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AND INDUSTRY**



**DEPARTMENT OF TRADE AND INDUSTRY
POLICY SUPPORT PROGRAMME**

**International Competitiveness And Value Chains in Selected Manufacturing Sectors
Study
Code: A.1.001**

**THE COMPETITIVENESS OF THE SA AUTOMOTIVE
COMPONENTS INDUSTRY**

DECEMBER 1999

Submitted by

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FOREWORD

The Industrial Restructuring Project (IRP) was initiated at the beginning of 1996 as the KwaZulu-Natal Industrial Restructuring Project (KZN IRP). The project initially focused exclusively on KwaZulu-Natal, but is now aimed at supporting industrial policy in South Africa at the national, provincial and local levels. It is facilitated by international experts and is based at the School of Development Studies, University of Natal Durban. The project has two important features. Firstly, it focuses on critical issues that are impacting on the competitiveness of manufacturing sectors that are under threat from increased international competition and the liberalisation of the South African trade regime. Secondly, it is action-oriented in design. The findings that have been generated have, for example, been presented to numerous industry stakeholders, including government, business associations and trade unions. The project consequently has the support of various regional and national stakeholders.

This particular report/working paper has arisen out of both new research and the cumulative knowledge that has been generated from previous studies. These cover a number of IRP reports, working papers, journal articles and conference papers. Some of the themes covered include South Africa's manufacturing competitiveness, the automotive industry, the clothing and textiles sectors, footwear, middle-management capacity, human resource development, institutional support for industrial restructuring, and business services for manufacturing competitiveness. Enquiries regarding IRP material should be addressed to: The Librarian, Centre for Social and Development Studies, University of Natal, Durban, 4041. Tel: 031 2601031; Fax: 031 2602359; email: smithm@mtb.und.ac.za.

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At an academic level a special thank you needs to be directed towards Sean Ellis who helped with the fieldwork and the generation of some of the tables and figures for the report. The views expressed in this report are solely those of the author, however. As a result, all responsibility for its content lies with the author alone.

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INTRODUCTION

This 1999 automotive component manufacturing competitiveness report needs to be read in conjunction with the two previous automotive component manufacturing competitiveness reports written in 1998 and 1997 respectively¹. The Industrial Restructuring Project through three sets of extensive firm level research has built up a formidable firm-level database pertaining to the competitiveness of the automotive components industry in South Africa, with this 1999 follow-up study constituting a further entrenchment of this process.

Given the further liberalisation of the South African trade regime and the continued intensification of foreign competition in the domestic automotive market place the continued relevance of this type of analysis is unquestionable. If the automotive components industry in South Africa is to flourish through improving its output levels, growing its employment base and raising its levels of profitability then it is essential that competitiveness improvements continue to be made. Due to political economy issues and issues of global connectedness (see Barnes and Kaplinsky 1999 and Barnes 1999a) this may still be insufficient for firm-level success, but it is without any doubt a **necessary condition**. If automotive component manufacturers do not improve their competitiveness and better meet more demanding market requirements they will struggle to maintain their presence in the automotive market. Importantly, moreover, the Motor Industry Development Programme (MIDP) mid-term review process has almost been completed, and it is clear that the continued liberalisation, albeit at a slower pace, of the South African automotive industry will continue.

The principal purpose of the report is consequently to present an analysis of the trends relating to firm level operational performance at automotive component manufacturers, with special focus being given to the changes that have taken place over the last 18 months. Given the wide acceptance of the two previous reports and in order to ensure continuity, the report focuses on the same key firm-level areas as the 1998 competitiveness report – namely economic performance and operational competitiveness. As will be highlighted performance in both of these areas is rather mixed. On the economic performance front, most firms are clearly continuing to struggle, although there are certain firms that are flourishing, especially through exporting. In terms of operational competitiveness, the trend is more positive with the average performance of the surveyed firms suggesting consistent improvement in most (but not all) areas.

The report is structured almost identically to the 1998 report, with Section One focusing on the methodology employed for the research undertaking and Section Two presenting a profile of the companies that participated in the 1999 research. Section Three overviews the economic performance trajectory of the sampled companies, with Section Four constituting the core focus of the report. This is the section in which we explore the operational competitiveness findings from the sample of firms and critically evaluate their performance trajectory, especially since the last study undertaken in early 1998.

The major findings of and the important policy considerations that emerge from the study are then discussed in a brief conclusion.

SECTION ONE: RESEARCH METHODOLOGY

¹ See Barnes (1998) *Competing in the Global Economy: The Competitiveness of the South African Automotive Components Industry*, **CSDS Research Report No. 13**, and Barnes (1997) *Facing up to the Global Challenge: The State of KwaZulu-Natal's Automotive Component's Industry*, **CSDS Research Report No. 11**.

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The methodology employed for the 1999 follow-up competitiveness study was the same as that followed for the 1998 study. Firms were sent a very similar detailed questionnaire to the one used last year, except insofar as it only covered 1998 and present performance levels. No historical data was requested given the fact that this was covered in the 1998 study. Some additional questions were, however, added to the questionnaire, with a number of the weaker questions posed in 1998 removed. With the exception of nine of the eleven KwaZulu-Natal Benchmarking Club members, who were included in the survey as part of their annual benchmarking activities, these questionnaires were sent out in mid-October 1999, with the deadline for their return being the 19th of November 1999. Firms were given the option of completing the questionnaire and returning it to the Industrial Restructuring Project, or alternatively they could also request a firm-level visit where the questionnaire and purpose of the study could be explained as it was in 1998; after which the questionnaire would be returned.

We attempted to use the same sample population as last year (i.e. the 35 firms that returned the questionnaire in time for the writing of the 1998 report), although two of the firms that had previously participated closed in the interim. In addition, another five firms were unwilling to participate due to their being too busy or ownership changes having taken place.

Five new firms were therefore included in the sample, with the same detailed questionnaire used for these firms, except insofar as data was requested for the period from 1994 through to the present in order to ensure data consistency for the longitudinal data set. Firm-level visits were also undertaken at all five firms. These five firms were introduced with the expectation that they would ensure that the sample size reached 30 firms at the least. Importantly, given the stratified sampling methodology used in 1998, the five firms that were introduced in 1999 had the same employment size spread as the 1998 sample population.

Despite the use of the same methodology as last year and the clear benefits that firms derived from participating in the 1998 study², only 21 questionnaires were returned in time for the writing of this report. This was made up of 16 firms from the original sample of 28 firms and five from the new firms. Telephonic requests for the return of the questionnaires indicated that a number of the firms, whilst extremely keen to participate, were under enormous pressure due the upturn in the automotive market from September 1999. This had resulted in their slow response to participation in the study. The 12 outstanding questionnaires, whilst promised to us, therefore missed the deadline for the writing of this research report.

Inasmuch as this does not in any way corrupt the integrity of the 1999 data set it does unfortunately limit its population size. Given the fact that we had anticipated a data set comprising at least 30 firms, this is a limitation that needs to be recognised.

² The 1998 findings were presented to the NAACAM executive, the Motor Industry Development Council, the Department of Trade and Industry, three regional chapters of NAACAM (Eastern Cape, Gauteng and KwaZulu-Natal), a number of individual firms and the KwaZulu-Natal Benchmarking Club. In addition, each of the firms that participated in the 1998 study received a copy of the competitiveness report.

SECTION TWO: PROFILE OF SAMPLED FIRMS

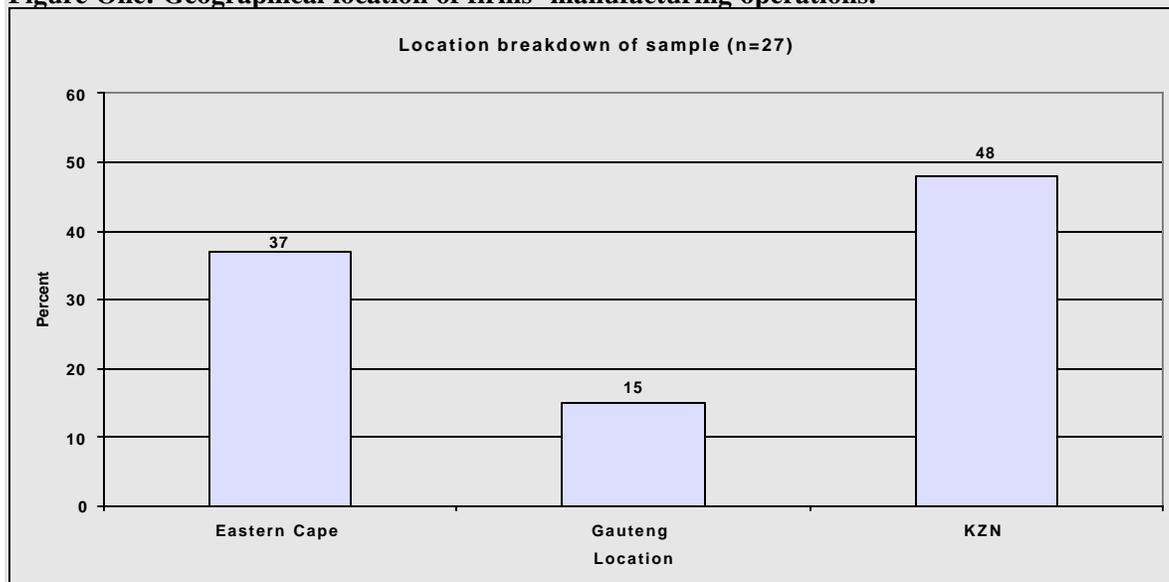
It is important to outline the profile of the firms included in the sample population as this highlights both their representivity and biases. The total sample of firms is therefore disaggregated in this section according to similar criteria as 1998. Where notable differences exist between the two sample sets these are highlighted. The eight profile criteria are listed below.

1. Geographical location
2. Size (employment and turnover)
3. Position in the automotive value chain
4. Automotive sub-sector (principle activities and raw materials usage)
5. Market focus
6. Levels of exporting
7. Date of establishment
8. Ownership

2.1. Geographical location

The 21 sampled firms together have 27 manufacturing plants located in South Africa. The majority of firms (86%) only have one manufacturing plant, with a small percentage having two (5%) or three (10%) plants respectively. As outlined in Figure One, the largest percentage of the sampled firms' plants are located in KwaZulu-Natal (48%), with 37% based in the Eastern Cape and only 15% in the Gauteng.

Figure One: Geographical location of firms' manufacturing operations.



This highlights a bias in the geographical spread of the sample. Gauteng is in fact the most important automotive

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component manufacturing province in South Africa with 55% of NAACAM's members, followed by the Eastern Cape with 26% of NAACAM's members and only then KwaZulu-Natal (at 11% of NAACAM's members). The geographical location of the sample is moreover quite different from the 1998 sample, with Gauteng's representation dropping markedly and the Eastern Cape and KwaZulu-Natal's increasing quite substantially. This stems from the fact that the majority of non-responses to the 1999 study were from the Gauteng.

2.2. Firm size

Given the fact that a stratified sampling procedure was used for the 1998 study and that the five replacement firms in the 1999 study were selected on the same basis there is an even spread of firm sizes amongst the population sample. For example, roughly half the firms employ more than 300 people, with the other half employing less than 300. Turnover spread is even more even with roughly one-third of the sample turning over between R4.8 million and R20 million, another one-third between R20 million and R100 million and the remainder above R100 million. These profile are highlighted in Figures Two and Three.

Figure Two: Employment profile of sampled firms

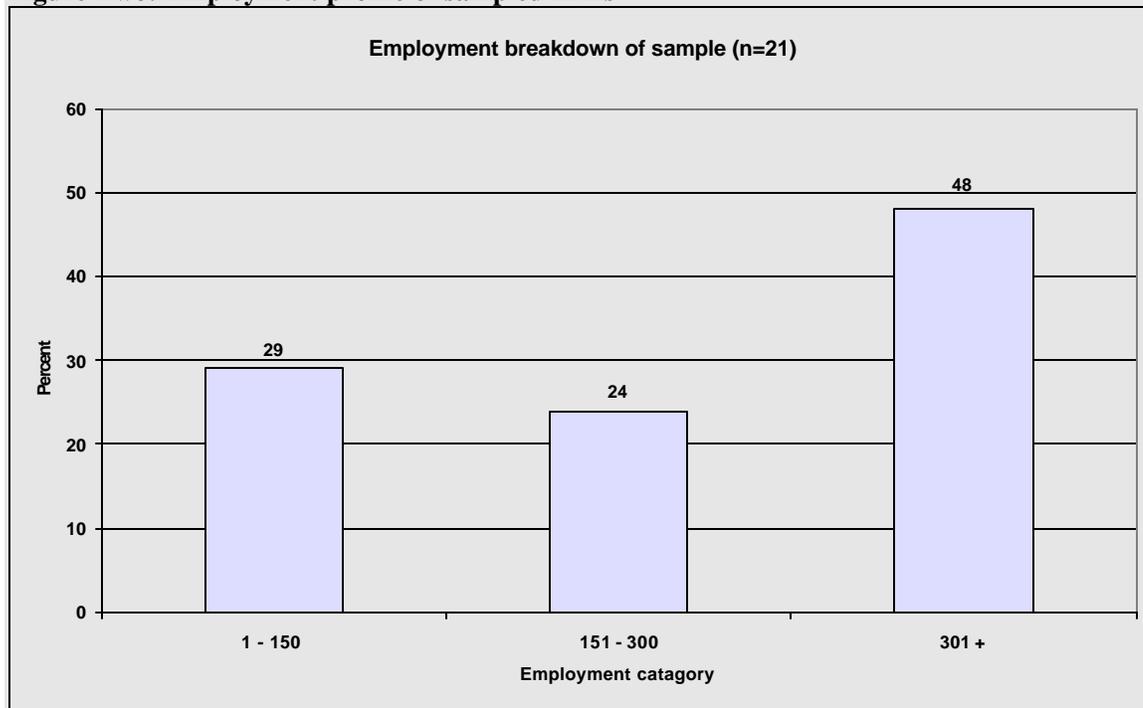
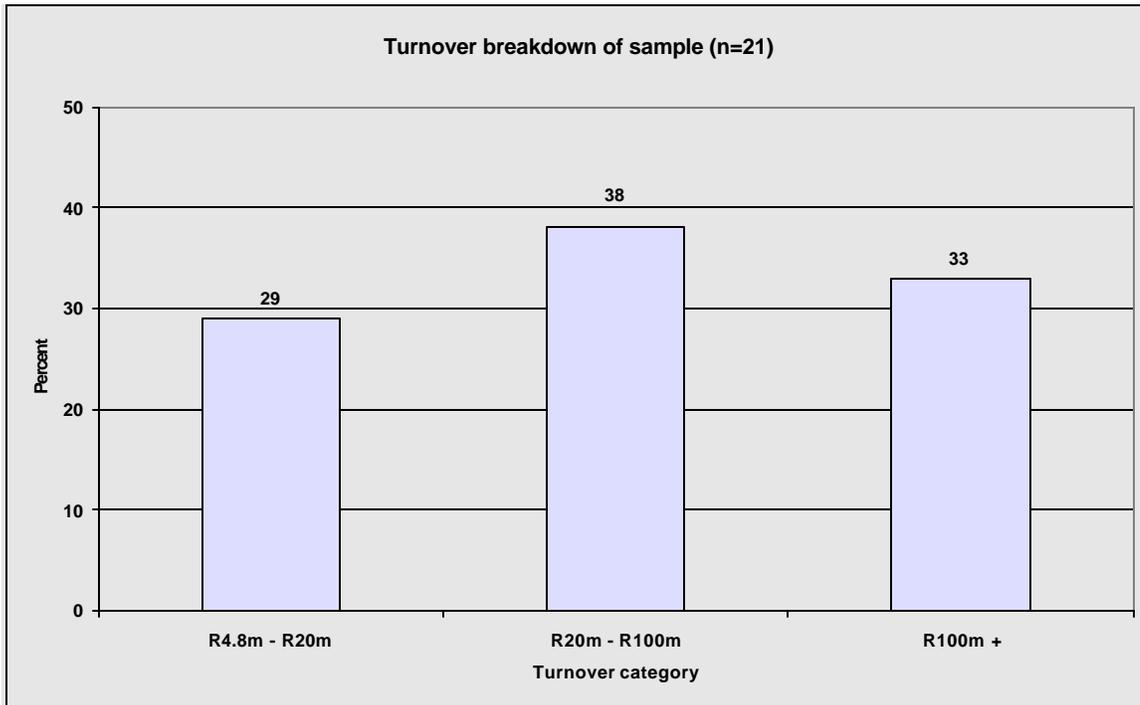


