

CHAPTER 6

DISCUSSION

This chapter explains, in detail, the findings of the researcher in comparison with the findings of previous researchers in the same field as well as with the answers provided by the experts and other entrepreneurs in the knitwear industry. The objective is to refine the understanding on the concepts articulated thereby furthering the scope of the study for further research and policy making initiatives. The concepts identified and hypothesized in this research are mentioned, one by one, and their relationships and influence on each other are discussed.

6.1 IMPACT OF OBJECTIVES OF INNOVATION ON INNOVATION ADOPTION

Conceptualising innovation adoption involves the definition, identification and analysis of three components: objectives of the adoption, obstacles to adoption and facilitators of adoption (Corrocher and Fontana 2008). This research proposed, initially, to examine the causal relationship between the objectives of innovation and the extent of innovation adoptions made by the firms. The items measuring innovation objectives were adapted from UK Community Innovation survey. The items measured the product, process, market and environment related innovation objectives that firms decided before adopting innovations in their respective concerns. It was hypothesized that innovation objectives will have a significant positive influence on innovation adoption. Based on the regression analysis, the researcher has found a significant positive influence of innovation objectives on innovations adopted by the firms, meaning that higher the innovation objectives higher will be the propensity of the firms to adopt innovations

The results of the study as well as adequate discussions with the experts and entrepreneurs in the cluster helped to understand that entering new markets, improving the quality of products manufactured and enhancing market share are the most important objectives before adopting appropriate innovations. This shows the

strong customer focus of the firms in the cluster. Though the Government has brought out several regulations especially for environment protection, those regulations stands as the least favoured objective for innovation adoption. The results of UK Community Innovation Survey (2012) reported similar observations. The results indicated that ‘product-related’ factors were the most frequently favoured objectives, with quality enhancements, being the most motivating factor followed by increased market share and increasing range of goods and services. The results reinforced the strong customer focused approach to innovation among the UK industries. Reducing environment impacts was the least highly rated factor overall, but a driver for over a fifth of large firms.

According to George B Weathersby, Chairman and CEO of Genesys Solutions LLC (2009), the focus of innovation should be broad: ranging from new consumer products to new business processes, from imagination to implementation, from new messages to new methods. To be successful, innovation has to become a central focus and priority of the whole organization. Corrocher and Fontana (2008), in their study on the objectives, barriers and drivers of ICT adoption among 128 SMEs in Italy found that planning for growth, providing more bandwidth to the desktop and to the backbone, and planning a migration to a new technology were perceived by IT managers as the most important objectives leading to ICT adoptions. With respect to innovation objectives, they concluded that IT managers seem to adopt ICT innovations with the objectives of increasing operational efficiency, implementing a technology-based growth and managing risk. A significant positive relationship was established in their study between innovation objectives and innovation adoption.

Leiponen and Helfat (2005) conducted a firm level statistical analysis on the impact on innovation of breadth in both innovation objectives and knowledge sources on a broad sample of firms in the Finnish economy. The results proved that broader horizons with respect to innovation objectives as well as knowledge sources had significant positive association with successful innovation adoption. However individual innovation objectives, both general and specific, were not consistently significant predictors of innovation success. The survey was conducted during a

three year period of 1994-1996 on a sample of 1030 manufacturing firms. According to Loof et al (2001), technological opportunities, factor intensity and sector characteristics influence the innovation decision. In a sector with high technological potentials, firms are more inclined to innovate. If they do not innovate, they may lose their market position.

6.2 IMPACT OF FACILITATORS OF INNOVATION ON INNOVATION ADOPTION

This research proposed to examine the causal relationship between the internal and external facilitators of innovation and the extent of innovation adoptions made by the firms. The items measuring the facilitators were decided on the basis of exhaustive literature review as well as discussions with the experts in the industry. It was hypothesized that facilitators will have a significant positive influence on innovation adoption, meaning that higher the presence of facilitators, higher will be the propensity of the firms to adopt innovations. Based on the regression analysis, the researcher has found a significant positive influence of innovation facilitators on innovations adopted by the firms. The regression paths of each facilitator towards innovation adoption were tested and all the paths were found to be significant.

6.2.1 Impact of External Facilitators of Innovation

The environment in which a firm operates significantly influences both the opportunity for innovation, in technological and market sense, and the strategy and process of innovation (Tidd 2000). The present study found a significant positive influence of competition and turbulence on innovation adoption. The impact is more on technological innovation adoption followed by administrative innovations. Kretschmer et al (2011) also observed similar results in their study on the French car dealer industry with respect to the adoption of two different innovative software technologies. They found that an increase in competitive pressure led to an expansion in the scale of dealerships and increased the returns to adopting HR software (independently of the size of the dealership). The direct effect of increasing competitive pressure was the likelihood of adopting HR software.

Competitive pressures may provoke adoption of innovation. A dynamic environment requires organizations to innovate in order to adapt to the changing environment. Competition encourages organizations to engage in environmental scanning leading to innovation adoption that provides organizations with a means of survival. According to Robertson and Gatignon (1986), in highly competitive markets, innovation adoption is essential to uphold one's market position. Empirical evidence for the same can be found in the industrial organization literature as well as the marketing literature. In the industrial organization literature, supporting evidences can be found regarding the positive influence of both high industry concentration and low industry concentration on the adoption and diffusion of innovations (Kamien and Schwartz 1982).

