MONASH UNIVERSITY

FACULTY OF BUSINESS AND ECONOMICS

RESTRUCTURING AND CHANGING MANUFACTURING MANAGEMENT PRACTICES IN AUSTRALIA

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RESTRUCTURING AND CHANGING MANUFACTURING MANAGEMENT PRACTICES IN AUSTRALIA

ABSTRACT

In this paper, manufacturing practices in the Australian Textile, Clothing and Footwear (TCF) Industry over the period 1989 and 1993 are examined. This is accomplished through a comparison of two near identical surveys conducted as part of the Global Manufacturing Research Group activities.

The period 1989 to 1993 was one of considerable turbulence for the TCF industry with changed government policy, significantly lowering industry protection to "level" the competitive playing field. The industry also experienced an economic recession during this period which greatly affected production output and employment levels.

Practices examined in this paper includes the use of forecasts, production planning, lateness of orders, capacity management, methods of purchasing raw materials and subcontracting. The findings reveal a wider use of forecasts, more thorough production planning, increased shop-floor control, increased quality and greater customer focus. These trends demonstrate that improved competitive practices were being implemented in the sample group.

INTRODUCTION

In 1990 a number of government policies aimed at developing a more internationally competitive Australian TCF industry were put into place. This re-orientation involved the reduction of industry protection and a combination of export and technology incentives. The purpose of the government program was made clear in the following TCF Development Authority's reference to "The Plan" in "The State of the Industry Report" (TCFDA, 1990):

> *"The TCF industries of the future will look different to the way they look today. The textile and tanning industries have the opportunity to become larger and more oriented to international markets. The clothing and footwear industries are likely to be smaller but much better at servicing the local market. This process is being supported by the application of Government policies aimed at encouraging effective long-term industry restructuring. "*

Against the backdrop of an economic recession, these policies translate to major changes in the manufacturing environment of the Australian TCF Industry. The period was one in which companies had to adapt rapidly to growing import competition and also cope with lessened overall local demand in a time of recession. Many companies did not survive. Others down-sized considerably and yet others developed new niche and/or export markets. Furthermore, competition from TCF imports was given a boost following the Federal Government's March 1991 statement which accelerated the reduction in protection. One effect of this initiative was to reduce investment confidence, and hence investment. The period 1989 to 1993 was indeed a trying time for the TCF industry.

This paper addresses the changes in manufacturing practices over the period 1989 to 1993. It sees some substantial changes, albeit in a small sample, changes in areas such as technology, forecasting and quality practices which definitely suggest a "new look" TCF Industry.

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2. A CHANGING INDUSTRY

Resulting from the immediate implementation of "The Plan", and the severe Australian economic recession of the early 1990's (and indeed the global recession), the industry suffered a major setback, struggling to meet the new challenges yet at the same time coping with a drop in demand. An historical drop in Australian TCF sales and profits occurred in the early 1990's. Plant closures and large scale layoffs were widely publicised in the local media. The industry suffered considerable shrinkage and government retraining schemes were put in place to train displaced production workers for non-TCF employment. The majority of those displaced production workers were mass production machinists in the clothing sector, (TCFDA Annual Report, 1991/1992)

A drop in manufacturers' sales was recorded between the periods 1989/1990 to 1990/1991, the height of the economic recession in terms of domestic consumption (including imports). There was a slight recovery in the period 1991/1992, although sales figures did not rise above the 1989/1990 level until the following year, at the same time domestic consumption figures started to rise. (see Figure 1.)

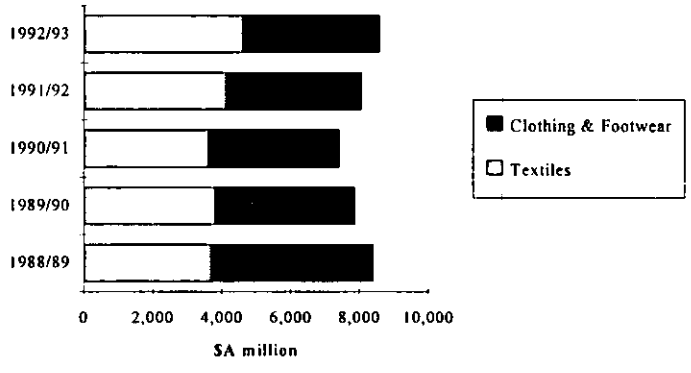


Figure 1. Australian TCF Manufacturers Sales ($Amillion) 1988/89-1992/93 (Includes domestic and export sales). *Reference: Australian Bureau of Statistics.*

DOMESTIC SALES

The TCF sales drop (see Figure. 2) was due to domestic sales plummeting in the clothing and footwear sectors, due probably to the dual effects of lowered domestic consumer demand (see Figure 3) in a time of economic recession and competition from imports as protective import duties were lowered. A drop of over $A1,000 million in overall TCF domestic sales occurred between 1989 and 1991, although most of that figure was within the clothing and footwear sectors, with a $A692 million clothing/footwear drop over 1989/1990, followed by a $A289 million drop over the following year.

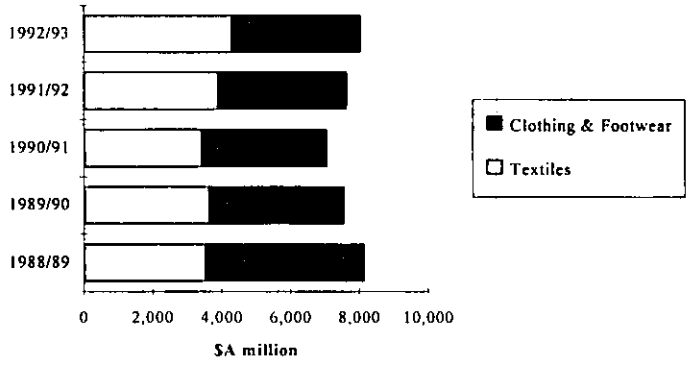


Figure 2. TCF Domestic sales ($Amillion). *Reference: Australian Bureau of Statistics.*

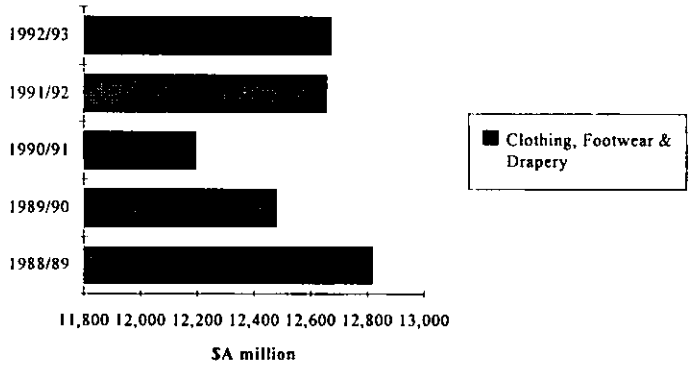


Figure 3. Domestic Consumption ($A million).
Reference: Australian Bureau of Statistics.

EXPORT SALES

A steady increase in exports in all three sectors (Textiles, Clothing and Footwear) occurred over the period, fostered by an Australian government push to improving overall export performance, with grant dissemination and import credit allowances for exporting companies. So while domestic sales were dropping in the early 1990's, exports were steadily increasing. (See Figure 4.) This latter fact would suggest a considerable restructuring effort towards exporting. It could be said that the clothing and footwear industry exceeded initial government expectations at the time of implementation of "The Plan" that, "*The clothing and footwear industries are likely to be smaller but much better at servicing the local market.*" (TCFDA, 1990) by trebling their exports, and hence their global market outlook, over the four years. However, the government import credit scheme, introduced soon after "The Plan" was inaugurated, would have provided an increased incentive for this export rise.

