

5 How do firms cooperate?

So far Part A has explained what cooperation is, why it can occur and the firms most likely to be involved. We now turn to examine cooperation in detail. We turn the spotlight on the way firms engage in business cooperation. This gives us a profile of the arrangements themselves and the firms most commonly using each type. We ask questions like: what proportion of firms have cooperative arrangements with customers? Is most cooperation undertaken on a formal or informal basis? How common are arrangements with firms overseas?

There are two sections in this chapter. In the first we measure the *intensity* of business cooperation occurring between firms in Australian manufacturing industries. We look at the number of arrangements firms have, how many other firms are involved in each arrangement and whether the arrangements are formalised or remain informal.

In the second section, we examine the *nature of the partner firms* in the arrangements. These firms can be classified as either customers, suppliers, or other firms or they can be divided into domestic or overseas-based firms. We also ask whether firms with certain characteristics (young firms, big ones) choose different sorts of arrangements than most firms. Our aim is to give a picture of how much cooperation is going on and what sort of cooperation is occurring.

For all the possible forms of arrangements there are two ways of grouping firms for comparison:

- We could look at the proportion of firms with each type of arrangement on a non-exclusive basis (for example formal and informal arrangements), which allows for the fact that some firms have both. Added together these will generally make more than 100 per cent. For example, 76 per cent of cooperating firms have formal arrangements and 69 per cent have informal arrangements. This grouping is used to provide an accurate indication of the relative frequency of each type of arrangement.
- We could see how many firms have *exclusive* types of arrangements. Thus, what proportion of firms have *only* formal, or *only* informal arrangements and what proportion have a combination of both (these figures will add up to 100 per cent). We do not focus much on exclusive arrangements in this chapter because the firms which have exclusive arrangements tend also to have only one arrangement. There is no point in effectively repeating the analysis of the number of arrangements. The use of exclusive arrangements becomes more important in the following chapters as it allows the benefits and costs to be allocated to particular forms of arrangements.

We summarise the main users of each form of arrangement in Table 5.1. Those firm characteristics with a rating of three (•••) have a major influence on the type of arrangement, while those with a one (•) rating have no influence. For example, the age of a firm has a major influence on the likelihood of cooperation with overseas firms, but a low influence on the number of partners in an arrangement.

Table 5.1 Firm characteristics and type of arrangements – summary

	<i>Size</i>	<i>Age</i>	<i>Growth perform- ance</i>	<i>Exporters</i>	<i>Product type</i>	<i>Techn- ology</i>	<i>Compet- ition</i>	<i>Owner- ship</i>
Number of arrangements	***	**	**	**	.	***	.	.
Number of partners within arrangements	***	.	***	**	***	***	.	.
Formal or informal	***	**	***	***	***	***	.	.
Customer/ supplier/other	***	***	.	**	***	***	.	.
Arrangements with overseas firms	***	***	**	***	**	**	.	.

Notes: . = no influence; ** = minor (indirect) influence; and *** = major (direct) influence.

Source: BIE survey

5.1 Intensity of arrangements

5.1.1 Number of arrangements

Information on the number of arrangement per firm is a key indicator of the intensity of firms' cooperation. Do larger firms tend to have several, or just one important arrangement? Do exporters tend to have more than five arrangements? Box 5.1 demonstrates how one firm regularly uses a number of cooperative arrangements.

As discussed in Chapter 2, firms have been split into three groups according to the number of cooperative arrangements they have – those with only one arrangement, those with two to four, and finally those with between five and ten arrangements. Those with more than ten arrangements have been excluded from analysis as it is unlikely that all these would be cooperative business arrangements (that is some are probably arm's length relationships). It was found that around 30 per cent of cooperating firms have only one cooperative arrangement, 46 per cent have between two and four, while 24 per cent have between five and ten cooperative arrangements.

Box 5.1 Achieving big things through cooperation

Davison Engineering provides repairs, servicing, problem solving and manufacture in fields as diverse as airport laundries, pumps, carpet tufting machines, vacuum presses, and parts for waste authorities.

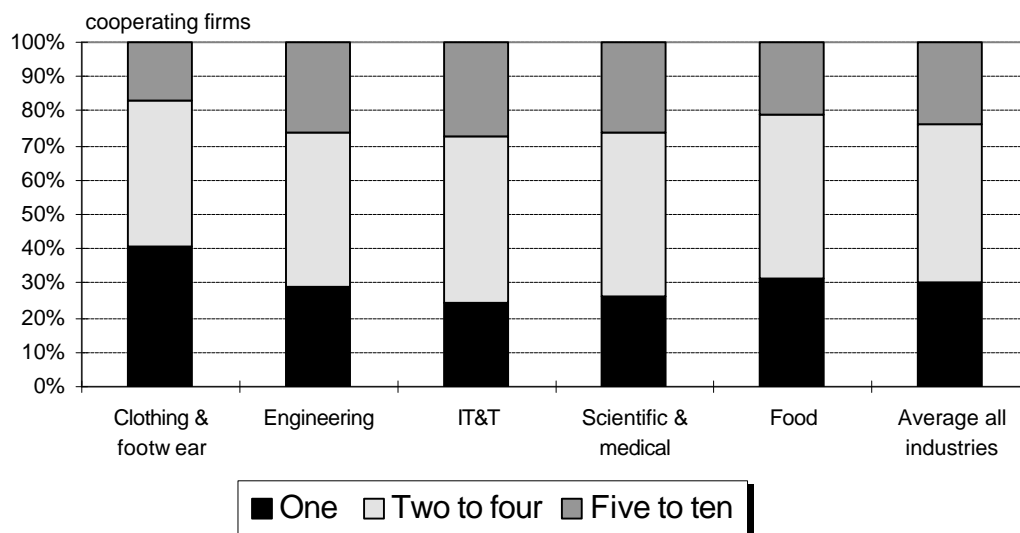
It has a full time staff of only twelve yet through cooperation with other engineering companies the firm has been able to tackle very large jobs. The cooperative system is one of loose contacts of almost a family-like nature between firms in the engineering industry. In contrast to many other companies, cooperative arrangements tend to start formally with arm's length contracts specifying partner obligations and end up being informal once trust develops between companies.