In the marketing literature, Gatignon and Robertson (1989) reported support for their hypothesis that higher levels of competition inspired innovation adoption. According to them, firms most receptive to innovation were in concentrated industries and collaboration with suppliers and buyers were important in achieving innovation adoption. A positive linkage between market turbulence and innovation adoption had been established by Zhu Wang (2007) in his empirical research on retail and banking industries. Calantone et al (2003) reported that the paths from innovativeness to strategic planning and from risk taking to new product development speed were significantly greater in highly turbulent environments.

Vincent et al (2004) also reported similar findings in their study on mediating role of innovation towards business performance. Environmental turbulence was found to have a strong positive correlation with innovation in manufacturing industries. The results from model testing found that competition positively influenced product innovation but had a negative direct impact on financial performance. This shows that that it may be possible for firms to try and overcome the negative impact of competition on performance through innovation. Similarly, they found a positive relationship between environmental turbulence and innovation. Innovation provides organizations with a mechanism for dealing with the uncertainty present within the environment. In times of high turbulence, the uncertainty present in the environment may drive innovation because organizations

are constantly scanning their environment for new opportunities. While environmental turbulence was found to be a driver of innovation, it was not significantly related to financial performance. Prospect Theory (Kahneman and Tversky 1979) also argued that in times of great uncertainty, organizations are more likely to be risk seeking and therefore more likely to innovate.

The present study revealed that among the various sources that supply information regarding innovation, market sources such as suppliers, customers and competitors provide more information followed closely by internal sources and other sources such as conferences, trade fairs, journals, associations etc. Baldwin (1994) opined that SMEs usually make less frequent usage of outside sources of knowledge reflecting their limited capacity to absorb outside knowledge. Major sources of innovations for the SMEs are found to be customers, suppliers and internal management. These observations are similar to the findings of the present study. Personal contacts with and geographical proximity to the suppliers and customers improve the effectiveness of innovation among the small firms. This can be especially true in the case of industrial districts and clusters that promote regional concentration of innovating SMEs (Tidd 2000). In general, there is a positive association between the extent of external scientific, technical and professional inputs and the performance of SMEs. However, maintenance of such relationship involves costs, and their management can be difficult for the SMEs.

6.2.2 Impact of Internal Facilitators on Innovation

The researcher has found a significant positive influence of internal facilitators on the innovativeness of the firm. The internal facilitators in the present study include leadership (mostly in the form of transformational leadership), supportive climate for innovation, organizational structure (more organic in nature), market orientation and focus on R&D. A review of available literature has shown supporting evidences with respect to these relationships established by the researcher. Internal factors such as climate, strategy and organizational structure are empirically found to be important for the innovation performance of the firms (Cooper, Edgett and Kleinschmidt 2004). Building creative climate in the organization involves, among other things, systematic development of

organizational structures, communication policies and procedures, reward and recognition systems, training policies and other systems in place. In organizations with supportive climate for innovation, employees with good and bright ideas can strengthen them with the support from the system. The often quoted example of company with strong climate for innovation is 3M. At 3M, the organization culture allows employees to work on their innovative ideas and allows them up to 15% of their time for such activity (Pinchot 1999).

According to Solomon et al (1998), supportive climate for innovation can predict innovativeness of the SMEs in a positive manner. Innovation friendly strategy, organizational structure, leadership and climate are among the effective factors that affect organizational innovation (Khandwalla and Mehta 2004). Damirch et al (2011) also found a positive relationship between supportive climate for innovation and leadership towards innovative behaviour of SMEs in Iran. Scott and Bruce (1994) established in their study that an organizational climate which supported innovation strongly increased the level of innovative behaviours among the engineers and the scientists of the R&D department of a big American company.

Leadership, more of transformational in nature, provides the situation for increasing the level of innovation of the workers by designing realistic and challenging goals, and entrusting them to their followers to achieve these goals (Shamir, House and Arthur 1993). Pullen (2010) in his study on Spanish medical device sector found that formalized new product development (NPD) process and an innovative climate were negatively correlated. However, innovative climate combined with an informal NPD process related positively to NPD performance.

One of the most researched themes in studies on innovation success and failure is the need to understand the customer needs. By developing a wide spread awareness about internal as well as external customers, innovation and quality can be improved. However, not all industries have the same degree of customer involvement (Tidd 2000). Keskin (2006) in his study on 157 SMEs in Turkey found positive relationship between firms' market orientation and innovativeness. Market orientation and entrepreneurial drive provides the foundation for

organizational learning and such learning is associated with the development of new knowledge crucial for firm innovativeness and performance (Liu, Luo and Shi 2002). Erdil et al (2004) in their study at Marmara region also found significant positive correlation between market orientation and firm innovativeness leading to innovation performance.

Grinstein (2008) in his meta-analytic study on the effect of market orientation and its consequences on innovation found that market orientation positively influenced innovation consequences, but competitor orientation's effect was dependent on a minimum level of customer orientation. He also argued that the relationship between market orientation and innovation consequences was stronger in highly competitive environments but weaker in technology turbulent contexts. Also, the influence was stronger in large firms, service companies, and in countries characterized by high individualism and high power distance national cultures.

Studies in the past have shown that the relationships between structure and context are stronger for higher performing organizations than for lower performing organizations (Pullen 2010). In large firms, deliberate organizational design and formal procedures are necessary for integrating knowledge and managing the enterprise effectively. In small firms, characteristics of the senior managers or the entrepreneurs, their networking, knowledge, training, experience etc., play a vital role in adoption of innovative business practices (Tidd 2000). The decision to adopt or not to adopt innovation is purely based on entrepreneurial judgement and the organizational structure or system may not be an influencing factor. Zaltman, Duncan and Holbek (1973) however, proposed that more formalized and centralized organizations (often the larger firms) are less likely to initiate innovation adoption decisions, but are better equipped to actually implement innovations.

