delivered on time. On this particular point, according to the survey results, many firms cooperate with their suppliers over delivery schedules. Nevertheless, many firms interviewed for the network case studies complain about late deliveries. In other words, there is more cooperation on this aspect but this has not solved all delivery problems. The suppliers themselves agree that this is a crucial issue, because they often receive orders at the very last moment, and thus are unable to satisfy demand on time. Furthermore, delivery time becomes a really serious problem when suppliers are required to develop *ad hoc* inputs.

From what has been said so far, it appears that there has been an improvement in supplier-manufacturer relations but also that such improvement has not been universal. Some categories of shoe firms obtain better services from suppliers than others. The most privileged are export-oriented enterprises. Suppliers prefer to work with them because they pay without delay, sometimes in advance.

Although export-oriented firms have more privileged relationships with their suppliers and generally do not complain about service and quality, many of them stress that to meet the delivery and quality conditions fixed by buyers they have to supervise their suppliers very closely. Firms are still learning how to work in an integrated system based on a common language, which facilitates understanding and reduces costs of transactions.

A major problem is lack of standardization or, in other words, lack of a common system of measurement adopted by the majority of the Mexican manufacturers and suppliers. In this respect, the footwear entrepreneurial associations together with the main suppliers have recently promoted a joint initiative to agree a common system of standards.

Going back to the relationships between shoe firms and their suppliers, a further differentiation derives from size. From the empirical investigation it appears that small firms usually have pure market relationships with dynamic, good-quality suppliers. To bargain on delivery and payment conditions, some small firms prefer to buy components and raw materials from traditional, low-quality suppliers.

To conclude, in Guadalajara two main effects of liberalization on the supplier-manufacturer system can be stressed:

—first, there is an increase in cooperation: suppliers and shoe manufacturers have begun to think and act as an integrated system to compete in the open, highly competitive market;

—second, this evolution concerns only some of the enterprises, generating an increasing heterogeneity by size and market within the cluster.

(b) *Backward linkages with subcontractors*

In Mexican footwear clusters division of labor is generally low, certainly much lower than in some Italian or Brazilian clusters investigated in recent studies (Schmitz, 1995; Rabellotti, 1995). According to our sample survey, 60% of the firms do not externalize any stage of the production process, 19% externalize upper stitching, 18% sole cutting, 14% hand stitching and 12% heel covering. The majority of firms which externalize some of their production have more than 70 employees.

A comparison with the results obtained in our previous investigation (Rabellotti, 1997) suggests that division of labor has not increased considerably since liberalization, but, cooperation with subcontractors has increased in several areas. While previously we did not find any sign of cooperation with subcontractors, according to the recent survey after trade liberalization 80% of subcontracting firms in the sample cooperate in quality control, 60% in information exchange and 52% in negotiation of payment and delivery conditions.

Moreover, there are some other signs of a slow evolution toward a greater division of labor in the cluster. For example, some firms have begun to specialize only in upper stitching, working for large enterprises, which have recently increased their export production and decentralized part of their orders for the domestic market to local subcontractors.

(c) *Forward linkages in the domestic market*

Before liberalization Mexican shoe producers mainly sold their products directly to retailers. Because of their geographical concentration they acted as a coalition, imposing their quality conditions onto a very fragmented market¹⁴ (Woodruff, 1997). In the protected domestic market, the local trade associations played a crucial role in gathering and diffusing information about retailers' behavior,¹⁵ reinforcing the dominant position of the Mexican manu-

facturers toward retailers. In his study on the structure of contracts in the Mexican footwear industry, Woodruff (1997) concludes that the institutional structure of the market in the closed economy gave the manufacturers the ability both to set the low quality standards for the industry and to judge whether those standards were met, reducing their incentives to make innovation in product quality and to develop a more sophisticated commercial strategy. Moreover, the existence of weak relationships between shoe manufacturers and retailers, characterized by very little cooperation, is also a clear result of our previous empirical investigation (Rabellotti, 1997).

