

Applied Research

Perceptions on the Transfer of Technology to China: A Survey of British Companies

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Evidence from a survey shows that British engineering companies with a business interest in China recognise the potential benefits from technology transfer to China. The major strategic objective in transferring technology to China is to gain access to the Chinese market. British firms have a high opinion of the capability of Chinese enterprises to learn to use new technologies but they give a low rating to their managerial and technological capabilities and quality of existing equipment. Foreign companies appear to have a cautiously favourable view of the economic and political environment but the legal framework for doing business, time consuming negotiations, inconvenience of communications, bureaucracy, and unclear organizational authority are identified as the most difficult problems.

Keywords: Technology transfer; Perceptions; Capacity; Obstacles; China

INTRODUCTION AND METHODOLOGY

The Chinese government has recognised the role of technology transfer in China's industrial development and has, therefore, actively encouraged imports of foreign technology. Chinese state enterprises are also keen to acquire technology from abroad and transfer of manufacturing technology to China has become an important part of the strategy of many manufacturers in industrialised countries.

Perceptions of foreign and Chinese enterprises on the objectives and benefits of technology transfers as well as the problems associated with them clearly influence their willingness to engage in such

transactions and the preferred forms of commercial arrangements for the transfers. In order to gain greater understanding of the perceptions of enterprises either engaged in or contemplating technology transfer, questionnaire surveys of actual and potential British technology suppliers and Chinese enterprises were carried out. This paper reports on the survey of British technology suppliers [1] and more detailed interviews with a small number of British managers with recent experience of doing business in China. A survey of the expectations of Chinese enterprises has also been conducted. Based on these two surveys, a comparison of suppliers' perceptions and acquirers' expectations has been made elsewhere [2].

The surveys are one aspect of a research project examining (a) the motivations for technology transfer transactions between British enterprises and Chinese state-owned enterprises, (b) the influence of recent economic reforms and policy changes in China on technology transfer, and (c) factors which contribute to the commercial success of technology transfer. Earlier work [3] identified policy changes as a significant explanation for the expansion of technology transfer and the emergence of alternative transfer channels. More recently, the project has examined the broader context of technology transfer to China [4] and case studies of Chinese and British companies engaged in technology transfer within different forms of relationships between technology suppliers. (See [5] for conclusions from selected case studies on the strategic issues which affect the commercial viability of foreign technology acquisition by Chinese state-owned enterprises.)

The survey of British companies was conducted in collaboration with the China-Britain Trade Group through its network of companies. The questionnaire was mailed to about 1200 companies in all types of engineering and related industries. Three types of questions were used in the survey: (a) multiple choice, (b) grading on a 5-point scale, and (c) ranking of factors according to their perceived importance or influence. To avoid confusion as a result of differing interpretations of "technology transfer", the term was defined as the transfer of product or process technology in the form of "hardware", "software", or a combination of the two by any means including sale of technology, licensing agreements, joint ventures, and formation of subsidiary companies. As our concern is with the enterprise level, technology transfer is defined as acquisition of any technology by an enterprise with the aim of changing its products or processes, irrespective of whether the same or similar technology has been acquired by other Chinese enterprises. This broad definition contrasts with that often used in other studies [6].

Altogether 207 companies responded with completed questionnaires. A further 20 returned unanswered questionnaires indicating that they did not

intend transferring technology to China but would be selling end-products. In view of the rapidly changing market conditions and policy environment in China and the involvement of increasing numbers of foreign businesses in China, companies which were at an early stage of involvement were also encouraged to respond. Figure 1(a) shows that a significant number of respondents are at the exploratory stage during which they were typically collecting and assessing information about (a) business conditions in China and (b) procedures for making contacts with prospective partners. Those at the exploratory stage along with those in discussions with one or more companies made up over 50 percent of the respondents. A small proportion of respondents had completed contracts. However, Figure 1(b) revealed that the current involvement of foreign companies are likely related to their sizes with a higher percentage of larger companies at the further stage and more smaller companies at the initial stage. It shows that with more ownership competitive advantages larger firms are able to conduct their business at the earlier stage so as to exploit ease of market entry as well as less competition in China. Moreover, more detailed

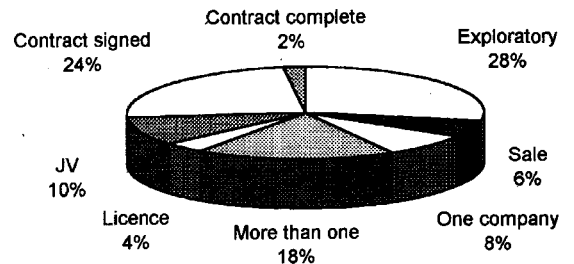


FIGURE 1(a) Current involvement in technology transfer in China

Exploratory	= exploratory only.
Sale	= direct sale and/or sale through agents.
One company	= preliminary discussions with one company.
More than one	= preliminary discussions with more than one company.
Licence	= detailed negotiations leading to a technology licensing agreement.
JV	= detailed negotiations leading to a joint venture.
Contract signed	= contracts already signed and agreements in operation.
Contract complete	= contracts already completed.

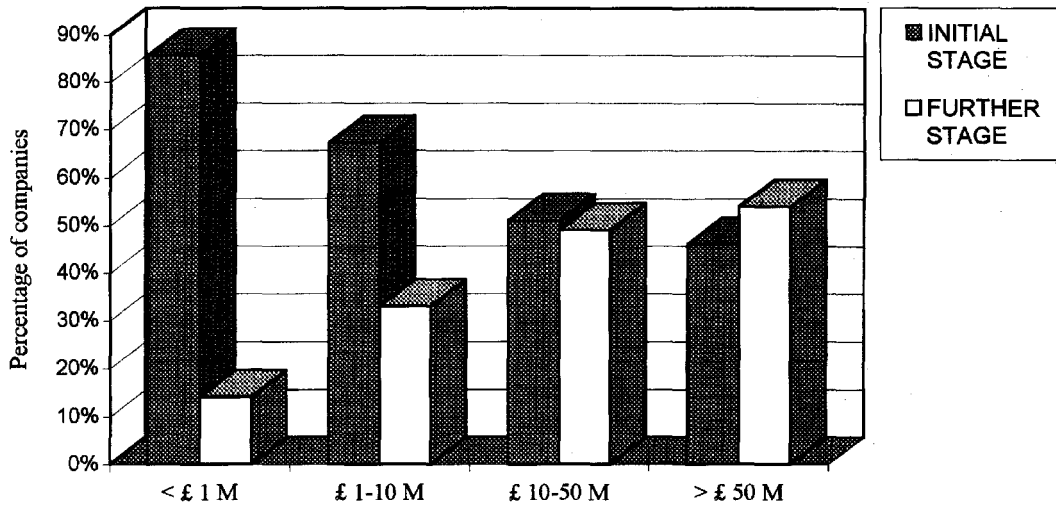


FIGURE 1(b) Current involvement in technology transfer: company size differences

- Initial stage = exploratory only;
preliminary discussions with one company; or
preliminary discussions with more than one company.
- Further stage = detailed negotiations leading to a technology licensing agreement;
detailed negotiations leading to a joint venture;
contracts already signed and agreements in operation; or
contracts already completed.

interviews have indicated that companies prefer to start their involvement with a low level of commitment such as sale of mature technology and then develop closer longer-term collaboration with their partners if the first contract produces satisfactory results. Over 20 percent of companies have more

than one form of technology transfer agreement currently in place.

For the purpose of the analysis companies were organised into sectors (see Table I). The number of replies to each question differed according to their level of involvement in China and other circumstances specific to the companies. For some multiple choice questions, respondents were asked to give more than one answer and in the questions which required ranking, the number of factors ranked varied substantially between respondents. Therefore, in the following analysis of the results, there is some variation between questions in the total number of responses.