Cooperation typically occurs in three areas. Davison Engineering may work with one or more companies with complementary skills where a half completed task for a customer is passed onto another firm for completion. Work is also passed on to other companies if they do not currently have the capacity to carry it out. The third area where cooperation occurs is through the sharing of information on customers, suppliers, running of the business and on acquiring investment goods.

Source: BIE interview

Industries

Firms in the Clothing and footwear industry have a significant tendency towards having only one cooperative arrangement and away from having larger numbers of arrangements (Figure 5.1). This accords well with our finding in Chapter 3 that Clothing and footwear firms have the lowest overall participation in cooperative business arrangements. This is further supported by the fact that the industry with the highest level of overall cooperation, IT&T, also has the lowest proportion of cooperating firms with only one arrangement and nearly 30 per cent with between five and ten arrangements.

Figure 5.1 Number of arrangements, by industry

Source: BIE survey

New industries, such as IT&T and Scientific and medical, appear to use cooperative arrangements as an integral part of business strategy and are therefore likely to have a greater number. Firms in the more mature

industries, such as Food and Clothing and footwear, are not ‘born cooperators’ and have less of a tendency to be involved in several arrangements.

States

Firms in Queensland are more likely than firms in other states to have only one cooperative arrangement, while very few have five to ten arrangements. Again, this is in keeping with the finding that the overall level of cooperation by Queensland firms is relatively low. This also coincides with Buttery’s (1993) finding. He posed a similar question of Queensland firms and found that only 20 per cent of cooperating firms had more than five individual arrangements.

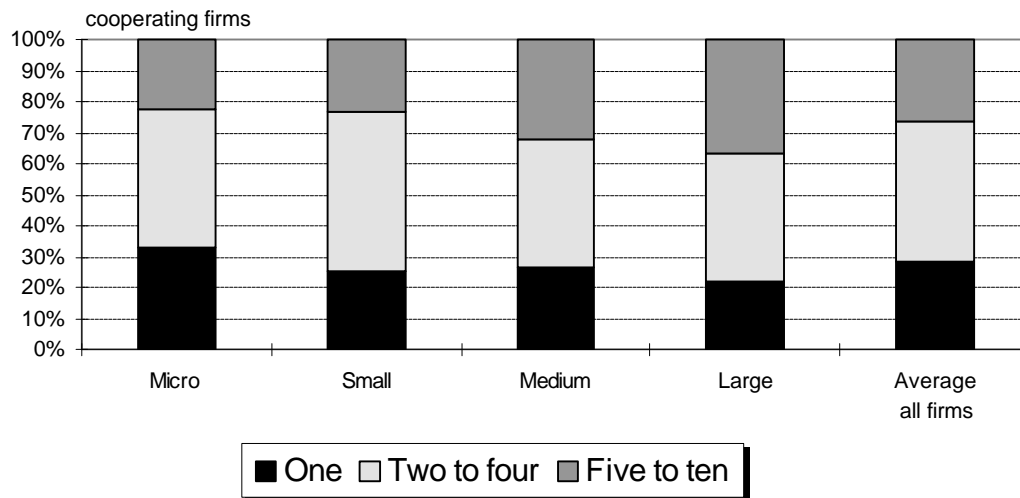
Western Australian firms, which have a high participation rate in cooperation (48 per cent of firms), have a significantly large number of firms with five to ten arrangements and a small proportion with only one arrangement.

Major influences on number of arrangements

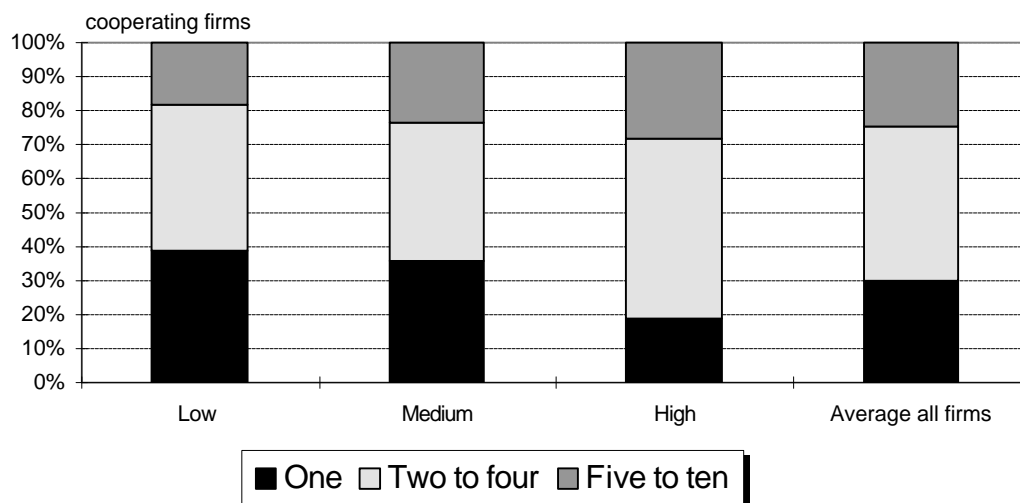
Not surprisingly, most of the factors that influence participation in cooperation also affect the *number* of arrangements adopted by firms. We found:

- As firm size increases there is a tendency for the number of arrangements to also increase. Small firms are more likely to have only one cooperative arrangement and significantly less likely to have between five and ten arrangements (Figure 5.2).
- Low and medium technology firms are more commonly only involved in one cooperative arrangement (Figure 5.3). High technology firms, on the other hand, are less likely to have only one arrangement and more likely to have between two and four.
- Although the age of a firm is not a significant factor in determining whether a firm cooperates or not (Chapter 4), it does appear to be related to the number of arrangements. Young firms are significantly less likely to have five to ten cooperative business arrangements and more frequently have only one.
- Exporting firms are significantly more likely to have five to ten arrangements and significantly less likely to have only one arrangement. To export, firms often rely on a large number of other firms, such as distributors, which are often vital to a successful export strategy. Firms which do not export may have less need for these extra linkages in carrying out their operations. Additionally, as noted in Chapter 4, exporters are predominantly in the new industries which have a naturally higher level of cooperation. Moreover, exporters also tend to be larger firms, with 77 per cent of large firms exporting compared to around 35 per cent of small firms.
- High growth firms are significantly more commonly involved in five to ten linkages and less frequently in only one.
- There is *no* significant difference between the proportions of producers of capital goods, final goods and intermediate goods with differing numbers of arrangements¹.