In the post-liberalization environment, the power of the manufacturers' coalition was weakened by providing retailers with the option of procuring product from foreign producers. This had an initial negative impact on the industry, with large increase in imports and the loss of "morality" of retailers, who began to pay late and return unsatisfactory products with more frequency. Woodruff writes that "Trade liberalization also had the effect of replacing the quality standard set by the manufacturers' coalition with one determined by world markets" (Woodruff, 1997, p. 19).

The findings of our survey show that since trade liberalization there is some cooperation between shoe firms and domestic buyers in information exchange, quality control, negotiation of payment and delivery conditions and setting of product specifications (Table 3). Furthermore, relationships are rather stable, given that 67% of the sample firms trade with the same buyers.

Trade liberalization also stimulates an increasing concentration in the domestic market: wholesalers, large retail chains and department stores are growing at the expense of

small individual retailers. The large majority of firms interviewed for the network case studies said that after liberalization they increased their share of sales to wholesalers, large retail chains and department stores. The main reasons cited for their preference for large customers over small individual retailers were prompter and more reliable payments and larger size of orders.

In the Mexican domestic market, retail chains are probably the most innovative buyers. From our empirical investigation it appears that retail chains have recently improved their relationships with shoe manufacturers, increasing information exchange and frequently providing suggestions on components and raw materials and where to buy them. Some retail chains even provide to their suppliers components and raw materials needed for their products.

A new way of shoe distribution, increasingly popular in the Mexican market, is catalogue sales. The first catalogue distributor was established successfully a few years ago in Mexico City. The success of this first initiative soon became an example for others, adopting the same selling system: the distributors create a catalogue and then sell shoes to nonprofessional door-to-door sellers. Catalogue sales require a strong capability to plan production and stocks. Distributors create catalogues including a large number of different patterns, styles and colors and receive very fragmented orders, often consisting of a few pairs. In order to reduce the fragmentation of orders, some catalogue distributors have recently begun to offer training courses to some of their sales vendors.

From what has been said so far, it appears that the distribution system prompted by liberalization is increasingly characterized by a

Table 3. *Post-liberalization cooperation with buyers*^{a,b}

	Domestic market (%)	International market (%)
Information exchange	67.2 (N = 61)	80.0 (N = 25)
Negotiation of payment and delivery conditions	60.7 (N = 61)	60.0 (N = 25)
Technological assistance	18.0 (N = 61)	28.0 (N = 25)
Quality control	63.9 (N = 61)	80.0 (N = 25)
Setting of product specifications	42.6 (N = 61)	60.0 (N = 25)
Production organization	13.6 (N = 59)	20.0 (N = 25)

^a % of firms which cooperate a lot with their suppliers. In parenthesis, the total number of respondents for each question.

^b Source: author's survey.

clear division between production and commercialization. Shoe producers are aware that selling to wholesalers or large retail chains may create a dependency on them, but at the same time they know that in the new, highly competitive market it is difficult to sustain an independent sale strategy. According to many enterprises interviewed, the establishment of stable and collaborative relationships with buyers is the most effective way to limit their dependence on the distribution system. At the same time, most wholesalers and retailers interviewed know that to sustain competition with adequate quality standards and fast and reliable delivering times they need to establish stable and collaborative relationships with their suppliers.

(d) *Forward linkages in the export market*

Before devaluation, the manufacturers of Jalisco state (of which Guadalajara is the capital) exported an average of five million pairs of shoes per year. In 1995 exports doubled to 10 million pairs. Approximately 40 of Jalisco's 315 shoe factories, which are members of the Camara, now export with some regularity, as compared to only five in 1990.¹⁶

The export market is dominated by US brokers, who after the devaluation discovered in Mexico some enterprises able to produce good quality shoes at competitive price. Exporting firms are generally of large size: in our sample 59% of total exporting enterprises have more than 70 employees, 30% have between 21 and 69 employees and only 11% have less than 20 employees.

The exporting firms interviewed in Guadalajara are generally happy with their experience with brokers. Usually US buyers decide product specifications and then help the Mexicans to produce them. Manufacturers and brokers often collaborate in identifying, and sometimes directly purchasing, components and raw materials.

