

industry opted for an environment associated with specialisation as found in the manufacture of special purpose machines where product customisation is high and the technology is dynamic.

With the shrinking of its traditional consumer base at home, the industry found itself in a poor competitive position. The UK firms had few competitive advantages in NC machine tools; this was an area where the Japanese industry was particularly successful in developing products aimed at a mass market in engineering rather than at the sophisticated demand of particular sectors. At the same time, the volume segment of the market was being threatened by the substitution of NC for conventional machine tools as well as by increasing levels of competition from developing countries in established Commonwealth markets. So the UK manufacturers who tried to alter their strategies, whether to different markets like the US, or to different customers, like the jobbing and oil industries, found themselves facing insurmountable opposition from Japanese producers.

The product strategies followed by UK companies in the 1980's have been to withdraw from those declining markets such as standard lathes subject to low cost competition from the Far East and switch to products offering greater prospects for growth. These have been those segments where the machine is sold either on the base of technological advantage or for its capability to meet highly specific needs on the part of the customer. Hence companies have been reorientating their range to distance themselves from the stalemate market environment, and place an increasing emphasis on volume production in areas of rapid technical change. At the same time, this led to firms to acknowledge that marketing had to play a larger part in product development with greater emphasis over product engineering. More firms are subsequently shying away from the role of manufacturer and emphasising their role in R&D, assembly and marketing (Rendeiro, 1988).

The industry has witnessed a move out of conventional machine tools, in particular conventional lathes, and the switch to NC machine tools. Figure 3.1 shows the extent of companies' success in trebling the proportion of NC machine tools of total sales from 14.5% in 1980 to 52% in 1990. That UK manufacturers were slow in recognising market developments is indicated by the fact that in 1981 NC accounted for just under 40 per cent of domestic machine tool consumption, but sales by UK manufacturers comprised less than half that percentage. The gap has been entirely narrowed since the mid 1980's and now the proportion of consumption and manufacturers sales is roughly equal. Indeed the relative success was such that the UK achieved the greatest rise in the share of machining centres in production of all European producers in the 1980's. As Figure 3.1 indicates, machine centres account for 20.8 per cent of total machine tool sales by British manufacturers in 1990 as compared to 4.1 per cent in 1980.

A volume strategy has required a considerable degree of standardisation and rationalisation of product design, in order to be able to exploit available economies of scale in production. So, Cincinnati Milacron, the UK subsidiary of the US giant have phased out a large number of low volume products, in order to concentrate on the production of a narrow range of low cost horizontal and vertical machining centres for world markets.

Simultaneously other producers have followed the route of supplying niche