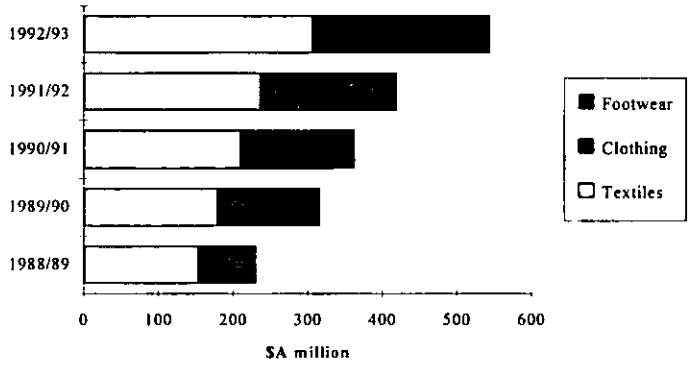


Figure 4. TCF Export Sales ($A million) 1988/89-1992/93.
Reference: Australian Bureau of Statistics.

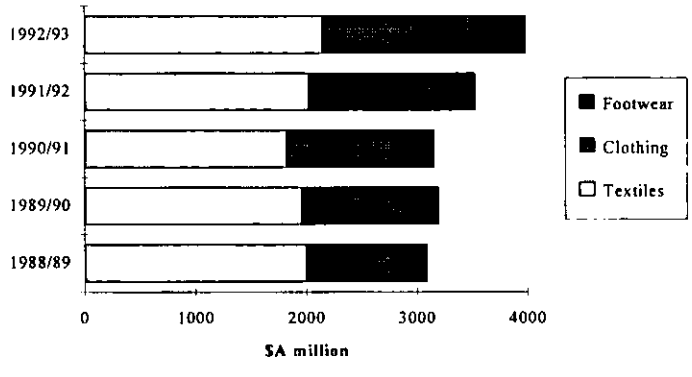


Figure 5. Imports by Sector ($A million). *Reference: Australian Bureau of Statistics.*

Whereas the textile industry did not suffer a relatively large-scale import rush in any one year (in fact, textile imports actually fell in 1989/1990 and 1990/1991) in the clothing industry the increase was quite marked, rising by $A200 million in 1989/1990, plateauing in 1990/1991, then rising a further $A200 million in each of the two ensuing years. (See Figure. 5)

The effect of increased imports on employment (see Figure. 6) was quite marked. It would appear evident that in the labour intensive clothing industry, the large annual 1990/1991 drop in employment was a direct result of reduced domestic sales in those companies which were geared towards the local market and were relying on it to sustain the labour force.

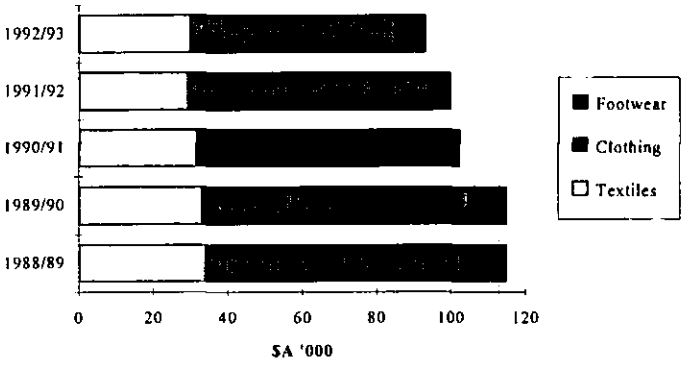


Figure 6. TCF Employment ('000). *Reference: Australian Bureau of Statistics.*

Overall TCF employment dropped by over 20,000 employees between 1988/1989 and 1991/1992. Official statistics on retrenchment are shown in Figure 7.

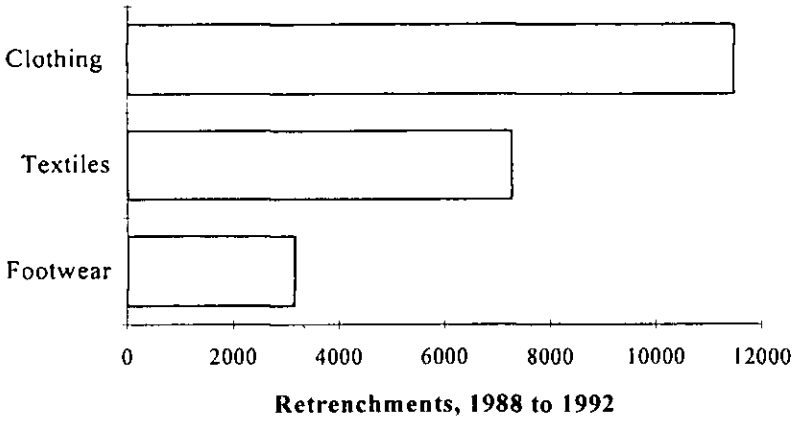


Figure 7. Retrenchments, 1988 to 1992. *Reference: Australian Bureau of Statistics.*

VALUE-ADDED PER EMPLOYEE

Whilst the industry was contracting, with a rise in plant closures and employee layoffs occurring over the period 1988 to 1993, labour productivity was rising, as can be seen in Figure 8 displaying annual value added per employee. One reason for this increase in employee value-added is possibly that TCF companies had moved into the higher value end of the market in order to remain competitive against cheap imports from developing countries. According to the Annual Report of the TCF Development Authority, over a six year period from 1987 to 1993, the aggregate value added per TCF employee grew by 11% compared with an increase of 2% in manufacturing in general. This increased the level of value-added per employee to about 75% of the manufacturing average (see Figure 8).

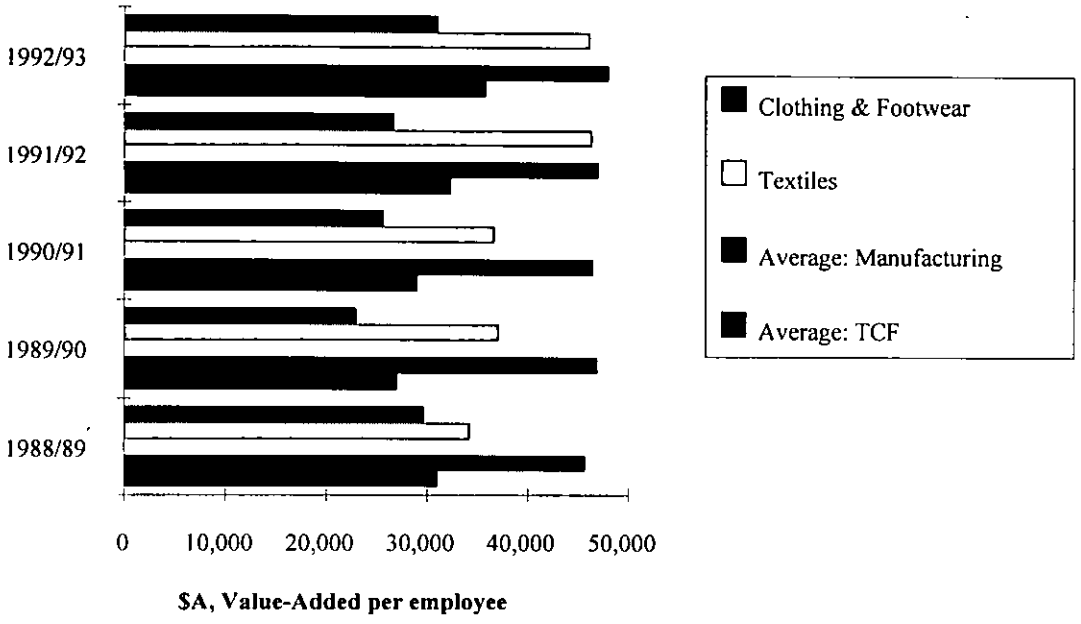


Figure 8. Value-Added Per Employee. *Reference: Australian Bureau of Statistics.*

3. THE SURVEY - GATHERING THE INFORMATION

Both the 1989 and 1993 studies were conducted as part of the research activities of the Global Manufacturing Research Group (Whybark and Vastag, 1992). The questionnaire used for data gathering was essentially the same for both surveys. The detailed findings of the 1989 survey have been reported elsewhere (see Sohal and Samson, 1992).

The change towards proportionally more textile representation in the 1993 sample, with less clothing industry representation reflects the changing face of the industry, whereby the clothing industry has been most affected by the industry downturn, partly due to its reliance on mass production and labour intensive operations, with closures and retrenchments occurring in a period of economic downturn and increasing imports.