The exporters interviewed in Guadalajara all agree that they are learning a lot from the brokers, particularly regarding organization of production, quality control and technology. Table 3 shows that exporting firms cooperate intensively with international buyers in information exchange, quality control, negotiation of delivery and payment conditions and setting of product specifications. Other advantages of the export market mentioned by the enterprises interviewed are the large size of orders and the

relative standardization of products, allowing economies of scale.

Apart from exports to the US market, the cluster had a few isolated experiences of exporting to Latin American countries, often thanks to direct contacts established during the trade fair in Guadalajara. According to the Director of the Camara del Calzado, Latin America is a promising market, particularly for small and medium firms in Guadalajara, since quality and speed matter less.

To conclude, we can say that regular exports are only experienced by a restricted number of enterprises in Guadalajara—those with the capacity to supply large orders. Export manufacturers have to meet demanding price, quality and delivery standards. This requires rapid access to suitable inputs, quick response capabilities on the part of suppliers and therefore a well-functioning and highly integrated local footwear system. Exports thus generate positive externalities to other firms located in the cluster.

(e) *Horizontal linkages with other shoe enterprises*

Our interviews suggest that during the years of most intense crisis horizontal cooperation was particularly low: firms were too involved in their day-to-day survival, and were not able to establish cooperative links and invest in joint projects. In those years groups of firms, which had previously regularly exchanged information, machines or sometimes orders, ceased to do so. In addition, the crisis changed profoundly the relationships at cluster level, as many firms went bankrupt and others reduced or transformed their activities. Since the recovery, however, footwear enterprises have begun to build new networks. As can be seen in Table 4, this process is still at an early stage and only horizontal cooperation aimed at information exchange takes place among a significant number of firms. Other forms of horizontal cooperation within the cluster are quite low.

While horizontal cooperation did not emerge as a significant phenomenon in quantitative terms, our empirical investigation provided interesting information about recent as well as earlier initiatives which were not affected by the crisis.

Among the latter are the *agrupamientos industriales*, which began in 1983 and formally ended in 1987.¹⁷ The *agrupamientos* were promoted by National Financiera (Nafin), the

Table 4. *Post-liberalization cooperation with other local shoe enterprises (% of firms)*^a

	A lot (%)	A little (%)	Never (%)	Total number of firms
Information exchange	22.2	44.4	33.3	63
Joint orders	9.5	12.7	76.2	63
Joint product development	7.9	11.1	81.0	63
Machinery lending	6.3	17.5	76.2	63
Joint sale	7.9	12.7	79.4	63
Joint training	3.2	6.5	88.9	62
Joint purchase	7.9	12.7	79.4	63

^a *Source:* author's survey.

main Mexican development bank, using a methodology originally developed by UNIDO. The groups of firms, after a period of training, set up joint projects such as exchanges of machines, workers, orders, information or common purchasing of inputs. Over 1983–87 Nafin promoted the creation of seven groups of footwear producers, the majority of which went on to meet regularly after the end of the project. Furthermore, some other collective initiatives were stimulated as side effects of the program, namely the creation of a credit union and of a technological institute for the footwear sector.

Moving on to more recent experiences of cooperation, we observed several group initiatives. An interesting example is a group that brings together 80 suppliers of the largest Mexican catalogue distributor and aims to encourage cooperation in product development and joint purchase of components and raw materials. A planned project between the distributor and Nafin seeks to facilitate access to credit for firms belonging to the group.

Another group is composed of the main exporting firms located in Guadalajara. This group comes together for informal exchanges of information on technological aspects, to discuss availability and quality of components and raw materials and to exchange machinery and technicians.

To conclude, although the experience of cooperation described above can not be generalized, there are an increasing number of cases of interfirm collaboration in the Guadalajara cluster. It is, however, too early to tell whether this represents a shift toward a more cooperative culture.

(f) *Institutional linkages*

During the crisis of 1992–94 the three local branches of the trade association concentrated most of their efforts on lobbying the Federal

Government to support the footwear industry. Finally, in May 1995 a document for the development of the sector was approved, including as its main measure the increase in tariffs to 35% for a period of five years. This act is generally considered as the beginning of the recovery for the industry.