Figure Three: Turnover profile of sampled firms

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Whilst the two figures do suggest significant variance in firm size amongst the population sample, they do not reveal the magnitude of this variance. For example, the smallest firm included in the survey employs only 52 people, whilst the largest employs 1,080, giving the total sample a range of over 1,000 employees, or alternatively a ratio of 1:21 (i.e. the largest firm is 21 times larger than the smallest). In turnover terms the range is, however, significantly larger with the smallest firm's turnover being R4.8 million and the largest R330 million, giving a ratio of 1:69.

The spread of turnover figures is not directly comparable to the spread for employment however as two firms were unable to provide their turnover figures, except insofar as to highlight that it was above R100 million.

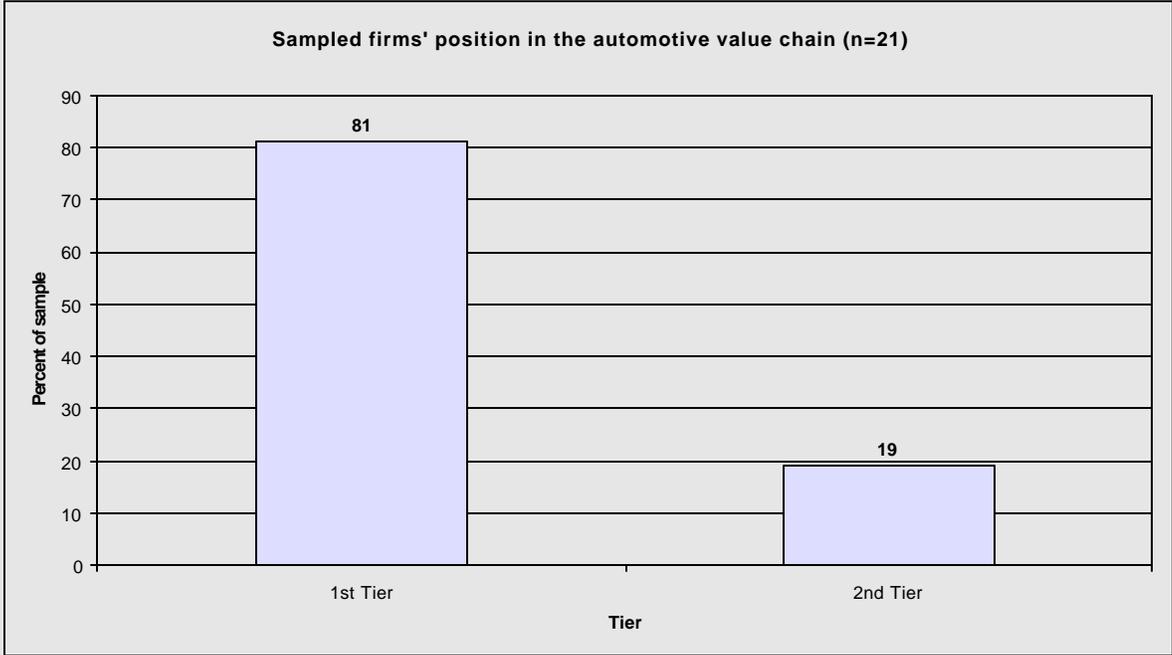
2.3. Position in the automotive value chain

Consistent with the 1998 survey, the overwhelming majority of sampled firms are first-tier automotive component manufacturers (81%), with their production feeding directly into an OEM or the automotive aftermarket. This is unsurprising given the biases in the 1998 firm selection process, where NAACAM was asked to facilitate contact with Eastern Cape and Gauteng firms.

Four second-tier manufacturers are, however, once again included in the sample, with two of the four located in KwaZulu-Natal, one in the Eastern Cape and one in the Gauteng. The four second-tier component manufacturers do not skew the sample in any way as they are all strongly automotive oriented. The position of the sampled firms in the automotive value chain is highlighted graphically in Figure Four below.

Figure Four: Automotive value chain position of sampled firms

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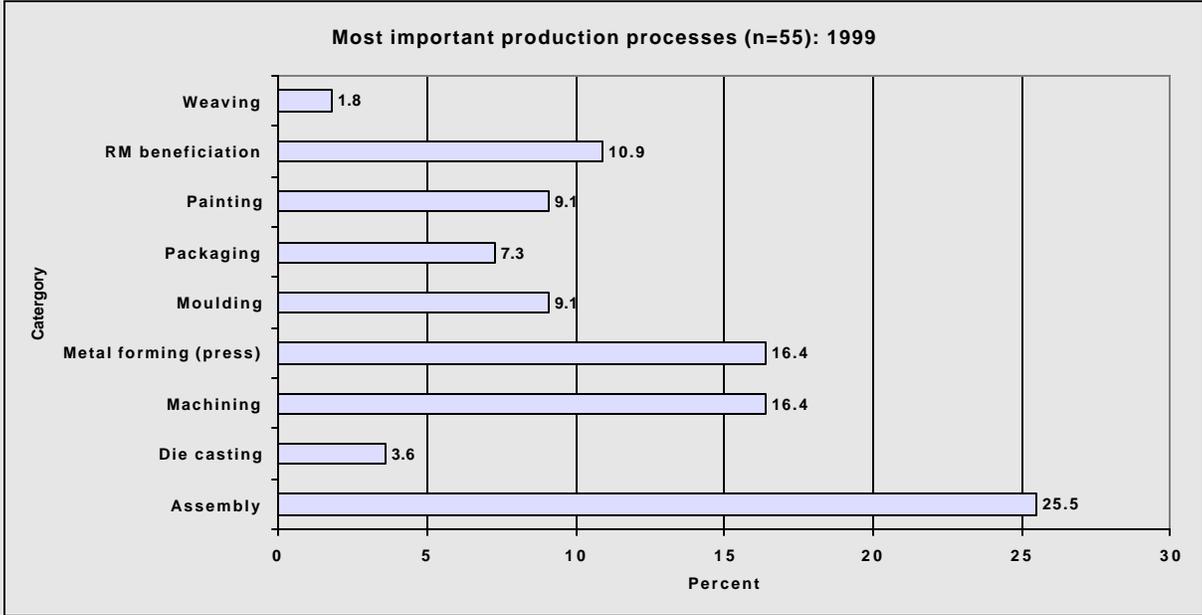
2.4. Automotive sub-sector: Primary production processes and raw materials usage

Unsurprisingly, a diverse range of manufacturing activities takes place at the sampled firms, with the 21 firms claiming to have 55 core production activities between them. This illustrates quite clearly the diverse nature of the automotive components industry. Certain firms, however, claimed to have as many as five core functions with this suggesting their wide footprint in the automotive marketplace. The breakdown of these core activities as a proportion of the total sample of 55 activities is presented in Figure Five.

The three most important activities in order of their importance are assembly (25.5%), metal forming/pressing (16.4%) and machining (16.4%). These activities are in the same order of importance as they were for the 1998 survey.

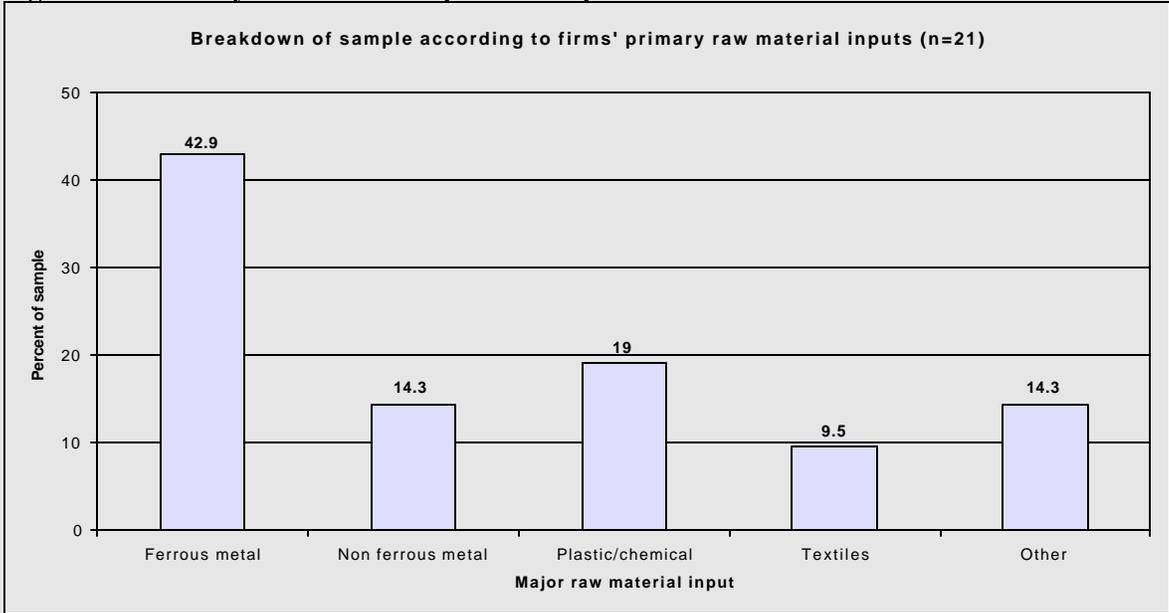
Figure Five: Principal production processes at sampled firms

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The population sample can be split into five categories in terms of principal raw materials used. These pertain to ferrous metals, non-ferrous metals, plastics/chemicals, textiles and “others”. As highlighted in Figure Six, nearly half of the sampled firms are primarily users of ferrous metals, although there is also a significant proportion of firms who are primarily users of plastics/chemicals inputs. Only a small percentage of the firms are primarily textiles or non-ferrous metals users, with the “other” category including firms that are primarily users of electronic components and glass inputs. This profile is very similar to that of the 1998 sample.

Figure Six: Primary raw material inputs at sampled firms

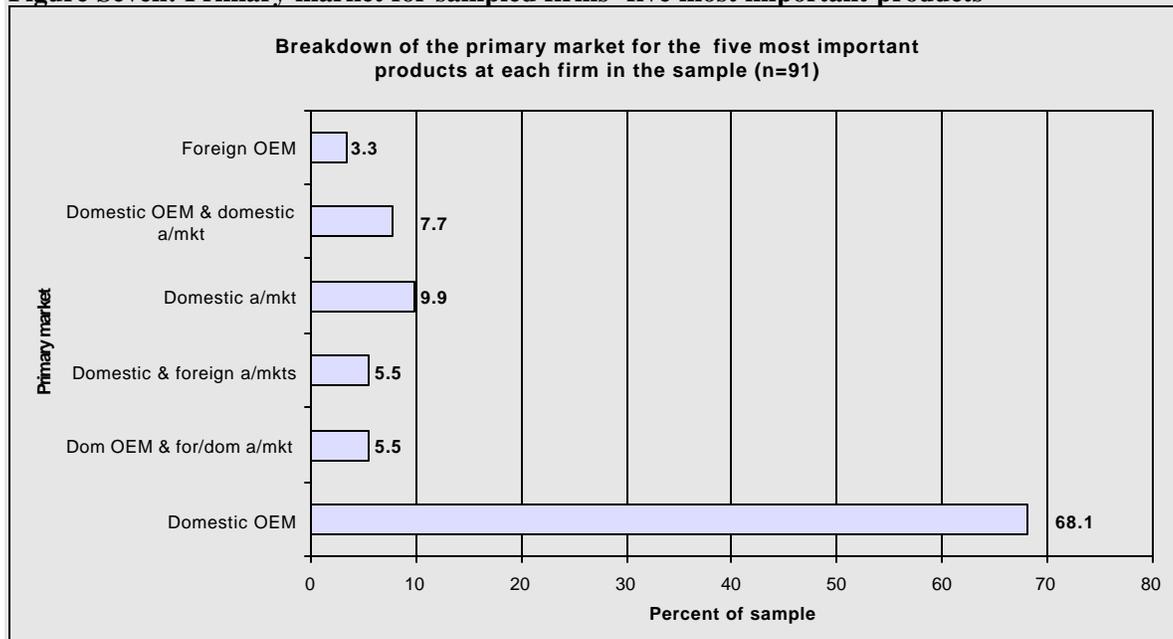


2.5. Principal markets

As was the case in 1998, the domestic market is still clearly the most important market for the automotive components industry. Most of the sampled firms in 1999, for example, indicated a strong orientation for their major products of either exclusively domestic OEM supply (68.1%) or domestic OEM and foreign and/or domestic aftermarket supply (14.3%). This striking bias is clearly illustrated in Figure Seven. Only 15.4% of the sampled firms' five most important products are sold exclusively into either the domestic aftermarket or the domestic and foreign aftermarkets, whilst only 3.3% of the sample of 91 products are sold principally to foreign OEMs, making this the least important of all the firms' markets.

