

5. Conclusion

This chapter concludes the findings, gives suggestions for future research, provides implications for managers and ends by presenting the limitations of the study.

5.1 Summary and Conclusion

This main purpose of this research was to prove enhanced firm performance with the implementation of lean manufacturing. The study was carried out in Swedish manufacturing firms. The research has provided empirical evidence of the lean implementation at a number of manufacturing companies, spread over several different industries. The result shows that the average implementation so far is on a moderate level. The weakest parts are inventory managed by suppliers, SPC and other statistical techniques, Kanban, close supplier localisation and contractually agreement on cost reductions with suppliers.

As established in earlier studies (see for example Cua et al., 2001 and 2006; Olsen, 2004; Shah and Ward, 2003 and 2007), lean should be used as a total concept and not based on its different parts. This indicates that the different parts complement each other and creates synergistic effects. In this study lean manufacturing was measured as a total concept in one independent variable.

The result from the study shows that there is a positive relationship between the independent variable lean manufacturing and firm performance. There is also a positive relationship between lean manufacturing and financial performance as well as non-financial performance respectively.

5.2 Suggestions for Future Research

It was found in this study that the implementation of lean manufacturing in Swedish manufacturing industry is moderate. It would be really interesting to understand the reasons for this, since lean is a concept that have existed for some time and Sweden manufacturers high technology products in an expensive environment. A bigger sample size could make it possible to investigate whether there are differences between different industries that lower the average implementation level.

This was a cross-sectional study. A longitudinal study could reveal differences before and after implementing lean manufacturing practices. A problem with this will however be that it takes time to implement the practices and even if trying to do it in parallel it will be a trial and error period with continuous improvement.

This study has not considered lean manufacturing outside the manufacturing industry. As service providers are increasing the use of lean manufacturing practices, similar research could be done in the service industry. A sector

such as health care is still in an early stage of lean evolution and little research has been done (Hines et al., 2004). The instrument to assess the implementation of lean manufacturing used in this study was however developed for manufacturing firms, and the research design has to be modified to suit the environment in the service industry.

With an increasing globalisation, global sourcing is used to a greater extent and material is often purchased from low cost countries. This will affect the quality, transportation time, usage of hubs, information sharing etc., of which many items will influence lead times, lot sizes and just in time deliveries, which in turn will affect lean manufacturing and firm performance. Global sourcing is a factor which has not been included in this study and could be examined separately in relation to lean manufacturing and financial performance.

5.3 Implications

The result of this study is in line with several other studies that suggest that lean manufacturing should be used as a philosophy and a holistic concept. When implemented as a total concept, lean manufacturing will lead to improved performance. Cua et al. (2006) inquire future research to confirm the integration of the practices of JIT, TQM and TPM, which have been done in this study. Shah and Ward (2007) end their conclusion by saying that the

empirical research of lean manufacturing is still in its infancy and this study has added empirical evidence to current knowledge.

The implications for managers are to not focus on some of the tools, but to implement lean principles in the total value chain and in the organisational culture. To increase the lean implementation practices in the studied companies focus should be placed on pull production systems as well as development of suppliers and controlled processes. These are all connected and cannot exist independently. A pull production system demand JIT deliveries and cannot exist without a good relationship, education and development of suppliers. For the pull production system to be successful the processes must run smoothly and ensure a high and consistent quality. When the companies increase the implementation within these areas, they will experience improved firm performance.

5.4 Limitations of the Study

There are several limitations of this study. As the sample size is very small it is not possible to make generalisation about Swedish manufacturing firms in general. The study is cross-sectional which means that the data is collected at a certain point of time. This is especially important when it comes to self-evaluation of firm performance. An attempt was made to reduce this impact by asking the respondents how the performance had changed during the last three years. Another issue when discussing such a broad concept as lean

manufacturing is of course time of implementation. The problem here is that the implementation of different practices probably takes several years and some are implemented in parallel, while other are implemented after each other. Self-evaluation does always create a risk of bias. Some people tend to put high overall scores and some low. When the sample size is small the risk of this bias is higher. The last issue is that all intended industries was not represented in the study. Due to small sample size it was not possible to control for industry differences.