In Guadalajara, the crisis hit several institutions aimed at supporting footwear enterprises: first, the Instituto Tecnológico del Calzado, an institution set up with the collaboration of the Camara and specialized in training and technological assistance, was closed due to lack of demand of its services; second, the credit union suffered from a very high rate of insolvency, caused by a huge increase in interest rates after the devaluation.

As regards the Camara del Calzado, during the crisis it engaged only in defensive activities. With the beginning of the recovery it has started again to organize and promote the local trade fair. With an intense promotional activity in the domestic and international markets, the number of exhibiting firms increased from 70 in 1995 to more than 250 in 1996. There was also a significant increase in the number of foreign buyers who visited the fair. Particularly large was the participation of buyers from Latin America. Furthermore, the Camara holds training courses to prepare small firms which seek to participate for the first time in the trade fair. For promotion abroad, the Camara also organizes joint participation of groups of local firms to the main international exhibitions, promotes new market studies and provides an information service on foreign buyers.

In the field of training and technological assistance, the Camara is involved in the establishment of a local branch of Ciatec in Guadalajara. Ciatec was created in Leon by Conacyt, the Mexican national science and technological council, and is an institution with

a long tradition in supporting the footwear sector. In Guadalajara, it will supply services, previously offered by the Instituto Tecnológico, making available to local enterprises its highly specialized know-how, accumulated in many years of activities in Leon.¹⁸

Given these new institutional activities, the response of local footwear enterprises appears to be quite good: according to the results of our survey, 45% of the sample firms said that they use the services supplied by the Camara more frequently than before liberalization.

From what we have said so far, it emerges that in Guadalajara institutional support has begun to flourish again, particularly with a focus toward the promotion of the cluster in the international market. Local enterprises appreciate these efforts and seem to be willing to strengthen horizontal cooperation through institutions.

5. IS FIRM PERFORMANCE INFLUENCED BY COOPERATION?

In the previous section we presented a descriptive analysis of the changes occurred in vertical and horizontal linkages within the footwear cluster of Guadalajara after trade liberalization. Our focus was on cooperative behavior both vertical and horizontal. In what follows, with ordinary least squares (OLS) regression analysis, we assess if cooperation is related with performance using the results obtained from the questionnaire survey covering a sample of 63 enterprises. Furthermore, we test the relationship between size and firm performance.

The independent variables included in the regression model are indicators of horizontal,¹⁹ backward and forward cooperation²⁰ in the domestic market and two dummy variables for large and small size. The response variable is a

performance indicator obtained with principal component analysis (Table 5).²¹

Concerning cooperation, the main results of the regression analysis, presented in Table 6, are as follows: horizontal cooperation through the entrepreneurial association (C31) and with other local shoe firms (C32) and backward cooperation with leather and sole suppliers (LOGD4143) are positively and significantly related with performance. Among our cooperation indicators, forward cooperation with buyers in the domestic market (LOGF61) is the only variable not statistically significantly related to performance. Furthermore, though not reported here, the computed values of the standardized *beta* coefficients²² suggest that horizontal cooperation through the entrepreneurial association is the largest of any regressors, followed by backward cooperation with leather and sole suppliers and horizontal cooperation with other local shoe firms.

As can be seen from Table 6, besides cooperative behavior size also influences firm performance. The dummy variable for small size (Ds) is in fact negatively and statistically significantly related with the dependent variable. In the next section we will see that cooperative behavior depends also on size, further confirming the hypothesis of the existence of a considerable internal heterogeneity within the cluster.

Finally, given that in the questionnaire performance was originally measured by several indicators, the robustness of the regression model is also tested substituting the dependent variable FAC1 with the seven original variables.²³ The results confirm the robustness of the original model for at least four of the performance variables: production (B21), sales (B23), profits (B24) and employees (B28) trends as dependent variables.²⁴ They are positively and significantly associated with horizontal cooperation with other shoe firms

Table 5. *Variables included in the performance equation for OLS estimation*

Variables	
FAC1	Dependent variable obtained from principal component analysis on performance indicators
C31	Horizontal cooperation through the entrepreneurial association
C32	Horizontal cooperation with other local shoe firms
LOGD4143	Log of backward cooperation with leather and sole suppliers
LOGF61	Log of forward cooperation with buyers in the domestic market
Ds	Dummy for small size (20 or less employees)
Dl	Dummy for large size (70 or more employees)

