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TRANSFERRING MANUFACTURING TECHNOLOGY TO CHINA: SUPPLIER PERCEPTIONS AND ACQUIRER EXPECTATIONS

David Bennett[1], Zhao Hongyu[1], Kirit Vaidya[1] and Wang Xing Ming[2]

[1] *Aston Business School, Birmingham, UK*
[2] *The Business School of the People's University of China, Beijing, China*

ABSTRACT

Results of complementary surveys of foreign and Chinese engineering enterprises with respect to their objectives and expectations regarding technology transfer into China show that the major strategic objective of foreign enterprises, to gain access to the Chinese market, fits well with Chinese enterprises' main objective of improving domestic competitiveness but less well with that of accessing world markets through technology transfer. Foreign firms rate highly the capability of Chinese enterprises to learn new technologies but they are much less sanguine than Chinese enterprises about the managerial capabilities, level of technological development and equipment quality of the latter and regard the inadequate legal framework as a significant obstacle.

INTRODUCTION

The transfer of manufacturing technology to China has become an important part of the strategy of many manufacturers in industrialised countries. The Chinese government has recognised the role of technology transfer in improving the performance of Chinese enterprises and its contribution to the overall increase in China's industrial development and has therefore actively encouraged imports of foreign technology. Chinese enterprises are also enthusiastic to acquire technology from abroad.
Although the amount of foreign technology being transferred into China has been growing there remain questions regarding the influence of a number of factors on the effectiveness of technology transfer transactions namely:
(a) the possible differences in objectives between foreign and Chinese firms;
(b) the level of mutual understanding about different objectives;
(c) the willingness to resolve differences between the two sides, and
(d) differences in perceptions and expectations about resources and capabilities of the respective enterprises and the economic, political and institutional environment.

These questions are addressed in this paper which describes the results from two complementary questionnaire surveys which were conducted as part of a wider programme of research concerning technology transfer under China's economic policy reforms. One survey investigated the objectives, perceptions and expectations of UK and UK-based foreign companies with an interest or actual involvement in China (Zhao et al, 1995); the other survey of Chinese companies investigated their views and expectations of foreign technology suppliers. The results add to the findings of other studies carried out elsewhere which are either more limited in scope or have a particular focus such as on national technology policy (see for example Ball et al, 1993 or Oldham, 1991).

COMPANY SIZE, PAST EXPERIENCE AND CURRENT INVOLVEMENT

Completed questionnaires were received from 207 UK and UK-based foreign companies and 193 Chinese enterprises, in a range of engineering and related sectors. The matching sectors in the two surveys were aerospace, automotive, electronics, power generation and electricity, engineering components, machinery, machine tools and tooling. Approximately 1200 questionnaires were sent out in each survey giving a response rate of 17 per cent. In the UK, questionnaires were sent out in cooperation with the China-Britain Trade Group to companies with a known interest or involvement in China. The questionnaires in China were sent to members of the Machinery Industry Ministry Technology Import Information Centre network and for sectors outside the machinery industry a random sample of companies was selected from directories of Chinese enterprises.

Both the surveys included large, medium sized and small companies. In the UK survey 32 per cent of firms had a turnover exceeding £50 million and 40 per cent had a turnover of less than £10 million. In the Chinese survey, 28 per cent of enterprises had a turnover exceeding RMB 500 million (equivalent to £38.5 million) while 50 per cent had turnover less than RMB 100 million (equivalent to £7.7 million). The percentages in each size group according to turnover are therefore comparable, although as would be expected, the number of employees per enterprise was much higher in China than in the UK.

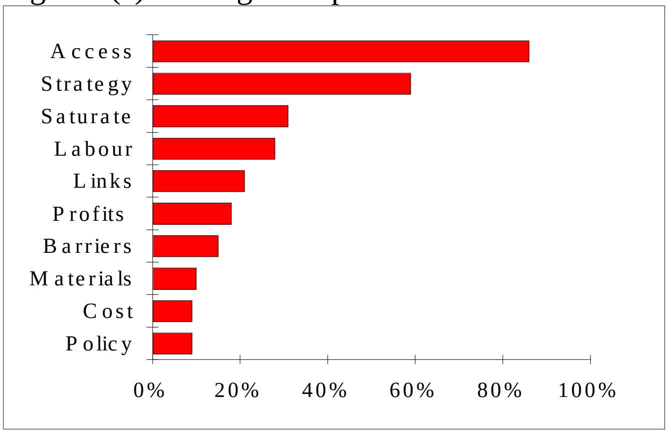
STRATEGIC OBJECTIVES OF ENTERPRISES

Figure 1 shows that for foreign companies the most important strategic objectives were access to the Chinese market and for technology transfer to be part of their global strategies. These are complementary objectives as companies incorporate the growing Chinese market and production location in their global strategy. The third reason for technology transfer into China, saturation of the existing markets, and the relatively low importance of cheap labour confirms that the most important objectives for technology transfer in these industries are related to the Chinese market and not the use of China as a production location for exporting. Economic incentives were considered to be significant for 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.