Despite increased levels of exporting (see 2.6.) the seven domestic OEMs are without any doubt then, still the most important market for the sampled automotive component manufacturers.

Figure Seven: Primary market for sampled firms' five most important products

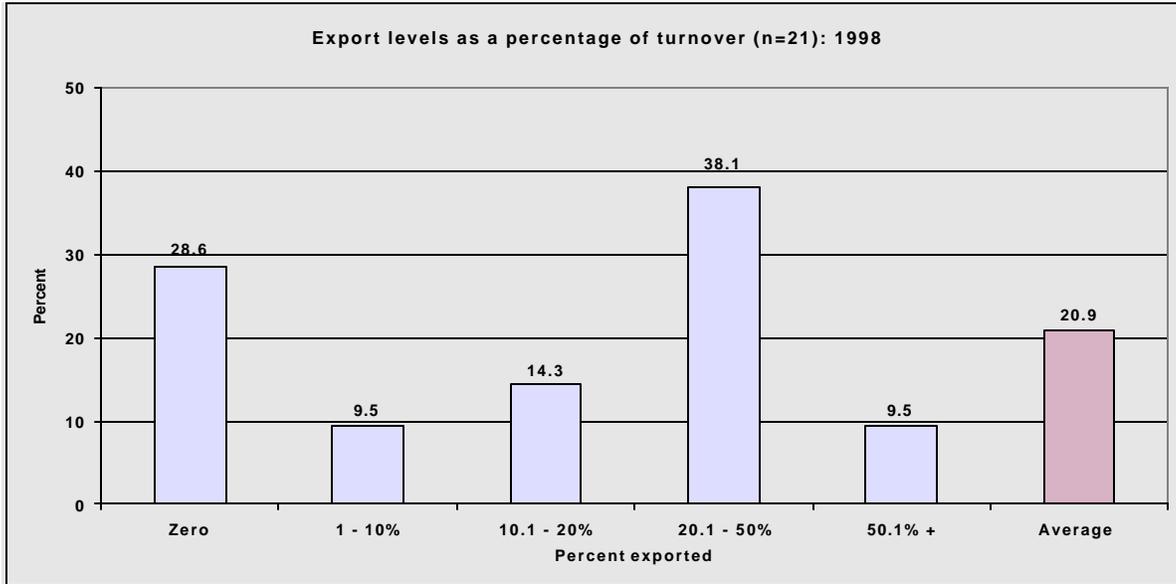


2.6. Levels of exporting

Despite the sample population's continued overall domestic market reliance, there are a small number of firms that are generating significant proportions of their turnover through exporting, with their figures increasing the average level of exporting for the sample population to 21% of turnover. The massive variability in exporting is illustrated in Figure Eight. As highlighted, over one-quarter of the sample do not export at all, with a further one-quarter exporting only between 0.1% and 20% of their turnover. A large number of firms (38%) fall between 20% and 50%, with only 10% of the sample generating more than 50% of their turnover from export sales.

Figure Eight: Exporting levels at sampled firms expressed as % of turnover

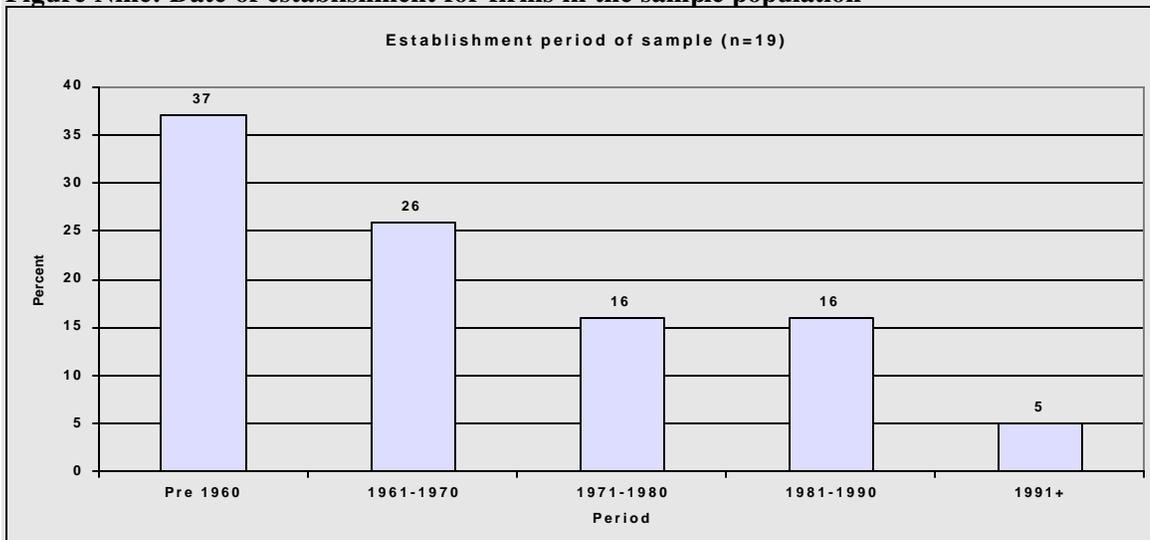
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2.7. Date of establishment

The age profile of the sampled firms suggests their entrenched activity in the automotive industry in South Africa. Just under two-fifths of the sampled firms were, for example, established prior to 1960, with another one-quarter of the firms established during the 1960s. As was the case amongst the 1998 sample of firms, new investments then trailed off through the 1970s, 1980s and 1990s. Quite strikingly, only one of the firms included in the survey started its operations within the last ten years and only 37% of the sample within the last 30 years.

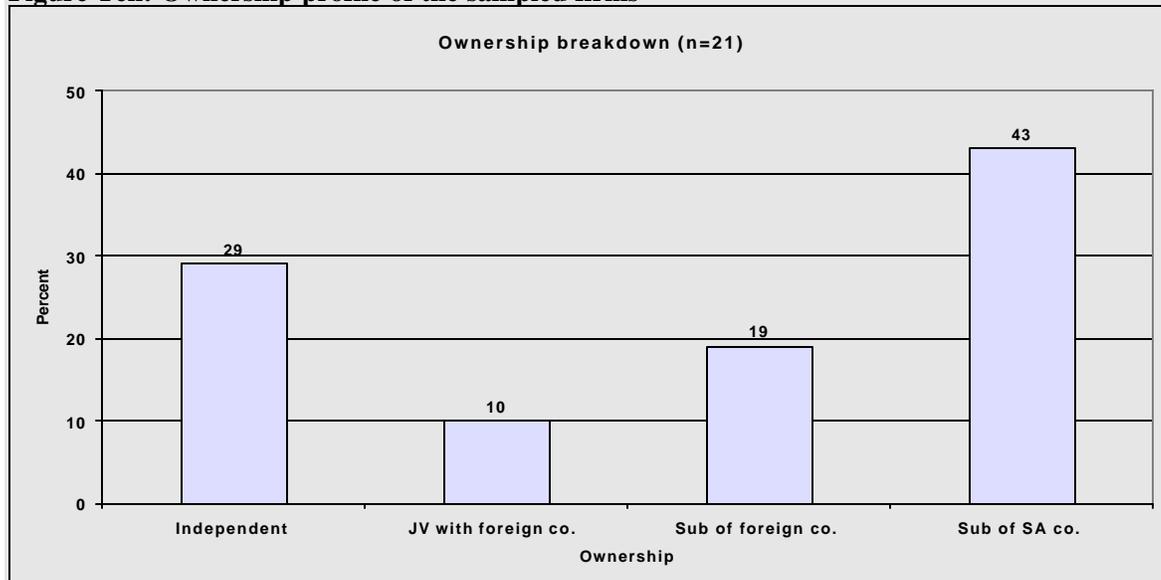
Figure Nine: Date of establishment for firms in the sample population



2.8. Ownership

At a superficial level little appears to have changed in ownership terms since the 1998 competitiveness survey. The majority of sampled firms in 1999 are South African owned either via a national holding company or as an independent operation. This dominance of local ownership is clearly illustrated in Figure Ten, with roughly 70% of sampled firms falling under South African ownership. This is consistent with the 1998 sampled firm profile, where 75% of firms were South African owned. Significantly, however, a number of important ownership changes have taken place amongst the sampled firms over the last 12 months. Two of the firms that were owned by a national holding company at the end of 1997 are now involved in joint ventures with foreign companies, whilst two firms have experienced changes in their foreign ownership over the last 18 months.

Figure Ten: Ownership profile of the sampled firms



2.9. Summary

The profile of the 1999 sample of firms is very similar to the 1998 sample. The only major change relates to the geographical spread of the sample, with the Gauteng significantly under-represented. The breakdown of the sample according to firm size, ownership, primary production activities, primary raw material usage, market and export orientation and period of establishment suggests consistency with the 1998 sample. Once again, however, it is important to bear in mind the large variances in the profile of the sample, with this being evident for almost all of the categories explored. The findings presented in Sections Three and Four of this report consequently need to be understood with this variance in mind. Aggregated findings may accurately represent the average performance of the population sample, but they do not represent the performance of individual firms.

SECTION THREE: ECONOMIC PERFORMANCE TRAJECTORIES

Economic performance figures provide a sound indication of the financial health of firms, and as such are important to consider. Importantly, moreover, economic performance trajectories illustrate the manner in which firms have reacted in the past to the competitive pressures facing them – pressures that have intensified in the automotive components industry with the launch of the MIDP and the industry’s reintegration into the global automotive environment. In this regard, the economic performance indicators generated from the 1998 competitiveness study suggested very mixed economic performance amongst the sampled firms, with employment down, turnover stagnant and profitability levels mixed between 1994 and 1997.

Critically, though, economic performance figures highlight the manifestations of firm-level (un)competitiveness. They do not reveal the reasons underpinning firm-level success or failure. Firms fail or succeed through their ability to meet their markets’ principal performance requirements and because of their ability to connect into particular value chains – not because of their economic performance figures. The same can be said for an industry - overall competencies in terms of a multitude of competitiveness issues are key to its success or otherwise. Economic performance trajectories over a period of time reflect how well firms have met their market challenges but they do not explain the reasons underpinning poor or good performance and as such offer little indication of future competitive response. This will become increasingly clear in Section Four, when the market driver approach to understanding the competitiveness of the sampled firms is explained.

With this important caveat in mind, the economic performance trajectory of the 1999 population sample is analysed according to three important criteria in this section: employment, turnover and profitability. As will be highlighted 1998 proved to be an extremely difficult year for the majority of firms, with performance clearly having deteriorated since 1997. However, as also highlighted, 1999 has thus far proved to be a significantly better year for the majority of sampled firms, with economic performance indicators suggesting a turnaround in performance. Importantly, a number of outliers influence the sample average, with some very encouraging performance findings matched by extremely poor performance trajectories. Where applicable the outliers in the sample are highlighted.

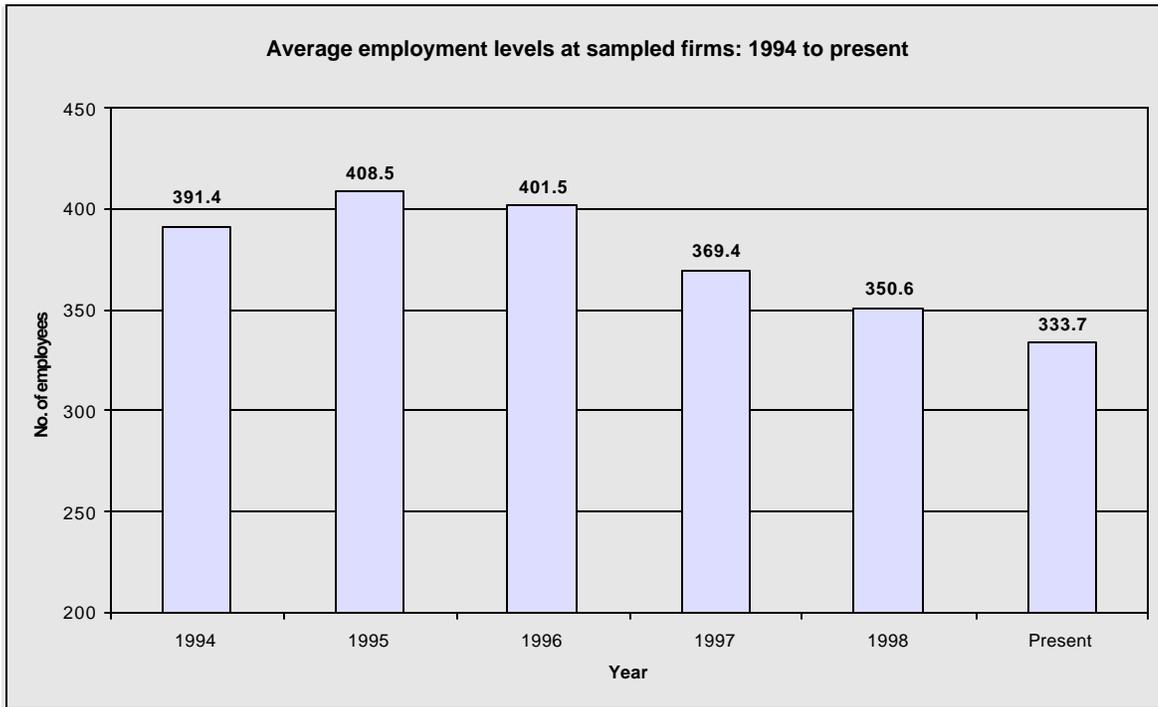
Overall, though, the sample of firms is clearly struggling, although there is some dynamism that prevents too gloomy a picture from emerging. Of critical importance though, these figures represent the findings from surviving firms. The two firms that have closed their operations over the last 18 months are not included in the analysis. The economic picture painted in this section would look less encouraging if these firms’ performance figures were included.

3.1. Employment

As highlighted in Figure Eleven, From a peak in 1995 of, on average, 408.5 employees per sampled firm, employment has fallen by 18.3% to 333.7 employees presently. Importantly, moreover, whilst the most severe loss of jobs took place between 1996 and 1997 (down 8%), the trend between 1997 and 1998 (down 5.1%) and 1998 and presently (down 4.8%) has continued to be negative with significant further job losses recorded, albeit at a slower pace.

