

**BUYER SUPPLIER RELATIONSHIPS IN THE
ENGINEERING INDUSTRIES IN SLOVENIA AND
COMPARISONS WITH HUNGARY**

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Editor of the WP series: Peter Stanovnik

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Ljubljana, December 2000

1. INTRODUCTION

Social aspects of economic action need to be considered for a realistic understanding of economic activity/1/. Lam/2/ gives a good discussion of tacit knowledge as the critical resource of firms and economies, and the role of tacit knowledge in technological innovation and organizational learning. She argues that (/2/ p. 488), "...the extent to which tacit knowledge constitutes the knowledge base of the firm, and how it is formed and used are powerfully shaped by the broader institutional context. The knowledge of the firm is socially embedded. It is rooted in firms' coordination mechanisms and organizational routines which, in turn, are heavily influenced by societal institutions." What is emerging from research in the developed industrial countries on the role of enterprises in economic growth is that the size of enterprises is not so important as the inter-enterprise linkages involving both domestic and foreign firms, linkages with institutions of the state, and attention to the market for final products. We believe that close co-operation of companies with their partners, especially involvement in joint development, offers a valuable channel for the acquisition of tacit forms of knowledge critical for companies in the transition economies in keeping pace with their competitors in the European Union. Amin and Thrift/3/ give a good account of the importance of 'associationist networking' for regional development in the European Union. Lane and Bachmann/4/ provide a solid exploration into the trust-based relationships between buyer and supplier firms in Britain and Germany. There has also been recent interest in the networks in post-socialist countries. (See the various contributions to Grabher and Stark/5/. Much of this focus has been on the restructuring of existing networks and past legacies. For this group the fall of socialism and the assumed withdrawal of the state did not result in a mix of atomistic firms gravitating under newly released market forces into more efficient configurations, but rather the pre-existing networks were subjected to various shocks and contortions, but new configurations were strongly bound by established linkages. These networks then provide some measure of stability in the transition, although they may either promote or deter economic performance in the economy, depending on the motivations of the actors and the flexibility of the network. Humphrey and Schmitz/6/ explain how trust between companies has emerged as a key issue in the developing and transition countries. Similar themes are developed further in a detailed study of inter-firm relations in Hungary/7/. Jaklič and Hocevar/8/ have gone furthest in exploring these issues in Slovenia.

We start with the assumption that a well-developed network of ties between economic actors indicates a healthy industrial environment where firms can optimally concentrate on their core competencies, allowing the most efficient division of labour between co-operating agents. Firms in such conditions would be well situated to learn from each other and be tuned to market needs, creating an optimal environment for rapid innovation. Of the applicant countries to the European Union, Slovenia and Hungary have perhaps the most experience with market economies due to their respective brands of market socialism. We might therefore expect productive networks to have deeper roots here than in the other transition countries. As the most trade oriented republic of the former Yugoslavia, itself open to trade with the West, Slovenia already had many productive links with Western European firms. Hungary, on the other hand, received of the bulk of foreign direct investment immediately after the transitions of 1989. This has given Hungary the opportunity to establish links with foreign firms, especially in Budapest and the Northwestern counties nearest Austria and Slovenia. We should expect these external links to augment domestic networks in the two countries.

The point of the research is to look at how firms co-operate with each other at the most basic level. This means looking at the mechanics of how buyers and suppliers are able to co-operate and innovate and bring better products to the market in a competitive environment. Buyer-supplier relations are fundamental to the working of a market economy. Economic activity is not a simple matter of supply and demand in perfect market without interaction costs. In a real economy buyers and suppliers have to communicate to each other what they need, what they can provide, what help they can offer in producing something new, what time scales are involved, what terms of payment are acceptable, and so on, all in a volatile environment where they do not know exactly how much they will need, what future prices will be like, and how reliable their partner really is. Relationships that help to overcome market uncertainties and aid in communicating needs and capabilities can develop between buyers and suppliers. The basis, depth, breadth and development of these links may be different depending on the environment in which companies are embedded.

With this in mind we target those companies working in industrial branches dealing with complex products where we could expect a fair amount of co-operation between firms in supply chains. For this reason we select companies in the engineering sectors NACE 29-35. We only consider medium and large size companies since these are a small fraction of the total number of companies but account for most of employment and economic activity in these sectors. These companies also happen to be a very important part of the economy, employing a large share of the labour force, and accounting for much of the countries' exports. The co-operation and innovation we study also have obvious implications for the ability of companies to compete and co-operate with companies in the European Union, which is relevant for EU enlargement issues.