4. THE RESPONDENTS

Figure 9 presents the respondents classified by industry sector. Both surveys represent a return rate of approximately ten percent of the total mail-out group. Of interest is the fact that the number of textile establishments actually increased over the recession period, apart from a drop of one in 1989/1990. (See Figure 10.)

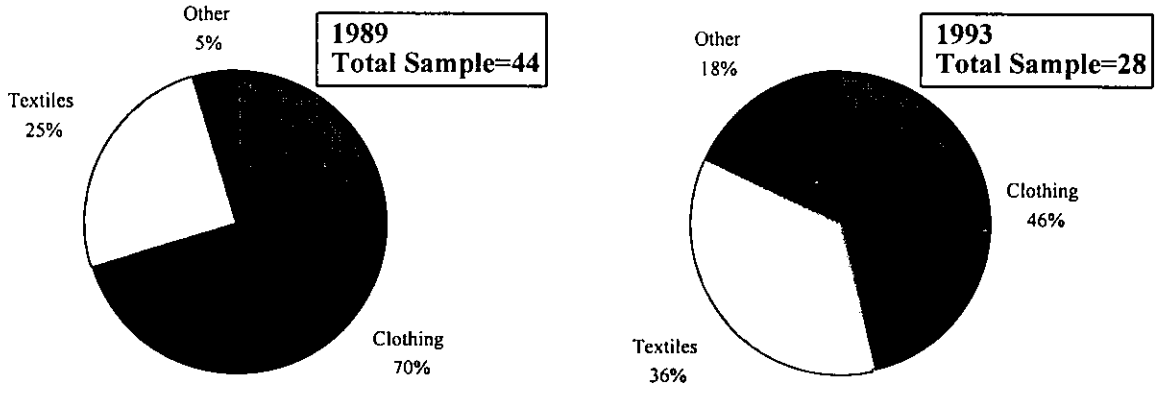


Figure 9. Samples classified by Industry Sector.

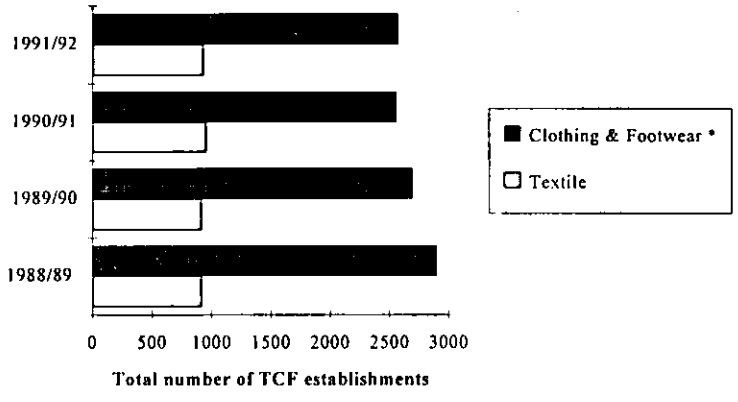


Figure 10. Total Number of TCF Establishments* (Includes establishments with under 4 people). *Reference: Australian Bureau of Statistics.*
* Knitting mills listed separately in ABS.

5. COMPARING THE 1989 AND 1993 RESPONSES

A comparison of the two studies is useful in providing an overview of developments from 1989 to 1993 in the TCF industry, given that the sample of survey returns echoed what had been happening in the industry in the two periods. That is, the second sample reflects, in the main, a selection of slightly larger companies which have weathered the recession and which are more geared towards exports.

Comparisons are made of practices relating to: the application of forecasts; production planning and issues such as lateness, raw material purchasing and sub-contracting. Although the Global Manufacturing Research Group questionnaire was considerably modified between 1989 and 1993, much of the data is still comparable. The 1993 questionnaire is much more comprehensive, with Likert scales to ascertain degrees of manufacturing practices taking place within companies.

DOMESTIC SALES

In 1993, thirty percent more of the responding companies had domestic sales above $10 million (stated in US dollars). This would tend to indicate an increased share of what had been a depressed domestic market, amongst respondents. (See Figure 11).

FORECASTING

Use of Forecasts

Figure 12 compares the various uses of forecasts for 1989 and 1993 in the TCF industry. A significant change is noted, in that most of the companies make use of forecasts for all the specified manufacturing planning categories.

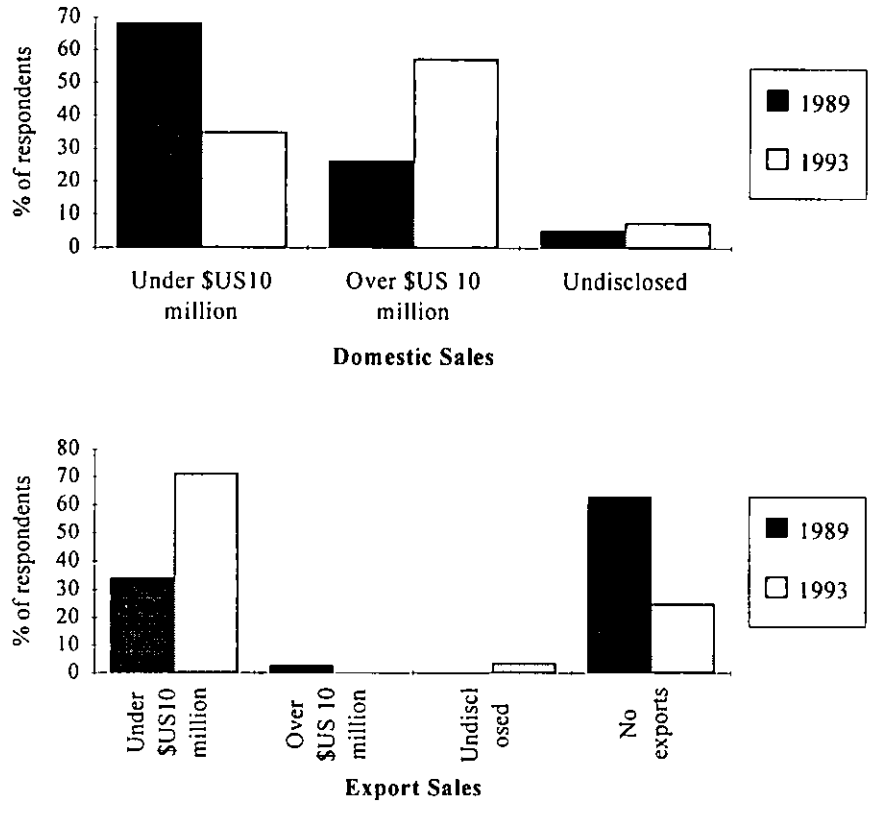


Figure 11. Samples classified by Sales Turnover

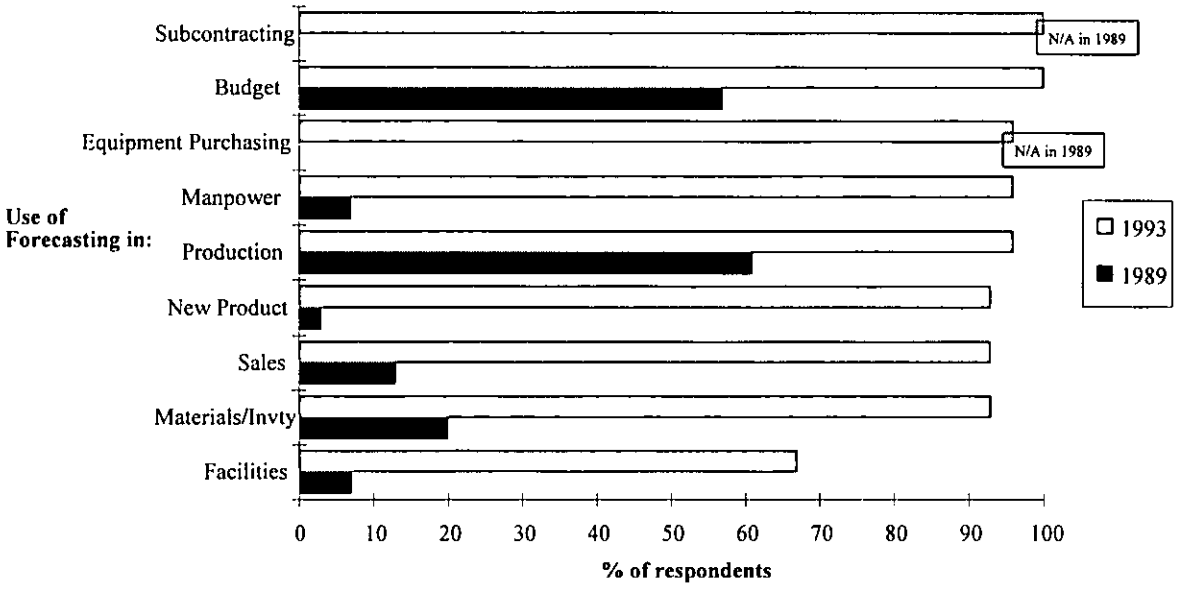


Figure 12. Areas where Forecasting is used

Persons Preparing Forecasts

A downward shift in responsibility for preparing forecasts can be seen in Figure 13a. Whereas in 1989 the usual person responsible was the CEO (in 70% of cases), by 1993, in just over a third of all companies, the usual person who prepared the forecast was a department or division head and in just under a third of the companies it was the President/CEO or Managing Director, followed by the Vice