Figure Eleven: Average year-end employment levels at sampled firms: 1994-present

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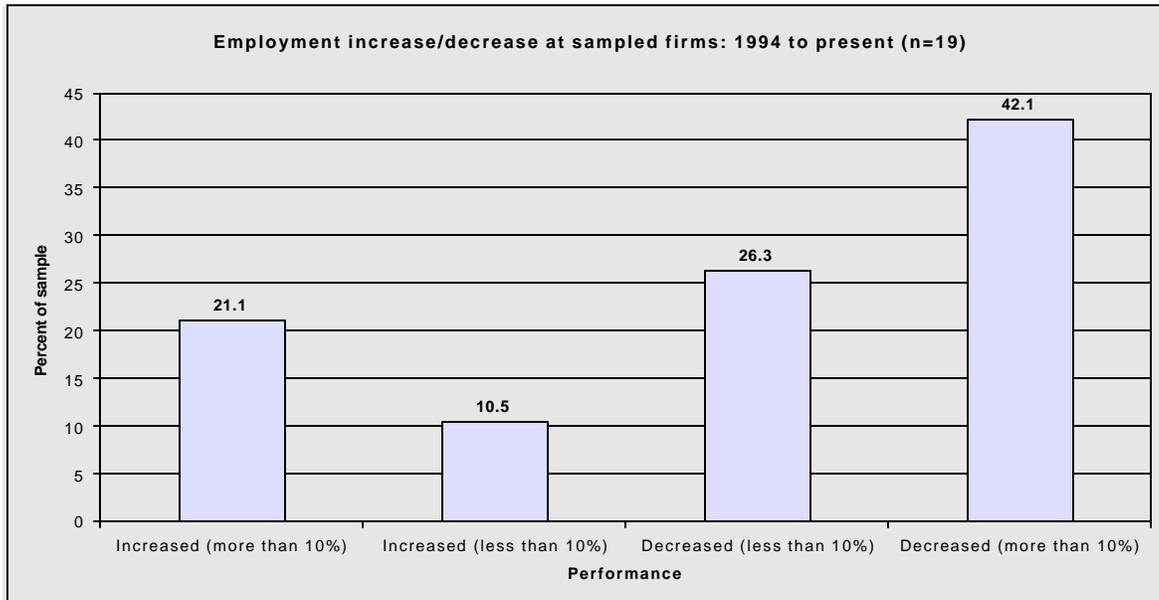


These average figures are however skewed by significant performance variance amongst sampled firms for the period from 1994 to the present. Some firms have, for example, increased the size of their labour force consistently since 1994, whilst others have rapidly shed labour over the same period. As revealed in Figure Twelve, though, this latter trend has tended to dominate with 43% of the sampled firms experiencing job losses of over 10% between 1994 and present.

Notwithstanding this prevalent negative trend, over 20% of the sampled firms experienced employment gains of over 10%. The firm with the most positive growth trajectory grew its employment levels by over 200% between 1994 and present, whilst the worst performing firm shed well over half of its labour force (52%) over the same period.

Figure Twelve: Employment trends at sampled firms: 1994 to present

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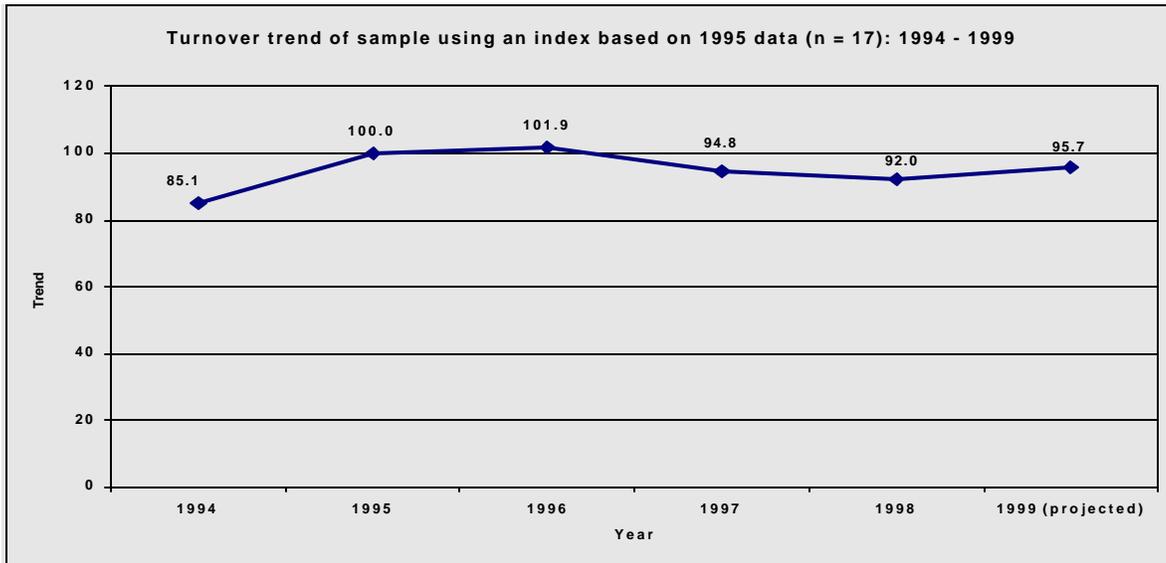


3.2. Turnover

The turnover trend generated for the sample of firms reveals a less negative picture than the employment trend outlined above. As highlighted in Figure Thirteen, whilst the sampled firms have, on average, struggled to maintain their output levels in real terms since 1996, with average turnover levels actually decreasing in by 9.7% real terms between 1996 and 1998, they are predicting a positive growth trajectory for 1999. Even the anticipated upturn in 1999 does not, however, take average turnover levels to their 1996 levels, thus highlighting the difficulties experienced in the industry over the last few years.

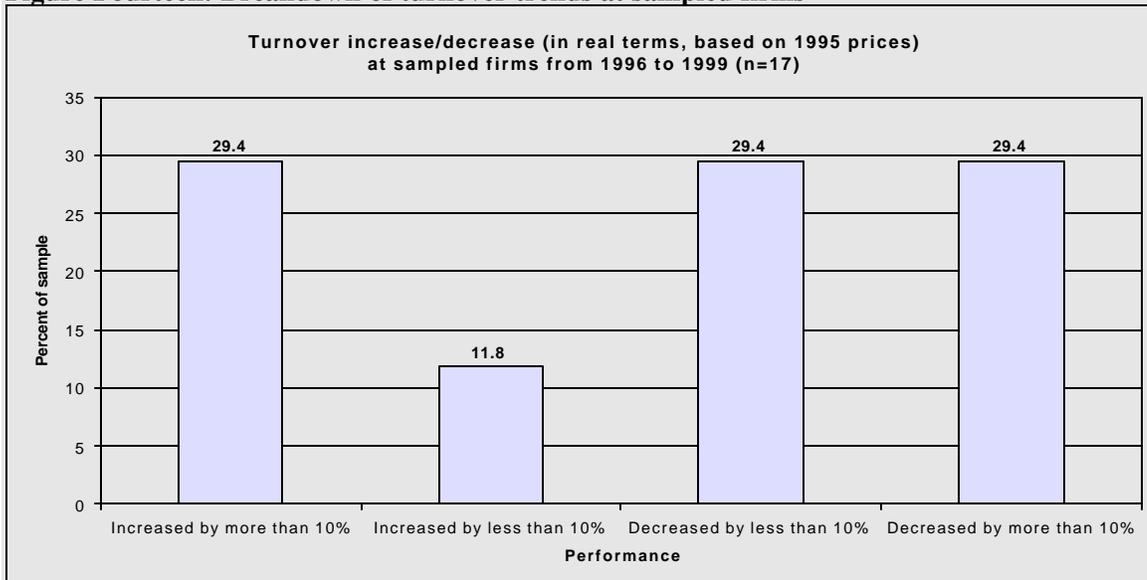
Figure Thirteen: Turnover trend of sample in real terms using an index based on 1995 Rand values.

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In actual terms and at 1995 prices the trend outlined in Figure Thirteen reveals that average turnover levels at the sampled firms dropped from a high of R78,142,500 in 1996 to R70,544,900 in 1998, with anticipated 1999 levels being R73,384,600. As with the employment trajectory of the population sample the average turnover figures represented in Figure Thirteen are strongly influenced by highly variable turnover performance at individual companies. Whilst most firms have struggled to maintain their output levels over the last few years, some firms have performed exceedingly well. Over 40% of the sampled firms have, for example, increased their turnover in real terms since 1996. This is highlighted in Figure Fourteen, which illustrates turnover performance variance amongst the firms since 1996.

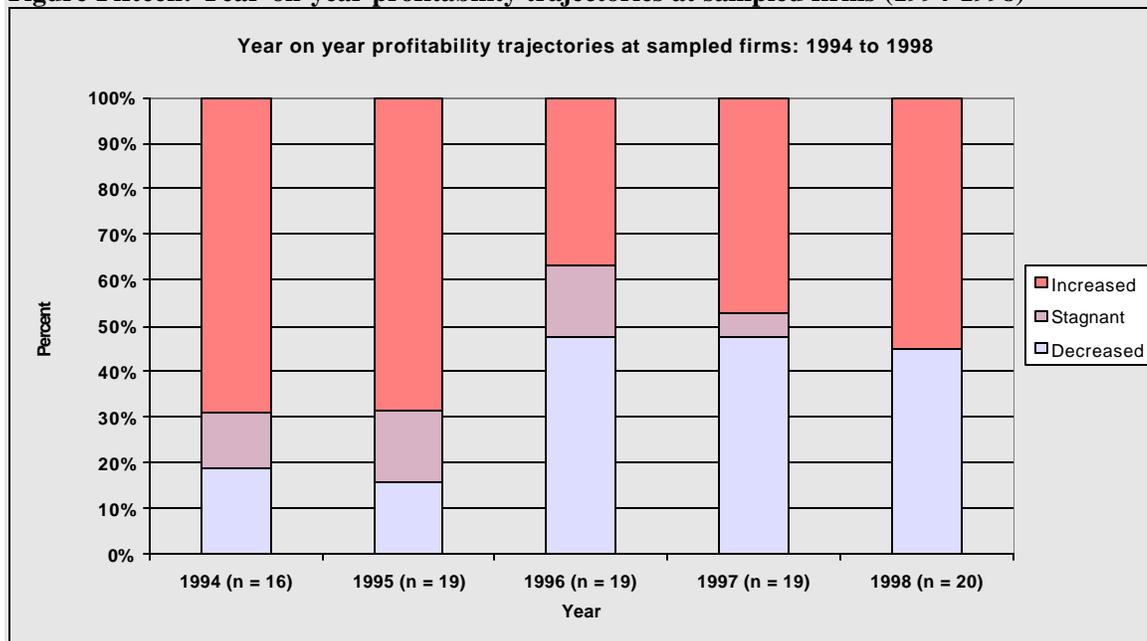
Figure Fourteen: Breakdown of turnover trends at sampled firms



3.3. Profitability trends

Consistent with the 1998 population sample, profit trends at sampled firms have been highly variable over the period 1994 to 1998. Whilst certain firms have consistently increased their profitability levels over the last five years, others have experienced steady erosions in their levels of profitability from one year to the next. Figure Fifteen highlights the highly varied nature of the sample's overall profitability trajectory. Significantly, the overall picture for the sampled firms appears to have improved over the last year. The proportion of firms experiencing improved profitability has increased from just under 50% for the period 1996 to 1997 to over 50% for the period 1997 to 1998. This represents a major improvement on the 1995 to 1996 period when only approximately one-third of firms increased their profitability levels. It does not, however, compare with the 1993 to 1994 and the 1994 to 1995 periods when only 15% of firms claimed to experience decreasing year on year profitability levels.

Figure Fifteen: Year-on-year profitability trajectories at sampled firms (1994-1998)



3.4. Summary of economic performance findings

The economic performance trajectory of the population sample, whilst generally rather weak, is highly differentiated. Certain firms are doing far better than others, with this apparent from the turnover, employment and profitability trends presented. Firms have clearly, however, been under enormous pressure throughout the latter part of the 1990s, with the most recent performance figures of the firms suggesting that 1998 continued to be an extremely difficult period for many firms. Projections for 1999 appear to be far more optimistic, although performance levels are still far removed from their 1995 high.

As already argued, the key variables determining economic success or failure are extremely complex. Economic performance indicators consequently offer us little explanation as to why firms are doing either well or badly. This is the major weakness of analysing firm-level performance on the basis of economic figures. They are indicators of performance after the fact and as such illustrate symptoms rather than causes of firm level failure or success. Whilst

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they may still be of enormous interest, this renders the economic performance figures weak measurement proxies for understanding the competitiveness capacity of automotive component manufacturing firms (or for that matter any manufacturing firm). As per past firm-level IRP research into international competitiveness, it is therefore essential to use better measurement proxies for understanding this critical facet of firm level success or failure, as clearly illustrated in Section Four.

SECTION FOUR: OPERATIONAL COMPETITIVENESS FINDINGS

Consistent with the 1998 competitiveness study, the 1999 study focused its attention on an alternative set of measurement proxies that better illustrate the operational competitiveness of the automotive components industry in South Africa. The reasons underpinning the use of what we now call “the market driver approach” were explained in the 1998 competitiveness report and again the international benchmarking report written for the DTI PSP in September 1999 (see Barnes 1999b). There is consequently no reason to further labour the point, except insofar as to highlight the critical fact that the market driver approach takes as its starting point the requirements of the market and then uses operational performance measures to illustrate the extent to which firms are meeting these market requirements. These principal market requirements and the operational competitiveness measures used to determine adherence to such requirements are presented in Table One below.

Table One: Market drivers and their related operational performance measures	
Market drivers (demands)	Operational performance measures
1. Cost control	<ul style="list-style-type: none"> • Inventory holding: <ol style="list-style-type: none"> 1. Raw materials stock holding, 2. Work in progress levels, 3. Finished goods stock holding
2. Quality	<ul style="list-style-type: none"> • Customer return rates, • Internal reject, rework and scrap rates, • Supplier quality performance
3. External flexibility	<ul style="list-style-type: none"> • Time from customer order to delivery, • Delivery frequency and reliability to customers, • Delivery frequency and reliability of suppliers
4. Internal flexibility	<ul style="list-style-type: none"> • Machine changeover times, • Batch and lot sizes, • Inventory levels, • Throughput time through factory, • Machine utilisation levels
5. Capacity to change (human resource development)	<ul style="list-style-type: none"> • Labour/management turnover levels, • Absenteeism rates, • Training expenditure and types of training, • Employee development, • Suggestion schemes/continuous improvement
6. Innovation capacity	<ul style="list-style-type: none"> • R&D expenditure • Proportion of sales from new products

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As argued in the 1998 competitiveness report, understanding how well South African automotive component manufacturers meet the key market drivers outlined in Table One will go a long way towards helping one understand the competitiveness capacity of the industry. Of particular importance here, is the competitiveness data illustrating the extent to which firms have improved (or deteriorated) their operational performance since the 1998 study. The 1998 study highlighted the critical fact that performance improvements had been substantial from 1994 through to the end of 1997, but that they were still significantly short of international competitiveness standards.