Table 6. OLS estimation of performance equation ^a

Variable	Beta Coefficient	Std. Error	T-Statistic
Constant	-0.304	0.234	-1.301
C31	0.281***	0.105	2.688
C32	0.538*	0.286	1.881
LOGD4143	1.571**	0.715	2.196
LOGF61	0.282	0.324	0.871
Ds	-0.494*	0.262	-1.883
Dl	0.117	0.262	0.447
R-squared	0.422		
Adjusted R-squared	0.355		
S.E. of regression	0.802		
F-statistic	6.237		
P-value (F-statistic)	0.000		

^a Dependent variable is FAC1; number of observations: 63.

* 10% level of significance.

** 5% level of significance.

*** 1% level of significance.

(C32) and through the entrepreneurial association (C31), with backward cooperation with leather and sole or heel suppliers (LOGD4143) and with the dummy for small size (Ds).

To conclude, the hypothesis that since trade liberalization shoe firms' performance has been positively influenced by cooperation with other firms is confirmed by regression analysis on a random sample stratified by size, covering 63 enterprises located in Guadalajara. Horizontal cooperation with other local shoe firms and through the entrepreneurial association as well as vertical cooperation with input suppliers contributes significantly to sample firms' good performance.

6. A TEST OF SIZE HETEROGENEITY WITHIN THE CLUSTER

The industrial district literature has given little attention to internal differentiation by size or by performance within clusters, but it has instead favored the diffusion of an idea of homogeneity and unity which rarely exists. In our previous work on two Mexican footwear clusters and two Italian districts the enormous internal heterogeneity came out clearly as a by-product of research (Rabellotti, 1997). Furthermore, internal heterogeneity is the focus of a recent comparative paper on footwear clusters in Brazil, Italy and Mexico (Rabellotti and Schmitz, 1999).

The present analysis of the structural changes originated by liberalization in the Guadalajara

shoe cluster confirms the existence of a considerable internal heterogeneity. From the qualitative empirical evidence presented in Section 4 the following forms of internal heterogeneity within the cluster can be emphasized:

- first, heterogeneity is generated by the suppliers' practices: some shoe manufacturers cooperate with them to develop *ad hoc* inputs tailored to their requirements, others have to buy what is available in the market;
- second, heterogeneity is generated by the use of different marketing channels: exports vs. domestic sales and within the domestic market department stores, large retail chains, catalogue sellers or small individual retailers;
- finally, there is also heterogeneity by size, confirmed by Table 7, showing that after trade liberalization large and medium firms have performed better than small ones.

The relationship between internal heterogeneity by size and firms' performance is tested with OLS in the model presented in Table 6. In this equation the effect of the dummy variables for large and small size on performance is additive; in other words, it increases or decreases performance by a fixed amount, regardless of the other predictors. An alternative model allows the effect of size to be different for different combinations of the other predictors, namely of cooperation indicators. The new equation to be tested is obtained by

Table 7. *Performance indicators by size*^{a,b}

	≥ 70 employees (N=20) (%)	21–69 employees (N=21) (%)	≤ 20 employees (N=22) (%)	Chi-squares ^c
Production	70.0	61.9	22.7	11.105 (0.025)
Export	50.0 (N=16)	23.8 (N=8)	4.5 (N=3)	20.185 (0.003)
Sales	75.0	52.4	22.7	11.698 (0.020)
Profits	25.0	14.3	–	12.422 (0.053)
Average price	65.0	42.9	68.2	
Average delivery time	35.0	33.3	36.4	
Product quality	80.0	76.2 (N=20)	73.0 (N=21)	
Employees	35.0	23.8	9.1	

^a % of firms which after liberalization have registered an increase in the listed performance indicators (for average delivery time it is indicated a decrease).

^b *Source*: author's survey.