President/Director at 14% and the owner at 11%. The least nominated person was the group/section manager.

A comparison of the major functional sections having responsibility for production planning in 1989 and 1993 shows little change. Sales and marketing still lead (see Figure 13b). As functional categories were paired in the 1989 questionnaire, for example, Sales/Marketing, Finance/Accounting, Administration/Planning and Production/Engineering (not listed in the 1993 questionnaire), direct comparison between functional groups is not possible. However, it should be noted that sales and marketing have 24% increased responsibility, finance and accounting have 15% decreased responsibility and administration and planning have slightly increased responsibility, for forecasting.

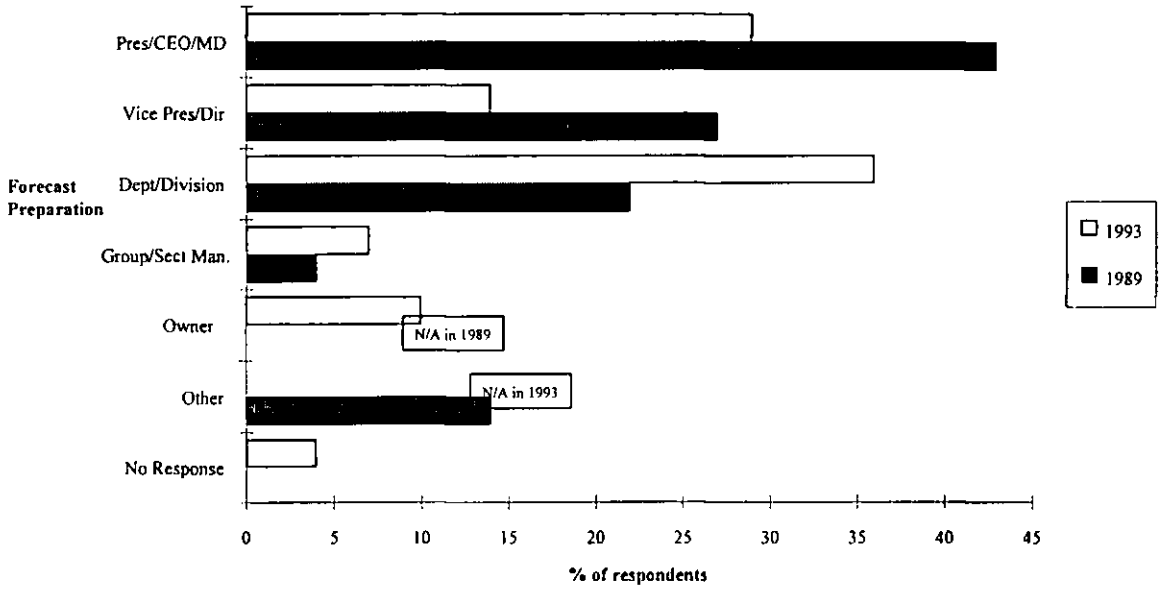


Figure 13a. Forecast Preparation

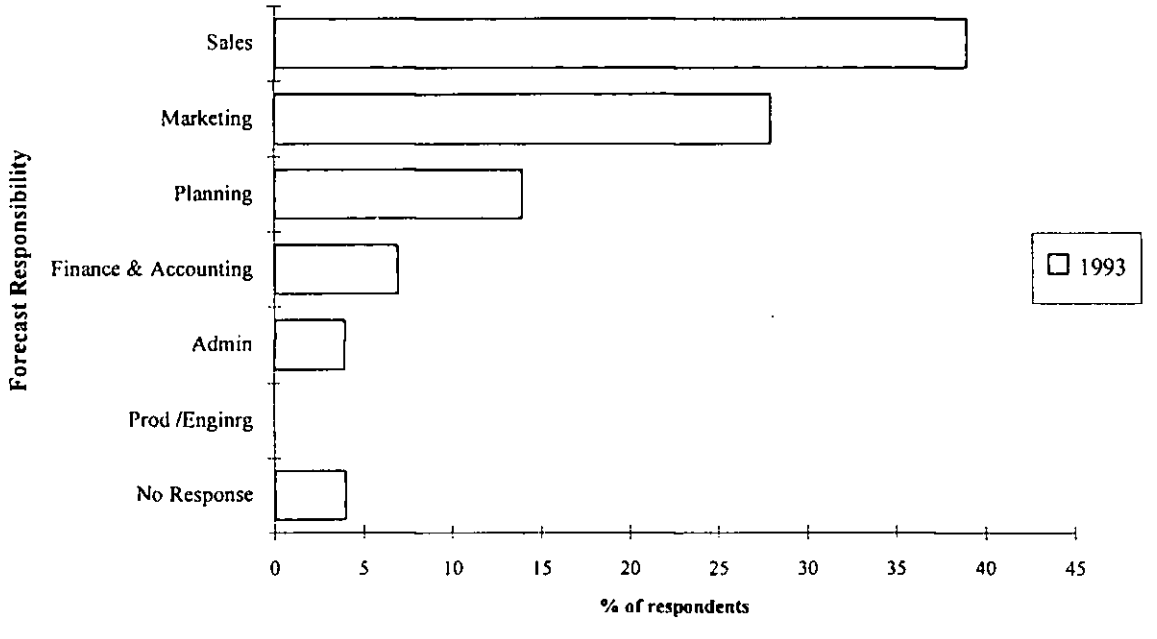


Figure 13b. Forecast Responsibility

Factors Considered In Company's Forecasting

It is clear from Figure 14 that, based on a consideration of both external and internal environmental factors, forecasting is much more thorough generally in 1993 than was the case in 1989. Again, an increased awareness and application of best practices and a more outward looking industry spurred towards export markets can be seen as an attributing factor.