This section consequently presents the key findings of the 1999 competitiveness study and as such constitutes the central focus of the report. Importantly, moreover, its presentation format follows the market driver sequencing outlined in Table One.

4.1. Market driver No. 1: Cost control

As highlighted in Figure Sixteen, total inventory holding figures at the sampled firms suggests performance deterioration between 1995 and 1997. This contrasts significantly with the findings from the 1998 competitiveness study, which suggested large improvements in inventory performance between 1995 and 1997. Improvements at the 1999 sample of firms have only occurred over the course of 1998, with these levels still sitting at only just below 1995 levels (61.3 days verses 62.2 days).

Figure Sixteen: Average total inventory holding at sampled firms (1995 to 1998).



The reasons underpinning the worsening performance in total inventory holding between 1995 and 1997 and the improvement between 1997 and 1998 are difficult to identify. One could postulate that with increased exporting there would have been a related increase in finished goods stock holding, and perhaps even raw materials, over the period from 1995 to 1997, but this does not appear to be entirely the case. As highlighted in Figures Seventeen, Eighteen and Nineteen these two inventory types have followed broadly similar trajectories to work in progress (WIP) levels at the sampled firms. WIP levels cannot be attributed to value chain changes and this consequently suggests that the sampled firms only began grappling with inventory control issues in 1998. For example, raw material (12.7%), WIP (8.9%) and finished

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goods stock holdings all deteriorated between 1995 and 1997, although the most significant deterioration was in finished goods stock holding (at 38.5%). The performance improvements in 1998 were, moreover, least evident for finished goods stock holding (only 6.9%), with raw material (24.9%) and WIP (16.4%) levels showing far more positive improvement.

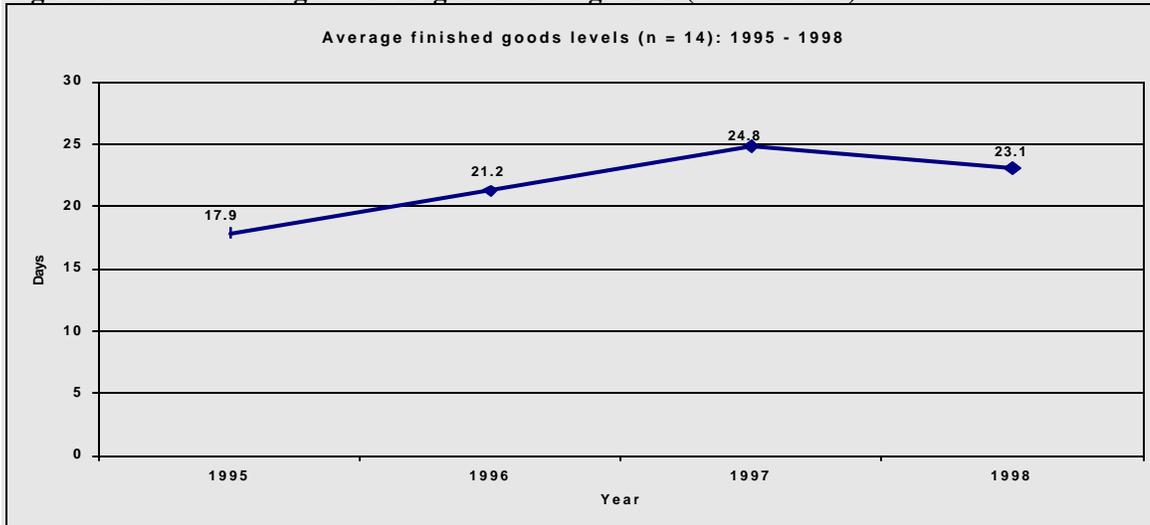
Figure Seventeen: Average raw material levels (1995 to 1998).



Figure Eighteen: Average work in progress levels (1995 to 1998)



Figure Nineteen: Average finished goods holding levels (1995 to 1998).



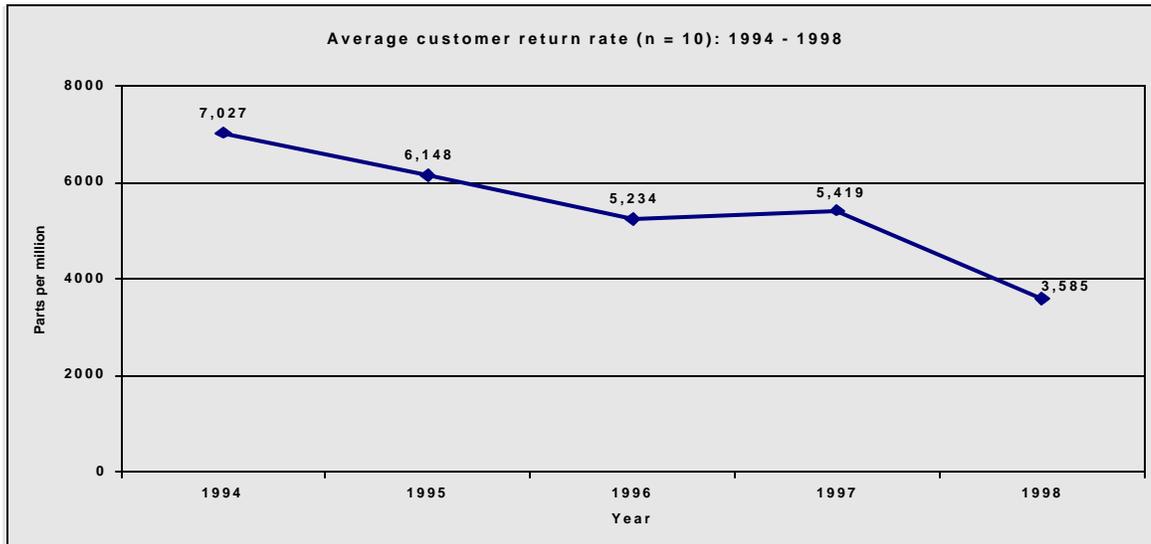
4.2. Market driver No. 2: Quality

There are two critical components to quality at companies: their external and internal performance. External performance relates to customer return rates, which highlights firm-level ability to meet customer quality requirements. Importantly, though, this measure does not necessarily reflect internal quality performance at firms. Firms could be manufacturing good quality products for customers by building stringent quality checks into their production processes. Quality products are therefore being generated, but at an exorbitant cost. It is therefore important to measure internal quality performance at firms as this indicates the extent to which quality is being built into their production processes. Internal quality comprises a number of different elements: rejects, scrap and reworks.

The average customer return rate of the population sample is presented in Figure Twenty, and as is obvious, consistent and significant improvements in performance have occurred through the period from 1994 to 1998. The only anomaly in the trend is the slight worsening in external quality performance between 1996 and 1997. This matches the findings from the 1998 competitiveness study although the worsening performance between 1996 and 1997 was much larger for that sample of firms. Notwithstanding this fact, customer return rates halved between 1994 and 1998, thus revealing excellent competitiveness response by sampled firms in terms of this particular market driver. Much of this would appear to be related to significantly increased customer quality requirements, especially for OEM supply. The sample of firms (n=21), as a result of these pressures, presently have 43 quality accreditations between them. Nineteen of the 21 firms are consequently either ISO9001 or ISO9002 listed, whilst ten firms are QS9000 listed and another eleven VDA6 rated.

Figure Twenty: Average customer return rates (1994 to 1998)

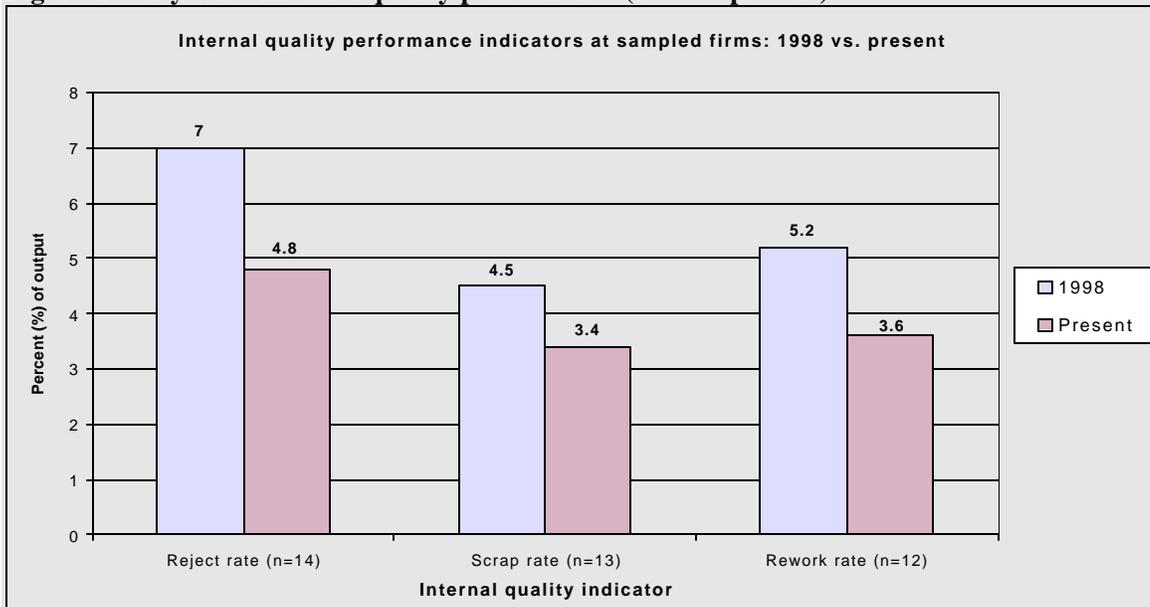
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The internal quality data requested in the 1999 competitiveness study was incompatible with the internal quality data requested in the 1998 study and as such no longitudinal database is available to assess internal quality improvements since the mid 1990s³. We were, however, able to assess the sampled firms' internal quality improvements over the duration of 1999. These relate to reject, scrap and rework rates and as highlighted in Figure Twenty-One, all three of these critical measures suggest significant improvements in a short period of time for the sampled firms. Internal reject and rework rates have, for example, decreased by an impressive 31%, with scrap rates also down by 24%.

³ The internal quality measures generated in the 1998 competitiveness study were significantly refined for the 1999 study, hence this incompatibility.

Figure Twenty One: Internal quality performance (1998 to present)



These significant improvements may be symptomatic of the quality drive most firms are presently on. For example, 16 of the 21 sampled firms were attempting to obtain additional quality accreditations at the time they were surveyed. Of these 16 firms, seven were attempting to obtain QS9000 accreditation, whilst an additional six were aiming for an ISO14001 listing. The principal drivers for these additional accreditations were:

- Customer requirements (44%)
- The need for compliance with international standards (31%)
- Entry into export markets (19%)
- Parent company requirements (6%)

Whether the implementation of improved quality systems is a sufficient explanation for the massive improvement in internal quality performance over such a short period of time is, of course, highly questionable. It will be extremely interesting to plot these trends in 2000 to see if the 1998 to present improvements are simply aberrations or rather indications of sustained competitiveness improvement.

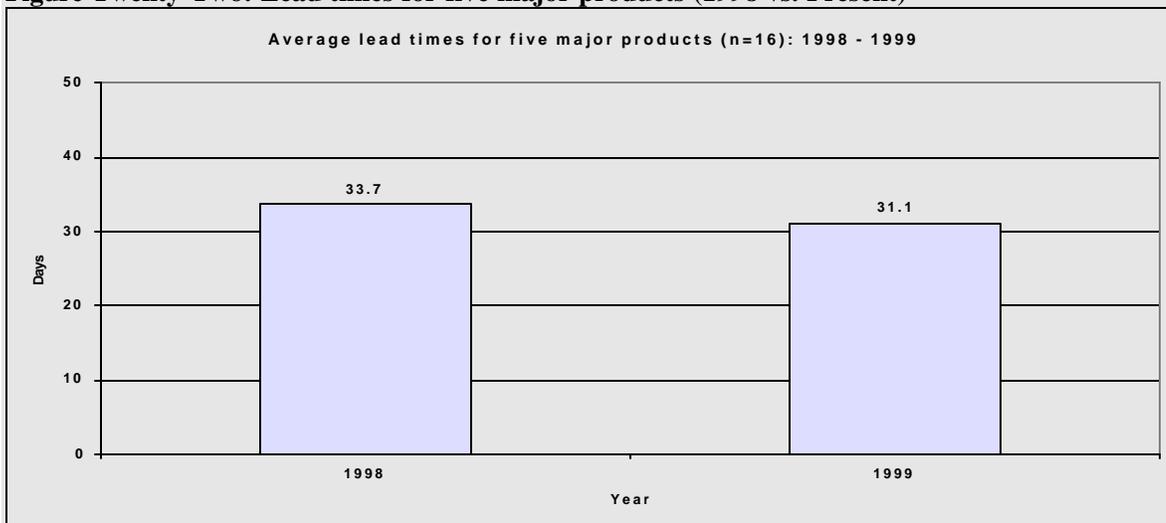
Given the fact that both external and internal quality performance is impacted on by value chain issues such as changing customer requirements and the quality of raw material inputs, we requested for the first time an indication of the sampled firms' supplier performance levels. Quite strikingly, despite having excellent quality accreditations, we found that only 12 of the 21 firms actually even measured supplier quality performance levels. Average supplier quality performance for these 12 firms was moreover a high 8,574 parts per million.

4.3. Market driver No. 3: External flexibility

Value chain flexibility is a key determinant of a firm's ability to meet its customers' flexibility requirements, hence the importance of measuring operational competitiveness in this regard. Value chain flexibility (along with internal operational flexibility) determines the ability of a firm to respond quickly and reliably to a customer's order in **real** terms. The issue of real terms is critical here as holding on to buffers of finished goods inventory can generate false flexibility. This represents flexibility at high cost, hence it being false.