The present study found that though focus on R&D was minimal among the cluster firms, internal R&D was better adopted by them in comparison with external sourcing of R&D. Small firms rely more heavily on in house or informal R&D rather than formal R&D (Tidd 2000). Discussions with entrepreneurs in the cluster also revealed that informally developed innovations internal to the firms are mostly adopted by them when compared to formally developed or externally sourced ones.

However, the regression results have revealed that focus on externally sourced R&D better predicts innovation adoption rather than those internally carried out. Formal R&D by SMEs appears to be only weakly associated with profitability, and is not associated with growth (Oakey, Rothwell and Cooper 1988).

6.3 IMPACT OF BARRIERS ON INNOVATION ADOPTION

Barriers to innovation among SMEs have been the theme for investigation in a large number of national and international studies (Tiwari and Buse 2007). This research proposed to examine the causal relationship between the barriers to innovation and the extent of innovation adoptions made by the firms. It was hypothesized that barriers will have a significant negative influence on innovation adoption, meaning that higher the barriers, lower will be the propensity of the firms to adopt innovations. Based on the regression analysis, the researcher has found a significant negative influence of perceived barriers on innovations adopted by the firms thereby accepting the hypotheses set in this regard.

The results showed that among the barriers initially hypothesized, collaboration with universities, Government regulations and incentives as well as non availability of funds internally were insignificant. Lack of information on technology and lack of qualified personnel were the most significant barriers felt by the responding entrepreneurs. The respondents opined that Government policies neither motivate nor hinder their innovativeness. Focus on R&D as well as collaboration with research institutions was found to be minimal. Need for proper market research that updates the respondents about the upcoming trends and fashions in the target markets is found to be the need of the hour. Availability of skilled and knowledgeable workforce is a major barrier. Additionally, the movement of such employees from one company to another in the cluster is very often and unwarranted. This again poses a barrier to the entrepreneurs.

According to the results of the Community Innovation Survey (Robson and Achur 2012), costs were most commonly perceived as the significant barrier to innovation, including the direct resource cost of innovation activities, its perceived economic risk and the costs of acquiring finance. The impact of UK and EU

regulations were also thought to be a barrier to innovation, specifically for smaller enterprises. Fewer enterprises had such constraints as lack of knowledge. The lack of qualified personnel was viewed as one of the most important constraining factors by smaller businesses. The results also highlighted that those businesses that are innovative 'learn' about barriers to innovation as a result of their attempts to innovate.

Holzl and Janger (2011) investigated the innovation barriers across a number of European Union member states. The findings confirm that innovation barriers are lighter in countries closer to the technological frontier, than for countries more distant from the frontier. With regard to specific barriers to innovation, it was found that financing constraints to innovative activity are assessed to be more relevant in countries distant to the technological frontier, while skill constraints are more relevant to those closer to the frontier. The evidence regarding barrier-related non-innovators showed that there is a negative relationship between the propensity to innovate and the perception of innovation barriers.

Kamalian et al (2011) recorded similar results with respect to the lack of skilled labour. In their study on SMEs at Iran, they found that collaboration with universities and other higher educational institutions was insignificant and lack of skilled labour was prominent. Cost was yet another major barrier. Corrocher and Fontana (2008), in their study on ICT adoption among 128 SMEs in Italy found that costs, technological uncertainty and lack of relative advantage were the most important obstacles to innovation adoption.

Tiwari and Buse (2007), in their study at the Metropolitan region of Hamburger in Germany also observed that financial constraints and difficulty of getting suitable qualified personnel are among the major constraints faced by the SMEs surveyed. Alinaitwe et al (2007) in their study on the enablers and barriers that affect productivity in Uganda building industry found significant negative correlation between barriers and innovation adoption. In their study, the size of market and the security issues (country related external barriers) were the worst barriers that lowered the productivity of the building industry. However in a study conducted at Cyprus, Hadjimanolis (1999) observed that barriers as perceived by the

business owners/ managers of SMEs were not statistically correlated to their innovativeness.

6.4 TYPES OF INNOVATION

The present study has identified three important dimensions of innovation adoption namely technological innovation (comprising of product and process innovations), administrative and marketing innovations. The results revealed that the most frequently adopted innovations by the responding SMEs in the Tirupur cluster are administrative innovation, followed closely by marketing and technological innovations in the order. Past research on innovations among SMEs exhibit similar characteristics across sectors. Lin and Chen (2007) in their study on innovativeness among the manufacturing SMEs in Taiwan found that 80% of the surveyed companies adopted some sort of innovation. The two major types of innovations among the firms were found to be technological and marketing innovations. Among the technological innovations, SMEs are found to be more likely to involve in product innovations rather than process innovations (Hoffman, Parejo, Bessant and Perren 1998).

6.5 IMPACT OF INNOVATION ADOPTION ON BUSINESS PERFORMANCE

SMEs play a very important role in the economic development of nations. Due to this reason, innovation in the context of SMEs is an interesting area of research. Innovation helps organizations in creating competitive advantage in the marketplace that will provide them with superior financial performance (Ahuja 2000). However, some scholars have opined that while innovation has the potential to create the opportunity for increased performance, the act of innovation can be very costly and risky and may lead to decreased financial performance (Markham and Griffin 1998). According to Van de Ven (1986), innovation demands substantial costs and may create resource constraints for small firms. Although SMEs have considerable financial and other resource limitations, they are often successful innovators. The introduction of innovative products, services, processes etc.,

according to the requirements of niches they serve, provides the SMES with additional opportunity to stand out from competition (Porter 1980).