TABLE I Industrial Distribution of Companies Surveyed

Sectors	No. of companies
Aircraft and aerospace	12
Automobiles and automotive	17
Chemical processing plant and products	6
Power generation and electrical engineering equipment	16
Electronics	23
Engineering components	24
Engineering products	7
Industrial machinery and machine tools	42
Tools and production equipment	21
Food, drink, and tobacco processing equipment and products	7
Service and software	21
Civil engineering	6
Others	5
Total	207

ATTRACTION OF CHINA AS A TECHNOLOGY RECIPIENT

Respondents were asked to indicate their reasons for transferring technology to China (or considering technology transfer if they were at an exploratory

stage) and why they had decided to consider transferring technology to China in preference to other countries. Respondents could indicate more than one reason for transferring technology to China. On average, companies indicated about 3 reasons.

Figure 2 (a) shows that “to gain access to the Chinese market” was identified by most of the companies as a reason for technology transfer. For almost 60 percent of the companies, technology transfer to China is a part of their global strategy. Saturation of existing markets elsewhere in the world was the third most important reason. By contrast, local advantages, such as “China’s policies for foreign investment” and “cheaper raw materials”, were only identified as benefits by a few companies although “to gain access to a cheaper labour force” was more attractive. Cross tabulation of the reasons shows that “access to market”, “part of global strategy” and “saturation of existing markets” are the most common combinations

of reasons. “Access to market” and “part of global strategy” were given as reasons by 110 companies or over 50 percent of the companies. Just under 30 percent (60 companies) included the combination “access to market”, “part of global strategy”, and “saturation of existing markets” in their reasons. These results and the relatively low importance of cheap labour indicate that the most important objectives for technology transfer into China are related to the Chinese market and not the use of China as a production location for exporting.

It is also interesting to note that 58 percent of companies did not look at any alternative countries before considering China for technology transfer. Among the remainder some indicated that they were considering other countries in addition to China rather than as an alternative. With its open door policy, fast industrial growth and market prospects, China is clearly being recognised as a very promising market

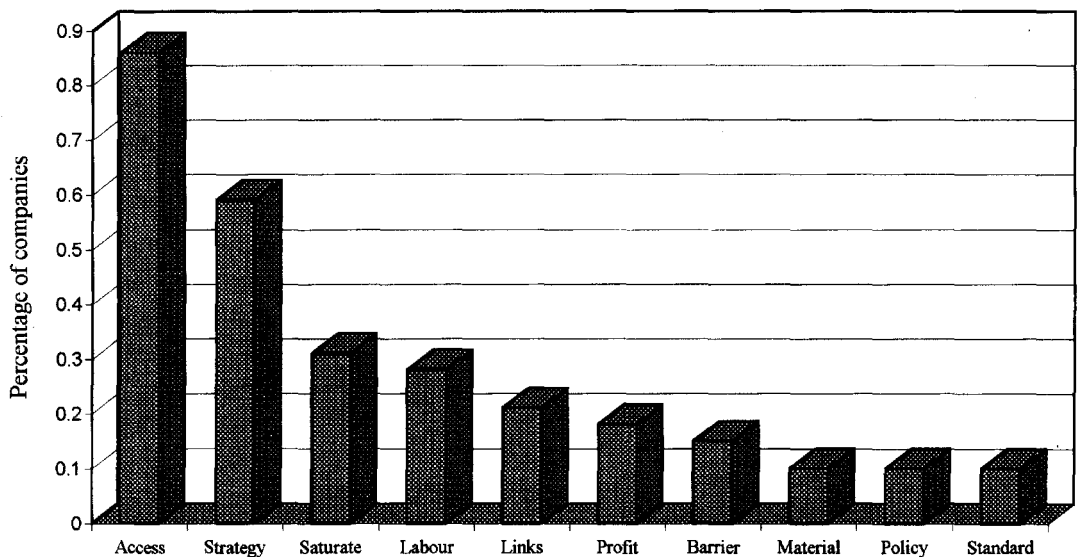


FIGURE 2(a) Reasons for technology transfer to China

- Access = to gain access to the Chinese market.
- Strategy = as part of the company’s global strategy.
- Saturate = to increase scope for making increased profit when markets are saturated.
- Labour = to gain access to cheaper labour.
- Links = to exploit the benefit of linking foreign business partners.
- Profit = to compensate for falling profits from existing markets.
- Barrier = to overcome trade barriers.
- Material = to gain access to cheaper raw materials.
- Policy = to take advantage of China’s favourable investment.
- Standard = to use standard technology in a less costly way.

for technology. However, it is not an easy market to penetrate and therefore the manner in which British and other foreign companies choose to gain access to it is an important issue.

In most cases, technology transfer is in the form of collaboration with a Chinese company for the purpose of using the technology to produce and market a product in China. The choice of technology transfer to gain access to this market indicates that British firms prefer to access this market indirectly through the sale of technology or through closer collaboration with Chinese firms (e.g., via contractual or equity joint ventures). Possible reasons for this are lack of knowledge about the market and to gain access to the appropriate marketing channels. Economic incentives were considered to be significant by only a small proportion of firms, but it is likely that once a company has decided to focus on the Chinese market, incentives for encouraging technology transfer as opposed to exporting to China swing the balance in favour of the former.

Of the companies that had already taken the decision to transfer technology, 66 percent indicated that they would transfer (or had transferred) "*established technology*." However, only 10 percent said the perceived benefit of doing so was "*to use standard technology in a less costly way*", the remainder indicating that the main benefits they saw related to gaining access to the Chinese market.

Transfer of "*established technology*" can be explained within the eclectic paradigm [7,8] framework. Technology owned by a firm is a part of its ownership specific advantages from which it will seek to maximise benefits through the mode of international operations it chooses. A concern with making technology available to Chinese partners is the loss of the ownership specific advantage which is the technology itself. China offers an expanding market for established technologies which are at a mature stage of the life cycle in industrialised countries. With an established technology, the benefits of extracting the most value out of this knowledge by technology transfer and developing access to an expanding market arguably outweigh the risk of misappropriation resulting from sharing this

knowledge. Also, with an established technology, the likelihood of other firms with competing technologies entering the market sway the balance in favour of technology transfer. Further, the benefits from a technological collaboration would exceed the investment returns from a firm's own internalised activities if the complementary advantages can be effectively exploited between the partners. For this purpose, some foreign companies would even transfer their advanced technology to explore the potential collaborative benefits. Figure 2(b) shows that among those companies who intend to transfer their recent innovations to China over 60% regarded it as part of their global strategies. This is particularly the case in those industries where technological development is faster and the comparative advantages shift more frequently, as well as the predictable benefits from the large local market potential. In them machine tool industry for example, all the interviewed U.K. companies have transferred, or intend to transfer, their advanced technologies to China due to its large domestic market and low costs of labour force with fairly satisfactory skills.

EFFECTIVENESS OF DIFFERENT INFORMATION SOURCES IN CHINA

Nine possible information sources in China were listed, and respondents were asked to rank them according to their effectiveness (see Figure 3). The analysis shows that opinions concerning the sources vary greatly between different companies, and their size seems to be an important determining factor (see Figure 4).