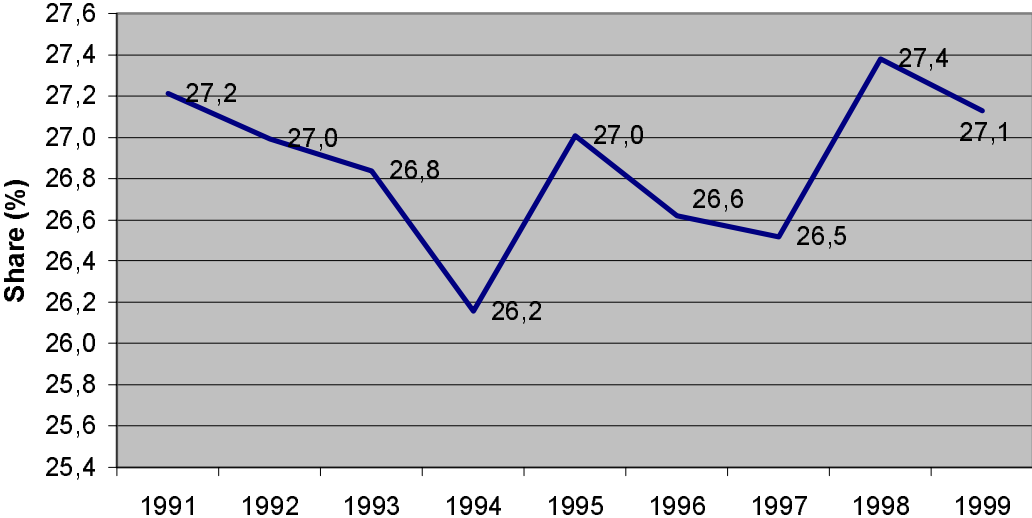
2. THE ENGINEERING SECTOR IN SLOVENIA

The engineering sector forms a very important part of the Slovene manufacturing industries and the Slovene economy in general. According to the data of the Statistical Office of the Republic of Slovenia/9/ and the Agency of the Republic of Slovenia for Payments/10/, 21.7% of the total number of companies engaged in manufacturing in Slovenia are in the engineering sectors (NACE 29-35). In 1999 these companies employed 27.1% of the manufacturing workforce and generated 31% of the total income of manufacturing firms in Slovenia. In most of these sectors, and especially in NACE 29 (Manufacture of machinery and equipment), the early years of transition witnessed the break-up or liquidation of a number of large companies, which changed the structure of the industry. The relatively high number of small companies in the sector is primarily the consequence of these changes, though it also reflects the typical pattern of co-operation, through subcontracting, of larger and smaller companies in the sector.

One major side-effect of the crisis among the large companies was the dispersion of the R&D workers who had previously worked in the R&D departments of those companies, and the "brain-drain" of industrial R&D workers to more lucrative occupations, mainly in trade and services. All through the 90s employment in engineering fell, except for the year 1998 when there was a slight increase in the number of employees in the studied sectors. Figure 1 shows that the share of the labour force employed in the engineering sectors as

compared to all manufacturing sectors decreased from 27.2% in 1991 to 26.2% in 1994, but increased to 27.4% in 1998 again. Over the last few years employment in engineering thus remained generally steady, and actually showed an increase in 1998, indicating that the period of “shaking-out” surplus workers has ended.

Figure 1: Employment in engineering sectors as a share of employment in manufacturing 1991-1999.



Source: Statistical Office of the Republic of Slovenia: Statistical Yearbook of the Republic of Slovenia, years 1995-2000.

Figure 2 shows that output fell but then grew during the years of transition in the NACE 34-35 (Manufacture of transport equipment) sectors, and even more so in the NACE 30-33 (Manufacture of electrical and optical equipment) sectors, with NACE 29 (Manufacture of machinery and equipment) lagging behind somewhat.