The present research has empirically proved that innovation adoption positively influences business performance. This positive causal relationship has been established between various types of innovations adopted by the firms and business performance measured in terms of financial and market performance. The researcher has also tested and empirically proved the mediating role of innovation towards business performance. Past researches have proved that innovation serves as a key mediator between antecedents of innovation and performance (Damanpour and Evan 1984). Though some researchers have considered the construct 'innovation' as a total mediator, some others have treated it as a partial mediator. Vincent et al (2004) in their study on the mediating role of innovation on firm's performance also proved that product innovation increased financial performance suggesting that innovation is a mechanism through which organizations can achieve a competitive advantage in the marketplace. Research evidence suggests that there is a strong correlation between market performance and new products (Tidd 2000). New products help to increase and retain market shares and also increase profits derived from those markets. Rosenbusch et al (2010) in their meta-analyses of 42 empirical research studies covering 21,270 SMEs have found that innovation has a positive effect on firm performance.

However, certain other studies have empirically established weak linkage between innovation and business performance. Hughes (2001) investigated the innovation-business performance linkage among the SMEs of UK and European Union. He found positive relationship between innovation and employment or turnover growth, but weak or rather absent relationship between innovation and profitability. In their study on SMEs in Taiwan, Lin and Chen (2007) found that innovation had a weak link with company sales. They also found that administrative innovations were found to be the most crucial factor in explaining sales rather than technological innovations. In the present research, marketing innovations were found to be predicting business performance slightly more than administrative innovations. Also all the three types of innovations significantly predict more of the

market performance of the firms when compared to their financial performance. In their study on 300 manufacturing SMEs in UK, Siqueira and Cosh (2008) found that innovations positively moderated between firm capabilities and competitive advantage. According to them, product and administrative innovations significantly predicted firm performance.

6.6 ASSOCIATION BETWEEN DEMOGRAPHIC VARIABLES AND INNOVATION ADOPTION

There are other aspects like the firm's age, ownership structure and size that may influence the innovativeness of the firms. Also, the personal background of the entrepreneur in terms of his education, experience in the industry and source of business inheritance can exert influence on the innovativeness of the firms. It was hypothesized that all these variables namely firm's age, ownership and sizes as well as the personal profile of the entrepreneurs are reflected in the latent constructs identified in the model such as leadership, market orientation, climate for innovation, organizational structure and collaboration and networking with others in the cluster. Hence, these variables were not included in the conceptual model and their influences on innovation adoption were analysed separately using chi-square statistics. Association of other organizational and personal related variables with innovation adoption were also tested and the results showed the presence of significant association.

The present study has empirically proved that there is significant positive association between ownership structure of the firms and their innovativeness, though the strength of such association is found to be moderate. Cosh et al (2007) investigated the impact of management characteristics and ownership structure on a firm's innovation performance on 440 British SMEs. They found that innovative efficiency of SMEs was significantly affected by their management characteristics and ownership structure. Managerial ownership was found to have a non-monotonous and non-linear relationship with the firms' innovativeness. Lee and Ging (2007) in their study on SMEs in the Malaysian manufacturing sector found that medium-sized firms that are public limited companies were less likely to adopt innovations. Minetti et al (2011) studied the impact of firms' ownership structure

(corporate governance) on firms' innovation decisions on 20,000 Italian manufacturing firms. They found that ownership concentration negatively influenced the probability of innovation, mainly by reducing firms' R&D activities.

The present research focuses only on the Small and Medium Enterprises operating in the knitwear cluster of Tirupur. The classification of firms as SMEs here is based upon the investment the firms have made in the plant and machinery as per the guidelines of MSMED Act of the Government of India, 2006 (MSME 2010). However, in several studies, classification of firms into small, medium or large is based upon the number of employees working in those firms. On this premise, the association between size of the firm (with reference to number of employees) and innovation adoption was tested and the relationship was found to be positive and significant in the present research. However, the strength of such association is found to be moderate.

Schumpeter (1942) argued that large firms are more innovative than small firms. Damanpour (1992) in his meta-analytical review using 36 correlations derived from 20 published studies found a positive relationship between organization size and innovation. In addition, he established that size is more positively related to innovation in manufacturing and profit-making organizations than in service and non-profit-making organizations. Forfas Innovation survey, Ireland (2006) surveying 6177 companies also reported significant positive association between the size of the firms and their innovativeness. Vincent et al (2004) in their meta-analysis of 83 empirical studies also found significant association between firm size and the extent of innovation adoption.

Pianta and Vaona (2006) investigated the differences between small, medium-sized and large firms on their performance in the introduction of new products and processes at the industry level across 22 manufacturing sectors in Europe. They found that product and process innovations were associated to different innovative inputs and strategies pursued by firms. They observed systematic differences between the behaviour of large firms and SMEs concluding that size and innovativeness are associated. However, Bala Subrahmanya in his

study on Indian SMEs found a negative relationship between firm size and innovation intensity (2006).

The present research has established a significant positive association between firms' age and their innovativeness, though the strength of such association is found to be moderate. The impact of age on innovation has been studied quite extensively in the literature and the results are often contradicting. In their study, Kimberly and Evanisko (1981) argued that older organizations are better at innovation as they have established systems that support innovations. Vincent et al (Vincent, Bharadwaj and Gowtham 2004) in their meta-analysis however, found that age has a negative relationship with product innovation.