¹ The two other firm characteristics considered in Chapter 4, form of ownership and level of competition, are not examined in depth here or in the following sections. In the case of ownership this is because of the very small sample numbers for each of the various forms which makes statistical comparisons difficult. In the case of competition, as well as sample size problems (very few firms in the low competition group), no significant

Figure 5.2 Number of arrangements by firm size (employees)

Source: BIE survey

Figure 5.3 Number of arrangements, by technology content

Source: BIE survey

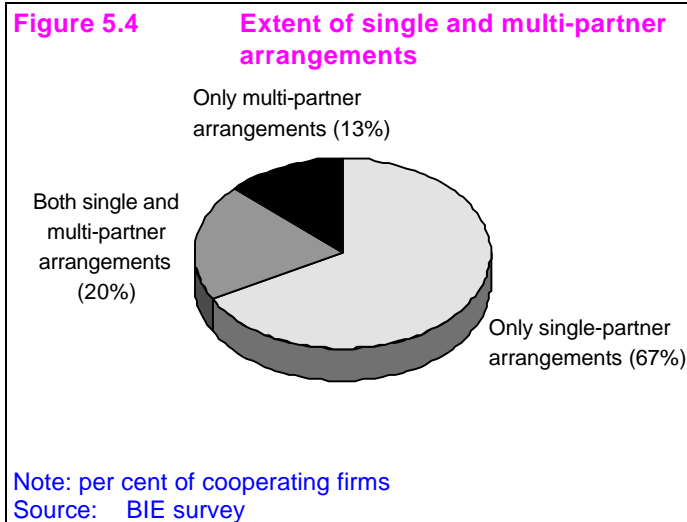
differences were found in the use of different types of arrangements between firms experiencing either medium or high levels of competition and the average firm.

5.1.2 Number of partners within arrangements

Just as the number of arrangements firms have is of great interest, so is the issue of the number of partners within arrangements. Do firms mainly cooperate on a one-to-one basis? How common are networking type arrangements where three or more firms cooperate? This information is particularly interesting to policy

makers and administrators involved in assisting the development of networking.

In the BIE survey, 87 per cent of cooperating firms have arrangements which involve only one other firm, while only one third of cooperating firms have business arrangements which involve two or more other firms (Figure 5.4). Around one-fifth of firms have both types of cooperative arrangements. Only 13 per cent of cooperating respondents were exclusively in networking type arrangements, while two-thirds of firms cooperate only on the basis of one-to-one arrangements.



So single-partner arrangements dominate business cooperation. These involve a link with a single partner (a supplier for example) rather than many partners. To most Australian firms a cooperative arrangement means dealing directly with one other firm. Networks are used much more rarely although there are now government programs which promote these (see Appendix D). Networks can produce large benefits for member firms, as illustrated in the case of PTE Hydraulics (Box 5.2).

Box 5.2 **Multiple firm network – PTE Hydraulics**

PTE Hydraulics is a small engineering company involved in a training development network. The group has been operating about 15 months and is an initiative of the Queensland Department of Employment, Education and Training and two consultants who act as facilitators. It comprises seven small manufacturing companies within a five kilometre radius of each other in Brisbane. The principals of these companies meet bi-monthly to discuss problems and solutions.

Some companies have advantages in certain areas, such as full use of shopfloor groups or computer-aided machinery, and the meetings allow a faster transfer of knowledge of these methods and their benefits and associated problems.

This network has resulted in some very good training to date, especially at the supervisor level. However, the firms are still on a learning curve and PTE expects future benefits to be even greater.

Source: BIE interview

Table 5.2 Single-partner and multi-partner arrangements, per cent of cooperating firms

	<i>Single-partner only</i>	<i>Multi-partner only</i>	<i>Both</i>
All firms	67	13	20
States			
NSW	70	14	16
VIC	69	11	20
QLD	54	21	25
SA	51	13	36
WA	67	7	27
Industries			
Clothing and footwear	72	13	15
Engineering	64	13	23
IT&T	63	13	24
Sci/med	72	10	17
Food	58	18	23
Firm size			
Micro	69	9	22
Small	65	15	21
Medium	58	19	23
Large	65	15	21
Age of firm			
Young	69	13	18
Established	66	13	21
Mature	63	14	23
Turnover performance			
Low performers	74	10	16
High performers	60	14	26
Exporting status			
Non-exporters	69	13	18
Exporters	60	16	24
Type of product			
Intermediate	63	15	22
Capital	66	10	24
Final	66	14	20
Technology			
Low-tech	72	14	14
Medium-tech	66	15	18
High-tech	61	12	27

Source: BIE survey

We used our survey data to map the frequency of such network arrangements compared to single partner arrangements for different regions, industries and firm characteristics (Table 5.2):

- While there are only very slight differences in the level of single partner arrangements between industries, there are some notable differences in the frequency of networks. The Food industry has much more multi-firm links than average, while the Sci/med industry has significantly less. The higher level of networks in the Food industry can be at least partially explained by the relatively homogenous product of firms in specific sectors of this industry. Fairly uniform items such as wine or confectionary are eminently suitable for sharing production facilities and common international

marketing initiatives.² The Scientific and medical industry, on the other hand, produces highly differentiated products. This may result in reduced areas for cooperation between any more than two firms. Moreover, face-to-face interviews with these firms suggested that multi-firm links often have a role similar to an industry association rather than a cooperative business arrangement (that is, sharing information and providing common support for industry objectives).