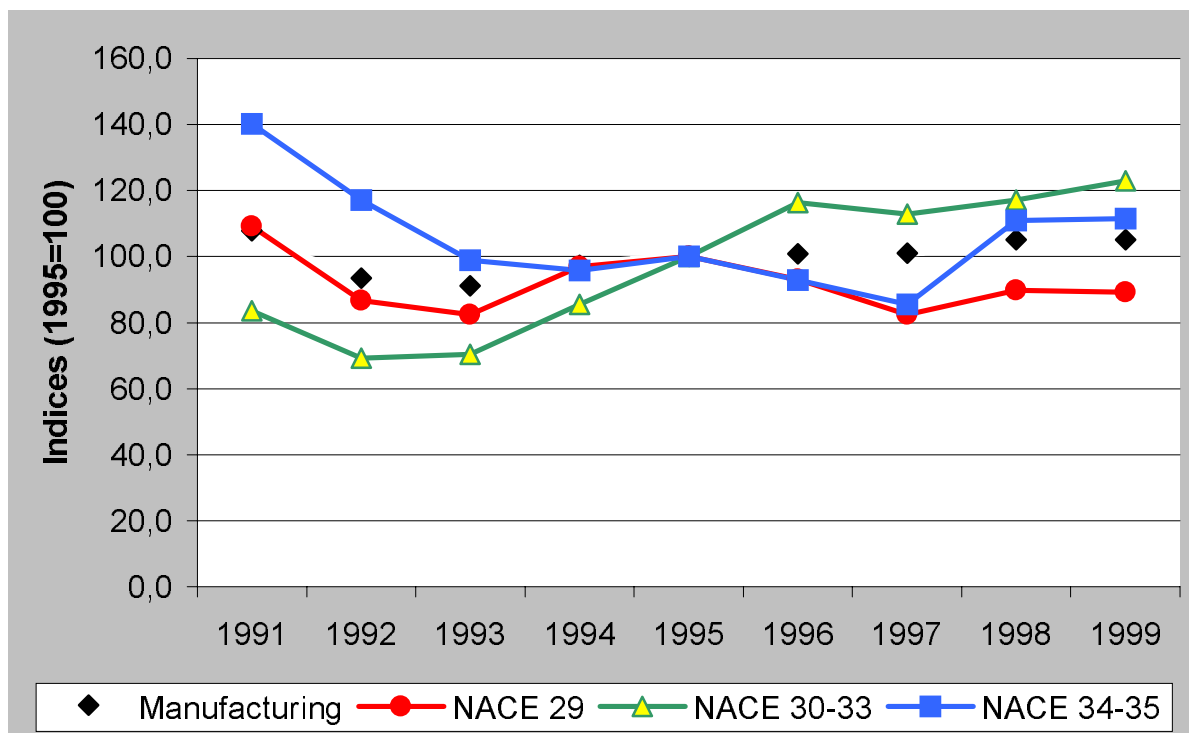
Companies in the engineering sectors are major exporters. According to the data of the Agency of the Republic of Slovenia for Payments, 62% of the total sales in the NACE 29-35 sectors are generated by exports. This is further broken down in Table 1.

Table 1: The share of exports in the total sales of the engineering sectors in 1999.

NACE	Sectors	Exports as a share of total sales (%)
29	Manufacture of machinery and equipment	65.8
30-33	Manufacture of electrical and optical equipment	55.3
34-35	Manufacture of transport equipment	64.9

Source: Agency of the Republic of Slovenia for Payments (2000): Poročilo o poslovnem izidu, sredstvih in obveznostih do virov sredstev gospodarskih družb v Republiki Sloveniji v letu 1999.

Figure 2: Industrial production by sector in 1991-1999, indices (1995=100).



Source: Statistical Office of the Republic of Slovenia.

Among the engineering sectors the strongest export position belongs to the domestic appliances sector (NACE 29.71) where the export sales amounted to 81.5% of total sales in 1999.

Exports in the engineering sectors grew steadily over the period 1994-98. The increase was especially significant in NACE 29 and 34-35. Table 2 shows that the share of exports of

the studied sectors in total exports of all manufacturing sectors has been increasing over the past few years and reached 40% of the total exports in manufacturing in 1998.

Over the last few years productivity growth has been quite impressive in all of the engineering sectors except for NACE 29. According to the data of the Statistical Office of the Republic of Slovenia, productivity in NACE 30-33 increased by almost 50% over the years 1996-2000 as compared to the average productivity in 1995. During the same period the productivity in NACE 34-35 increased by more than 100%. In both sectors the productivity growth was higher than the average of all manufacturing sectors, while in NACE 29 the productivity growth lagged behind the average for manufacturing.

Table 2: Export of NACE 29-35 sectors as a share of total exports of manufacturing sectors in the period 1994-99 (in %).

Year	NACE 29	NACE 30-33	NACE 34-35	Engineering sectors (NACE 29-35)
1994	11.9	10.3	12.0	34.1
1995	12.1	10.5	12.7	35.2
1996	12.6	11.4	13.0	37.0
1997	13.6	11.2	12.6	37.3
1998	14.2	10.6	15.3	40.1
1999	14.3	10.8	13.8	39.0

Source: Statistical Yearbook of the Republic of Slovenia, years 1997-2000.