Balasubramanian and Lee (2008) also found a negative relationship between firm age and innovation quality, in terms of technology in their study on US patent data set. Huergo and Jaumandreu (2004) conducted a longitudinal study on 2300 firms of Spanish economy during the period 1991-1998 to understand the association between firm age and propensity to adopt innovations. They found that entrant firms presented the highest probability of innovation while the oldest firms showed lower innovative probabilities. Certain firms with intermediate ages also showed a high probability of innovation, and exiting firms were associated with lower levels of innovations.

The present research has found a significant positive association between the education level of the entrepreneur and the extent of innovativeness brought in his firm. The strength of such association is found to be moderate. The researcher has also established significant positive but moderate, association between the prior experience of the entrepreneur in the knitwear industry and innovation adoption. Ciemleja and Lace (2008) reported similar results in their study on Latvian entrepreneurs. They argued that knowledge is an important precondition for the innovative performance of an enterprise. They established direct relationship between the educational level of entrepreneurs and innovativeness of the firm. In their study on 149 Korean biotech SMEs, Kang and Lee (2008) found that experience of CEO was one of the important determinants of innovation performance.

Owner's work experience and educational qualification were found to be influencing innovativeness of SMEs in China as well. This argument is based on the findings of an empirical study conducted on 75 SMEs in Zhejiang Province of China (Tie-jun and Jin 2006). The entrepreneur constitutes one of the key factors in the adoption of ICT innovations by SMEs. His background, education and experience significantly influence his decisions towards innovation in his business (Barba-Sánchez, Martínez-Ruiz and Jiménez-Zarco 2007). Bala Subrahmanya (2003) also found that technical educational background and previous work experience of entrepreneurs in the same industry have a positive association with innovativeness of small firms.

The study has revealed that there is significant positive but weak, association between the entrepreneur's generation in business in terms of the source of inheritance and innovation adoption. Discussions with entrepreneurs and experts in the industry revealed that there can't be much differentiation among the first, second and third generation entrepreneurs with respect to their innovativeness. It was felt that innovation adoption can be a little easier for the second or third generation entrepreneurs as proper systems will be in place when they take over the business from their parents or relatives. First generation entrepreneurs may consider innovation adoption to be risky at times, as they are new to the business and might be worried about the cost and risks involved.

The study revealed that there is a significant positive, but weak association between export orientation and innovation adoption. In their study on Finnish service industries, Leiponen (2002) concluded that innovative service firms are strongly oriented towards domestic markets. In other words, highly export oriented service firms had lesser share of sales originating from innovative services. The entrepreneurs in the cluster opined that export orientation has always motivated or forced them to adopt innovations as per the requirements of the markets they are serving. Sometimes, innovation adoption is volunteered by the entrepreneurs. Some other times, it is either suggested or forced by the buyers. Hence, being international has a positive linkage with innovativeness, though the study has shown that it is not as strong as generally perceived.

6.7 ASSOCIATION BETWEEN DEMOGRAPHIC VARIABLES AND BUSINESS PERFORMANCE

The present study has established a positive but weak, and significant association between ownership structure of firms and their business performance. McMahon (2007) investigated relationships between ownership structure, business growth and financial performance among 1872 Australian SMEs. He found no statistically significant relationship between the proportions of equity held by SME managers and achieved financial performance in the businesses examined. Lauterbach and Vaninsky (1999) examined the relationship between ownership structure and firm performance among 280 Israeli firms. The study revealed that ownership structure impacts firm performance.

The present study revealed significant positive and moderate association between the age of the firm and business performance. Significant association has also been proved between business performance and the size of the firms. Islam et al (2011) in their study on SMEs in Bangladesh reported similarly that older companies are more successful than younger companies. McMahon (2007) reported that enterprise size is significantly linked to business performance. However, according to Indarti and Langenberg (2008), neither the age of the firm nor its size in terms of number of workers is significantly associated with business success. Bala Subrahmanya (2011) in his longitudinal study on 157 SMEs in the auto components, machine tools and electronics sectors of Bangalore found a significant negative relationship between age of the firm and sales growth.

The present study has proved that there is significant positive association between the education level of the respondent entrepreneurs and their business performance, though the strength of such association is weak. The results are similar to the findings of Bala Subrahmanya (2011). In his study, he found a significant positive, though relatively low relationship between technically qualified entrepreneurs and their firms' sales growth. However, according to Kang and Lee (2008), academic experience of the CEO, among others, is an important determinant of innovation performance of SMEs in the bio-technology industry of South Korea. The present study has also revealed a significant positive and moderate association

between entrepreneur's prior experience and business performance. This finding is similar to that of Kolvereid (1996).

According to the results of the present study, there is no association between the generation of the respondent entrepreneurs in their businesses and their business performance. The results are similar to those of Indarti and Langenberg (2008). According to them, origin of enterprises, either established or inherited, did not distinguish them in terms of business success. Discussions with the entrepreneurs in the cluster confirmed that such an association may not be relevant in the knitwear cluster of Tirupur.

The present study has proved that there is significant positive and moderate association between the export orientation of the firms and their business performance. Erminio and Rugman (1996) suggested that the extent of exporting could be positively related to an SME's financial performance. Exporting provides SMEs speedy entry to foreign markets with little capital investment and higher opportunity to gain valuable international experience. However, Lu and Beamish (2001) found that exporting had a negative and linear relationship with performance.