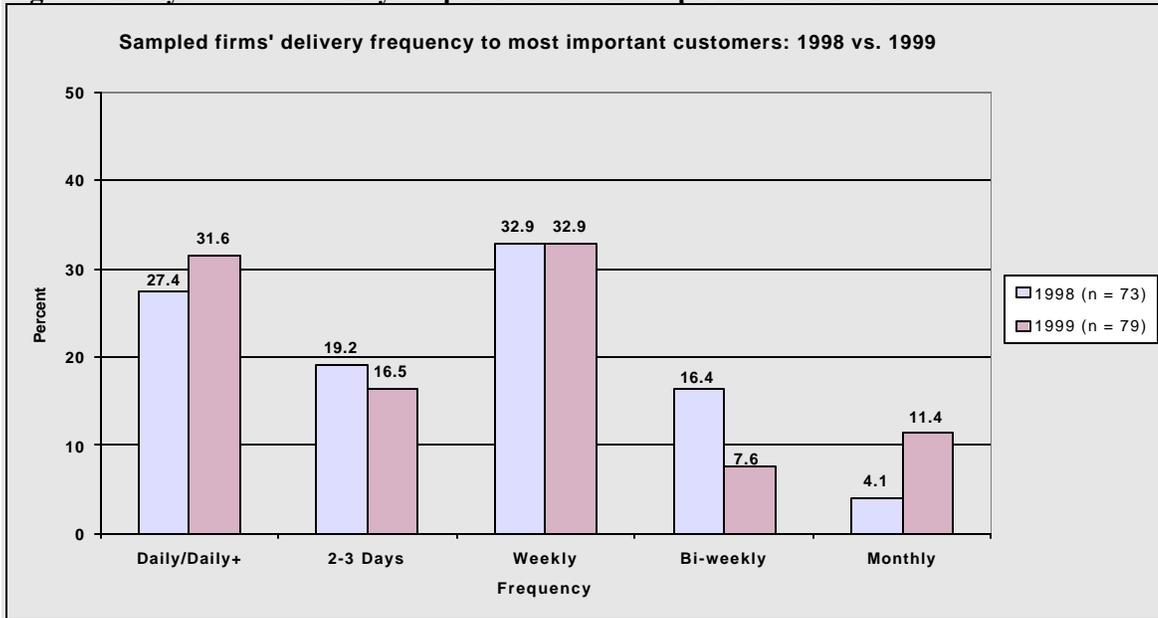
As highlighted in Figure Twenty-Two this is an area where the sampled firms have made improvements since the end of 1998. Average lead times (response times from the placing of a customer's order to the delivery of the product) for their five major products has decreased from 33.7 days in 1998 to 31.1 days at the time of their participation in the study.

Figure Twenty-Two: Lead times for five major products (1998 vs. Present)



Importantly, at the same time as lead times have come down the sampled firms' delivery frequencies to their major customers have increased. This is illustrated in Figure Twenty-Three. A greater proportion of deliveries to major customers now take place on a Just In Time (JIT) basis (i.e. on a daily or more frequently basis), although there are also interestingly more deliveries taking place on a monthly basis. This, however, simply represents the increasing importance of export deliveries that frequently occur on a monthly basis.

Figure Twenty-Three⁴: Delivery frequencies to most important customers

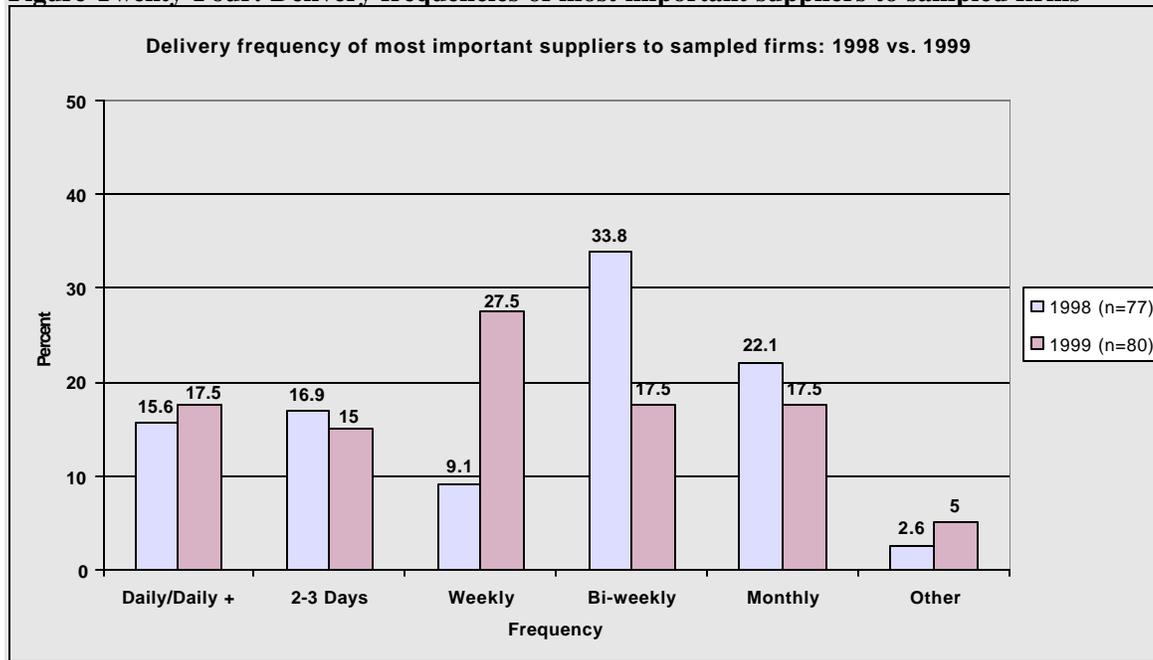


Despite the improved external flexibility performance of the sampled firms, their average delivery reliability record to customers (i.e. % on time deliveries) is not particularly good at only 90.7%. Of greater importance, though, is the central question of whether the findings presented in Figures Twenty-Two and Three represent real external flexibility improvements?

One important way of ascertaining this is to assess whether supplier delivery frequencies into the sampled firms have increased. If this is occurring then one could surmise that JIT is being forced through the value chain thus leading to the development of real value chain flexibility. As highlighted in Figure Twenty-Four this is moreover quite clearly happening, with suppliers delivering more frequently to the sampled firms in 1999 relative to 1998. Whilst daily or more frequently deliveries have only increased slightly there has been a significant shift towards receiving supplies on a weekly rather than bi-weekly or monthly basis. To illustrate this point: In 1998 only 42.6% of major supplier deliveries to the sampled firms took place on a weekly or more frequently basis, with this figure shifting to 60% in 1999.

⁴ Figures Twenty-Three and Twenty Four represent the delivery frequency figures of the sampled firms in 1999, as well as their delivery frequencies reported in the 1998 competitiveness study. The findings consequently represent the sampled firms' responses from both the 1998 and 1999 surveys.

Figure Twenty-Four: Delivery frequencies of most important suppliers to sampled firms



Despite this significant improvement in value chain flexibility since the last competitiveness study it is disconcerting to note that the delivery reliability of suppliers to the sampled firms is extremely poor at only 83.6% (n=16). Even more strikingly, moreover, five of the 21 firms do not even measure this crucial competitiveness determinant.

4.4. Market driver No. 4: Internal flexibility

The various internal flexibility measures generated suggest that the external flexibility improvements that have taken place at the sampled firms are part of a broader drive towards improved overall flexibility at their manufacturing operations. This is evident not so much from the average manufacturing batch and lot sizes at the firms, but rather from their improved throughput and machine changeover times. Importantly, moreover, and as argued below, sampled firms also have a built in degree of flexibility on the basis of their generally low levels of machine capacity utilisation.

Batch⁵ and lot⁶ sizes: Both batch and lot sizes for their five major products have, on average, decreased very marginally at the sampled firms. This insignificant improvement is highlighted in Figure Twenty-Five below. The small sample size for both measures arises from the fact that many firms were unable to provide their average batch and lot sizes because of their significant volatility. This weakness applies to the majority of the flexibility measures generated, however.

Figure Twenty-Five: Average batch and lot sizes for the five major products manufactured at sampled firms (1998 vs. present performance)

⁵ Batch size refers to the quantity of manufacture of the product before machines are changed over to manufacture another product.

⁶ Lot size refers to the quantity of product transferred from one workstation to the next during the course of production.

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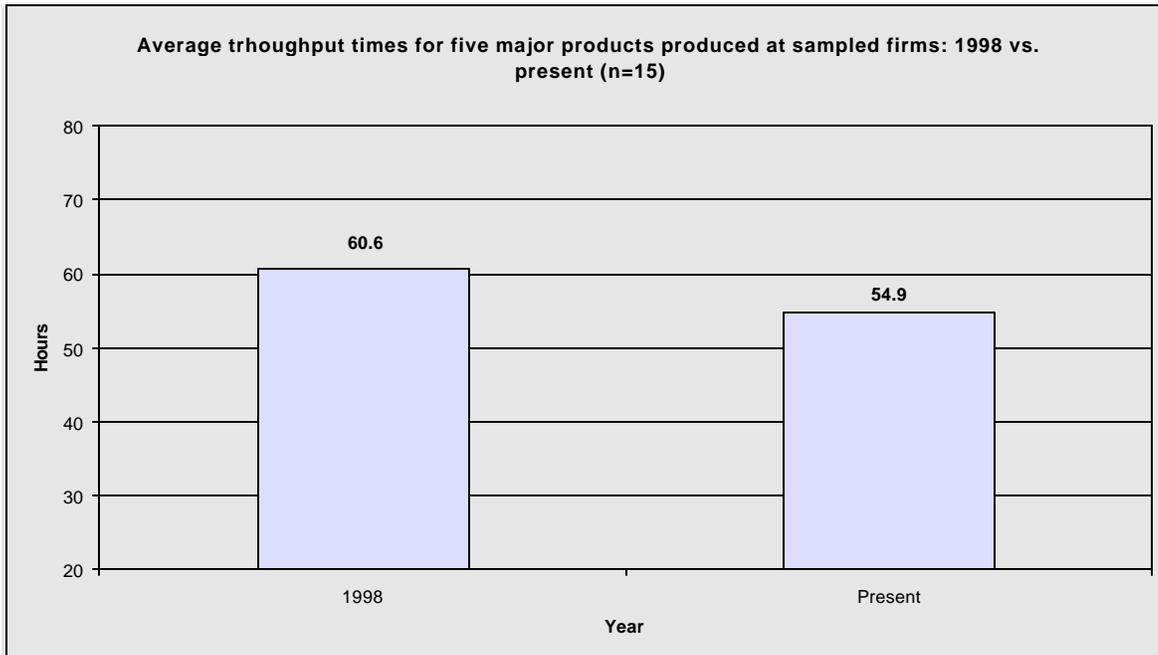


Throughput times⁷: In line with the external flexibility findings, far more significant improvement is evident in terms of the firms' average throughput times. This improvement is graphically presented in Figure Twenty-Six below.

Figure Twenty-Six: Average throughput times for the five major products manufactured at sampled firms (1998 vs. present performance)

⁷ This refers to the time taken from the beginning to the end of production in a manufacturing plant. It is therefore a very useful indication of the velocity of manufacturing throughput at firms.

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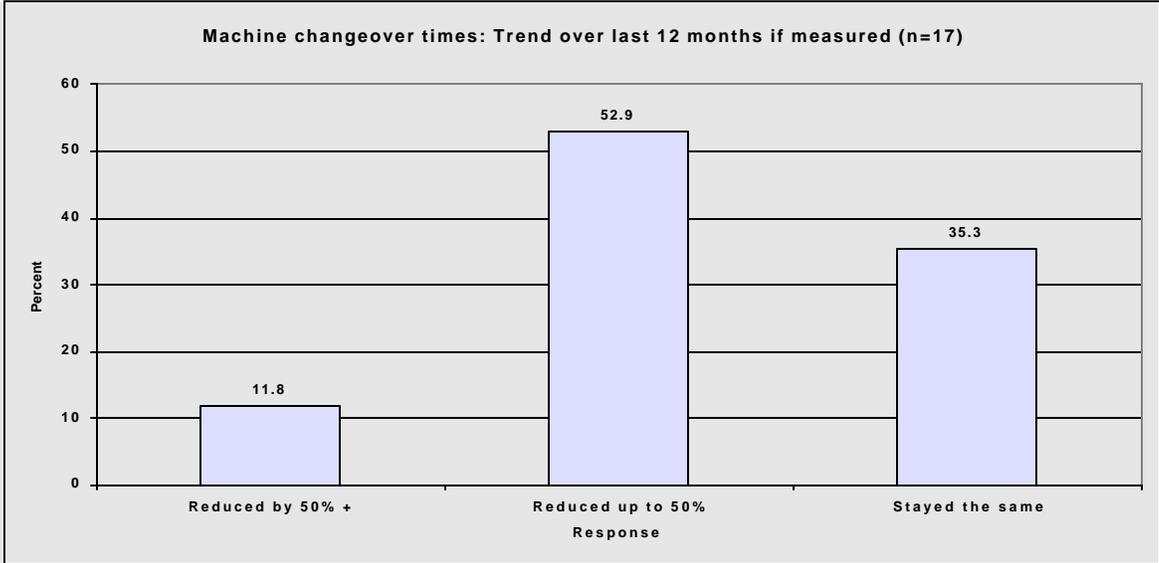


Machine changeover times: In order to make possible the manufacture of smaller batches of product, and to facilitate more rapid manufacturing throughput, it is essential for firms to focus on improving their machine changeover times through the application of single minute exchange of die (SMED) principles etc. If this is not done the ability of firms to improve their internal flexibility will be greatly restricted.

To generate an understanding of whether firms were focusing their attention on this critical facet of their operations we asked firms to indicate whether they measured the time of their machine changeovers or not. If they did measure then we asked them to indicate whether their times had improved or deteriorated over the course of the last 12 months. Of the total sample of 21 firms, 17 (81%) indicated that they did measure their machine changeover times, and as highlighted in Figure Twenty-Seven below, most of these firms were experiencing some level of machine changeover time improvement. Two of the 17 firms have in fact improved their changeover times by over 50% over the course of the last 12 months.