- There are relatively high levels of multi-partner linkages in both South Australia and Queensland. The South Australian situation can be directly related to the high level of Food industry responses. Queensland has a significantly higher proportion of firms which are exporting (see Chapter 4) which have a greater tendency to enter multi-firm arrangements.
- Smaller firms are less involved in arrangements with more than one partner than other sized firms. This suggests that smaller firms face some barrier to entering business networks. When they do cooperate they tend to form arrangements with only one other firm.
- High growth firms make significantly more use of networks.
- The greater the technology content of a firm's product the more likely they will participate in networks. About 40 per cent of high tech firms had network arrangements compared to about 30 per cent of low tech firms.
- Exporters have a significantly higher level of network arrangements. However, as exporters tend to be large firms, and non-exporters small firms, this relationship between exports and network arrangements may be due in part to size variations.

5.1.3 Formal and informal arrangements

Cooperative arrangements can be classified as formal or informal. In the survey we asked firms to classify their arrangements without being given a strict definition of either formal or informal arrangements.

This self-classification therefore reflects the real world understanding of the terms. In interviews with firms it was apparent that formal arrangements are commonly accepted as those which are legally binding and involve a contract outlining what is expected of all parties to the agreement.

On the other hand, an informal arrangement is a trust-based tacit agreement. All parties generally know what is required of them. But they cannot be forced to keep their word, apart from the fear of losing the benefits of cooperation. Informal arrangements are often based on a history of previous dealings, trust, reputation and mutual dependence. The arrangement tends to stay together as long as all involved are happy and trust is maintained. Informal arrangements are classified as cooperative business arrangements provided they have some continuity and are not one-off relationships put together for a specific task.

But why do we care?:

- formal arrangements provide a measure of *committed* cooperation, while informal linkages often represent marginal forms of cooperation; and
- policy makers and program designers are interested to see which types of firms adopt the more formal arrangements.

² In fact there are government-supported Food industry networks which operate in this manner (see Appendix D).

The stories of the two companies in Box 5.3 show that often a definite choice is made by firms as to whether a formal or an informal form of arrangement would best suit the situation. As we pointed out in Chapter 3, the choice is not arbitrary. We hypothesised that larger firms may cement their arrangements by formalising them, thus minimising problems due to the movement of key personnel.

Box 5.3 To formalise or not to formalise

NetComm Ltd is a designer, manufacturer and marketer of high performance PC communications products and telecommunications access services for the Internet information super highway. It has over fifty per cent share of the Australian modems market. Exports account for a relatively small share of total sales.

NetComm has a mixture of formal and informal arrangements. Its smaller, short term relationships tend to be operated on an informal basis. Some of its long-term cooperative arrangements have also started life as informal relationships. NetComms' principal guideline is that the minute long-term security or profitability comes under threat it seeks to formalise arrangements.

Breseight Australia is a small engineering company based in Sydney. It currently has major contracts to supply components for two large communications companies and has cooperative arrangements with several of its own suppliers.

Breseight management believes that formality is often a matter of evolution and arrangements being allowed to take their own course. However, wherever possible the company prefers the flexibility of informal arrangements with suppliers and the comfort of formal agreements with customers.

Source: BIE interviews

A large number of firms have both formal and informal arrangements. The majority of firms with cooperative arrangements (76 per cent) have formal arrangements and 69 per cent have informal arrangements, while 45 per cent of firms have both. Despite the apparent interest in these two forms of cooperative arrangements previous studies have tended to concentrate on only one type of arrangement, or have not made a clear formal/informal split.

While we found some variation in the frequency of formal versus informal arrangements by industry, region or firm characteristics, this variation was less stark than for other features of cooperation (Table 5.3).

Table 5.3 Formal and informal arrangements, per cent of cooperating firms

	<i>Formal only</i>	<i>Informal only</i>	<i>Both</i>
All firms	31	24	45
States			
NSW	28	27	45
VIC	31	22	47
QLD	47	19	33
SA	38	20	42
WA	20	33	47
Industries			
Clothing and footwear	30	30	40
Engineering	31	28	41
IT&T	24	19	57
Sci/med	41	12	47
Food	37	12	51
Firm size			
Micro	29	26	45
Small	27	23	50
Medium	35	21	44
Large	40	15	46
Age of firm			
Young	36	19	45
Established	29	27	44
Mature	32	22	45
Turnover performance			
Low performers	34	21	45
High performers	26	20	54
Exporting status			
Non-exporters	31	27	41
Exporters	32	19	49
Type of product			
Intermediate	27	30	43
Capital	28	20	52
Final	34	23	43
Technology			
Low-tech	37	35	28
Medium-tech	33	23	44
High-tech	27	18	55

Source: BIE survey

At the industry level, no industry has a particularly strong tendency towards either formal or informal arrangements. The Food and Scientific and medical industries are the only two with any noticeable difference between the level of formal and informal arrangements – both favouring formal arrangements. These are two very different industries in many respects. The Food industry has more multi-partner arrangements, which are also more likely to be formal. In the Scientific and medical industry, strict regulation of product quality often necessitates the formalisation of the arrangements.

Firms located in Queensland use informal arrangements less than the average. Buttery (1993) has made a study of cooperation by Queensland firms which confirms these figures and shows an even lower

acceptance of informal arrangements. Buttery found that 20 per cent of surveyed firms (both cooperating and non-cooperating) would enter a network or alliance on the basis of trust alone while 50 per cent would require a contract. Additionally 20 per cent of firms required both. We do not know why Queensland firms are so keen to formalise their arrangements. Formal arrangements are associated more strongly with particular industries but there is not a large proportion of either Food or Scientific and medical firms amongst the Queensland respondents. There is a relatively high proportion of IT&T firms in Queensland, but these lean only marginally towards formalised arrangements.

As a firm becomes larger it tends to become more involved in formal arrangements and relatively less involved in informal arrangements. There are a number of possible explanations. It may be that formal arrangements are more costly to form, maintain and monitor so that large firms are the ones which can afford them, particularly in large numbers. Larger firms with their generally higher level of complexity and resources can also devote more time per employee towards the formation and maintenance of business arrangements. It may also indicate that this is the way large firms do business, generally preferring to tie things down because of the numbers in the organisation and the strategic importance of arrangements. Box 5.4 gives one example of a medium to large firm which has formalised its cooperative arrangements with even larger companies.