6.8 RESULTS OF INTERVIEWS CONDUCTED WITH EXPERTS AND ENTREPRENEURS IN THE INDUSTRY

Unstructured interviews and discussions with the entrepreneurs operating in the various segments of the knitwear value chain helped to understand how they have evolved to the present state of their businesses by infusion of various kinds of innovations. Entrepreneurs were asked several questions related to their businesses and their responses were recorded. Personal visits were also made to factories in each of the segments and manufacturing processes were observed.

In the knitting segment, technological innovations have taken place in leaps and bounds. Earlier circular knitting machines were used for knitting fabric; later companies started using open width knitting machines that are mostly imported from countries like Taiwan, Germany and USA etc. Such updated machineries have helped these firms improve their production capacity, product range as well as enhance the quality as per the internationally stipulated parameters. Wastage and

power consumption has also reduced with the usage of these advanced machineries. Major brands like Victoria Secret, M&S etc., are stipulating terms to knitting companies to manufacture fabric in advanced machineries. Now these firms can use different colours and weights of the yarn simultaneously. Administrative and marketing innovations are not much taken care of in the knitting business. Suitable HR policies can be implemented to promote labour welfare. Quality certifications can be obtained and strictly followed.

The Wet Processing Houses in Tirupur also have shown remarkable changes, keeping pace with the development in other sectors of the knitwear industry. In this segment, earlier open winch dyeing were done. This conventional textile wet processing required lot of water and energy as inputs. Now everything is closed process which is otherwise known as soft flow dyeing. Air flow processing is also done which consumes water even 30% less than soft flow machines. RO systems and Common Effluent Treatment Plants are in place as per the requirements of Pollution Control Board. Due to technological innovations in processing, wet processing firms are now able to keep up with the international standards in terms of colour fastness, wet crocking, hand feel, shrinkage, wastage etc. As far as the administrative innovations are concerned, these firms are mostly ISO certified. In addition they certify themselves with SA 8000, OEKOTEX, GOTS etc. that ensure suitable Quality Management Systems, HR policies and usage of environmental friendly dye stuffs. Marketing innovations are limited as they source orders from export or buying houses based upon the requirements of the customers.

The firms that undertake compacting are now adopting open width compacting with advanced imported machines that helps to adopt CAD during garment production. Shrinkage control is also adequately taken care of. Administrative and marketing innovations are found to be quite less in the compacting firms. Garmenting segment comprises of functions like cutting the fabric, stitching, checking, ironing and packing. Various latest software packages are used such as Lectra, Gerber, and Tuka Tech etc., for speedy accurate pattern making and grading and efficient laying to optimize fabric consumptions.

The Tirupur industry is emerging from hand cutting to CAM cutting facility thereby improving cutting room efficiency. Also the cutting room, sewing floor and garment finishing machineries are continuously being upgraded. Indian machineries are now replaced with advanced imported machineries such as over lock, flat lock and single needle machines that improve efficiency in operations and reduce power consumption and wastage. Ironing is mostly vacuum based. Needle detectors are used after packing as a final check. Technological innovations are taking place on a large scale as per the requirements of the market. Garments manufactured out of bamboo fibres, poly viscose, 100% viscose, organic and modal garments are some of the innovative products manufactured by this segment. Quality standards and certifications are done mostly based upon the demands of the customers. Sewing standards, ISO, SA 8000, GOTS, OEKOTEX and REACH etc., are the important certifications obtained. These are mostly related to HR and environmental norms. Nowadays, companies are offering incentive schemes to employees according to the output generated by them. Marketing innovations involve forecasting the fashion requirements for the upcoming seasons, developing samples accordingly and efforts to secure export orders.

The printing techniques have advanced from table to semi-rotary to rotary and latest advanced machines. These sophisticated imported machineries can print up to 7000-10,000 kilos per day when compared to their Indian counterparts that used to print much lower. The printers are using non PVC prints that are environmental friendly. Embroidery is also done using computerized advanced machineries. These innovative practices have helped these firms improve their efficiency and reduce cost, time and wastage involved in manufacturing. Marketing and administrative innovations are limited in this segment. The accessories involve the supplying of label, tags, carton boxes, hangers, zips, buttoning etc.

6.9 PROBLEMS FACED BY ENTREPRENEURS

Nearly 18% of the respondents opined that they faced problems while undertaking innovations. Though the business district of Tirupur earns USD 1200 million plus in foreign exchange annually, the exporters and other entrepreneurs in the Tirupur cluster face several problems. This is mainly because the Government

and local authorities are very slow in coping up with the dynamic growth of this cluster. One of the most important problems faced by the cluster is the fluctuation in the continuous supply of raw materials such as cotton and yarn and unwarranted rise in their prices. In comparison with its global counterparts, the production costs are much higher in Tirupur. It is noteworthy that similar firms in Bangladesh are able to quote upto 17% lower prices making price based competition severe and unhealthy.

The wet processing units are presently in trouble due to the intervention of Pollution Control Board. Though the effluent discharge to the Noyyal river was happening for over four decades, it went unnoticed. Now that the pollution has affected the farmlands in the surrounding villages, Government has taken punitive action leading to the closure of wet processing units not abiding by the pollution control norms. After several rounds of discussions, Government has announced financial support for setting up of common effluent treatment plants to solve the problem in the interest of the parties involved. Only a few dyeing houses are functioning now leading to disturbances in the functioning of the entire knitwear value chain.

