# Innovation and New Product Development by SMEs

## An Investigation of Scottish Food and Drinks Industry

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# Innovation and New Product Development in SMEs: An Investigation of the Scottish Food Industry

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**October 2009**

To my wife Renuka

# Abstract

This dissertation reports the results of case studies on innovation and new product development in eight Scottish food companies and a subsequent triangulation survey of 85 innovative Scottish companies.

The case studies are carried out using qualitative research methods and a realistic inductive research strategy. It is found that the case study companies use an informal and cross-functional innovation process, which is independent of the age of enterprise. It is also discovered that these companies develop new products, often luxuriant variants of their existing products, which are mainly indulgences rather than healthy foods and are sold mostly to large retailers. Use of production methods that are amenable to quick changes in final products and networking with customers, suppliers, other food companies and Scottish Enterprise is also observed. Creative people with high innovative proclivity, who often travel to new locations in search of product ideas, drive the process. The case study companies are high-variety-low-volume businesses, possess good understanding of customer needs and circumstances and are able to achieve a good fit between needs of the market and their own resources. Not facing financial constraints, these companies are able to attract and retain talent, needed to develop new products. Continuously learning from their NPD endeavours, they sell their products without any major advertising or marketing effort.

The subsequent triangulation survey of 85 innovative Scottish companies, from food as well as non-food sectors, confirms most of the above-mentioned findings. Contrary to the case study results however, the survey discovers that innovative Scottish companies face financial constraints while developing new products, do not sell most of their new products to large retailers or undertake travel to new locations in search of product ideas.

The main contributions to knowledge by this research include crystallisation of the new product development practices in Scotland, highlighting difference in product innovation between various sub-groups of enterprises, a new conceptual construct within which all notions and definitions of innovation can be accommodated and identification of a basic flaw in the present innovation policy in Scotland.

# Acknowledgements

I express my deep sense of gratitude to my supervisors, Dr. Janice McMillan, Professor Ron Masson, Mrs Susan Laing and Mr. Aidan Craig for their help, advice and steadfast support throughout this research.

Dr. Janice McMillan took over the stewardship of my supervisory team following Professor Masson's retirement. In a very short period she not only acquainted her well with the work that had progressed in her absence for over three years but also made pivotal contribution to writing up of the amendments to my thesis that were advised by the examiners.

Professor Ron Masson's commitment to steer this work unwaveringly in the right direction, his scholarship and his ability to motivate and inspire played crucial role at every stage of this research. I had occasions to meet him more as he also headed the Operations Management Group in which I had a teaching role and would always cherish Professor Masson's qualities as an exceptional human being.

Mrs Susan Laing, despite being in a much occupied role as Director of the Entrepreneurship Centre, made it a point to remain present at many of the interviews that were to form the backbone of this investigation. Her presence and leadership during the interviews helped immensely by extracting information that was to prove crucial in identifying the underlying innovation process in Scottish SMEs. She and Mr Aidan Craig were pivotal in arranging the validation session of this work.

Mr Aidan Craig brought to this research a vast first-hand experience of the Scottish food industry. He often challenged my interpretation of the evidence that this investigation generated in light of his intimate knowledge of the industry. That the findings of this research echoed so true during their validation by the Scottish food industry veterans is due largely to him. Mr. Craig steered the validation discussion skilfully, ensured that views of all present were taken and yet kept us all so focussed that it concluded at the stroke of its scheduled end.

The author is obliged to the Managing Director's of eight Scottish food SMEs who allowed me to investigate their enterprises, the owners and executives of these companies who unselfishly, unreservedly and at length, revealed to me the details of

innovation and new product development in their organisations in the spirit of sharing knowledge to create new knowledge. Without the participation of these, here anonymous, stars of the Scottish food innovation, this research would not have taken off let alone concluded.

Also acknowledged thankfully are the six Scottish food entrepreneurs Mr. Peter Ford, Mr. Mark Laing, Ms. Jo Macsween, Mr. Tony Stone, Ms. Lesley McVey and Mr. Robin Pollok who formed the validation panel, attended the validation session at a very short notice, enriched author's understanding of the innovation process in the Scottish food industry and provided this work the authenticity needed for its successful conclusion.

Dr. Fiona Peterson of Oxford Psychology Group is acknowledged gratefully for sending me her innovative personality questionnaire and for permitting me to use it in this research, Professor Jonathan Michie for sending me his unpublished paper *"Cooperation and Innovation: Evidence from the Community Innovation Survey"*, co-authored with Marion Frenz and Christine Oughton and for his permission to cite it and Mr. Robin Pollok, a director of Food Initiative Ltd for pre-testing both the paper and on-line versions of the survey questionnaire.

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# 1 Introduction

This dissertation reports a doctoral research on innovation and new product development in Scotland involving case studies of eight Scottish food SMEs and a triangulation survey of 85 innovative Scottish companies.