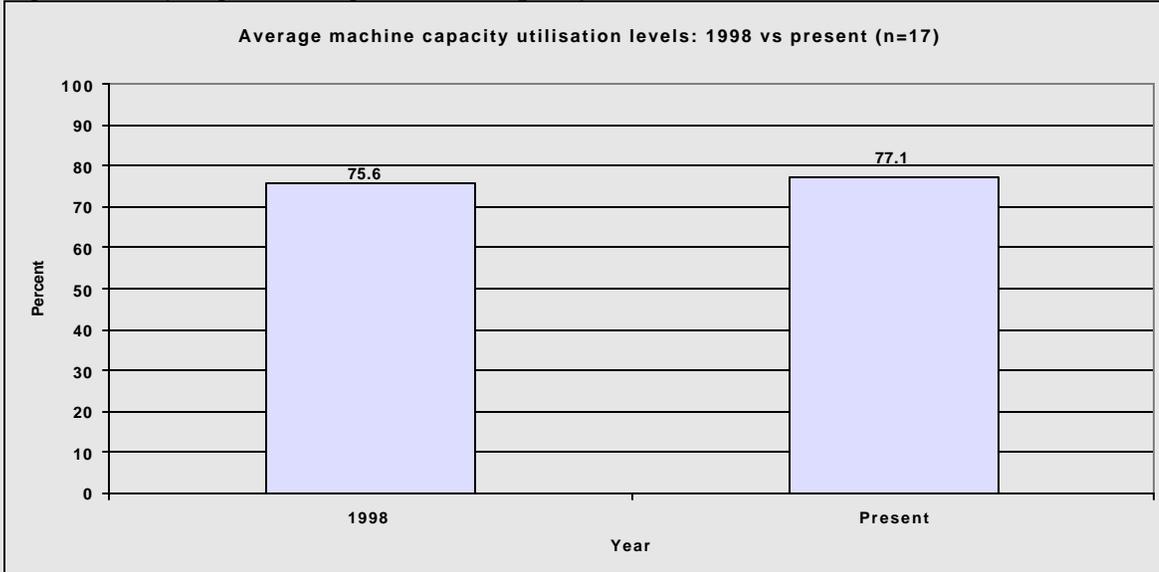
Figure Twenty-Seven: Machine changeover time changes over the last 12 months for those firms that measure this key variable

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Machine utilisation levels: Internal flexibility can simply be a condition of poor market conditions, as low market demand equates to low machine capacity utilisation and therefore increased flexibility to switch this excess capacity on whenever the need arises. As revealed in Figure Twenty-Eight, whilst sub-optimal capacity utilisation levels are evident, this does not appear to be the driver for increased flexibility at the sampled firms. The slight improvement in machine capacity utilisation between 1998 and present actually mitigates against the improved internal flexibility evident between 1998 and present; although the spare capacity that exists does provide the sampled firms with a certain level of flexibility.

Figure Twenty-Eight: Average machine capacity utilisation levels



Summary: The internal flexibility indicators explored above suggest significantly enhanced flexibility amongst the sampled firms, with these findings supporting the external flexibility measures also generated. Overall, then, both value

chain and operational flexibility would appear to have improved within the automotive component manufactures surveyed. Importantly, however, the measures generated were only for 1998 and present, and as such it is difficult to draw too many firm conclusions from such a short longitudinal data set.

4.5. Market driver No. 5: Capacity to change (HRD)

One of the major and most disconcerting findings of the 1998 competitiveness study was the poor levels of - and commitment to - human resource development at sampled firms. This was highlighted as one of the firms' key weaknesses, and one that would limit their ability to meet international performance requirements in the long term. Critically, do the findings from this sample of firms suggest the same? Or have significant improvements taken place in this regard, with human resource development now being given the attention required?

In order to explore these issues this sub-section is divided into two interrelated parts. The first part deals with the actual levels of employee development taking place at sampled firms, i.e. training expenditure and types of training, numeracy and literacy levels, etc. The second part explores the commitment of human resources to the companies surveyed. The key measures here are absenteeism rates, participation in suggestion schemes and labour, management and staff turnover levels. As was strongly argued in the 1998 competitiveness report automotive component manufacturers in South Africa will only survive if they have skilled workforces (labour and management) that are committed to the long-term success of the company. If these two mutually reinforcing building blocks are not in place then the ability to change at any individual firm will be greatly impaired.

4.5.1. Employee development

Despite low estimated levels of numeracy and literacy of workforces at the sampled firms (see Figure Twenty-Nine), as was the case in the 1998 competitiveness study, expenditure levels on training are abysmal relative to the firms' long terms development requirements. As a matter of fact the sampled firms spent more on training as a proportion of their remuneration bills and turnover levels in 1997 than they did in 1998 (see Figure Thirty). This is extremely disconcerting, highlighting as it does the continued lack of recognition amongst automotive component firms of the need for sustained human resource development at their operations.

Figure Twenty-Nine: Estimated numeracy and literacy levels

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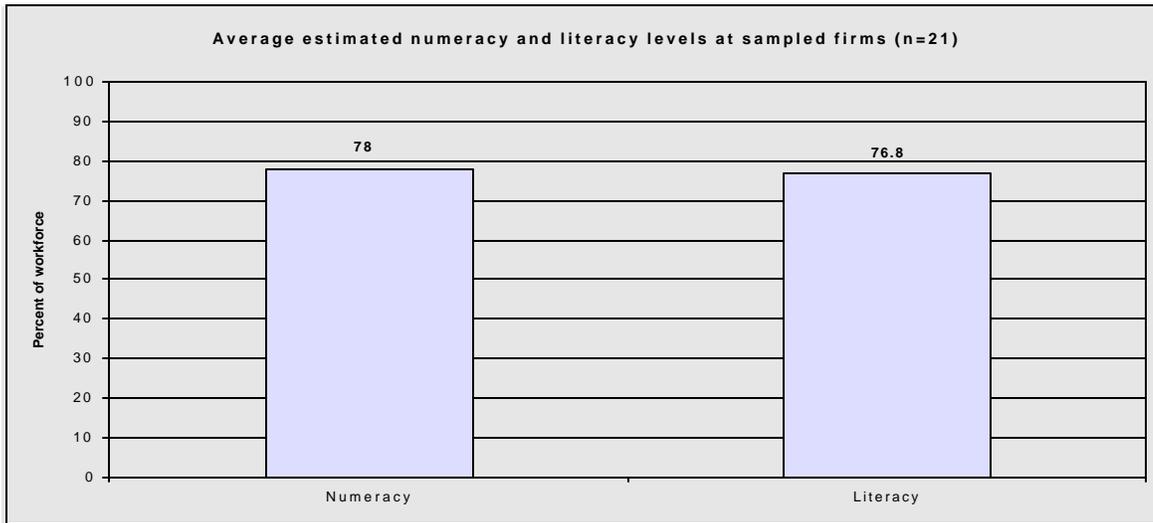
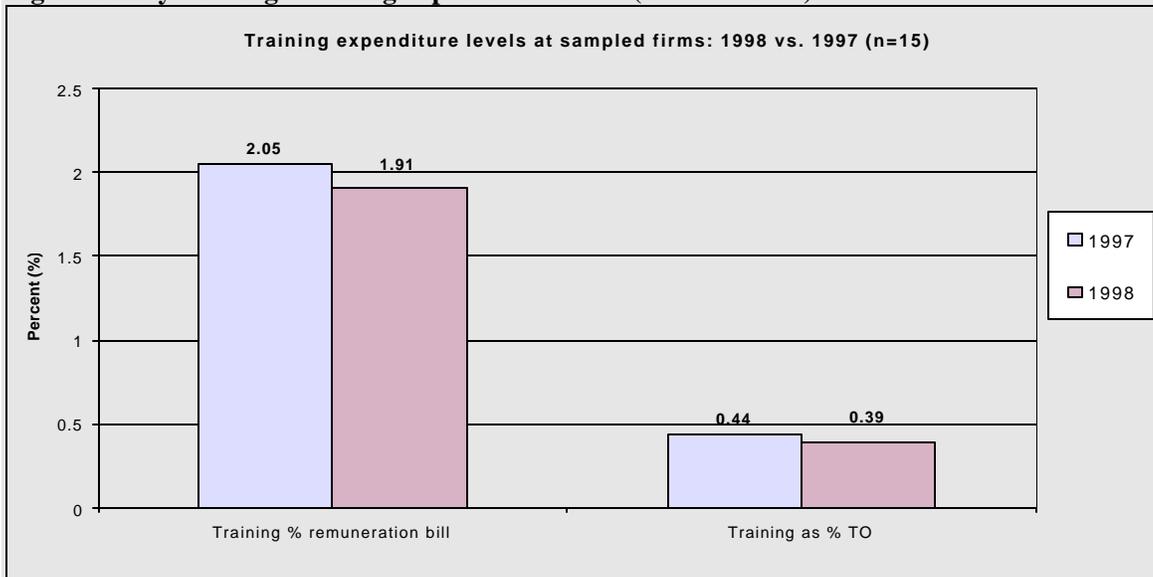


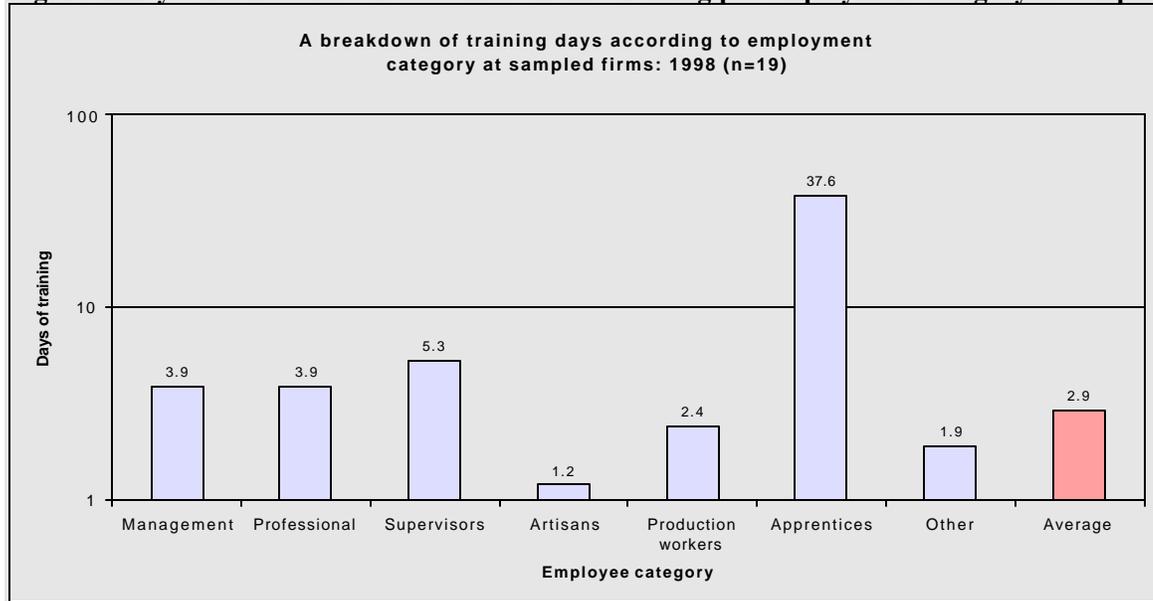
Figure Thirty: Average training expenditure levels (1997 vs. 1998)



The findings presented in Figure Thirty suggest that firms still view human resources as a cost to be minimised rather than as a resource to be used effectively in the drive towards international competitiveness. This view is further supported by a breakdown of formalised off-line training according to employment categories.

As is strikingly apparent in Figure Thirty-One, the majority of training days at the sampled firms are being directed towards middle to senior management. Production workers received an average of only 2.4 days formal off-line training in 1998, which is well below necessary training levels, especially given the poor history of training at the sampled firms and their recognition of human resource weaknesses in their operations.

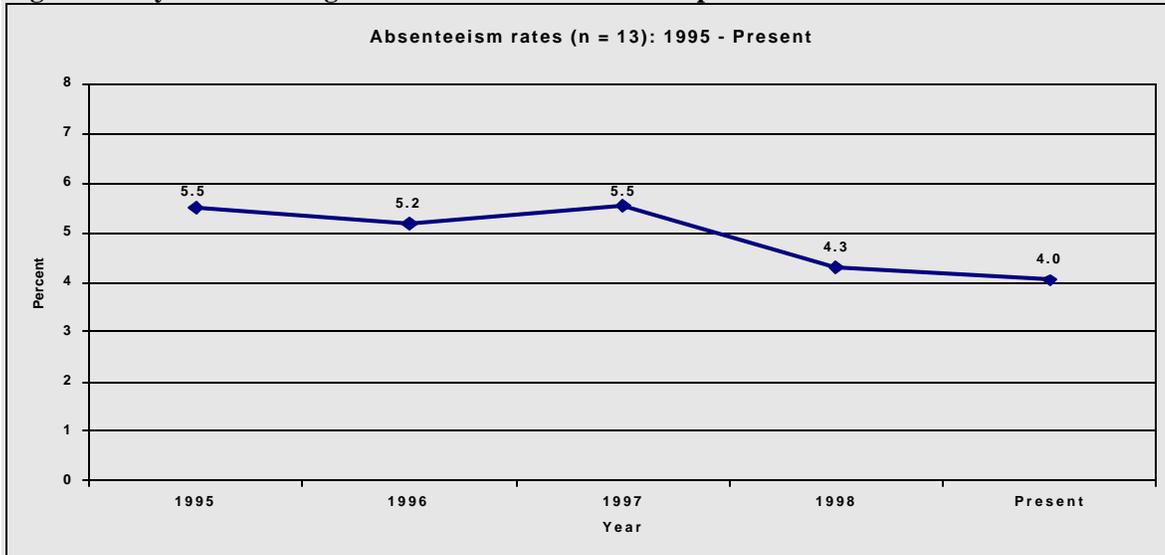
Figure Thirty-One: Breakdown of formal off-line training per employment category at sampled firms (n=19)



4.5.2. Employee commitment levels

The employee commitment measures generated are slightly more heartening than the training measures highlighted above, although they are still far off optimal levels. For example, whilst average absenteeism levels at the sampled firms have improved substantially since 1997, with the average level of absenteeism now sitting at 4% in comparison to the 5.5% of 1997, there are firms with absenteeism rates of under 2.5%. This suggests the improvement possibilities for the rest of the industry. The absenteeism progress made at the sampled firms is illustrated in Figure Thirty-Two, and as is clear sustained improvement has taken place over the last two years.