For the Chinese companies, improving competitiveness in the Chinese market and responding to competitive pressures were among the most important reasons for importing technology. These reasons match the main objectives of foreign suppliers. Development of technological capability and the importance of acquiring technology as a part of company strategy also indicate the importance of technology transfer for developing competitiveness. However, the second most important objective; that of gaining access to the world market, is at variance with the short-term objectives of foreign companies and might be seen as a long-term threat if the Chinese recipients of technology are potential competitors in world markets. However this could be avoided if as part of a global strategy foreign firms produce within China in collaboration with local enterprises.

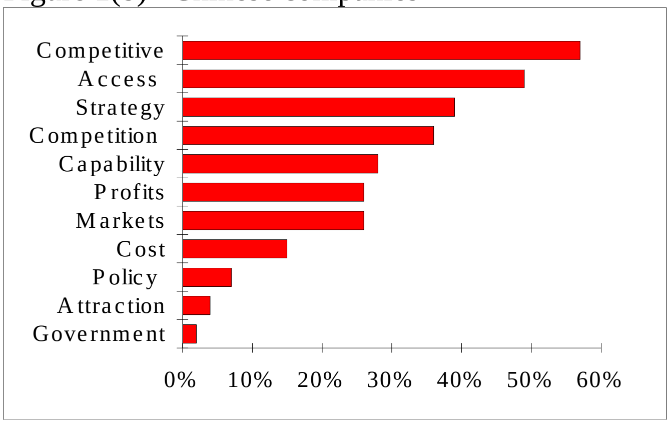
Figure 1 Strategic objectives of foreign and Chinese companies
(Percentages are those of companies citing each reason)

Figure 1(a) Foreign companies



Key
Access: access to Chinese market
Strategy: part of company's global strategy
Saturate: existing markets saturated
Labour: access to cheap labour
Links: benefit from foreign partner links
Profit: falling profit in existing markets
Barriers: overcome trade barriers
Materials: access to cheap raw materials
Cost: use standard technology more cheaply
Policy: take advantage of favourable policy

Figure 1(b) Chinese companies



Key
Competitive: improve competitive capability
Access: gain access to world markets
Strategy: part of company strategy
Competition: competitive pressure
Capability: develop technological capability
Profits: increase profits
Market: develop new domestic markets
Cost: reduce costs
Policy: take advantage of favourable policy
Attraction: increase attraction to foreign investors
Government: arranged by the government

ASSESSMENT OF CAPABILITIES AND RESOURCES OF CHINESE FIRMS

Figure 2 shows the ranking in importance and assessment by foreign and Chinese firms of the capabilities and resources of Chinese enterprises. For each attribute the shaded column shows its importance indicated by an average score between 1 and 7. The unshaded column shows the rating of the attribute of Chinese enterprises on a similar score range but with negative scores to indicate poor assessments. Foreign firms found quality of management, quality of equipment, technological development and ability to learn to be the most important aspects for the success of technology transfer. Their assessment shows that ability to learn is high whereas the other three factors are identified as important inhibitors.

Chinese firms broadly agreed that the factors identified by foreign firms are important. They also agreed that ability to learn was a positive attribute and the other three factors mentioned above pose obstacles. In addition, shortage of capital was identified as the most serious constraint. The striking difference between foreign and Chinese firms is that the latter assessed the problems to be less serious than the former.

Figure 2 Importance and assessment of attributes of Chinese companies

Figure 2 (a) Assessment by foreign companies

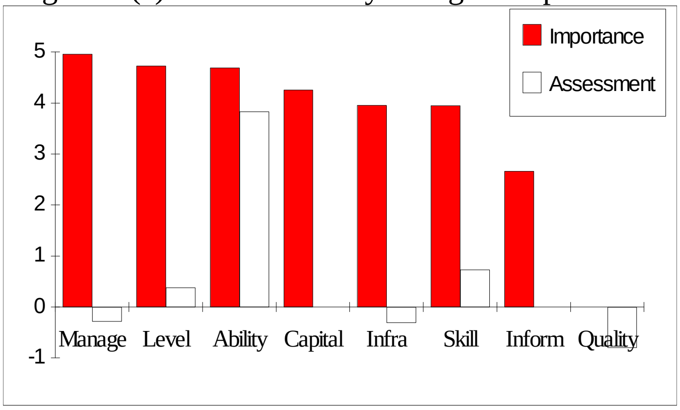
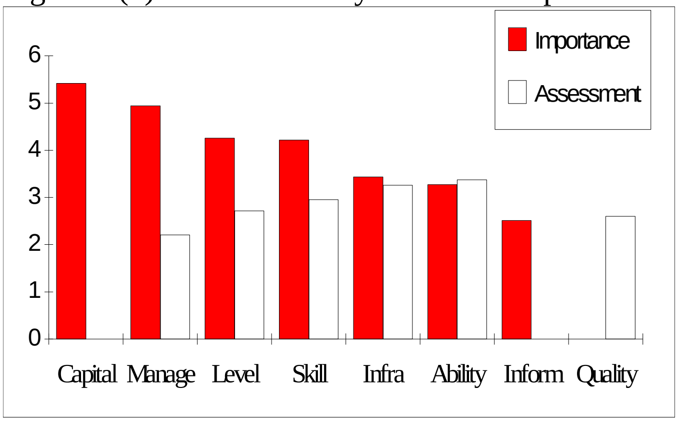