"*Business visits to China*" and "*personal or professional contact with China*" were cited as the best information sources by large and small companies, respectively (companies with annual turnovers over £50 million are defined as large, while companies with annual turnovers less than £1 million are defined as small). "*Using the company's previous trading contacts*", "*inviting prospective Chinese partners to the U.K.*" and "*contacting other foreign (British) companies with*

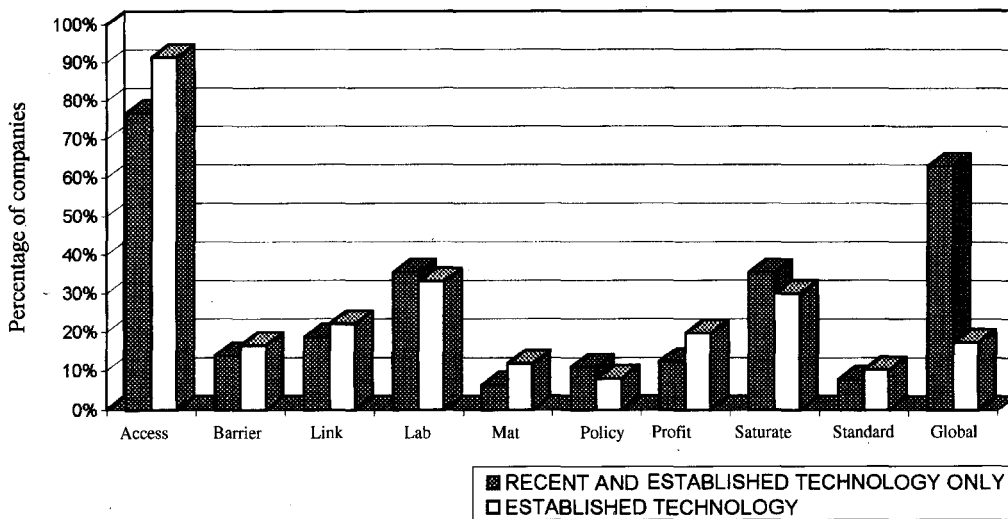


FIGURE 2(b) Reasons for technology transfer to China — technology type differences

- Access = to gain access to the Chinese market.
- Barrier = to overcome trade barriers.
- Link = to exploit the benefit of linking foreign business partners.
- Lab = to gain access to cheaper labour.
- Mat = to gain access to cheaper raw materials.
- Policy = to take advantage of China's favourable policies for foreign investment.
- Profit = to compensate for falling profits from existing markets.
- Saturate = to increase scope for making increased profit when existing markets are saturated.
- Standard = to use standard technology in a less costly way.
- Global = as part of the company's global strategy.

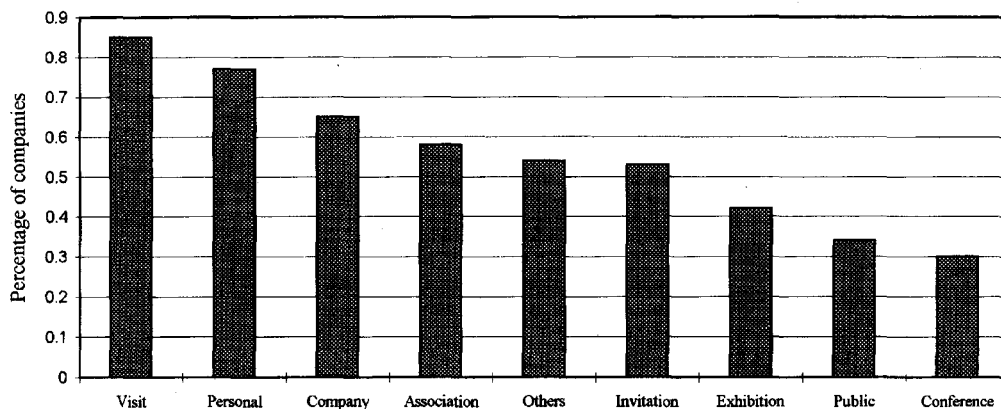


FIGURE 3 Perceptions of the effectiveness of information sources

- Visit = business visits to China.
- Personal = your own personal/professional contact with China.
- Company = your company's previous trading contact with China.
- Invitation = inviting prospective Chinese partners to the UK.
- Other = contacting other British companies with existing business in China.
- Association = getting information/making inquiries through professional associations.
- Exhibition = participating in a technological exhibition.
- Public = getting information/making inquiries through public media.
- Conference = participating in a technological exchange conference.

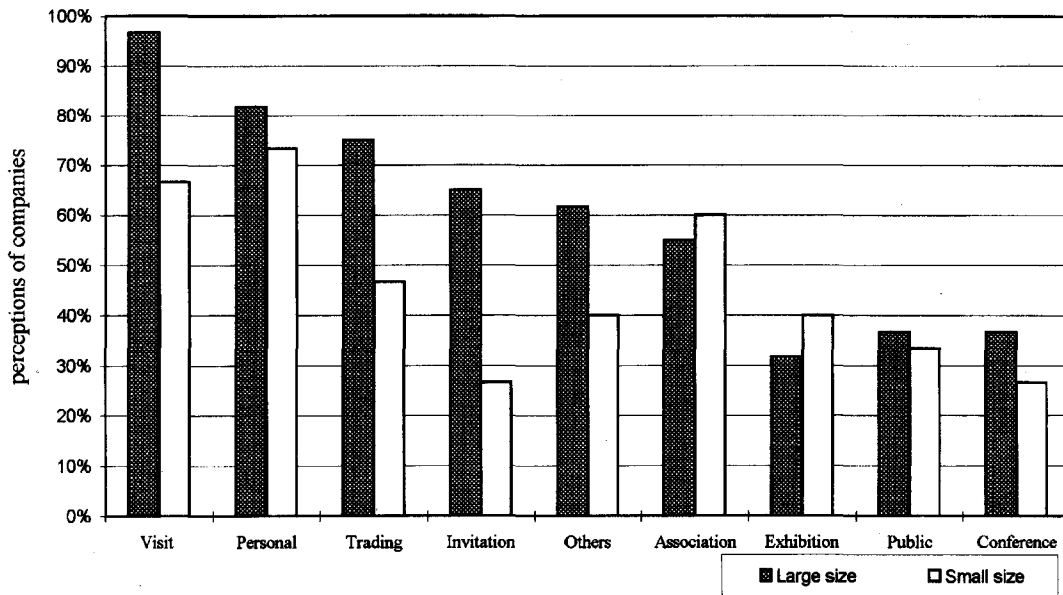


FIGURE 4 Differences in perceptions of the effectiveness of information sources — large and small companies.

existing business in China” were also important for large companies. Smaller companies, on the other hand, favoured “*getting information and/or making inquiries through professional associations*” (the China-Britain Trade Group was mentioned by a number of companies) and “*participating in a technological exhibition.*” Large and small companies considered “*information from public media*” and “*participation in a technological exchange conference*” to be the least important sources of information. In general, larger companies have more resources and are more likely to use the relatively expensive methods of seeking information such as visits and inviting prospective Chinese partners. They are also more likely to have existing contact with China. Smaller firms would initially seek less expensive sources of information such as professional associations and exhibitions. This is broadly confirmed by the survey.

INFLUENCE OF THE CHINESE BUSINESS ENVIRONMENT

The economic, political, legal, and cultural contexts were identified as the main elements of the business

environment. These have a bearing on market size and growth as well as the ease of doing business in China. In the questionnaire, economic conditions were separated into the economic situation (which is represented by indicators such as growth and inflation which affect the market conditions) and economic policy (which represents the government’s macroeconomic policies, as well as policies and incentives that directly affect foreign and Chinese businesses). Respondents were asked to rank each environmental factor according to its importance in influencing the technology transfer decision in general. Subsequent questions asked them to make an assessment of these factors in China.

Figure 5 shows the percentage of respondents who ranked each factor the most important environmental influence, while Figure 6 shows the perceptions of the respondents on each environmental factor. Significantly, economic factors emerge as the most important (Figure 5), and the respondents had a favourable view of the economic situation and policy in China (Figure 6).

Legal regulations have often been cited as important constraints on doing business in China. Evidence from the survey supports this view by

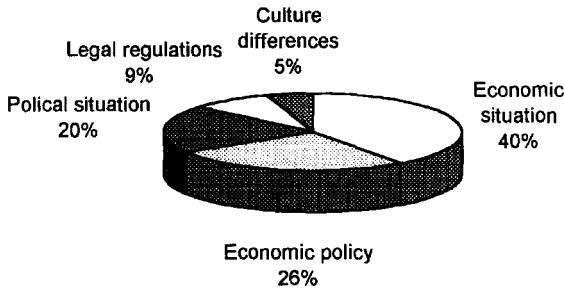


FIGURE 5 Importance of environmental factors.

identifying legal regulations as the least satisfactory environmental factor (Figure 6). However, Figure 5 suggests that legal regulations are a less important environmental factor than economic policy and the political situation. It appears that the respondents either do not consider legal regulations to be serious constraints or feel that the associated difficulties can be overcome as long as the other conditions are favourable. A concern may be that the limitations imposed by legal regulations may not be fully recognised by these British firms. Later discussion on obstacles to technology transfer at the enterprise level suggests that the importance of cultural differences may also be greater than indicated by Figure 5 as they affect business negotiations and practices.