Behind these mostly positive trends in the engineering sectors stands a pattern of export growth based on increased production, effective cost-reduction measures and introduction of new products, with employment being held steady. A considerable number of firms in NACE categories 29-35, especially 31, 32, 34 and 35 have honed their competitiveness on the basis of long-term strategic partnerships based on joint development and production, and on foreign investment. Prominent partners of Slovene engineering companies include leading European firms like Siemens, Renault, PSA, Bosch, Philips, Danfoss, Fiat and Liebherr. Quality has been one of the essential elements in this upgrading of competitiveness. According to the data of the Slovene Chamber of Commerce and Industry ISO 9000 series certificates have so far been granted to over 140 companies in the studied engineering sectors.

3. SELECTION OF COMPANIES

The Slovene IBON company register was used for the selection of companies. This is a register of all companies operating in Slovenia. All companies with more than 50 employees in the NACE categories 29-35 were selected as the population for our study. These two criteria gave us a total of 179 entries. Of these 179, 12 were deleted because when contact was attempted the companies were no longer in business or their actual activities did not correspond to one of the NACE categories we are studying (3 cases). The total population of companies we had available in Slovenia (in NACE categories 29-35) was then 167 companies.

We were not initially sure of what sort of response rate we would get, so we enlisted the aid of two representatives from the Slovene Chamber of Commerce who were competent for the selected industrial branches. They signed the contact letters that were sent to the companies, and in some cases they personally arranged interviews. In some cases the directors of some of the companies were personal acquaintances of members of the research team, and such connections were used to arrange interviews. We started by sending letters and initiating phone contacts with all of the 167 companies, but the response rate was fairly good, so that ultimately not all companies were contacted. We interviewed 48 of these companies, but did not include one of the interviews in the analysis. This interview was excluded because the company representatives were reluctant to release information, especially since there were several different people responsible for supplies and commercial relations in the many divisions of the company, and none of the interviewed people wanted to comment on business relations with which they were not directly involved.

Because of the non-systematic approach to obtaining interviews and the problem of self-selection we do not consider our final set of interviews a truly representative sample of the total population. Nevertheless 47 interviews were completed from these companies, which is 28% of the possible companies that satisfied our size and sector criteria.

What follows is a look at how representative these 47 companies are compared to the total population. Table 3 shows the coverage of the interviewed companies compared to the total population. The only category not covered is the NACE 35 category of *Other transport equipment*. The uneven nature of the coverage by branch is partially due to the order in which companies were selected for interviews. More companies were contacted in the branches that were first investigated. In any case, a variety of different types of companies were included in the set of interviewed companies.

Table 4 gives the distribution of interviewed companies by region, compared to the total population. The Ljubljana area and larger towns are not over-represented in comparison to the less urbanised areas. The only area that did not get covered is the region near the port city of Koper.

Table 3: Coverage by NACE category.

NACE	Total population	Interviewed	Coverage
29.1-29.3 Machines and machinery	32	11	34.4%
29.4-29.7 Machines and machinery	35	3	8.6%
30 Office, accounting and computing machinery	4	1	25.0%
31. Electrical machinery and apparatus	33	6	18.2%
32. Radio, TV and Telecom equip.	17	11	64.7%
33 Medical, precision, optical equip.	19	10	52.6%
34. Motor vehicles, trailers	22	5	22.7%
35. Other transport equip.	5	0	0.0%
TOTAL	167	47	28.1%

Table 4: Regional coverage of companies.

Postal code	Cities	Total population	Interviewed	Fraction (%)
1000	Ljubljana	35	10	28.6
12XX		8	2	25.0
13XX		5	3	60.0
14XX		7	2	28.6
2000	Maribor	15	3	20.0
22XX		4	2	50.0
23XX		21	5	23.8
3XXX	Celje	12	3	25.0
4000	Kranj	9	4	44.4
42XX		10	4	40.0
5XXX	Nova Gorica	13	3	23.1
6XXX	Koper	5	0	0.0
8XXX	Novo mesto	17	5	29.4
9XXX		6	1	16.7
TOTAL		167	47	28.1

Table 5 shows that the interviewed companies are fairly representative in size to the total population. Medium sized companies are defined here as having 51-250 employees. It must be noted that the size of the interviewed companies is the size from the IBON database. Two of the large companies listed here were actually medium based on the number of employees reported during the interviews. Since we do not have this information for the total population, the size listed by the IBON data is used here.

Table 5: Coverage by company size.