Figure 2 (b) Assessment by Chinese companies



Key
Manage: managerial know how
Level: level of technological development
Ability: ability to learn advanced knowledge
Capital: access to capital
Skill: labour skills
Infra: infrastructure support
Inform: access to international technical and commercial information
Quality: quality of currently used equipment

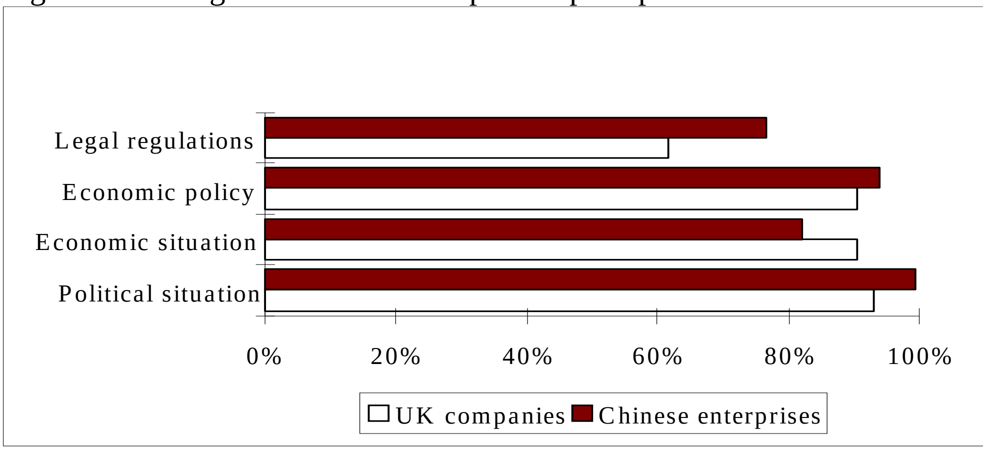
ASSESSMENT OF THE BUSINESS ENVIRONMENT

The business environment (Zhu et al, 1995) has macro and micro aspects. The macro aspects include the performance of the economy, government macroeconomic and industrial policies and the broader political and social conditions. The micro aspects include the more specific influences on business relationships and transactions. Examples are the specific role of government agencies and the cultural and legal context of business relationships.

Figure 3 shows the percentage of foreign and Chinese companies which assessed each aspect of the macro environment to be either very favourable, favourable or moderately favourable. Foreign firms generally regarded the macro environment to be favourable. The least favourable aspect of the environment was legal regulations which reflects concerns regarding the inadequacy of the legal framework for forming agreements and protecting the proprietary rights to the technology.

Culture in general terms was not thought to be a problem but this could be misleading. Culture may adversely influence negotiating styles and commercial habits (such as taking time to establish personal relationships and discussing around a subject before arriving at the essence of the matter). Other significant problems for foreign firms were difficulties in understanding organisational structures and authority within them and problems of dealing with multiple levels of bureaucracy.

Figure 3 Foreign and Chinese companies' perceptions of China's environmental factors



DIFFERENCES IN INFORMATION AND CONTACT CHANNELS

To access information on technology and to make contacts with potential suppliers of technology, the majority of Chinese companies relied heavily on their professional associations, technical exhibitions, technological conferences and, to a lesser extent, contact with other companies who had technology transfer experience. This contrasts with the UK companies who considered that the most effective information sources were direct contacts with potential purchasers of technology or visits to China rather than secondary or indirect sources.

OVERVIEW AND CONCLUSIONS

In summary, the surveys show that foreign and Chinese companies are highly motivated to engage in technology transfer transactions but their respective objectives as well as differences in capabilities and resources need to be recognised during negotiations. An obvious difficulty arises if the foreign enterprise has a Chinese market orientation while the Chinese enterprise seeks access to world markets.

The low rating of Chinese management capability and technological development will lead to a reluctance to commit to closer collaboration. Chinese firms typically look for greater collaboration in the form of joint ventures so they need to pay attention to rectifying these problem areas. Foreign firms on the other hand should not assume that all Chinese firms are poorly managed and need to be discerning in identifying the more capable enterprises.

Both foreign and Chinese companies need to be aware of the differences in the manner in which potential suppliers or acquirers obtain information and make contacts and ensure that they target the information channels effectively. This is especially the case when transfer is taking place as part of a collaborative venture. Foreign technology suppliers need to be aware of the differences that exist between industrial sectors in terms of infrastructure support, quality of currently used equipment, level of technological development, skills of the labour force and managerial know-how. In this way suitable allowances can be made and measures taken to ensure that the transfer of technology is carried out more effectively.

While there is considerable potential for technology transfer transactions and collaborations to go wrong, there is also a willingness on both sides to make relationships work. Over 90 per cent of Chinese enterprises and 86 per cent of foreign firms stated that they would seek to resolve conflicts by negotiation rather than abandon the relationship.

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