^c The significance level is in parenthesis. If the chi-squares are not reported the size distribution is not statistically significant.

defining a new set of independent variables that are the product of the dummy variables and the original predictors.²⁵ With the stepwise selection method we obtain the equation presented in Table 8.²⁶ The most interesting result is the variable LOGD4143*DI, which is statistically significant and positively related with performance. This suggests that large firms' cooperation with suppliers positively and significantly influences performance.

From the statistical results presented we can conclude that performance and some forms of cooperative behavior, namely cooperation with suppliers, varies with size. These results also confirm the existence of internal heterogeneity within the cluster investigated.

Table 8. *OLS estimation of performance equation with multiplicative dummy variables for small and large size (stepwise selection model)*^{a,b}

C31	0.314*** (0.106)
LOGD4143*DI	2.536** (1.020)
Ds	–0.606** (0.237)
Adjusted R-squared	0.361
S.E. of regression	0.820
P-value (F-statistic)	0.000

^a Dependent variable is FAC1; number of observations: 63; Constants are not reported. Standard errors in parentheses.

^b *Source*: author's survey.

** 5% level of significance.

*** 1% level of significance.

7. CONCLUSIONS

The main question addressed in this paper concerns the impact of market liberalization on the footwear industry cluster of Guadalajara. The impact was quite strong consisting of a huge reduction in the number of firms and in domestic production and in a large increase in shoe imports. Trade reform however made firms aware of global competitive pressures. Furthermore, the later return to partial protection and the Peso devaluation gave some firms the time to respond with greater cooperation with suppliers, buyers and through the entrepreneurial association.

Cooperation within the cluster increases firms' capability to grow and the indicators of performance in our questionnaire can be considered as a rough proxy for growth. Therefore, with regression analysis on data from a sample of 63 enterprises, we tested the hypothesis of a positive association between firms' performance and their cooperative behaviors. The model shows clearly that performance is positively and significantly related with some forms of vertical and horizontal cooperation. Therefore, one can conclude that cooperation, which is one of the main components of collective efficiency, contributes to firm growth.

External economies are another source of collective efficiency. This effect has not been measured in our investigation, but it is a clear

finding of the qualitative research. For instance, there are positive externalities generated by cooperation—called by Nadvi (1997) “external economies of joint action”—between some shoe manufacturers and suppliers: improvements in quality, fashion content, speed in delivery which percolate through the cluster. Important externalities also emerge from cooperation between the few exporting enterprises and their foreign buyers: learning from exports takes place at individual level among exporters but also spills over to the rest of the cluster.

A further effect of the structural changes caused by liberalization is the increasing heterogeneity within the cluster. Internal heterogeneity by size influences firms’ performance, as confirmed by regression analysis. Nonetheless, the more successful firms generate externality gains to others in the cluster.

From what has been said so far it appears that although some external events such as the peso devaluation and the return to higher market protection helped the footwear industry of Guadalajara, the increase in collective efficiency also played an important role in the recent recovery of the cluster. Nevertheless, the positive impact of collective efficiency affects only part of the cluster: those firms which enter into cooperative actions and those which are able to benefit from some externalities generated by cooperation. The main challenge for the future will be to transform the static part of the cluster. Is it possible to assist the less dynamic manufacturers to “switch gears” in order to meet the challenges of the increasingly competitive and rapidly evolving international market? How can they be helped to cooperate and upgrade? These are crucial questions for policy makers and donors.