Availability of skilled labour is yet another problem faced by the entrepreneurs in Tirupur. Certain big players are ready to spend on their training and development of their staff. But there is no guarantee that after training, these employees will stay back in the company. Some entrepreneurs opined that innovativeness among their staff is very less, due to which they receive less support for innovation adoption as well as implementation. Workers tend to follow old practices and shy away from innovative practices suggested by the entrepreneurs. The shortage in technical knowledge and skill hinders innovativeness and make firms uncompetitive in the market place.

Certain entrepreneurs opined that they faced regulatory related problems. The bureaucracy in India is not supportive to the smooth functioning of the business community. Government is not highly supportive in financial aspects, leaving entrepreneurs in distress while innovating. Lack of Research and Development institutions in adequacy is yet another hindrance. Government policies are not found to be supporting innovativeness among these entrepreneurs. Though innovation is

creative and challenging, it is sometimes difficult to derive expected profits out of the same. Hence certain entrepreneurs consider innovation as a risky idea and they prefer to stay away from risk taking.

6.10 SUGGESTIONS OFFERED BY THE ENTREPRENEURS

The entrepreneurs were asked to give their suggestions to the Government authorities as well as to other entrepreneurs to improve the overall innovativeness and competitiveness of the cluster. Some of the suggestions repeatedly offered by the responding entrepreneurs are noted as follows:

It is suggested that Government can offer support in bringing in latest manufacturing technologies and know how into the cluster. More R&D institutions can be set up in collaboration with universities and other educational institutions to promote innovativeness in the cluster. These institutions need to involve in open innovation with other such institutions and entrepreneurs globally. The global best practices in terms of technology, administration and marketing need to be assessed and shared with entrepreneurs in the cluster so that the competitiveness of the entire cluster is uplifted. R&D has to be encouraged among the firms through subsidies and suitable funding.

The scenario is that most of the firms in Tirupur are concentrating on US and UK markets. However, these markets today are not as lucrative as before. Government can encourage export to other countries. Government can encourage the industry by offering participations in trade fairs and delegations to other prospective markets. Regulations can be simplified in the best interest of the industry which contributes substantially to the foreign exchange of the country. Speedy solution to effluent discharge issue can ensure the full fledged functioning of the wet processing units. This will ensure smooth flow in business and a positive climate for innovation.

Entrepreneurs are advised to engage in fair and healthy competition, not in price but in knowledge. Innovations can happen only with the involvement of all employees as a team. Hence innovative practices need to get diffused within the organizations first. Later, these have to be disseminated throughout the cluster in

such a way that every firm in the cluster knows and adopts the best practices and stay competitive. Collaboration among the members in the cluster's eco system will surely ensure healthy innovation development and deployment.

6.11 SUMMARY OF FINDINGS

The following is the summary of the major findings of the present research:

- 50.3% of the responding companies are partnership firms
- Majority of the respondent companies are 6-10 years old (25.5%)
- 53.9% of the respondents have less than 20 permanent employees in their respective firms
- 25.5% of the respondents have more than 100 temporary employees working in their respective companies
- Though the knitwear cluster of Tirupur is an export oriented cluster, only 9.1% of the surveyed companies are 100% Export Oriented Units
- 57.6% of the respondents are catering only in the local/ national market
- The average annual turnover during the past three years for majority of the respondents (46.4%) is below Rs.10 crores
- 85.2% of the respondents agreed that they felt up to 20% improvement in turnover due to adoption of various types of innovation
- 42.7% of the respondents reported that they invested up to 5% of their sales value in R&D initiatives
- Majority of the respondents (51%) possesses 11-20 years of prior experience in the knitwear industry before starting their respective firms
- Majority of the respondents are first generation entrepreneurs (60.4%)
- Most of the respondents (56.8%) possess Bachelors Degree as their highest level of education

- Majority of the respondents (73.4%) undertake production purely based on buyer's design specifications. Less than 20% of the respondents only are developing their own designs of garments/ fabric etc. Branding own designs is still in its infancy among the business people of Tirupur, though there is a great scope for branding.
- 99.5% of the respondents agree to the statement that 'innovation is essential for growth'
- 82.2% of the respondents opined that they do not face problems while undertaking innovations
- The primary source of innovation information for majority of the respondents is 'market sources' comprising of suppliers, customers and competitors surrounding the firms
- Innovation adoption positively mediates between the pre adoption variables and business performance
- Innovation objectives have a significant positive influence on innovation adoption
- The most prominent objective for adopting innovation is to improve quality of products
- Internal facilitators of innovation have a significant positive influence on innovation adoption
- External facilitators of innovation have a significant positive influence on innovation adoption
- Barriers to innovation have a significant negative influence on innovation adoption
- Among the facilitators, internal facilitators can predict innovation adoption more significantly than external facilitators

- Among the internal facilitators, climate for innovation is a significant predictor of innovation adoption followed by market orientation
- In comparison with the facilitators, the influence of barriers on innovation adoption is felt at a lesser degree
- The interplay of innovation objectives, facilitators and barriers significantly predicts the propensity of firms to adopt innovations
- The prominent reason for industrial collaborations is found to be quality enhancement concerns
- Respondents' collaboration and networking with universities and research institutions are found to be insignificant
- Collaboration status with others in the knitwear industry eco-system is found to be very low and insignificant
- Though focus on R&D is significant, it is followed at a lesser degree by the firms in the cluster
- Focus on external sourcing of R&D has more impact on innovation adoption
- Among the external facilitators, collaboration purpose has more significant influence on innovation adoption
- Among the barriers, internal barriers have more negative impact on innovation adoption
- The most prominent internal barriers are lack of information on technology and lack of qualified personnel
- Majority of the respondents (55.2%) are high adopters of innovation
- The most frequently adopted innovations by the respondents in the cluster are 'administrative innovations' followed by 'marketing innovations'