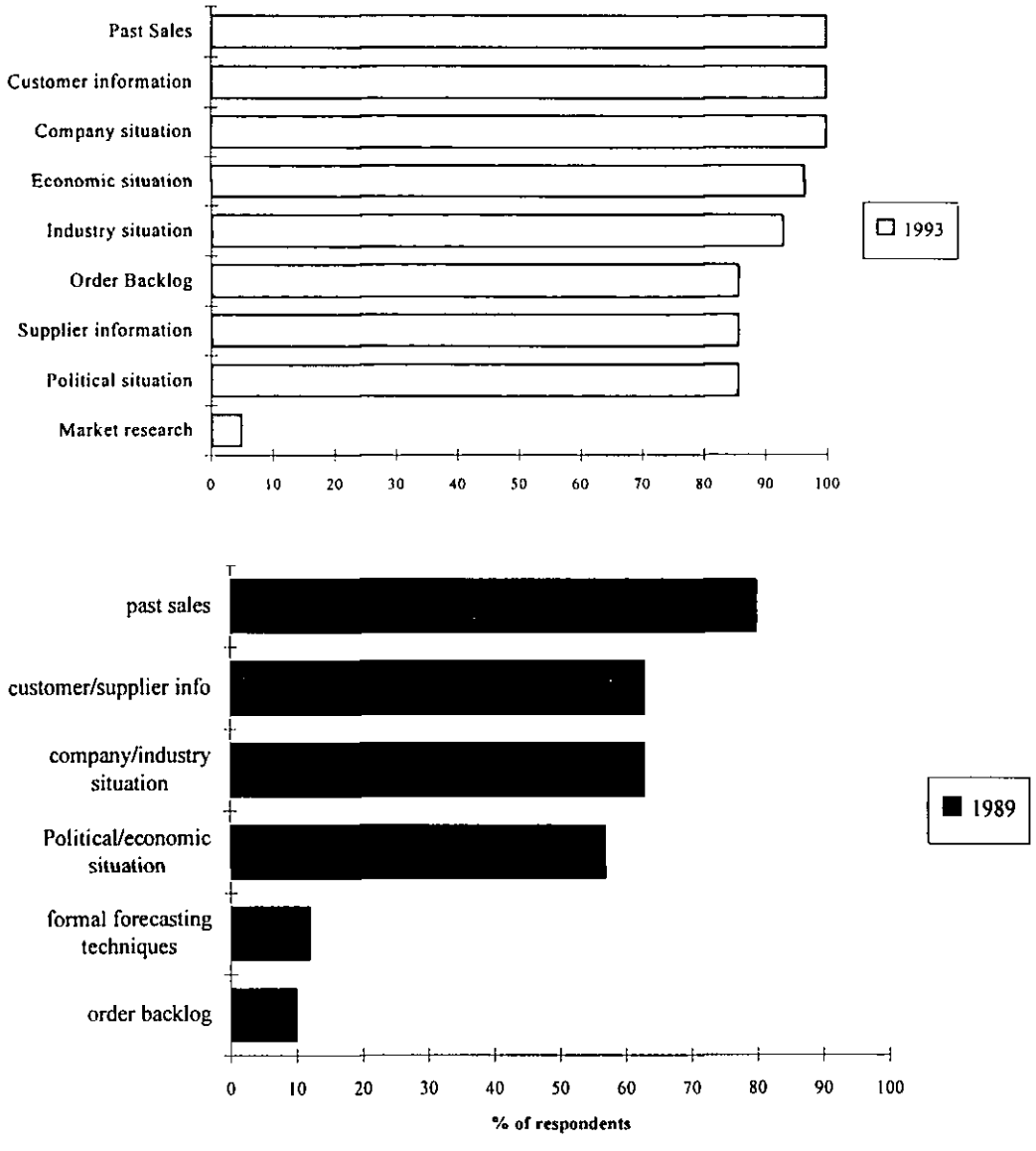


Figure 14. Factors considered in Company's Forecast

PRODUCTION PLANNING

Important Factors in Production Planning

Figure 15 shows the factors considered in preparing a production plan for the 1989 survey. The two factors considered most important for production planning had been order backlogs and

machine/labour capacity, suggesting insufficient industry capacity and poor planning and control polices. In the 1993 survey all the respondents indicated that they took all the factors listed in the questionnaire into consideration. This indicates a much more comprehensive approach to production planning.

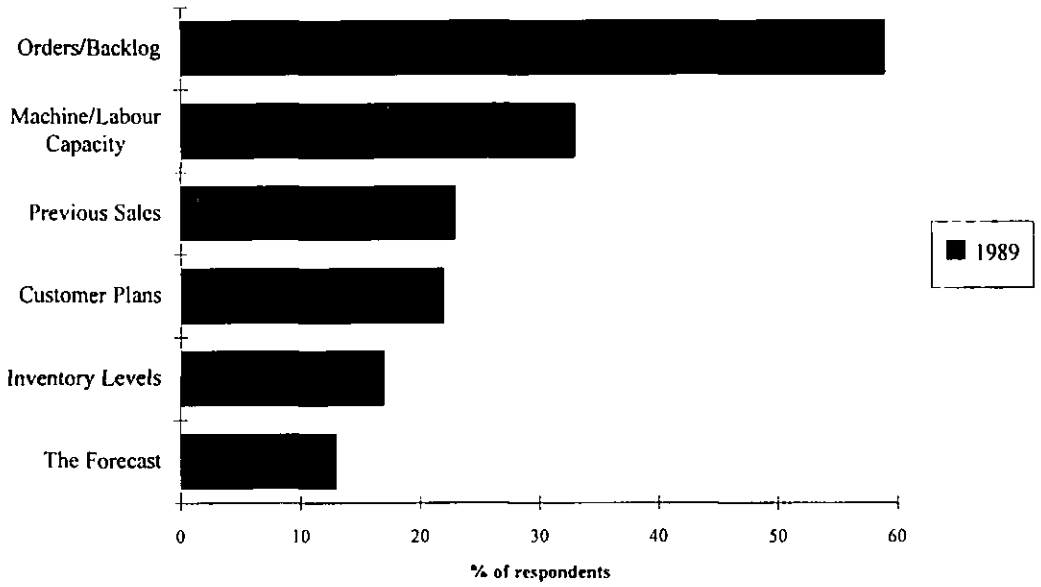


Figure 15. Factors in Production Planning

Uses of the Production Plan

Figure 16 shows a much wider application of the production plan in the second sample. Whereas materials/inventory planning and production scheduling were seen as the most important uses of production planning in 1989, in the 1993 sample most importance was placed on manpower planning and sales planning (the latter category being new to the later questionnaire). Both of these categories also scored highly on scales aimed at determining degrees of applicability within companies. In addition, a large increase in sales, budget, facilities and subcontracting planning is noticeable in the comparison.

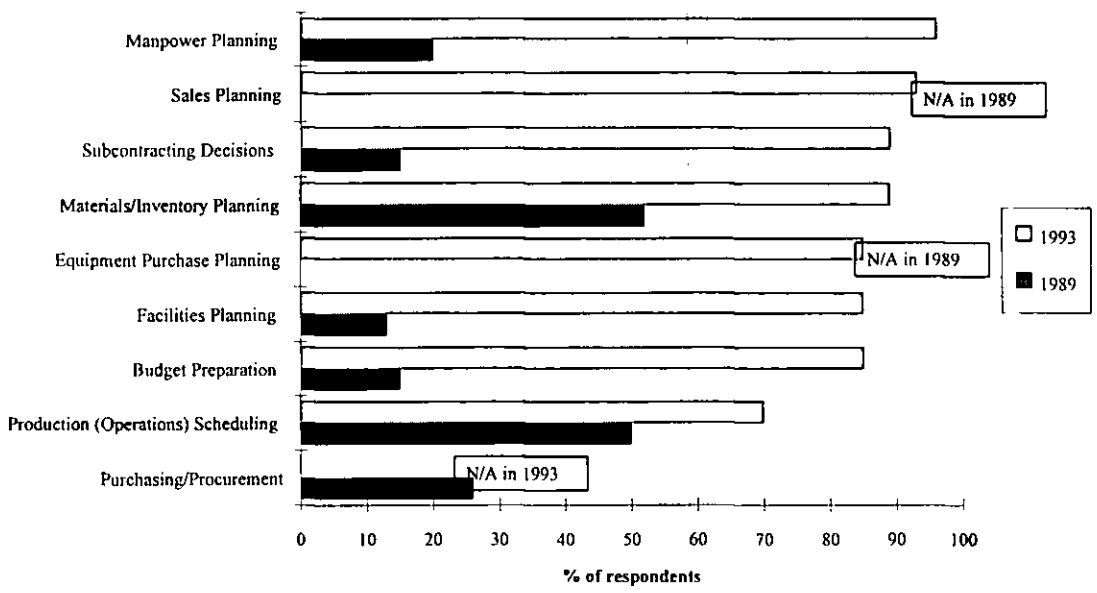
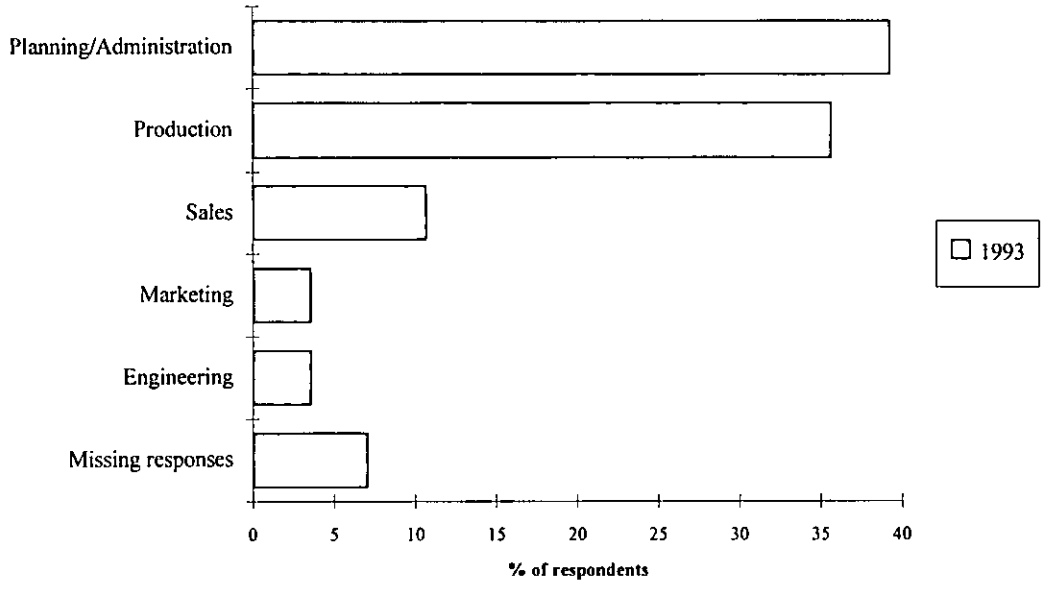