Size	Total population	Interviewed	Fraction
Medium	122	35	28.7%
Large	45	12	26.7%
Total	167	47	28.1%

One of the most important characteristics of the companies is the type of ownership. Since specific details on the amounts of various types of ownership were ascertained during the interviews, these details are not known for the total population of companies. We therefore do not have a comparison of the interviewed companies with the total population. We do however have many types of ownership well covered in the interviewed companies. Table 6 gives the breakdown of the dominant ownership forms of the interviewed companies. Since many of the ownership forms may be present in a given company, the dominant form need not exceed 50% of ownership. (The minimum dominant ownership share out of all of the interviewed companies turned out to be 39%.)

Due to the rules of privatisation in Slovenia, mixed ownership with a large amount of employee ownership is quite common. Thirteen of the interviewed companies had more than 25% of employee (internal) ownership. Employee ownership was dominant in four of these companies.

The Slovene Development Corporation (SDC) owns, in part or in full, companies that have not yet been fully privatised. This ownership form has been separated from the holding or parent company form, since this group may show different operational behaviour. This is the dominant ownership form in six of the interviewed companies.

Table 6: Dominant ownership forms of interviewed companies.

Ownership form	Number
Employee	4
Foreign	8
Funds	11
Holding or Parent Company (Domestic)	9
Management	9
Slovene Development Corporation	6
Total	47

Note: Ownership form refers to the dominant owner.

One of the features that becomes apparent in the selected industries in Slovenia is the persistence of companies originating in the old conglomerates based in Slovenia but operating on the entire former Yugoslav territory and beyond. Many companies in our sample are associated with the former giants Iskra, Gorenje, IMP, IMPOL and Agis.

The one company that seems to dominate our set of interviewed companies is the former electronics giant Iskra. Twelve of the interviewed companies still use “Iskra” as the first part of their names. To maintain the anonymity of the individual companies we do not give specific examples, but these are names such as “Iskra-Apples” and “Iskra-Oranges” depending on their products. (These companies may or may not still be partially owned by the shell company Iskra Holding.) Another eight companies are also privatised Iskra divisions that have not kept “Iskra” as part of their names. These companies alone account for forty-three percent of the interviewed companies.

4. THE INTERVIEWS

A team of one native speaker member of the Slovene partner institute and one member of the British group with active knowledge of the Slovene language conducted all but four of the interviews. All of the interviews were done in the native language. The interviews took between 45 minutes and in some cases several hours to complete, depending on the talkativeness of the person interviewed. We stayed to the format of the questionnaire and complete answers were recorded in written form. The interviews were not taped. The people interviewed included directors (31), sales managers (10), and one each of: assistant director, purchasing manager, technical director, director of finance, member of board of directors, specialist on management board. (More than one person from the company participated in some cases, but only the highest-ranking person interviewed is listed above.) One person was the director of two separate companies included in our interviews.

5. ANALYSIS

In order to look at how various factors affect the levels of co-operation of companies with their buyers and suppliers, we need a way to evaluate these levels. We define three levels of co-operation for both buyer and supplier relations. The levels are:

- 3 *Close* co-operation
- 2 *Moderate* co-operation
- 1 *Minimal* co-operation

We rank each of the interviewed companies by this classification both on relations with suppliers and on relations with buyers. These evaluations are made subjectively based on responses to the following question on technical interdependence and co-operation in the questionnaire:

11. Describe any technical interdependence and co-operation – especially in design.

For both buyer and supplier relations, indications of joint development are required for a rating of *close* co-operation. Likewise there can be no indication of technical interdependence for a ranking of *minimal* co-operation. The exchange of technical information was deemed to be more important than the integration of the supplier into the buyer’s production system, such as by just-in-time delivery. This is because we are really looking for channels of learning for innovation through co-operation. Otherwise the ranking of the level of co-operation of companies with their buyers and suppliers was done by subjective judgement. The breakdown of levels of co-operation for companies is shown in Table 7.

The next step of the analysis is to look at how the level of co-operation depends on some available control variables. The control variables we use are the dominant ownership form, size, export versus domestic market orientation, and complexity of products of the companies. Narrowly defined sectors frequently have too few companies in them for useful analysis.

Table 7: Breakdown of companies.

Supplier side	Close	8
	Moderate	20
	Minimal	19
	Total	47
Buyer side	Close	13
	Moderate	20
	Minimal	14
	Total	47

The first control variable we look at is the ownership type. We also look at the differences in levels of co-operation for companies of different sizes. (We use the natural logarithm of company sizes, since the distribution of company sizes is highly skewed.) The next control variable we consider is the export versus domestic market orientation of companies. We define three groups:

Export oriented (companies whose exports are 80% or more of sales)

Mixed (companies with 50-80% exports)

Domestically oriented (companies exporting less than 50% of sales)

Another variable we can examine is the complexity of the companies' products and production processes. We group companies into categories of low, medium and high complexity. Complexity mostly refers to how many subassemblies there are in the final product, but some weight is also given to the level of technology required to produce the product.