There were relatively small differences in perceptions on environmental factors between companies which had, and which did not have, experience of working in China. The former group had a lower than average opinion of the adequacy of the legal and political environment but a more favourable opinion of economic policies and the economic situation (see Figure 7).

Companies in the different industrial sectors also had varying perceptions on China's economic policies. Figure 8 shows that companies in the electronics, chemical, and food sectors gave a more favourable assessment of China's economic policies, whereas relatively more companies in the automotive and engineering products sectors regarded them to be unfavourable. Figure 9 shows a more detailed breakdown of the perceptions on economic policy of firms in the electronics, machinery, machine tools and automotive sectors. A possible explanation for these differences is that electronics and chemicals are relatively new and growing industries offering better markets prospects than many traditional industries such as engineering product and automotive sectors. Engineering products covers a wide range of activities and only seven of the respondents were in this sector. Therefore the value of any

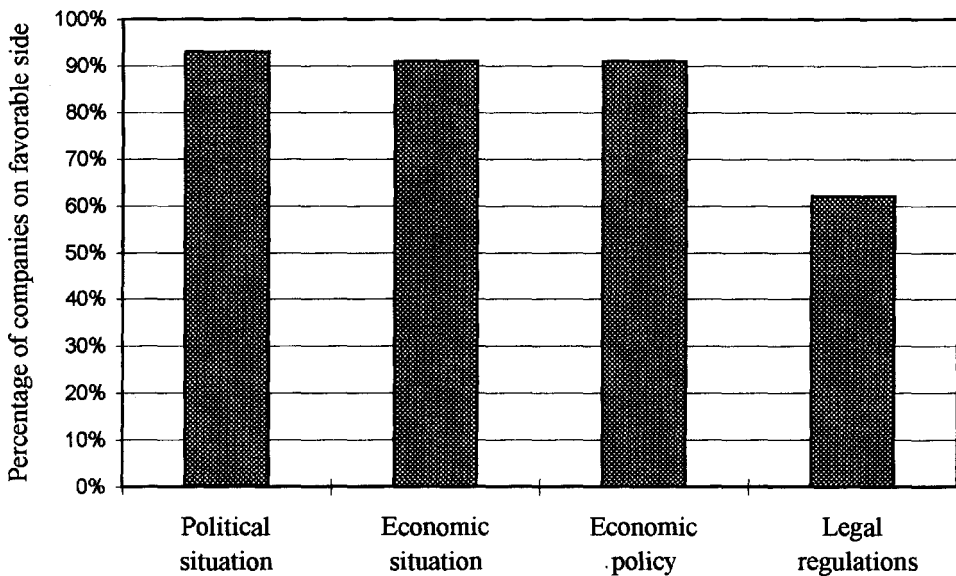


FIGURE 6 Perceptions on environmental factors.

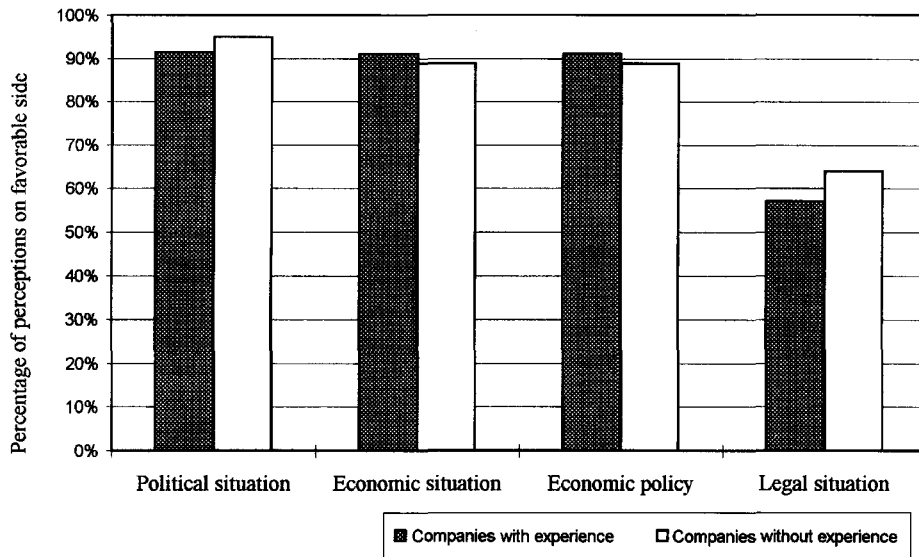


FIGURE 7 Perceptions on environmental factors between companies that have started and not started transferring technology to China.

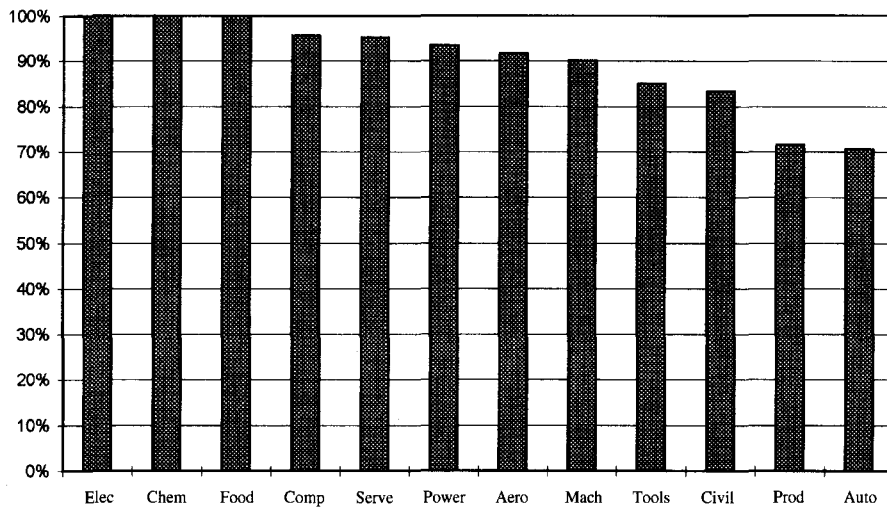


FIGURE 8 Perceptions of economic policy in different sectors

- Elec = electronics.
- Chem = chemical processing plant and products.
- Food = food, drink and tobacco processing equipment and products.
- Comp = engineering components.
- Serve = service and software.
- Power = power generation and electrical engineering equipment.
- Aero = aircraft and aerospace.
- Mach = industrial machinery and machine tools.
- Tools = tools and production equipment.
- Civil = civil engineering.
- Prod = engineering products.
- Auto = automobiles and automotive.

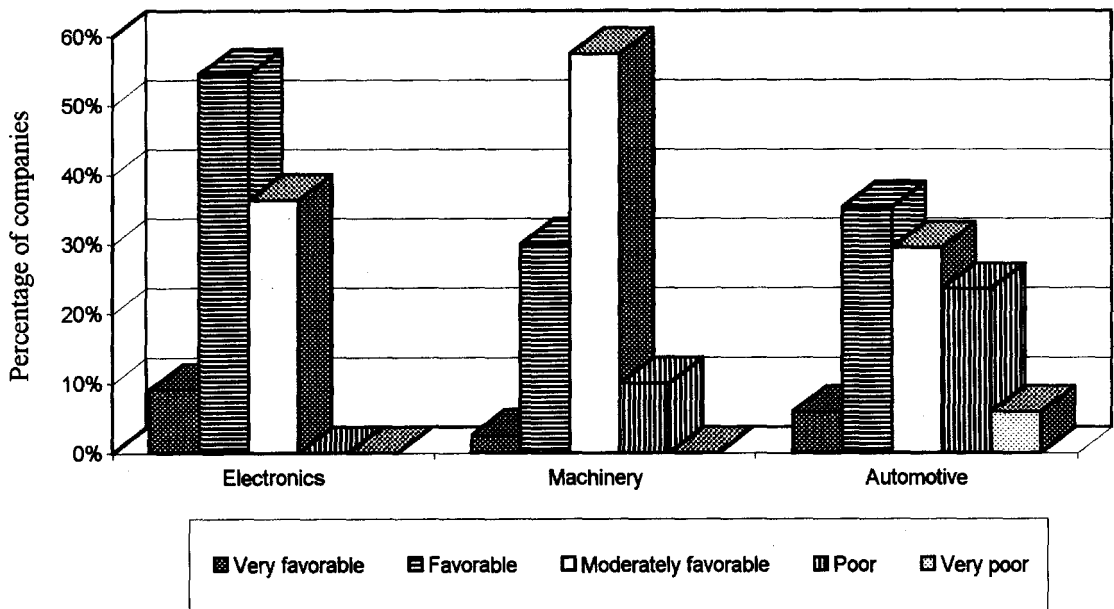


FIGURE 9 Perceptions on economic policy between electronics, machinery, and machine tool and automotive industries.