Figure 16. Uses of the Production Plan

The main uses of the production plan in the 1993 study were for employee planning, followed by sales planning and budget preparation

Authorisation to Start a Work Order

Not much difference can be discerned between the two periods in relation to who usually authorises work orders (see Figure 17), apart from the responsibility being about the same (approximately 40% each) for both planning/administration and production/engineering in the 1993 study, as opposed to a ratio of 47%:29% in the 1989 study This suggests that there has been a move towards devolution of responsibility for work authorisation to the shop floor over time, and is in line with the trends in management devolution in Australian manufacturing generally.



(Sales and Marketing need to be seen as an aggregate here, to compare with 1989)

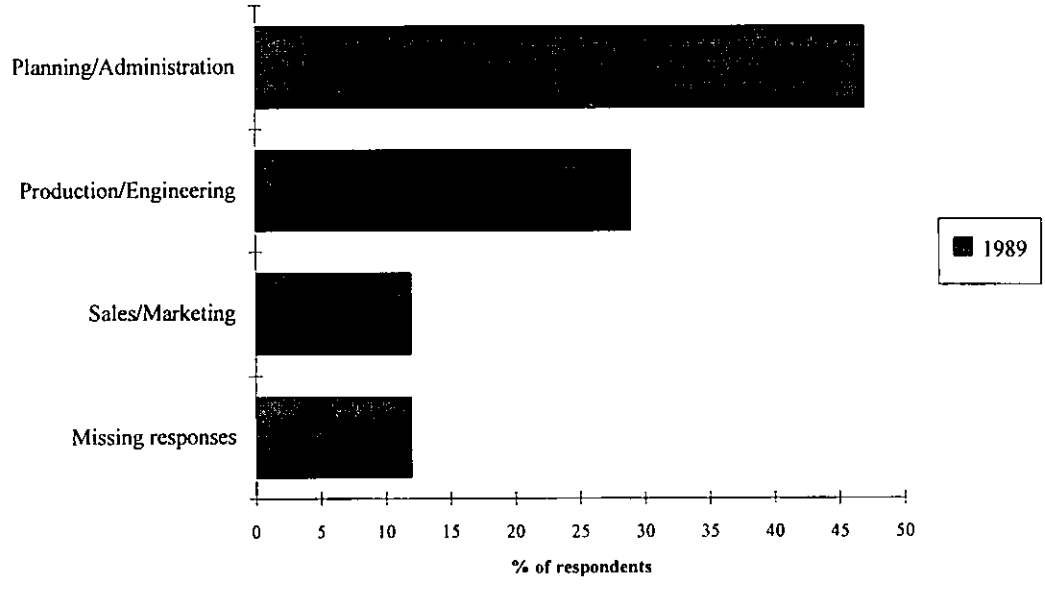


Figure 17. Authorisation to Start a Work Order

Factors Influencing Changes in Production Priority

In 1993, "Pressure from customer" stood out as the most significant factor affecting a change in production priority. The next most influential factor was pressure from marketing, followed by materials shortage and machine breakdown.

This result differed noticeably from the earlier study in that in 1989 the most significant factor overall was materials shortage followed by customer demand, whereas, even though customer demand ranked high in 1993, materials shortage rated low as a major cause of production priority changes, possibly displaying a trend towards more forecast-based and more carefully planned raw materials purchasing.

It was interesting to note, too that surges or changes in demand were not dictating production priority changes as much in the 1993 survey.

LATENESS OF ORDERS

Figure 18 compares the percentage of late orders for 1989 and 1993. There appears to be little improvement in this respect. However, there has been considerable improvement in average lateness of orders (see Figure 19). In 1993, 60% of the respondents claimed that the average lateness was less than one week with the remainder claiming that average lateness was between one week and three weeks. In comparison with 1989, nearly 10% of the respondents said that the average lateness was between three and six weeks and 52% said it was between one and three weeks with the remainder claiming it was less than one week.