Correlation coefficients of levels of buyer and supplier co-operation with these parameters are shown in Table 8 along with estimated significances. Note that all of the correlation coefficients have the signs one would expect. Foreign ownership is not strongly correlated with co-operation on either side in Slovenia. There is a strong correlation between the size of the company and co-operation with suppliers, although this does not appear strongly correlated with co-operation with buyers. There is a positive correlation between foreign market orientation and co-operation with suppliers, but this is not so significant for co-operation with buyers. As can be expected, the complexity of products is correlated with co-operation for both suppliers and buyers. This is not surprising, since there is less need for co-operation with simple products. There is an apparent dependence on the location of the company in the country. There is a positive correlation for co-operation with suppliers and buyers and location in the Western part of Slovenia.

Table 8: Correlation coefficients and their significances for levels of supplier and buyer co-operation compared to various parameters

	Level of co-operation with supplier		Level of co-operation with buyer	
	Correl.	Signif.	Correl.	Signif.
foreign ownership	0.15	1.0 σ	0.01	0.1 σ
ln(size)	0.36	2.4σ	0.11	0.8 σ
market orientation	0.24	1.6σ	0.13	0.9 σ
product com-plexity	0.25	1.7σ	0.26	1.8σ
location	0.27	1.8σ	0.26	1.8σ

In contrast to the findings of Jaklic and Hocevar/8/ that in most of the cases of the Slovene companies “customer relationships are very short-term in nature and full of mutual distrust” our research shows that the interviewed companies in the studied sectors are very much focused on long-term relationships with their buyers and suppliers. Of the studied companies only one reported a predominantly short-term nature of relationships with buyers, while two others claimed that they work with their customers on a more short-term basis, but they also have long-term ties with some of their buyers. The picture is very similar on the supplier side, especially with suppliers of strategic goods. Different research results can partly be attributed to the difference in the approach and the samples of the two studies since our research is focused on the engineering sectors, where more long-term co-operation is expected, and partly to the fact that our study was conducted 3-4 years later, so many of the links with buyers and suppliers that had only been established at that time, could have evolved into long-term relationships during this period. Out of 13 companies that were ranked into the category of “close co-operation” with their buyers, 10 report that they have co-operated with their main customer for 3-7 years. On the supplier side the ties tend to be even more long-term in nature since most of the interviewed companies report to have co-operated with their suppliers for more than 5 years and a large share of these for more than 10 years. From the conclusions of the Jaklič and Hočevár study and from our study we might infer that, according to Sako’s terminology/11/, over the past few years Slovene companies have moved away from the Arm’s length Contractual Relations (ACR) in the direction of more Obligational Contractual Relations (OCR). This is to a large extent a consequence of the fact that the companies in the studied sectors, being largely export

oriented, are becoming more and more involved in the international production networks where they are subject to extensive learning processes.

Two thirds of the interviewed companies have contracts with either all or with the most important buyers and suppliers. However, previous co-operation and good experience seems to provide the main basis for trust between partners. One of the managers points out that “the contract would not be the basis for trusting the partner.” He adds that “soft values and relationships with the partner are of a higher importance and these cannot be achieved simply by signing the contract.” Many of the interviewed companies stress the importance of personal trust and reliance on the people they know in the customer or supplier company. Mutual interdependence between the companies also seems to play an important role in quite a number of cases. Only one of the companies reported that it trusted the main customer on the basis of the contract they had concluded. We received similar answers on co-operation with suppliers where none of the companies believed that only contracts provide the basis for trust, although three companies mentioned contracts combined with previous experience as an important basis for trust. A few companies also said that good reputation and image of the customer/supplier company is important. Four of the interviewed companies believed that the basis for trusting the customer is in their own hands. The only guarantee that the customer will fulfil his obligation and continue working with the company is, as one of the managers puts it, “the provision of optimal service as a supplier, the fulfilment of all obligations agreed and the fact that the company is getting better and better.”

Many companies perceive contracts only as formal agreements, which have little influence on informal relations between partners and which are only to be used in the extreme cases. The interviews show that contracts are still worth having as a means of enhancing trust rather than a mechanism of threat. Most of the interviewed companies view legal recourse as the last resort and would only use it if there were no possibilities to settle the dispute by other available means. An agreement between partners to the mutual benefit and the maintenance of ‘partnerly’ relationships is perceived as the best solution because “business is chain-linked and serious disputes can block other business possibilities for the company,” so “a bad settlement is still better than the best court process.” The non-reliance

on the legal system is partly also the consequence of the inefficiency of the Slovene legal system. According to the statements of the interviewed companies it takes 3-4 years to settle disputes in court.