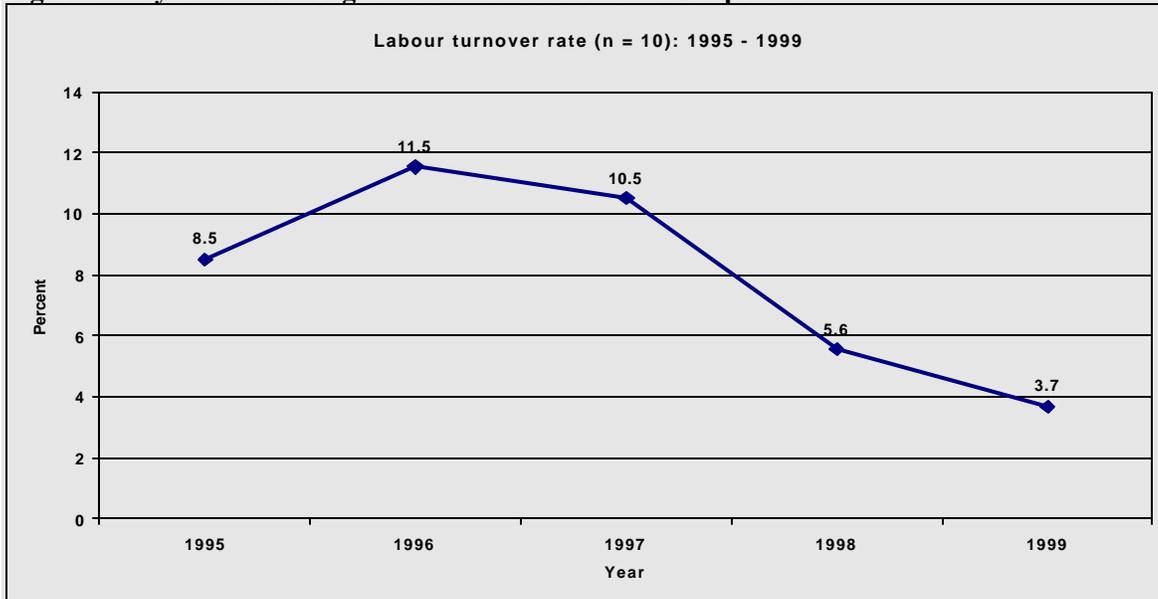
Figure Thirty-Two: Average absenteeism levels: 1995 to present



Labour turnover rates have also dropped at the sampled firms over the same period, with 1998 rates halving from 1997. This progress has, moreover, been sustained through 1999. Given the significant job losses occurring at the sampled firms this is perhaps unsurprising, but it is nevertheless a positive development as stable labour and management teams at companies facilitates trust relations. Whilst labour turnover rates have decreased to an average of only 3.7% (see Figure Thirty-Three), the same cannot, however, be said for management and staff turnover at firms. These are two important new measures included in the 1999 competitiveness study on the basis of firm level input that suggested management and staff turnover rates were important competitiveness performance indicators.

The average management turnover rate at sampled firms in 1998 was 10.2% (n=14), with staff turnover rates even higher at 10.5% (n=14). These are exceptionally high, with qualitative evidence suggesting that these levels are due to emigration, and affirmative action job-hopping at the management and skilled employee levels (especially in engineering). This high turnover mitigates against the building of trust relations between management and labour, as well as the generation of management commitment to the companies themselves.

Figure Thirty-Three: Average labour turnover rates: 1995-present



Notwithstanding these improvements in commitment indicators, worker involvement in company improvement processes appears to be rather muted. For example, only 45% of sampled firms (n=21) had suggestion scheme programmes in place for their workers. Even more strikingly, only four firms measured worker responses to their programmes, with these four firms receiving two, 100, 180 and one response respectively in 1998. In effect, then, only two of the 21 sampled firms actually appear to have active suggestion scheme programmes in place.

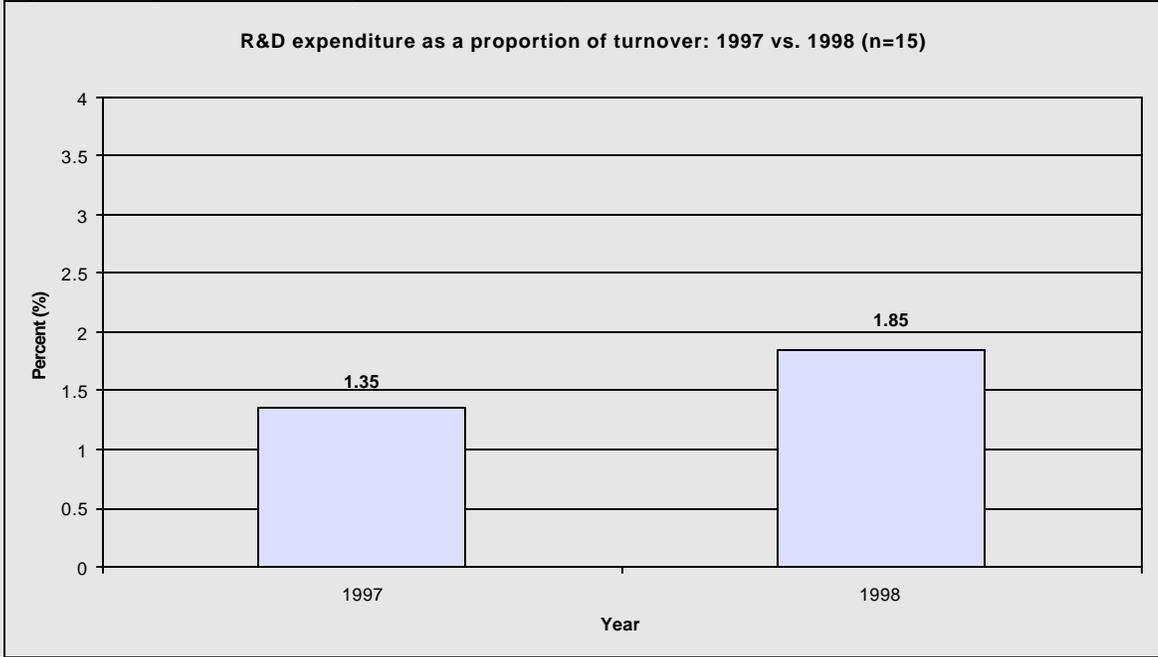
In summary, then, it would appear that despite some improvement in worker commitment measures, human resource development has remained stunted at sampled firms. Training levels are inadequate, with even the limited training that is taking place being directed towards middle and senior management rather than production workers. The sampled firms' capacity to sustain change is therefore questionable.

4.6. Market driver No. 6: Innovation capacity

In the 1998 competitiveness report it was highlighted that R&D expenditure at firms was minimal and that this trend was likely to continue with a further erosion in R&D expected as a result of global sourcing arrangements and the tiering of the automotive components industry internationally. It was argued that firms would be forced to rely on their manufacturing competencies for survival and not their innovation capacity in terms of new product development. The findings from the 1998 study do not, however, support these assertions. As highlighted in Figure Thirty-Four R&D expenditure as a proportion of turnover at companies actually increased between 1997 and 1998.

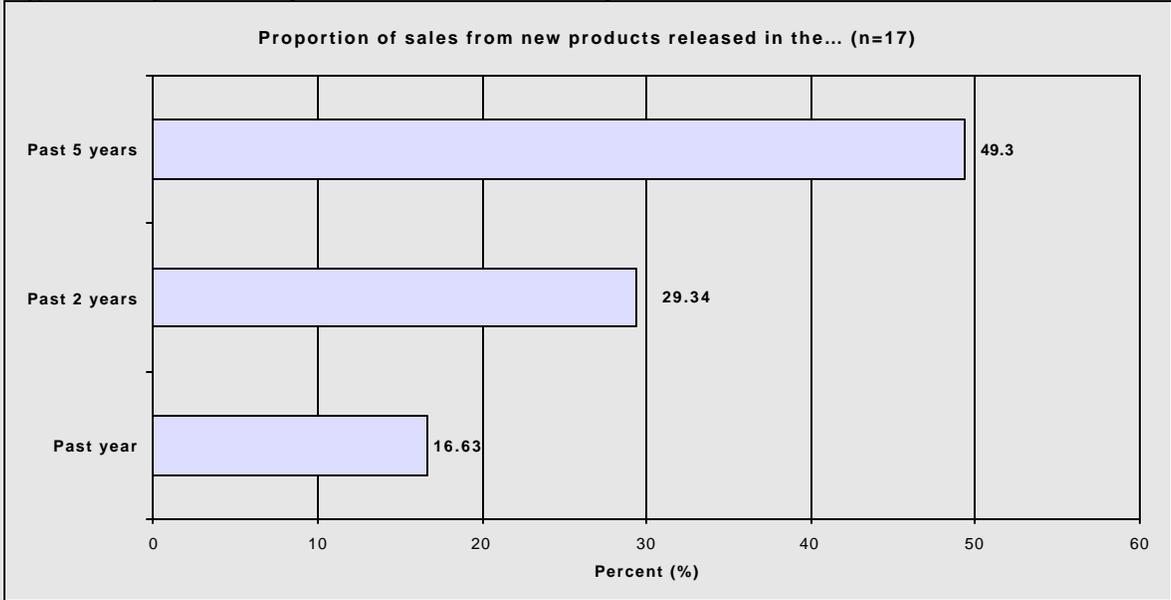
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Figure Thirty-Four: R&D expenditure levels (1997 vs. 1998)



Importantly, moreover, the sampled automotive component firms generated a large proportion of their sales from products released over the last few years. This is highlighted in Figure Thirty Five, with just under half of all sales generated from products released over the last five years and 17% from sales of products released over the last year.

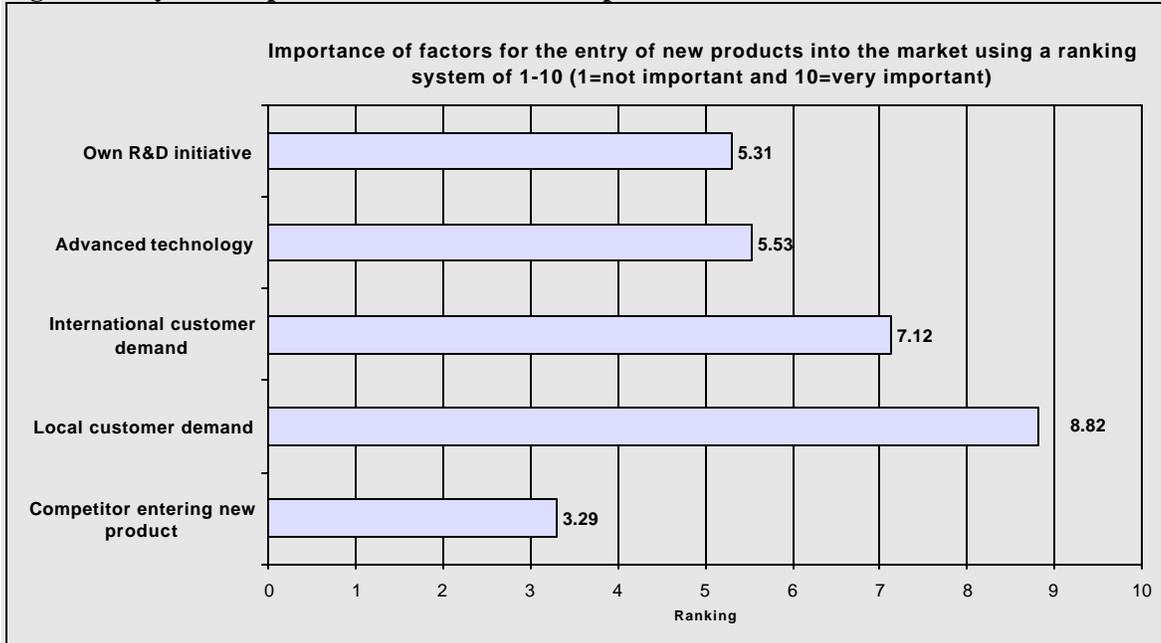
Figure Thirty-Five: Proportion of sales from new products



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The principal driver for the release of these new products was local customer demand. Using a ranking system of between one (not important) and ten (critically important) we asked firms to rank the factors leading to their introduction of new products. The findings from this ranking process are presented in Figure Thirty-Six and as is obvious local customer demand is the most important factor by a considerable margin, with international customer demand running a distant second in order of importance.

Figure Thirty-Six: Importance of factors for new product introduction



Despite strong international evidence suggesting the sustained erosion of demand for R&D at automotive component manufacturers in developing economies, the evidence presented above suggests that there is still presently scope for indigenous R&D capacity. A deeper exploration of this critical competitiveness issue is clearly required.

CONCLUSION

The findings presented in this competitiveness report illustrate the on-going developments and dynamics playing themselves out at a sample of South African automotive component manufacturers. It is therefore important that the study from which this report emerges be viewed as an extension of the 1998 competitiveness study.

As highlighted in the methodology and profile sections of this report, despite the small size of the sample population the firms have similar profile characteristics to the larger sample of firms included in the 1998 competitiveness study. Whilst the small sample size is a restricting factor there is no reason to believe that the firms that participated in the study are unrepresentative of the broader automotive components industry, except insofar as they are geographically distributed, with the Gauteng clearly under-represented in the sample. The economic and competitiveness findings presented in Sections Three and Four of the report are consequently critically important, highlighting as they do the performance trajectory of a small but largely representative sample of domestic automotive component manufacturers. Importantly, moreover, these findings are not only interesting from an academic perspective. They are also critical as mechanisms for better informing policy decisions within the Department of Trade and Industry.

Whilst, the economic performance findings reflect the difficulties experienced by automotive component manufacturers through the latter part of the 1990s, the competitiveness findings suggest that automotive component manufacturing firms are responding positively to the massive competitiveness challenges posed by the industry's reintegration into the global trade regime through the DTI's MIDP. Using the IRP's market driver approach to assess competitiveness improvements at the sample of firms it was found that positive responses had been generated for most of the market drivers. Weak competitiveness response was only noted in terms of the firms' capacity to change and cost control measurements. A summary of the firms' competitiveness responses to each of the market drivers is presented below.

Strong Competitiveness Response	Weak competitiveness response
<ul style="list-style-type: none"> • Internal and external quality performance • Value chain flexibility • Internal flexibility • Innovation 	<ul style="list-style-type: none"> • Cost control • Capacity to change (human resource development)

Critically, however, are the performance improvements outlined in the report strong enough to ensure the success of the firms in the face of extremely competitive international competitors? For example, whilst most of the competitiveness performance trajectories of the firms' are either mildly to strongly positive, economic performance indicators over the last few years suggest on-going economic difficulties for most of the automotive component manufacturers.

This raises a key policy concern. Are competitiveness responses occurring at a sufficiently rapid pace to keep up with increased international competition or are the performance gaps that exist between the domestic firms and their international counterparts still excessively large despite on-going improvement?⁸ The critical policy consideration that

⁸ See Barnes (1999b) What Chances Operational Competitiveness in the South African Automotive Components Industry? Evidence from an International Benchmark Undertaking, **CSDS Research Report No. 20**, for an outline of these gaps.

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arises out of this for government and the industry's other stakeholders is how to further consolidate the strong competitiveness responses of the firms, whilst at the same time supporting them in their endeavours to overcome the difficulties associated with their weak competitiveness responses. For example, human resource development issues were once again highlighted as the critical weakness of the firms surveyed. Unless resources are directed towards this key facet of firm level competitiveness response the industry will struggle to reach international standards of competitiveness. Whilst the findings presented in this report are indeed encouraging there is still a long competitiveness road to be travelled by the automotive components firms that participated in the study.

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