generalisation is doubtful. The lower assessment of economic policy for the automotive industry could be explained by the restrictions imposed by the Chinese Government on foreign investment in the automotive sector until 1997. However, some traditional industries, such as machinery and machine tools, and automotive, have now become preferential sectors being given favourable policy support by the Chinese government due to their strategic importance in the economic development in China.

CAPACITY TO ABSORB TRANSFERRED TECHNOLOGY

Companies were asked to rank seven factors according to their importance in influencing the capacity to absorb transferred technology. Figure 10 shows the results based on the first rank (highest rank only) and high ranks (the three highest ranks) for each factor. Of these, "ability to learn advanced knowledge" and "managerial know-how" were in general considered most important while of least importance were thought to be "skilled labour force" and

"access to international technical and commercial information."

When making an assessment of factors relating to the current technological situation in China the most frequent opinion is that it is "moderately good" or "poor" for most of the factors but there is a wide spread of opinion across the different industrial sectors. Figure 11 shows the general perceptions on each factor. Figures 12 to 16 show the differences *between* industries in the perceptions on each factor. The perceptions of each capacity factor are based on the weighted average scores across all respondents. Above the 'zero line' refers to opinions of 'moderately good/high', 'good/high' and 'very good/high'. Below the 'zero line' refers to opinions of 'poor/low' and 'very poor/low'. A score of 3 (or -2) would mean that all the companies surveyed considered the situation for a particular factor was 'very good/high' (or very poor/low).

As noted earlier, the electronics and chemicals sectors in China are relatively new compared with the more traditional industrial sectors such as machinery manufacture. This probably explains the differences described above, with the electronics and chemical industries having the best infrastructure,

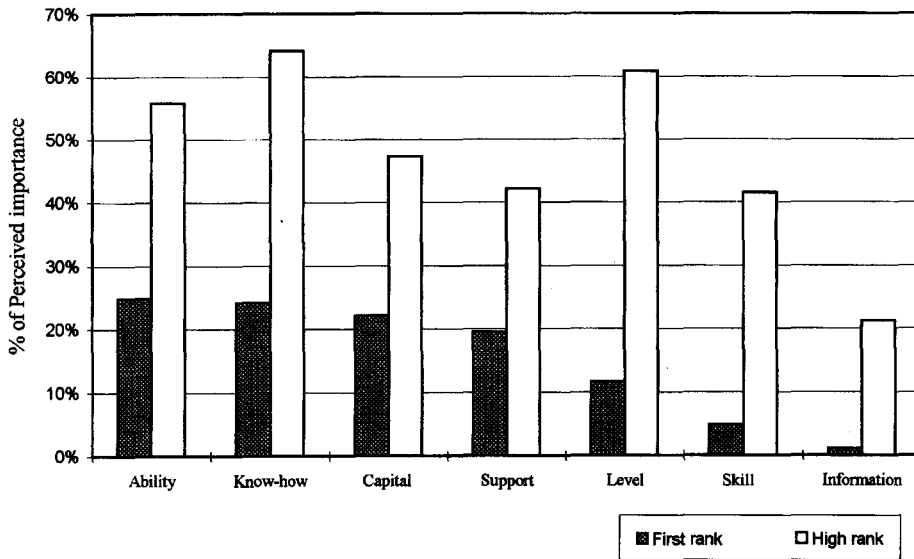


FIGURE 10 Importance of factors in influencing capacity to absorb transferred technology

- Ability = ability to learn advanced knowledge.
- Know-how = managerial know how.
- Capital = availability of capital.
- Support = infrastructure support.
- Level = level of technological development.
- Skill = skilled labor force.
- Information = access to international technical and commercial information.

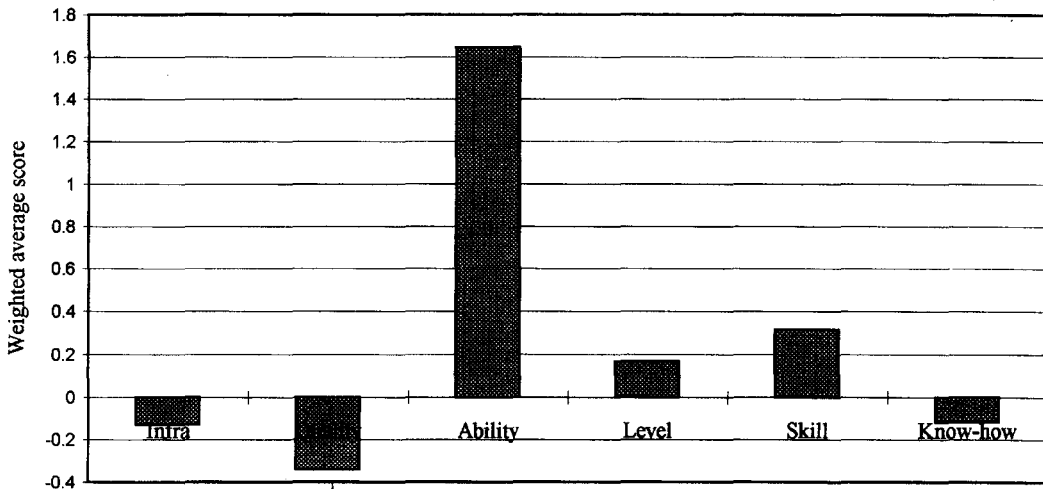


FIGURE 11 Perceptions on capacity factors

- Infra = infrastructure support.
- Quality = quality of currently used equipment.
- Ability = ability to learn advanced knowledge.
- Level = level of technological development.
- Skill = skilled labour force.
- Know how = managerial know how.

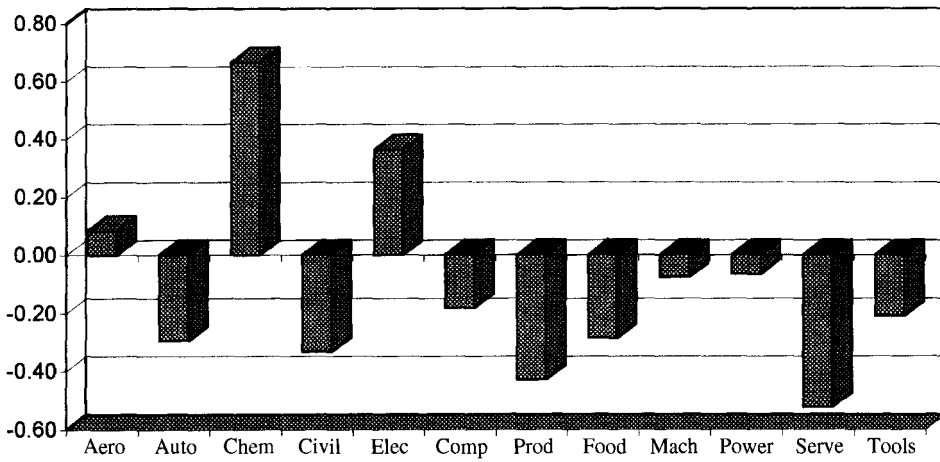


FIGURE 12 Perceptions of infrastructure support between industries

- Aero = aircraft and aerospace.
- Auto = automobiles and automotive.
- Chem = chemical processing plant and products.
- Civil = civil engineering.
- Elec = electronics.
- Comp = engineering components.
- Prod = engineering products.
- Food = food, drink and tobacco processing equipment and products.
- Mach = industrial machinery and machine tools.
- Power = power generation and electrical engineering equipment.
- Serve = service and software.
- Tools = tools and production equipment.