The interviewed companies rarely report serious disputes with their buyers or suppliers that would lead to the need for external mediation through court or arbitration. Over the past few years the companies interviewed seemed to have more of such disputes with Slovene rather than with foreign customers. Most of these disputes were with the highly risky newly founded Slovene companies, many of which have gone bankrupt over the past few years. Very bad payment discipline has been characteristic for a large part of the Slovene enterprise sector all through the 90s. For the supplier side no clear difference between Slovene and foreign suppliers can be reported.

There is no evidence from the interviews that the type of ownership is an overriding determinant of the co-operation patterns of companies in the studied sectors. We were able to find examples of close co-operation with buyers and suppliers in companies with practically all types of ownership including predominantly employee owned companies, companies controlled by the state through Slovene development corporation (SDC) as well as companies in the majority ownership of investment funds. This finding was rather surprising as we expected a significantly higher degree of buyer/supplier co-operation in foreign-owned companies compared to domestically owned/mixed ownership companies. This implies that managerial competence and company tradition in the business seem to play a more important role in determining the extent of co-operation behaviour than ownership. All of the domestically owned companies, except for the management owned companies and two companies owned by holdings, report that owners exert no direct influence on the functioning of the sales and purchasing functions in the studied companies. During the interviews several managers of companies predominantly owned by funds or SDC expressed an outright preference for “strategic owners” (mostly their buyers or suppliers), who could take a more proactive role in the company as opposed to the existing “inactive” owners.

In a number of cases, especially in companies characterised by a high degree of co-operative buyer/supplier relationships, we found good evidence of tacit knowledge building based on the co-operation with buyers. For instance, one of the studied companies reports to have received an enormous amount of technical know-how and knowledge in the area of quality, work organisation and system of continuous improvement from its main customer, a multinational company in household appliances. This same company works closely with a Slovene supplier and thus contributes to the further spreading of tacit knowledge in the sector and in the economy as a whole. In this way also the company's supplier gradually builds the capacity, which eventually enables him to be able to collaborate with the company in activities as demanding as joint development of new products. Such cases are important especially in view of the fact that all but one of the studied Slovene companies characterised by close co-operation with suppliers have actually reported domestic suppliers as their main partners in joint R&D activities. This information gives us good reason to believe that the increasing inclusion of the Slovene companies from the studied sectors into the international production networks has triggered extensive learning processes, which are gradually spreading out through the studied sectors. In this way companies from these sectors are building the necessary learning capacities, which could enable them to achieve a higher degree of functional discretion/12/ and consequently a better position within the networks.

What comes clear from the interviews is that most of the companies, and especially those in the NACE 34-35 sectors, rely heavily on European (often German) or international standards (ISO 9000 and 14000 standards, VDA 6.1, TÜV, UL...). Most of the interviewed companies have already obtained ISO standards or are going through the process of certification. Some of the companies work according to the ISO standards even though they have not yet been certified. The majority of the customers in this sector require certificates from their suppliers. This is especially important in the initial stages of co-operation when the customer has no experience with the particular supplier, so certificates mean a higher level of security that the supplier will fulfil his obligations.

From the high reliance on international standards we infer that it is not so much the Slovene institutional environment - including the legal system - that sets the rules of the

game for the Slovene engineering companies and their relations with buyers and suppliers, but rather international institutional arrangements, especially international standards. It is therefore not surprising that most of the interviewed companies were rather sceptical about a more active role of the state in fostering co-operation with buyers and suppliers. The majority of the interviewed companies were more in favour of the state policies aimed at creating a stable economic environment and a good legislative framework, comparable to the countries of Western Europe. Excessively complex and bureaucratized customs procedures need to be simplified. Several companies also emphasised the need for a more effective promotion of Slovenia abroad in order to facilitate initial contacts of the Slovene companies with potential new buyers and suppliers and provide a basis for trust building.

6. COMPARISONS WITH HUNGARY

Since this paper derives from a joint project on both Slovenia and Hungary, we can also give some comparisons of our analysis of inter-firm relations in Slovenia with what was found in Hungary. A similar number of interviews were done in Hungary (49) and Slovenia (47) using the same questionnaire. The main difference between Hungary and Slovenia is that foreign ownership is more important in Hungary, while daughter companies of former domestic conglomerates, like Iskra, play a large role in Slovenia.