NOTES

1. For a summary of the argument and evidence see Schmitz (1995).
2. A turning point may be defined as a break with the past that opens up new opportunities or poses new threats.
3. The other main cluster is Leon, specializing in men’s and children’s shoe production.
4. For details on the questionnaire used, see Rabellotti (1998).
5. It is not realistic to expect trade liberalization to lead to a substantially greater efficiency and competitiveness of the domestic industry in a short period of time. Following Ten Kate (1992), one should expect a lag of at least 5–10 years before the benefits of trade reform fully materialize.
6. A very good and comprehensive survey of this literature is presented in Rodrick (1995).
7. In a study on trade reform in Africa Lall (1998) adopts an alternative approach to standard neoclassical theory based on *evolutionary* or “neo-Schumpeterian”, theory to analyze how import liberalization may be expected to affect technological activity in developing countries.
8. External economies are defined as the by-product of some activities undertaken within the clusters; while cooperation effects are the result of explicit and voluntary cooperative behaviors (Rabellotti, 1997).
9. According to the last available census (1990), the population of the metropolitan area of Guadalajara is 2.9 million.
10. Although most of the firms selected were affiliates to the local trade association, a few firms, which did not belong to the Camara, were also interviewed.
11. In the previous survey carried out in Guadalajara, the sample was also randomly taken from the register of members of the local entrepreneurial association. According to the association and to sector experts interviewed, the lists are representative of the formal enterprises because when firms decide to register officially for paying taxes and social benefits, they usually become members of the entrepreneurial association, which helps them in dealing with bureaucratic procedures (Rabellotti, 1997).
12. The questionnaire was elaborated together with Peter Knorringa, Khalid Nadvi and Hubert Schmitz and also adopted for field work carried out in clusters in India, Pakistan and Brazil. For details see Rabellotti (1998).

13. Figures on the impact of liberalization on suppliers were collected only in the tannery sector. According to estimates of the local Chamber of Leather Producers, there was a 40% decrease in leather production (interview with Rogelio Alferéz, September 1996).
14. According to the 1989 Mexican Industrial Census there were more than 19,000 footwear retailers, the large majority of them individual retailer stores or very small chains.
15. Both the Camara del Calzado in Guadalajara and Leon have a data base which includes information respectively on some 1,300 and 4,300 retailers about their payment history and their behavior (e.g., if he/she accepts orders when delivered, how often he/she returns orders for quality problems).
16. These estimates are provided by the local Camara del Calzado.
17. In the 1990s a new initiative for promoting *agrupamientos industriales* was launched by the Camara del Calzado.
18. In Leon, the largest footwear cluster in Mexico, institutionalized cooperation has recently increased rather strongly for two main reasons: the local political situation and the very strong specialisation of the local economic system. Both at the state and the municipal level there are respectively a governor and a mayor who began their professional life in the footwear industry and who are therefore very receptive to the industry's problems. Furthermore, given that in 1992 the footwear *filière* accounted for 15.5% of the GDP of Guanajuato (the state of Leon) and for 68% of the GDP of the city of Leon (CEESP, 1993), the crisis of the sector hit the local economy strongly. This called for urgent policy interventions.
19. Horizontal cooperation through the entrepreneurial association has to be considered cautiously, given that the sample is selected from the list of the Camara's members. Among the Camara's members however there is a wide variety of opinions concerning the activities of the entrepreneurial association. This result is also confirmed by our previous inquiry (Rabellotti, 1997).
20. Information about cooperation with subcontractors and buyers for the export market was also collected, but due to the high number of missing values it could not be included in the statistical analysis.
21. For details on how aggregate indicators of performance and cooperation were constructed, see Rabellotti (1998).
22. The standardized *betas* are the estimated coefficients in a regression where the original variables have been divided by their sample standard deviation so as to clean the estimated coefficients of their dependence on measurement units.
23. The share of exports is omitted from the principal component analysis, due to the high number of missing values. The test can be done in two different ways: first of all, with seven OLS separate models in which the independent variables are always the same while the dependent variables are the seven performance indicators and secondly, with multivariate regression analysis, testing the relationship between a set of interrelated dependent variables (the seven performance variables) and one group of independent variables. For further details see Rabellotti (1998).
24. Results are not reported in the paper, but on request they are available from the author.
25. The full equation estimated with OLS is: $FAC1 = \beta_0 + \beta_1 DI + \beta_2 Ds + \beta_3 C31 + \beta_4 C32 + \beta_5 LOGD4143 + \beta_6 LOGF61 + \beta_7 C31 DI + \beta_7 C31 Ds + \beta_8 C32 DI + \beta_9 C32 Ds + \beta_{10} LOGD4143 DI + \beta_{11} LOGD4143 Ds + \beta_{12} LOGF61 DI + \beta_{13} LOGF61 Ds$.
26. The model does not change if backward and forward methods are adopted for variable selection. For further details on this methodology, see Rabellotti (1998).

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