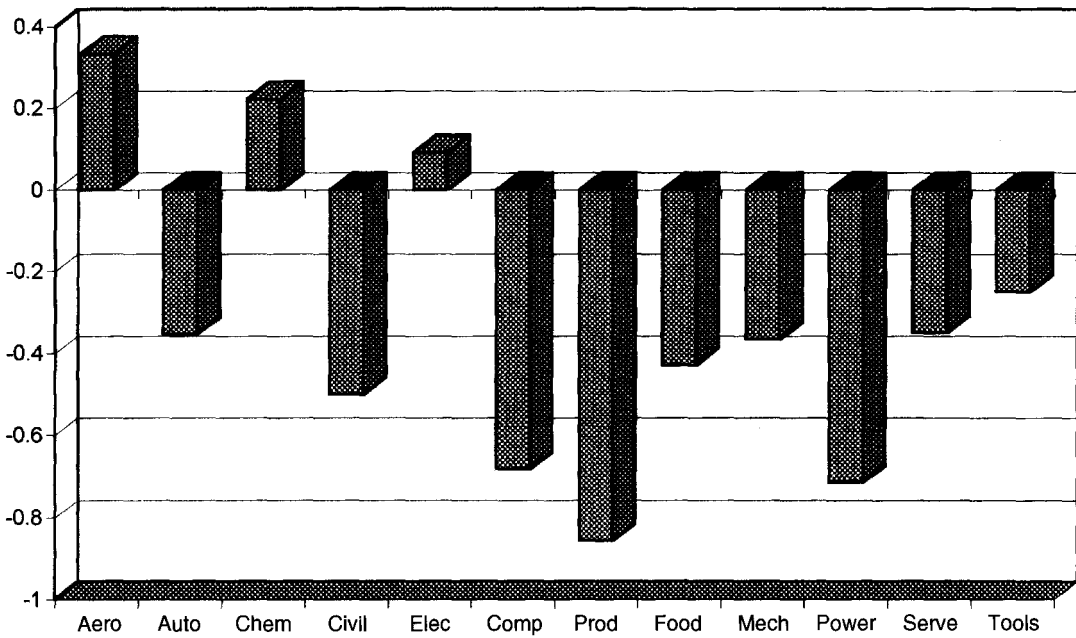


FIGURE 13 Perceptions of the quality of currently used equipment between industries.

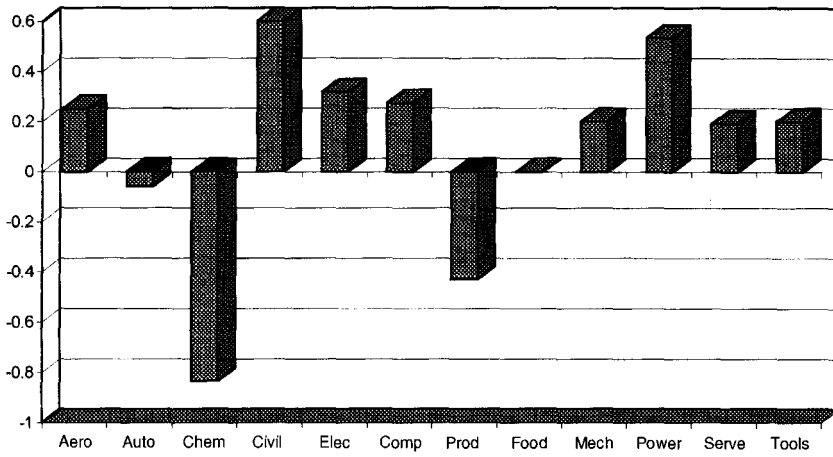


FIGURE 14 Perceptions of the level of technological development between industries.

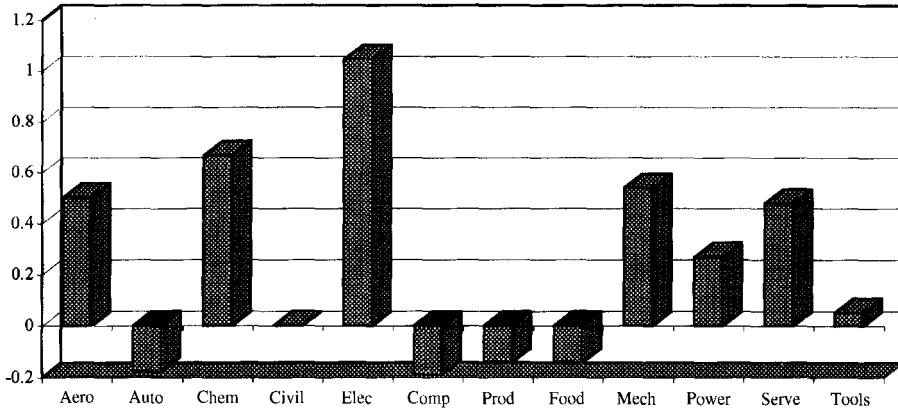


FIGURE 15 Perceptions of the skills of labour force between industries.

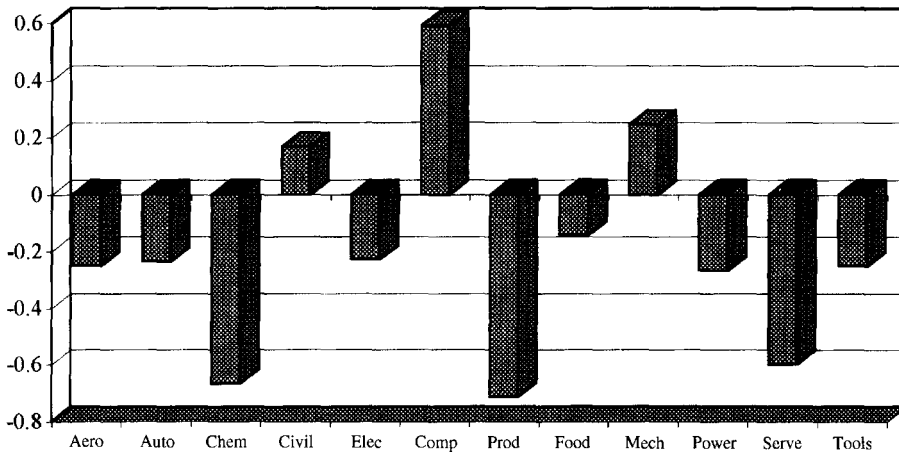


FIGURE 16 Perceptions of the managerial know-how between industries.

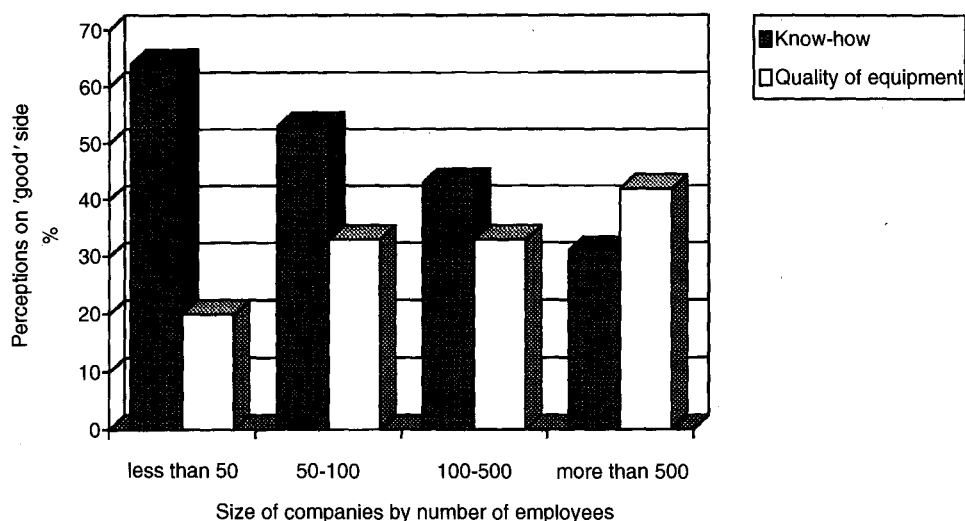


FIGURE 17 Company size vs equipment quality and managerial know-how.

good economic support and superior equipment. However, being newer, both industries also have less well developed managerial know-how. By comparison the machinery sector has poorer infrastructure support and worse equipment but better managerial know-how.