Box 5.4 Formalisation of arrangements

Agen Biomedical produces medical and veterinary diagnostic test kits, with a very high R&D component. In 1993/94 the sales were valued at \$9.5 million, of which \$8.5 million was due to exports. The company has always exported, as the Australian market is not big enough to support the required research. Exports go to Japan, the United States and Europe.

Agen has a series of relationships with distributors in different markets. These all started out as pure distributor relationships. But as the companies involved are large multinationals the majority of relationship have become formalised, and now involve joint R&D. Another one of these relationships is with Johnson&Johnson and involves informal joint research.

Source: BIE interview

High growth firms are slightly more likely to have formal arrangements than the average firm. Such firms tend to have both formal and informal arrangements. Surprisingly there is a greater polarisation of choice by poor growth firms: they tend to opt for exclusively formal or exclusively informal arrangements.

Exporters are slightly more likely to use formal arrangements. This can be expected on the grounds that many of these arrangements are with overseas firms (Chapter 4) and, as such, it is wise to have some form of contract to avoid misunderstandings when dealing with firms operating under different regulations and systems.

Capital producers also tend to use formal arrangements slightly more than the average. On the other hand, producers of intermediate goods have significantly more reliance on exclusive informal arrangements.

Firms producing a high technology output are much more likely to use formal arrangements than low tech producers.

5.2 Nature of the arrangement partners

5.2.1 Arrangements with customers, suppliers and ‘other’ firms

The AMC and McKinsey (1994, 1993) emphasise the importance to firm performance of having cooperative business arrangements with customers and suppliers. Of course links also may be formed with other firms either in the same or different industries – competitors, distributors and transport operators amongst others.

Leading the Way (AMC 1994) found that information was the key to a customer relationship. Knowing about a customer’s needs allows a firm to anticipate changing preferences and use this as a source of competitive advantage. In the *Wealth of Ideas* the AMC noted that most successful and innovative firms use a range of linkages – with customers, suppliers, R&D providers and other firms in their industry – to enhance their performance and gain access to ideas. Box 5.5 gives an example of a Brisbane-based company which is working with both its customers and suppliers.

Around half the cooperating firms in the BIE survey have linkages with more than one of these three groups (Figure 5.5). There is typically an even spread of arrangements, but it is slightly more common to work closely with customers (60 per cent of cooperating firms have customer arrangements).

It is not possible to determine the proportion of arrangements with ‘other’ firms that are with direct competitors, although anecdotal evidence gathered in interviews, indicates firms are often not comfortable working closely with competitors.

“I know who my competitors are, and would greet them at a conference, but I would never talk business with them.”

There are relatively equal numbers of firms with non-exclusive formal and informal arrangements with customers (41 per cent of cooperating firms have formal arrangements and 38 per cent informal) and suppliers (37 per cent formal and 35 per cent informal), while there is a tendency for arrangements with other firms to be formalised (39 per cent formal and 32 per cent informal). The greater formalisation of arrangements with other firms may be because they are generally outside day to day transactions and may also be with competitors, requiring more care in specifying obligations.

Box 5.5 Customer and supplier arrangements

Franna Cranes commenced operations in 1986 and is a fully Australian-owned private company. Exports account for about ten per cent of sales. About 55 staff are currently employed and annual revenue is approximately \$28m.

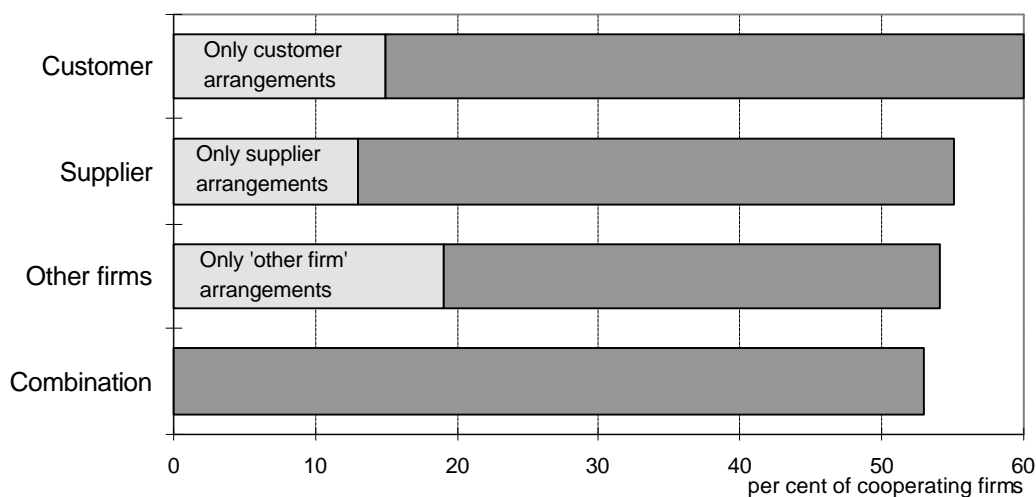
The company specialises in the design and manufacture of mobile cranes, as well as distributing European and Japanese cranes. At the moment the domestic market is protected by tariffs and also by the fact that it is too small for any of the big overseas companies to set up operations.

Franna Cranes aims to work closely with all its suppliers as well as maintaining contact with their customers. There is more widespread cooperation with suppliers now than in previous years. When the company started they relied on a few strong links, now there are many more but relationships are still on a one-to-one basis.

Cooperation has definitely proved beneficial for the company. The company actively seeks feedback on the performance of its cranes from users and talks to clients everyday. Most clients are self-employed operators.