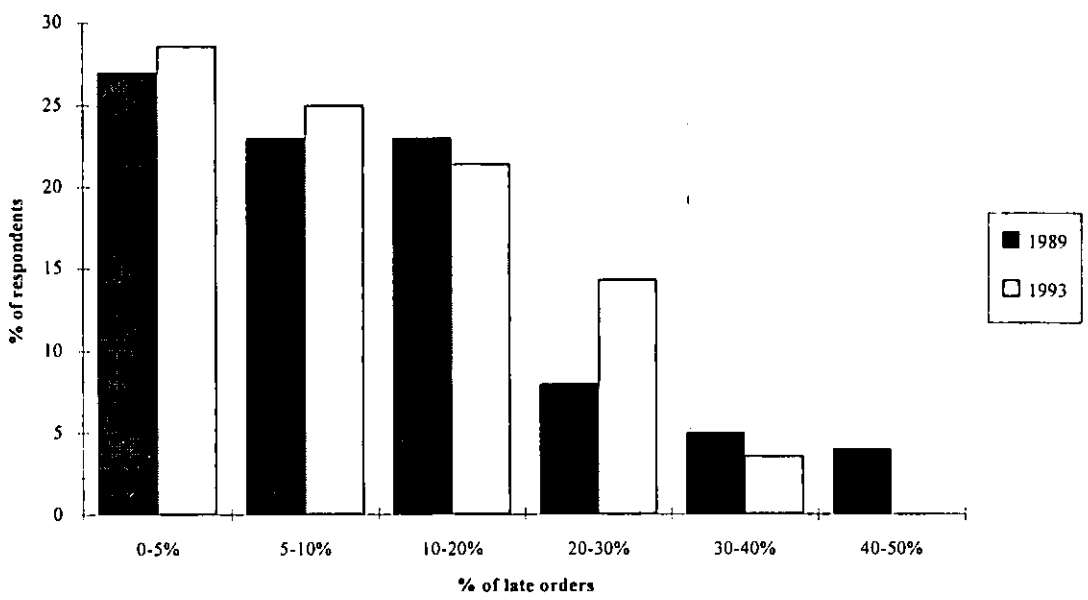


Figure 18. Percentage of Late Orders

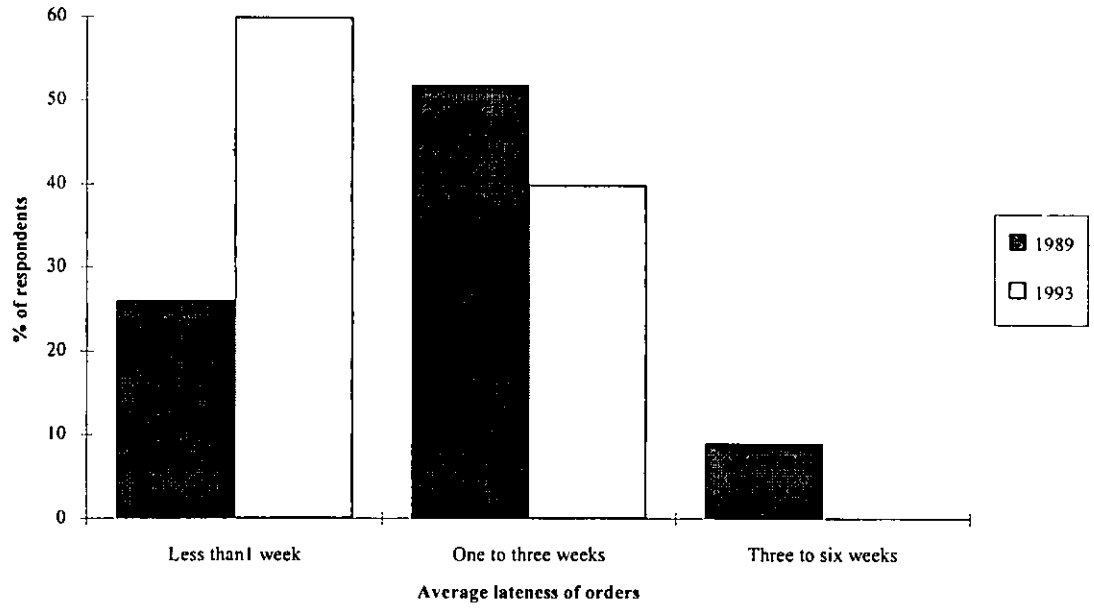


Figure 19. Average Lateness of Orders

Interestingly, in 1993 (see Figure 20), lateness was attributed mainly to poor materials quality (mean score of 3.5) and insufficient labour capacity (3.4). The former variable of poor materials quality was not tested in the 1989 questionnaire but as it is mentioned by 50% of respondents in the 1993 study, the results would suggest that there is room for improvement in coordination between suppliers and manufacturers as to product standards.

It is of note, in the case of labour capacity , that labour shortage at peak capacity times is more significant in the 1993 sample. This finding perhaps reflects the overall lower level of the TCF labour force in the 1990's. Improved quality in final product emerges clearly from the comparison. In 1989 50% of respondents reported poor final product quality to be a contributing factor to lateness, as opposed to 12% in 1993. (See Figure 20.)

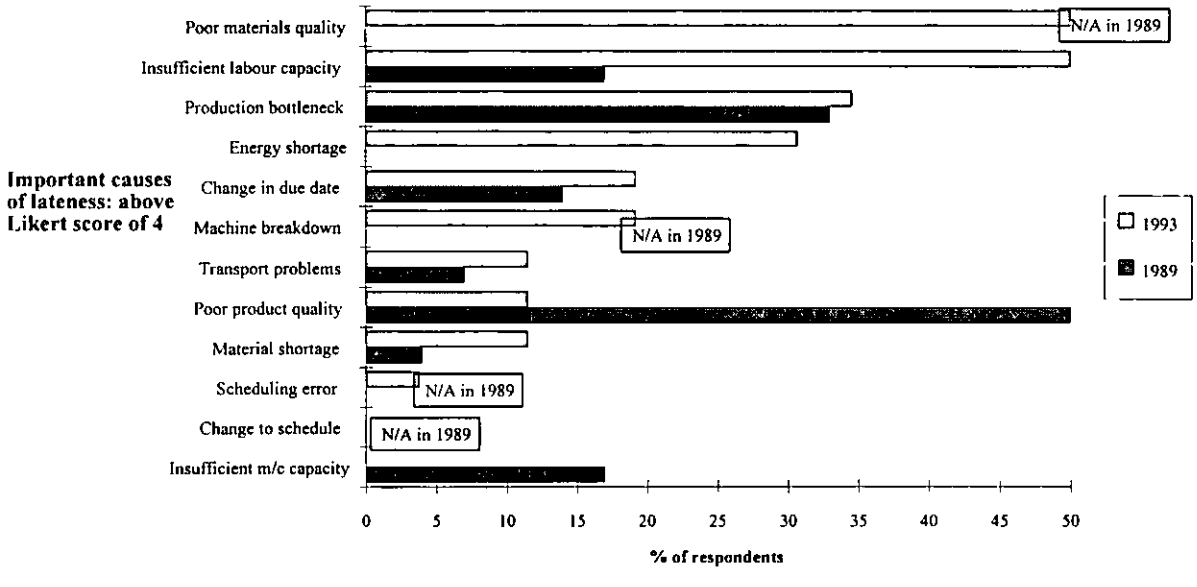


Figure 20. Causes of Lateness

CAPACITY MANAGEMENT

In both surveys, the use of overtime was the most frequent means of changing production (see Figure 21 and Table 1). In 1993, the most popular method of changing capacity stood out as the use of overtime, at mean score 4.2. Next in line were: hiring workers (3.1), allowing idle capacity (2.9) and subcontracting (2.8). Least popular were letting inventory build up (1.8) and backlogging orders (1.3).

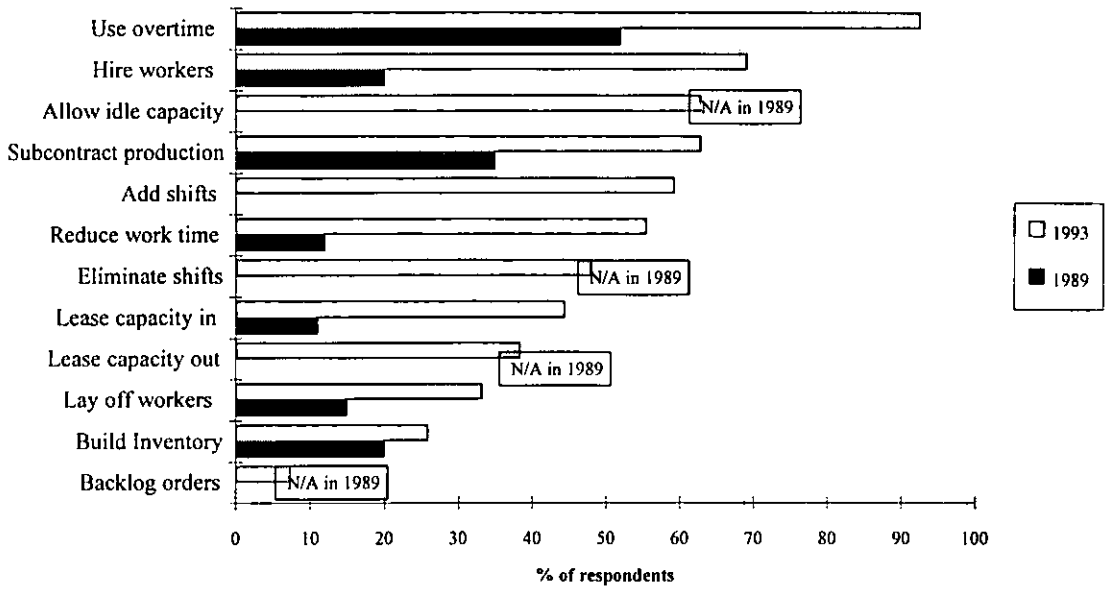


Figure 21. Means of changing capacity

Means of changing capacity	**1993: Mean Score** 0="not at all"; 5="to a great extent"
Hire workers	3.1
Use overtime	4.2
Add shifts	2.3
Subcontract production	2.8
Backlog orders	1.3
Lease capacity in	2.5
Lay off workers	2.5
Allow idle capacity	2.9
Eliminate shifts	2.4
Reduce work time	2.6
Build Inventory	1.8
Lease capacity out	2.5

Table 1. Means of Changing Capacity (1993 Data only)

METHODS OF PURCHASING RAW MATERIALS

Not much comparison can be made here (see Figure 22 and Table 2) except that in the 1993 study there was a significant change towards customer orders dictating orders of new materials. In 1993, raw material purchasing was, in the main, based on the production schedule, (score of 4.0). It was also based, to a lesser extent, on customer orders (3.7), production planning (3.7) and inventory levels (3.6). The three other factors of periodic interval, past experience and material shortage were still considered important bases for raw materials though, at 3.0, 3.1 and 3.0 mean scores.