Size of company also seems to have a bearing on perceptions, with large firms rating equipment quality as higher and the level of managerial know-how as lower (Figure 17).

POSSIBLE AND ACTUAL OBSTACLES TO TRANSFERRING TECHNOLOGY

Respondents were asked to rank a number of factors according to the extent to which they were regarded as obstacles to transferring technology. Figures 18 to 21 indicate the relative frequency of each factor grouped under four headings: (a) industrial environment obstacles; (b) difference obstacles; (c) efficiency obstacles, and (d) legal obstacles. The industrial environment refers to the context within which actual negotiations and business transactions take place. They include dealings with Chinese enterprises as well as officials in Government ministries and agencies.

Difference obstacles represent problems posed by differences between British and Chinese enterprises and institutions in culture, language and technology. Efficiency obstacles represent higher cost in time and other resources in concluding agreements as well as in the implementation of technology transfer while legal obstacles include inadequate regulations as well as inadequate protection of technology and restrictions on repatriation of profits.

The companies that had already transferred technology to China were asked which of the obstacles they had actually encountered in practice. The result is shown in Figure 22. Time taken in negotiations, commercial habits, excessive bureaucracy, and unclear authority are considered to be inadequacies of management in Chinese enterprises and are regarded as serious obstacles to technology transfer.

KNOWLEDGE AND BELIEFS ABOUT TECHNOLOGY TRANSFER SUCCESS FACTORS

In this part of the questionnaire the extent of respondents' knowledge and beliefs about transferring technology to China in relation to Chinese cultural and commercial particularities was

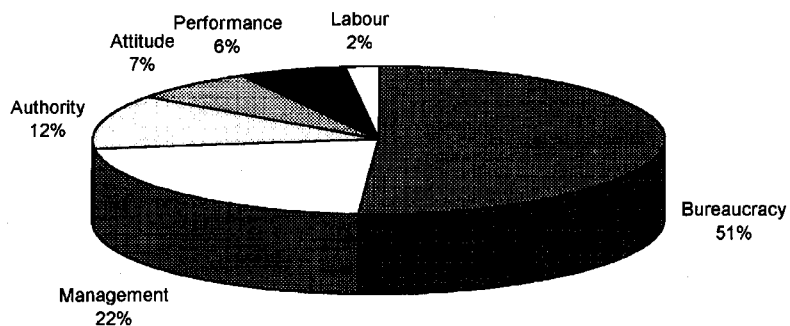


FIGURE 18 Industrial environment obstacles

- Bureaucracy = excessive bureaucracy.
- Management = unsatisfactory management.
- Authority = vague organizational authority.
- Performance = low industrial performance.
- Attitude = unsuitable management attitude.
- Labour = unqualified labour force.

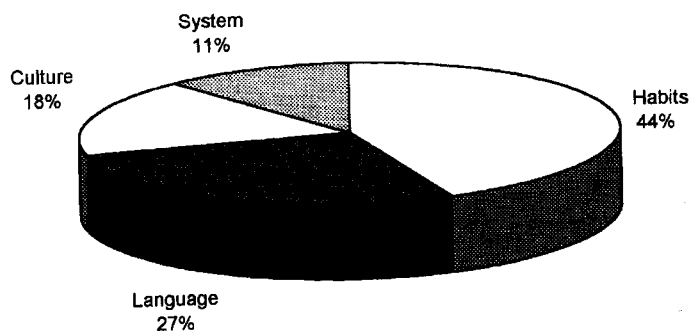


FIGURE 19 Difference obstacles

- Habits = commercial habits.
- Language = language differences.
- Culture = cultural differences.
- System = differences in technological systems.

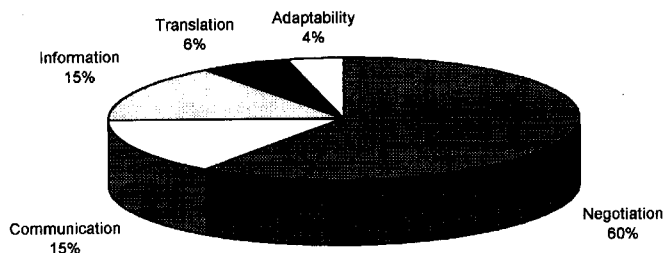


FIGURE 20 Efficiency obstacles

- Negotiation = time consuming negotiations.
- Communication = inconvenience of communication.
- Information = insufficient sources of information.
- Translation = inaccuracy in translation.
- Adaptability = low adaptability in process of absorbing technology.

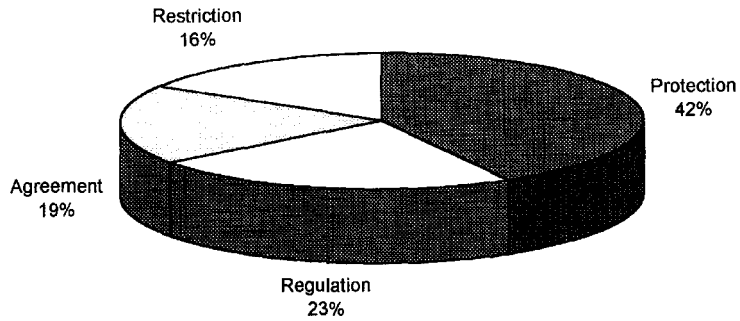


FIGURE 21 Legal obstacles

- Protection = unsatisfactory protection of transferred technology.
- Regulation = inadequate legal regulation.
- Agreement = agreements being changed from one side.
- Restriction = restriction on profit transfer.