Source: BIE interview

Figure 5.5 Extent of cooperation with customers, suppliers and 'other' firms



Source: BIE survey

We sought to discover systematic patterns in a firm's choice of partner³(Table 5.4):

- Firms in the Food industry have less supplier links than average. This can be explained by the nature of the Food industry, where suppliers are generally individual farmers providing a homogenous product which can also be bought from intermediaries such as wholesalers and markets. It is only the very

³ More prominent patterns appear when we look at exclusive arrangements: cases when a firm only works with one type of partner. But this is not worth examining closely. Why? Simply because we would really be running a reprise of section 5.1.1 where we looked at the *number* of arrangements. The sorts of firms which tend to form only one arrangement are clearly going to have a higher likelihood of forming an exclusive arrangement.

largest processors which actually work closely with these primary producers to ensure both the quality and quantity of supply.

- The IT&T industry had a higher incidence of customer relationships than other industries. Overall, 55 per cent of firms in our survey regard their flexibility in meeting customer needs as a component of their competitive advantage. This suggests that firms know the importance of working with their customers whatever their industry. This is supported by the finding of AMC and McKinsey (1994), that around 70 per cent of firms across all industries rate customer demands as very important or critical in driving performance.
- Links with other firms are significantly less frequent in the Clothing and footwear industry. This reflects their difficulty in cooperating with firms that are neither customers or suppliers. Firms in this industry often need preferred suppliers and tend to also work with retail stores. There is less cooperation with other firms.
- There was some regional variation in the types of partners in cooperative arrangements, but we do not think this is due to any inherent feature of regions, but instead reflects differences in states' industry structures. For example, the lower level of arrangements with suppliers in South Australia is probably caused by the high level of respondents in the Food industry. Here, supplier links are fairly uncommon⁴.
- There were no big differences in the type of partners chosen by firms of varying size.
- Young firms have more supplier arrangements and less customer links than the average firm. This suggests that supplier arrangements may often be the earliest form of business arrangement and actually supports the 'sequencing' hypothesis we outlined in Chapter 3. To a new firm, continuity of output is vitally important in establishing reputation. Hence, such firms often place greater emphasis on supplier arrangements than do older firms. Additionally, younger firms are less likely to have arrangements with other firms (45 per cent compared to an average of 54 per cent).
- Capital producers more commonly have cooperative arrangements with 'other' firms. Intermediate good producers have many more links with customers than to their suppliers. Firms producing final goods have a higher proportion of supplier links. The reliance on working closely with suppliers may enable strict quality control over inputs, in addition to the development of new products.
- 60 per cent of exporters have supplier arrangements as opposed to 50 per cent of non-exporters, and there is almost as large a difference in the level of arrangements with other firms (58 and 51 per cent respectively). However, exporters tend to be predominantly larger firms while non-exporters are generally small firms. These size variations may be the cause of differences.
- High growth firms have a significantly greater propensity to form arrangements with suppliers and other firms, but are only equally likely to have customer arrangements.
- Low-tech firms have fewer links with 'other' firms than the average.

⁴ There were other *apparent* differences in the type of partners by state. But we discount these because of low samples in the relevant categories.

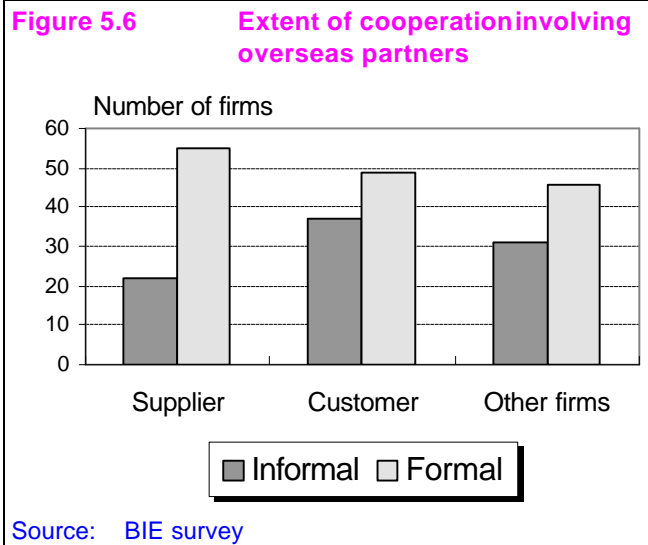
Table 5.4 Supplier, customer and other links, per cent of cooperating firms

	<i>Supplier</i>	<i>Customer</i>	<i>Other</i>
All firms	55	60	54
States			
NSW	57	62	51
VIC	58	60	54
QLD	54	47	63
SA	44	62	62
WA	60	69	51
Industries			
Clothing and footwear	65	62	41
Engineering	53	59	56
IT&T	59	71	56
Sci/med	67	55	53
Food	37	58	65
Firm size			
Micro	51	60	51
Small	61	67	54
Medium	53	62	60
Large	56	71	54
Age of firm			
Young	59	54	45
Established	52	61	56
Mature	56	64	57
Turnover performance			
Low performers	54	60	48
High performers	61	59	66
Exporting status			
Non-exporters	50	60	51
Exporters	60	62	58
Type of product			
Intermediate	44	68	57
Capital	52	56	62
Final	60	61	50
Technology			
Low-tech	60	63	45
Medium-tech	52	61	51
High-tech	57	59	63

Source: BIE survey

5.2.2 Overseas and domestic arrangements

The importance of working with companies overseas has been noted by several studies and was discussed in Chapter 3. AMC and McKinsey (1994) found 80 per cent of emerging exporters rated offshore customers as very important, or critical, sources of information. Buttery (1993) found that nearly 57 per cent of all surveyed firms which were networking had experience in alliances with overseas firms in the previous three years.