- Technological innovations adopted mostly are for increasing quality and improving manufacturing processes
- Administrative innovations adopted mostly are to improve Quality Management Systems and to renew organizational structures
- Marketing innovations mostly adopted are in the form of improving designs and packaging etc., to improve the appeal of the finished products
- Majority of the respondents (41.9%) score high on innovation implementation status
- Among the various types of innovations adopted, administrative innovations are found to be implemented well mostly
- Innovation adoption has significant positive, and substantive influence on business performance
- Majority of the respondents (45.6%) are high performers in their respective businesses
- Among the various performance indicators, customer satisfaction and improved overall reputation are the most important
- Innovation implementation positively moderates the causal relationship between innovation adoption and business performance
- Though impact of innovation adoption on turnover is significant, it is low when compared to other performance indicators
- Innovation adoption has more influence on market performance when compared to financial performance
- Marketing innovations have more significant impact on business performance when compared to technological and administrative innovations

- Majority of the high innovation adopter (65.6%) are high business performers
- There is a significant positive association between ownership structure and innovation adoption, though the strength of such association is moderate
- Innovation adoption is independent of the segment of business
- There is significant positive and moderate association between the age of the business and adoption of innovations
- There is a significant positive and moderate association between the number of workers employed in the firms and the extent of innovation adoption
- There is significant positive association between level of education of responding entrepreneurs and the extent of innovation adoption, though the strength of such association is moderate
- There is a significant positive and moderate association between prior experience of responding entrepreneurs in the knitwear industry and innovation adoption
- There is a significant positive but weak, association between the generation of entrepreneurs in terms of their entry into business and their extent of innovativeness
- There is significant positive but weak, association between the export orientation of respondents and their extent of innovation adoptions
- There is significant positive but weak, association between the ownership structure of the responding firms and business performance
- There is significant association between business performance and the size of the firms measured in terms of the number of workers employed

- There is significant positive and moderate association between the age of the business and business performance
- There is significant positive but weak, association between the education level of the respondent entrepreneurs and their business performance
- There is significant positive and moderate association between the prior experience of the respondent entrepreneurs and their business performance
- There is no association between the generation of the respondent entrepreneurs in their businesses and their business performance
- There is significant positive but weak, association between the segment of knitwear manufacturing operation and business performance
- There is significant positive and moderate association between export orientation of respondents and their extent of business performance

6.12 RECOMMENDATIONS

Based on the results, the researcher has empirically established the causal relationship between the facilitators of innovation and objectives and the rate of innovation adoption together leading to business performance. If suitable facilitators and objectives are present, innovativeness of the firms can be enhanced. In order for this to happen, the entrepreneurs and employees of SMEs themselves should take initiatives and change their traditional mind set. There are no formal courses or training specifically given for developing innovation skills among entrepreneurs and managers in the Indian context. Government, Universities and other such institutions can play a strategic role in this regard and offer support and encouragement to entrepreneurs. Technological innovations can happen extensively in the cluster only when focused R&D efforts are taken up intensively. Research institutes and labs can be promoted on a public-private partnership basis to complement in-house R&D efforts of the firms in the cluster. Suitable support through Technology upgradation fund scheme (TUFs) can be extended by the Ministry of Textiles with simplified procedures so that the cluster as a whole is benefited.

A well coordinated policy framework with involvement of textile ministry, finance, trade and commerce and technology can be designed and implemented at the regional level. Access to existing technologies, technology transfers within the country and across borders needs to be encouraged. Special incentives can be offered to innovative SMEs to go up in the value chain and expand themselves. Financial institutions can be encouraged to develop and offer package of schemes and incentives to support innovativeness.

Industry related associations such as TEA etc., can be more proactive and supportive by offering training and skill enhancement programmes to entrepreneurs as well as employees, conducting market researches and offering advisory services, representing cluster in other countries frequently, developing foreign partnerships, encouraging exchange of knowledge relating to the industry between countries, evolving sustainable business models for the industry, taking promotional efforts by organizing and participating in trade fairs and exhibitions within and outside the country and supporting entrepreneurs' every effort to deploy innovative best practices.

The 'Industry Innovation Cluster model', proposed by the National Innovation Council (2011) can be introduced into the cluster's existing eco-system. The Cluster Innovation Center (CIC) proposed under the model, will promote collaborations between the industry, academia, research institutions, professional service organizations, Government, non-Government agencies and the society, at large. CIC can act as a catalyst and support the cluster in effective implementation and management of innovation-driven activities within the cluster. The National Innovation Act (DST 2008), which though floated, but not fully implemented, can be brought in with special impetus towards research and development support, human resources training support and technology upgradation funding. Innovation collaborations at a global level can be promoted.

Entrepreneurs, on their part, can engage themselves in open innovations. They need to collaborate well within and outside the cluster. Common forums can be created wherein experiences of innovative best practices can be shared and thereby diffused within the cluster. Management of firms can be made more

professional. Appropriate climate for innovation and team coordination can be encouraged so that adoption and implementation of innovations will be successful and sustainable.

6.13 CHAPTER SUMMARY

This chapter provided explanation and discussion on the major results of the study and compared the same with the prior findings. The results were discussed with respect to the concepts involved, findings observed, interview with the experts and the findings of relevant literature. The discussions have helped to understand the relevance of the research in the light of the existing body of knowledge. Recommendations are offered to improve the innovativeness of the cluster members thereby enhancing the competitiveness of the cluster in the international knitwear market.