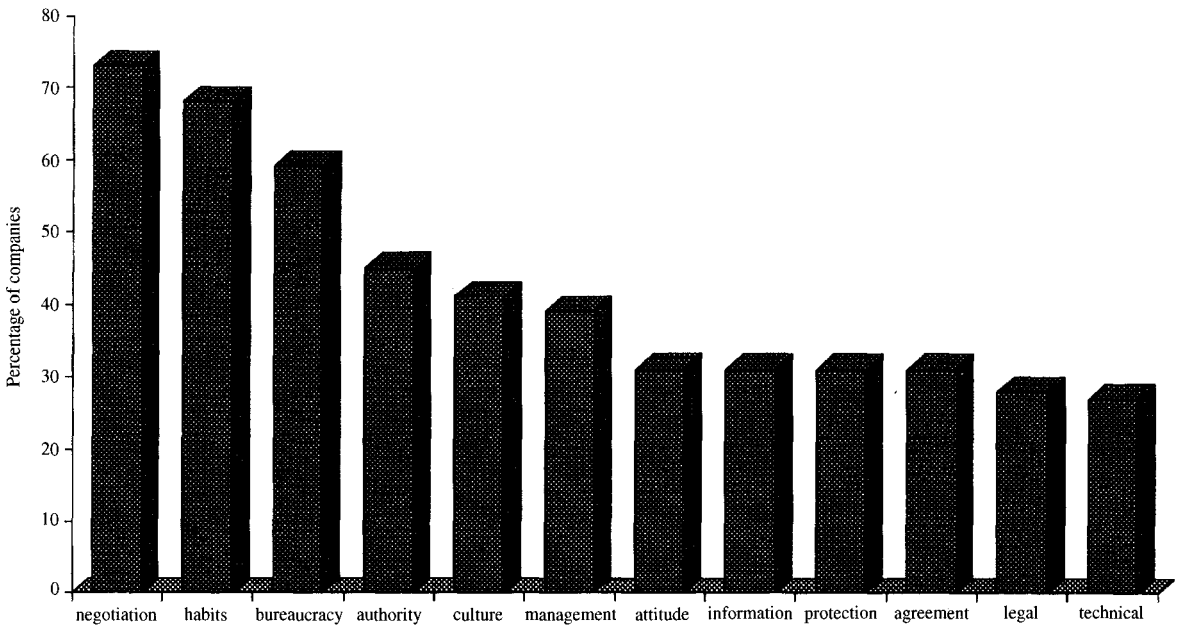


FIGURE 22 Frequencies of actual obstacles encountered

- Negotiation = time consuming negotiations.
- Habits = commercial habits.
- Bureaucracy = excessive bureaucracy.
- Authority = unclear organizational authority.
- Culture = cultural differences.
- Management = unsatisfactory management.
- Attitude = unsuitable management attitude.
- Information = insufficient sources of information.
- Protection = unsatisfactory protection of transferred technology.
- Agreement = agreements being changed from one side.
- Legal = inadequate legal regulation.
- System = differences in technological systems.

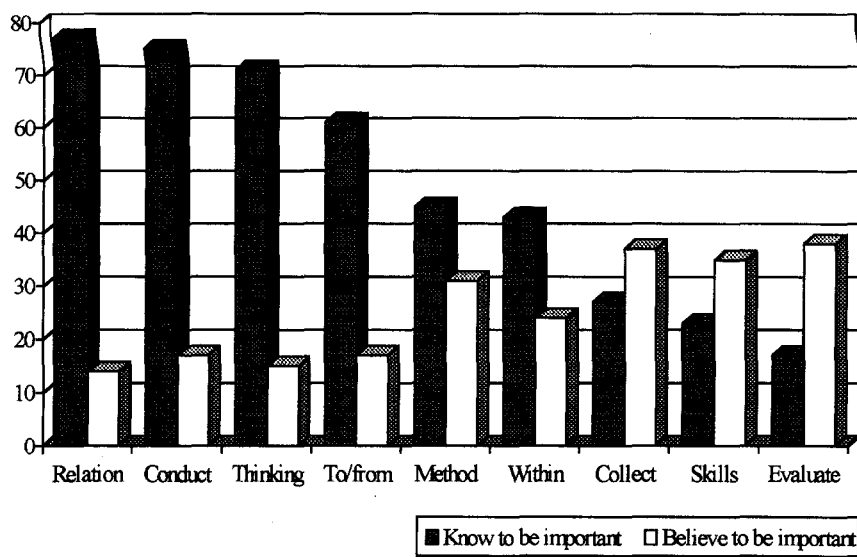


FIGURE 23 Knowledge and beliefs of importance about the Chinese cultural and commercial particularities in transferring technology in China

- Relation = establishing personal relationships.
- Conduct = understanding the Chinese way of conducting negotiations.
- Thinking = understanding the Chinese way of thinking.
- To/from = communicating to and from China.
- Method = understanding Chinese management methods.
- Within = communicating within China.
- Collect = finding ways of collecting Chinese company information.
- Skills = determining the availability of skills in China.
- Evaluate = evaluating the performance of Chinese workers.

determined by asking them to specify from a list of factors those they knew to be important and those they believed may be important. The comparison is shown in Figure 23.

Also mentioned as known to be important by respondents, but not specified in the questionnaire, were *official contacts*. Mention was also made of *understanding of the need for inducements for officials, Chinese enterprise structures and their relationships with ministries and identifying the key decision-makers and negotiators in Chinese enterprises and local authorities*.

Finally, the survey showed that most participants had a positive attitude towards technology transfer and had confidence about conducting business in collaboration with Chinese partners. When asked what they would do if encountering unexpected problems when conducting negotiations for transferring technology to China, the large majority of

foreign companies, said they would negotiate with their Chinese partner to find solutions together. Only

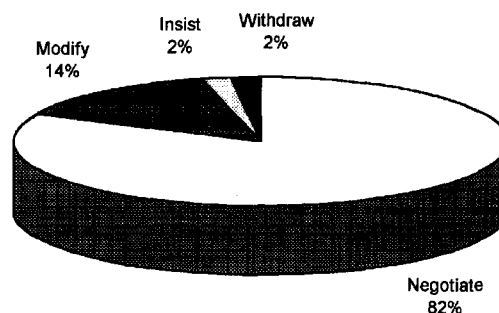


FIGURE 24 Options likely to be adopted to deal with unexpected problems

- Negotiate = negotiate with Chinese partner to find solution together.
- Modify = modify the strategy to comply with the situation encountered.
- Insist = fully insist on the original strategy.
- Withdraw = withdraw plans.

a few companies stated they would withdraw their investment or fully insist on their original strategies (see Figure 24). It seems that, in this case, the fundamental problem, i.e., *holdback*, in consummate co-operation [9], is well solved by trust, confidence, and collaborative attitude. An effective collaboration can be only acquired through full mutual efforts. This has been clearly realized and acted on by the majority of foreign companies.

CONCLUSIONS

Technology transfer has become an important channel for gaining access to the Chinese market. The potential of China is well recognised and market opportunities appear to be the most important driver for technology transfer. The established technologies of many foreign companies are still advanced by Chinese standards. Foreign companies who transfer recent technologies will normally do so to emphasize their technological advantages and superior quality of products compared with other foreign competitors and aim at gaining market share in the long term, rather than short term, by establishing solid collaborations with Chinese partners. The mechanisms for making information on China available do not seem to be functioning effectively. Opinions about the effectiveness of information sources are heavily influenced by each individual company's contacts with, or visits to, China which may determine the ease of finding trustworthy Chinese partners, so the possibility of not finding a good partner still remains.

China's economic policy is thought to be moderately favourable for technology transfer. However, there are some variations between industrial sectors due to the existence of preferential policies and special support by the Chinese government. The differences between sectors suggest that targeting of preferential policies has shifted from regions to industries. The imbalance in economic development between sectors is due to these differences in priority with some industries enjoying better infrastructure support and quality of equipment and technology.

More traditional sectors do not enjoy these benefits but may have better managerial know-how at the enterprise level.

Time-consuming negotiations, bureaucracy, and differences in commercial habits are overwhelmingly identified as the main obstacles, particularly during the negotiating stage. Differences in culture are widely understood, with their obstructive influences extending to commercial habits and management attitude and methods. Delays in making decisions are one result of their influence. Relationships are often thought to be characterised by a mixture of bureaucracy and corruption. However, the cultural and commercial habits in China are well known and generally accepted by foreign companies which seek to establish personal contacts, build on trust and mutual understanding, and establish official contacts.

Management at the enterprise level is one of the crucial issues which influences the technology transfer process. In larger Chinese enterprises and in some new sectors, low managerial know-how is perceived to be a serious problem and an obstacle. In such cases helping Chinese enterprises to acquire training in management and the transfer of knowledge are just as important as transferring technology hardware.

Among the legal concerns of foreign companies are the protection of transferred technology and the fulfillment of agreements. Chinese partners who acquire a reputation for not respecting agreements and delay completion of a contract agreement may be prevented from establishing further collaborations with foreign technology suppliers.

IMPLICATIONS AND FUTURE WORK

Technology transfer combines technical, economic, cultural, and managerial elements. Failure to establish a good understanding of these factors may result in an under estimation of the time and patience needed to reach an agreement or to unrealistic expectations being raised. The importance of each factor within an individual industry and enterprise needs to be identified and provides the

basis for formulating a foreign company's strategy for transferring technology.

On the basis of identifying the differences between foreign technology suppliers' perceptions and Chinese technology acquirers' expectations, future investigations will focus on the "goodness of fit" between the specific conditions of individual industries and enterprises, the appropriate forms of technology transfer and the value of technology being transferred. The extent to which the Chinese government and relevant public and professional agencies can support imports of technology will be examined.

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