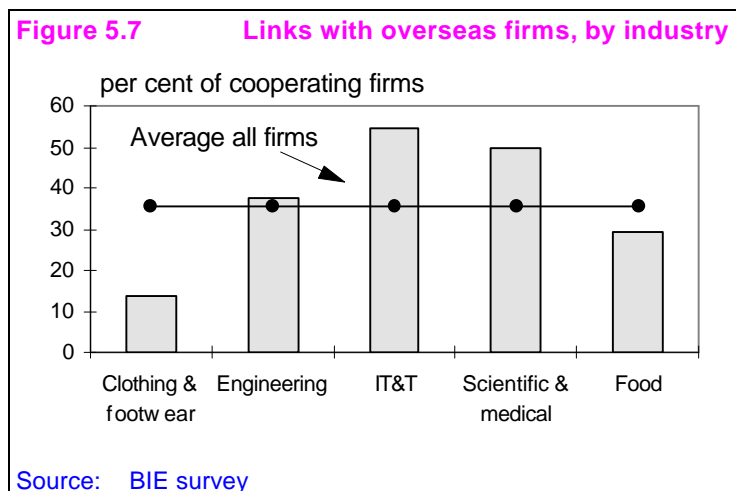
We found around 36 per cent of cooperating firms had arrangements with overseas firms, while the other two-thirds of firms only deal with domestic partners. The method of data collection did not enable the separation of firms with arrangements which *solely* involved overseas companies from those which involved *both* overseas and domestic companies. Hence, no information can be presented on firms with exclusive overseas arrangements.

As expected (see Section 5.1.3) most overseas arrangements are formalised. However, the level of informal arrangements involving overseas partners varies with the type of partner (Figure 5.6). Customer arrangements

are much more likely to be informal than are supplier arrangements.

When we looked deeper into the data we found that (Table 5.5):

- Firms in the IT&T industry are much more likely than the average firm to have overseas links (Figure 5.7). On the other hand, only a small share of firms in the Clothing and footwear industry have overseas links. This reflects, in part, the outward orientation of the IT&T industry and the focus on the domestic market by the Clothing and footwear industry.



- Western Australia has the lowest level of overseas links (and exports), despite its proximity to the growing markets of Asia. This reiterates the domestic focus of Western Australian firms profiled in Chapter 4. Queensland companies have the strongest links to overseas-based companies despite their relatively low overall level of cooperation. This is not unexpected, however, due to the slightly higher proportion of Queensland firms which are exporting (35 per cent) compared to the average (32 per cent). The relationship between overseas links and exports is investigated further below.
- Not surprisingly, the level of overseas arrangements appears to be closely related to the level of export activity. This relationship is examined in BIE (1994a) which found that over 30 per cent of small firms in emerging industries used joint ventures to assist with marketing their export product and nearly 60 per cent used distributors or agents for this task. Both the joint venture partner and distributors were mainly overseas companies. Box 5.6 gives an example of an exporter with a variety of cooperative business arrangements involving overseas-based companies. What is

surprising, is the number of non-exporters which did have links. We found that 22 per cent of non-exporters had such links (compared to around 56 per cent of exporting firms). Despite the benefits of cooperative business arrangements with overseas companies we found from face-to-face interviews that it was not always easy to develop these relationships. Work by Michael Porter (1990) in *The Competitive Advantage of Nations*, suggests a network of relationships is important for stimulating and sustaining a vibrant export sector. This theme is also expounded in AMC and McKinsey (1994) and the LEK report (1994).

- The majority of firms, whatever their size, tend to focus primarily on arrangements with domestic firms. Even so, the larger the firm, the higher the likelihood of an overseas linkage. This is not surprising since exporters tend to be larger firms.
- Young firms are less likely to have overseas arrangements. This is because of their generally smaller size and their lower export propensities (Figure 5.8).
- Producers of intermediate goods and capital equipment have significantly less overseas arrangements than average. Final good producers are the opposite, relying relatively heavily on overseas arrangements.
- Low technology firms use below average levels of overseas arrangements, while the opposite is true for high technology firms. High technology firms are predominantly in the IT&T and Scientific and medical industries which use relatively high levels of linkages with overseas firms and have a correspondingly high level of exporters. Accordingly, these findings are consistent with both export and industry findings.

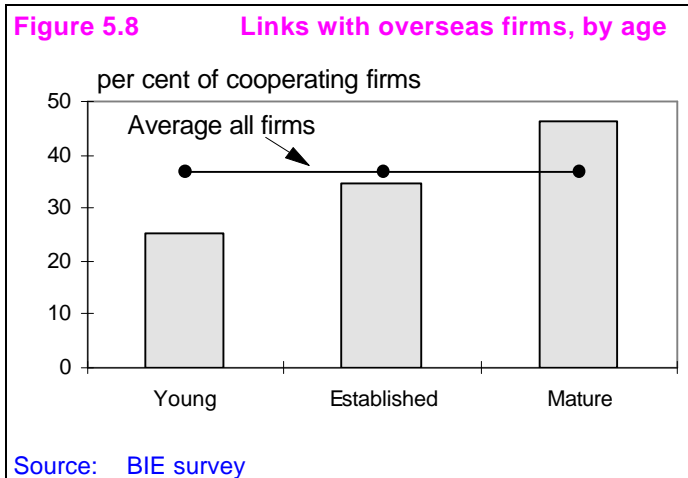


Table 5.5 Overseas linkages, per cent of cooperating firms

	<i>Proportion with overseas linkages</i>
All firms	36
States	
NSW	33
VIC	39
QLD	47
SA	46
WA	22
Industries	
Clothing and footwear	14
Engineering	38
IT&T	54
Sci/med	50
Food	29
Firm size	
Micro	27
Small	40
Medium	45
Large	50
Age of firm	
Young	25
Established	35
Mature	45
Turnover performance	
Low performers	30
High performers	41
Exporting status	
Non-exporters	22
Exporters	56
Type of product	
Intermediate	14
Capital	50
Final	38
Technology	
Low-tech	16
Medium-tech	32
High-tech	52

Source: BIE survey

5.3 Modelling analysis

‘There are lies, damned lies and statistics’. Whenever you try to distil patterns from data, it is very hard to really find out what determines what. You might, for example, find an apparent relationship between two variables, A and B. But on closer analysis you find that there is another variable, C, which causes B and A. The relationship between B and A is actually spurious. For example in this report, we have found age effects often reflect some other factor. Partial analysis – looking for relationships between two variables – is always subject to this risk. It may be helpful for rooting out really obvious relationships, but it can also spuriously pick up the influence of other omitted variables.