The pattern in Hungary as compared to Slovenia is that there is more foreign control in the companies – either by ownership or by dependence on much larger foreign buyers. Where there is co-operation with suppliers and buyers, Hungarian companies tend to have less control over the choice of partner. They often co-operate with suppliers that have been appointed by their buyers.

We found that Slovene companies tend to have more control over design activities and are not so dominated by their customers as was found in Hungary. Much of this is due to the legacy of large conglomerates such as Iskra, which was already operating on Western European markets even before the dissolution of Yugoslavia. But even many non-Iskra companies are domestically owned and managed and are very active in strategic decisions and development. Even without the Iskra daughters we observed at least as much joint

development between Slovene companies with their customers than found for Hungarian companies.

Another interesting difference between Hungary and Slovenia is found in co-operation on the supplier side. Both countries have a similar number of companies reporting joint development with suppliers (seven for Hungary and eight for Slovenia), however, in Hungary, only one had exercised control over the choice of supplier; in the other cases the supplier was appointed by the customer, in many cases the owner. All of the Slovene companies were involved in choosing their suppliers except for a foreign-owned company where the owner contracts the suppliers. But even in this case, the relationship with the most important supplier started before the owner bought the company. For another case the main supplier was also the buyer, however the relationship is “partnerly” and they report: “The company is very important for the supplier because this supplier is dependent on the company.”

It is also interesting to look at the locations of the main suppliers. For the Hungarian companies reporting joint development with the supplier, the suppliers are all located in Western Europe or Japan except for one where the domestic supplier is a foreign owned local plant. The Slovene companies have joint development more with domestic partners. In fact, all of the suppliers involved in joint development are Slovene except for in the one case above with the foreign owner, and in another where the company found a German supplier at a trade fair in Munich. One of the Slovene companies reported China as the location of their largest supplier, although they discuss a Slovene supplier as their most important, since it is a strategic supplier and the Chinese company supplies relatively simple input materials.

We can infer from these observations that although Hungary has benefited from more foreign investment than has Slovenia, Hungarian companies may have lost some control over their buyer/supplier relations. It is not clear whether this is just for the short term and allows stronger companies to build up autonomy over time, or whether this will have lasting consequences in solidified power relations with foreign companies. Certainly having foreign investment has helped Hungary, since the foreign-owned companies are

responsible for a large part of Hungarian exports and growth in exports. However, many domestic Slovene companies have managed to find or maintain buyers abroad without the benefit of direct foreign ownership.

7. CONCLUSIONS

In this paper we have explored the ways in which companies from the Slovene engineering sector co-operate with their buyers and suppliers, the extent and the nature of their integration into the international production networks and the contributing factors to co-operation. The analysis is based on interviews conducted with 47 medium-sized and large companies from the NACE 29-35 sectors, which represent an important part of the Slovene economy.

Our interest in the study of buyer/supplier relationships was based on the assumption that the embeddedness in the network of ties between economic actors can provide important channels for the transfer of tacit knowledge between companies. From the viewpoint of the involvement of Slovene companies in the international production networks we were interested to see whether this might have implications for the upgrading of the knowledge base of these companies and of the studied sector in general.

In contrast to some of the findings of previous research work in this field in Slovenia we were able to show that companies from the studied sectors are increasingly becoming involved in more long-term relationships with their buyers and suppliers. Although several cases of Arm's length Contractual Relations were found, Obligational Contractual Relations seem to be coming in the forefront as the companies from the studied sectors are becoming more closely integrated into the international production networks.

Looking at individual cases we found explicit evidence of the transfer of tacit knowledge, mostly between customers and companies interviewed. It was especially interesting to see that this knowledge triggered extensive learning processes, which not only contributed to the upgrading of the knowledge base in the companies concerned, but also effected their strategic suppliers, which were able to learn from the company and build their own

capacities through collaboration. Since most of the interviewed companies that were characterized by close co-operation with their customers also reported to have co-operated closely with suppliers from Slovenia, we can conclude that closer co-operation with buyers and suppliers provides a good opportunity for Slovene companies in the engineering sectors in Slovenia to improve their knowledge base, achieve a higher degree of functional discretion and thus pave the way for an improvement in their position within international production networks.

The evidence from Hungary shows a somewhat different picture from that found in Slovenia. The difference in the co-operation patterns with buyers and suppliers can at least partly be explained by the difference in ownership patterns. Hungarian companies tend to have less control over the choice of buyers and suppliers, which – in spite of the presence of a number of prominent multinational companies in the sector – inhibits the transfer of tacit knowledge within the sector and thus deprives the engineering sector from potentially highly beneficial learning effects.

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