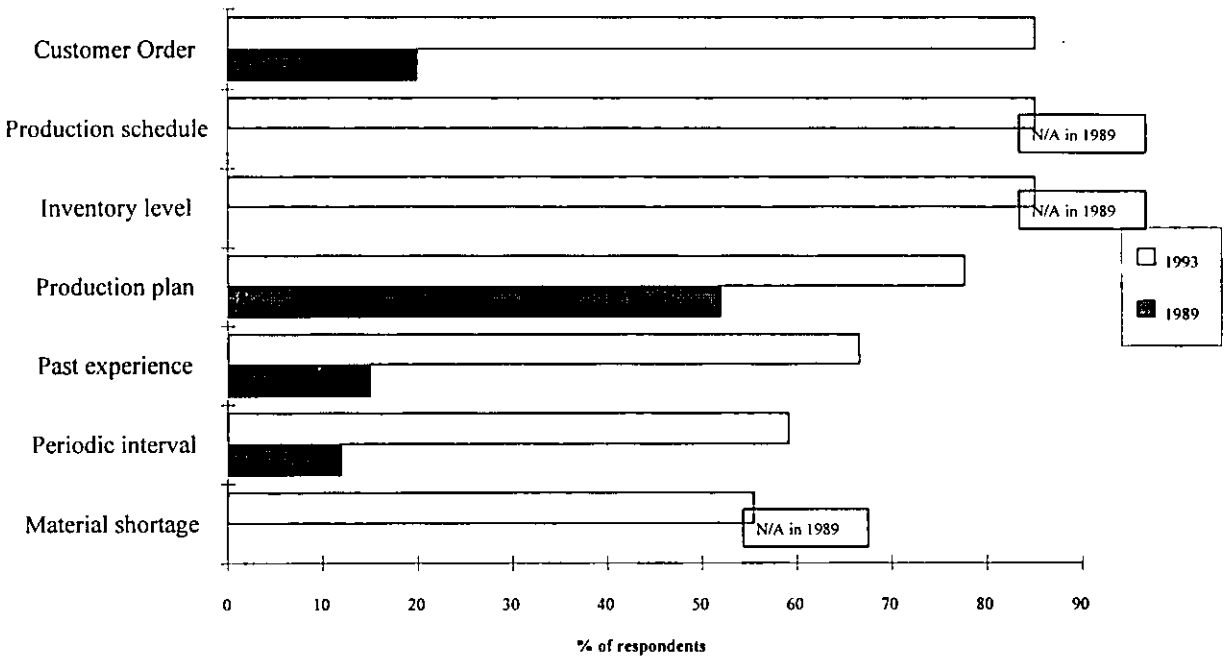


Figure 22. Methods of purchasing raw materials

Methods of purchasing raw materials	**1993: Mean Score** 0="not at all"; 5="to a great extent"
Periodic interval	3.0
Inventory level	3.6
Production plan	3.7
Production schedule	4.0
Material shortage	3.0
Customer Order	3.7
Past experience	3.1

Table 2. Importance of methods of Purchasing Raw Materials (1993 Data only)

SUBCONTRACTING

In both surveys, excess production load was seen as a major reason for subcontracting (see Figure 23 and Table 3). However, in 1993, production difficulty was also ranked highly by respondents, as was early delivery. As stated, the main reason given for subcontracting, in the 1993 study, for when it did occur, was excess production load (score of 2.5; see following explanation for low rating). The second most common reason was to facilitate earlier delivery and the third most common reason was production difficulty (both 2.3). The low ratings for subcontracting reasons reflect the fact that not all

the companies subcontracted, and also that in some of the cases where subcontracting did not occur, scores of zero were recorded, instead of blanks, which skewed the results to means of between 1.7 and 2.3. The quality issue in subcontracting cannot be compared over the period 1989 to 1993 as the variable was not applied in the 1989 survey. Facilitation of early delivery appears however, to be becoming an important factor in deciding to subcontract, and interestingly, that decision has become more top-down in the 1993 sample group.

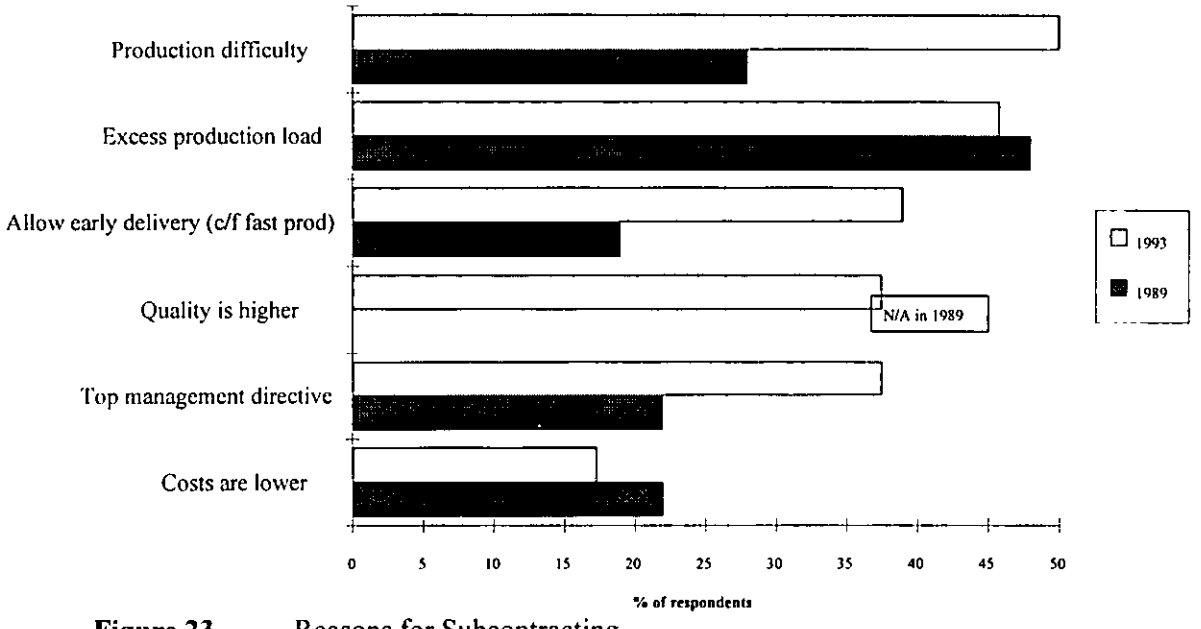


Figure 23. Reasons for Subcontracting

Reasons for subcontracting	**1993: Mean Score** 0="not at all"; 5="to a great extent"
Excess production load	2.5
Production difficulty	2.3
Top management directive	2.0
Allow early delivery (c/f fast prod)	2.3
Costs are lower	1.7
Quality is higher	2.0

Table 3. Reasons for Subcontracting

6. CONCLUSIONS

The comparison over the period 1989 to 1993 shows major changes taking place in the Australian Textile, Clothing and Footwear industry. Firstly, there is wider application of forecasts and a (small) move down the hierarchy to more middle management being involved in forecasting, with increased responsibility in the sales/marketing function. Secondly, more environmental factors were being taken into consideration in forecasting. Thirdly, more factors, both internal and external, were being taken into consideration for production planning. Fourthly, there was an increase in shop floor control. Fifthly, "quality" was seen as a high priority, as was "pleasing important customers" with more on-time deliveries and sub-contracting to facilitate early delivery. Sixthly, there has been a trend to customer-focussed pull-systems, with more customer orders dictating raw material purchases.

The comparison of the two surveys has been valid in that it has reflected degrees of modernisation and change occurring in the TCF industry, although generally the TCF still falls far short of world best practice. The comparison also reflects the general trends over the period; such as the drop in the number of clothing establishments, particularly small establishments, which resulted from lowered protection, the economic recession and the push towards exporting.

In terms of manufacturing management practices, the changes noted in the comparison reflect the restructuring processes being necessitated for TCF companies' survival in the more competitive environment.

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