Box 5.6 Arrangements with overseas companies– Agen Biomedical

In 1993/94, Agen Biomedical's sales were valued at \$9.5 million, of which 90 per cent were exports. Most of Agen Biomedical's cooperative business arrangements are with international companies, as these are the only ones large enough and with the necessary market contacts to be of assistance to Agen. The joint projects (both formal and informal) with these companies result in the development of reagents to test for particular diseases using the instruments produced by the larger companies.

Agen Biomedical tends to formalise a long run relationship, especially if large sums of money are involved. There are always problems of distance working with international companies, but the benefits make the extra effort worthwhile. These cooperative arrangements have given Agen a global view of its industry and the firm's role.

Agen's one-to-one relationships with international companies tend to have a clear commercial or project focus while multi-firm relationships generally only provide support and information. However, Agen is willing to cooperate with any firm (including competitors) as long as they can maintain the necessary level of control.

Source: BIE interview

In this section, we overcome the deficiencies of partial analysis by using regression methods – these control for all the myriad of influences, and give more reliable results. We are able to use the models to better understand what factors influences a firm's choice of cooperative arrangement. We use data for only those firms already in a cooperative business arrangement. The techniques used to construct and test the models are outlined in Appendix A⁵.

5.3.1 Number of partners

The likelihood of multi-partner arrangements increase with:

- firm size;
- firms which see their cooperative arrangements as a competitive advantage;
- firms which have links with 'other' firms (ie. neither customers nor suppliers); and
- firms located in Queensland and South Australia.

On the other hand, the likelihood of single partner arrangements increases with supplier relations and decreases with increasing size.

⁵ It is important to note one feature of the models. In most probit models, the researcher looks at the probability of mutually exclusive events. Gender, for example, is for most people a mutually exclusive category: you are either male or female. But in much of our analysis the categories are not mutually exclusive. For example, a firm may be in both a network and a single partner arrangement. Accordingly, when we model the likelihood of being in a network, we define a dependent variable which is unity when a firm is in a network and zero if it is not. This means that the usual symmetry that occurs in probit models employing mutually exclusive categories vanishes. For example, imagine a model of voting preferences where there are two parties, A and B. You can only vote for one party. Say that if income rises, a person is more likely to vote for the A party. Because A and B are mutually exclusive, you can also calculate the effect that income has on the probability of a person choosing B. When A and B are no longer mutually exclusive, this symmetry disappears. For this reason we model network choice and single partner choice separately.

5.3.2 Formal/informal

The firm characteristics which influence the formation of a formal or informal link are somewhat different to those which determine whether a firm forms a cooperative arrangement or not:

- modelling confirmed that firms in Engineering industries are less likely to have a formal arrangement;
- bigger firms are more likely to enter a formal cooperative arrangement; and
- firms linking overseas are more likely to choose formal arrangements.

We found that smaller firms or those firms with supplier arrangements more commonly use informal arrangements.

5.3.3 Customers/suppliers/others

We found that the choice of cooperative arrangement partner(s) is not dependent on the size of a firm. As the total number of arrangements firms have is generally low, once firms have an arrangement with one of the three types of partners it is less likely that they will have an arrangement with the other two types. Additionally, it was found no particular industry or state has firms more likely to work specifically with one of these types of firms.

So which variables are important?:

- a firm's tendency to work with customers is positively influenced by the presence of formal arrangements or arrangements involving overseas firms;
- firms facing constraints due to high costs, a proxy for high competition, are also increasingly likely to work with their customers;
- firms which use informal arrangements, produce intermediate goods or low technology products are more likely to have supplier linkages; and
- firms with overseas connections are more likely to forge multi-partner arrangements.

5.3.4 Overseas firms

The likelihood of links overseas:

- decreases for firms in the Clothing and footwear industry. This is most likely related to the strong domestic market focus of this industry;
- not surprisingly, is strongly related to export orientation;
- increases for firms which have competitive advantages in the areas of product design, quality of products, product range and technology or good ideas;
- decreases markedly for firms which produce intermediate goods; and
- increases for firms with formal arrangements.

5.4 Summary

There are many ways firms can cooperate with each other. Like people, firms choose the intensity of their relationships and the nature of their partners. Firms need to consider the whole spectrum of possible partners

– competitors, customers, suppliers, other firms in their industry and even firms outside their industry – and the full spectrum of arrangement modes.

So what types of arrangements do firms have? Over 80 per cent *of arrangements* involve just two firms (for example, a firm working closely with one of its customers). Around 90 per cent *of cooperating firms* have at least one of these single- partner arrangements. Two thirds of cooperating firms rely only on single-partner arrangements (though they may have more than one of these arrangements). Around one-third of firms have some multi-partner arrangements.

Firms do not favour either formal or informal arrangements. Many have both. Around 75 per cent of cooperating firms have formal arrangements, while 70 per cent have informal ones. Similarly, there is no clear favouring of either customers, suppliers or other firms (such as competitors, and distributors and) as arrangement partners. Indeed around 45 per cent of firms have arrangements with more than one of these partners. Australian firms appear to have relatively strong links with overseas companies. Around one-third of cooperating firms have these.

Firms with certain characteristics are both more likely to cooperate overall (Chapter 4) and more likely to favour certain forms of cooperative arrangements. There are four factors which appear central to a firm's choice of both arrangement intensity and partners:

- size;
- the technology level of the product;
- the type of product; and
- whether or not the firm exports.

For example, firms with low technology products favour arrangements where they work with suppliers.

So what does this mean for currently non-cooperating firms? Firstly, it demonstrates that firms of all types can, and are, cooperating and doing so in a variety of different ways. Secondly, it indicates that 'promiscuity' – having a wide range of cooperative partners – is beneficial to firms in engendering new ideas and processes. This is suggested by the relationship between positive characteristics of firms – high growth, high exports, large size – and their involvement in a relatively high number of cooperative arrangements with a range of partner firms. Of course causality may not run just one way. For example, large firms may find it easier to enter arrangements, while involvement in linkages may also stimulate sales.

Finally, this chapter does not suggest that any form of arrangement is 'better' than any other. Rather, firms need to seek out the form of cooperative arrangement and the partner(s) that best suit their needs.