## *1.1 Background and motivation*

The history of study and analysis of innovation goes back to three quarters of a century. Much of the early work on innovation, however, concerned the large corporation and analysed innovation from a technological perspective. Like much of SMEs research, innovation studies of small enterprises commenced later and were less numerous. The focus of such studies, however, remained high-technology enterprises. Small high-tech start-ups were considered the quintessential unit of small business innovation. The breakthrough nature of their innovations, the scorching pace of their growth and demolition of some of the most revered names in the world business by them, romanticised many of the more successful of these ventures and made them a part of the folklore of business history. Businesses of this kind were thus looked at with great interest and enthusiasm and continue to be a focus of academic and journalist interest. Innovative endeavours of people in traditional low-tech industries did not evoke similar response. Their innovations were less breathtaking. They grew rather slowly and did not confront large corporations head-on, knowing full well, the disastrous consequence of such a contest. Academics and media ignored these 'lacklustre' enterprises. This doctoral effort, to address the imbalance, attempts a comprehensive analysis of innovation in this, hitherto largely neglected, area of inquiry.

This research, however, is prompted not only by a relative scarcity of work on small low-tech enterprises. It springs from the belief that innovation studies of such enterprises are equally, if not more, essential. Though, it is now well accepted that SMEs are quite influential in determining the processes of income generation and employment creation in a region (Birch, 1981), it is less understood that in economies such as that of Scotland, the competitiveness and rates of growth are influenced substantially by the functioning of low-tech and traditional industries. In the year 2005, these industries constituted 93% of businesses, 89% of employment and 70% of turnover in the Scottish economy (Scottish Business Statistics, 2007). The future of Scottish economy and the well-being of Scottish people, at least in the medium term,

thus, depend significantly on the performance of these industries. Given the contribution of innovation in the competitiveness and growth of businesses, the significance of innovation studies in traditional low-tech industries in Scotland is too obvious to be stressed.

Within the low-tech traditional sectors of Scotland, food and drinks is the most important. It is one of the biggest employers of people in Scotland, its top exporter and its second fastest growing export sector. Food and drinks also constitute the single largest item of household expenditure in Scotland. Study of innovation in the Scottish food industry, thus, provides us with a good understanding of the process of innovation in Scotland in general.

## *1.2 Objective*

The objective of this research is to identify and analyse the main drivers of product innovation in the Scottish food industry and the underlying process through which innovative Scottish food companies develop new products. It further aims to triangulate the findings of this work through a larger survey of innovative Scottish companies.

## *1.3 Organisation of thesis*

Chapter 2 of this thesis provides the details of a review of literature on business innovation. It describes, analyses and evaluates previous major works on definition, taxonomy, determinants, process and effects of innovation.

The chapter begins by presenting a selection of evidence on the effects of innovation on the performance of an enterprise from over half a century of work in the field to highlight the beneficiary effects of innovation on an enterprise. Next, it examines major contributions on the definition of innovation. The definitional writing on innovation comprises of an array of diverse articulations. In this chapter, an attempt is made to unify many well-known definitions of innovation by conceptualising and diagrammatically presenting a new idea, *the innovation-span*. In the section on taxonomy of innovation, major innovation taxonomies are described and assessed. Next, the voluminous literature on the determinants of innovation is considered. In order to organise and put this considerable work in proper perspective, the determinants of innovation are classified into two broad strands, one relating to the internal characteristics of enterprises and the other to their external characteristics. This allows a

separation of the industrial and regional analysis of innovation from its microanalysis where innovation is explored at the firm level. The internal determinants of innovation are further subdivided into strategic and non-strategic factors. The rationale for such a division is that some internal strategic influences on the innovation process can be altered by the firm's policy initiatives, but some others, non-strategic ones are not so amenable. The study of strategic determinants is obviously more important than that of non-strategic ones. Strategic variables are of interest to firms that want to change the direction, pace or outcome of their innovative efforts. Non-strategic variables are 'given' at a point in time and though, over a period, the enterprises may be able to alter them or their influence, such manoeuvring has limited scope.

In the penultimate section of this chapter, the process perspective to innovation is discussed. Here the relative merit of analysis of the *process* of innovation is discussed vis-à-vis the exploration of its *determinants* and it is explained as to why process perspective provides a better vantage point to visualise innovation than analysis of its determinants particularly in the context of the small business. This section also details Cooper's (1990) contribution in analysing the process of innovation through his seminal Stage-Gate® work.

The last section in the literature review is on management or implementation of innovation. Here the issues of normative evaluation, legitimisation and conflict in management of innovation are highlighted and how they have a bearing on the conflict between the entrepreneur and the leader is discussed. Finally, other kinds of conflict that the entrepreneurs and the business leaders face while managing innovation is analysed. These include the conflict between need of a structured organisation and the flexibility required for innovation and the need to strike a balance between change and persistence and novelty and repetition.

Chapter 3 discusses the methodological issues. This chapter, on lines of other major qualitative research efforts in the field, gives a very detailed narrative of the research process used. It explains the procedure used to choose the case study companies and describes them in some detail. It discusses the meaning, rationale and limitations of case study research, the epistemological foundation of this work and explains how the research questions for this study are derived from identification of literature gap and how the case studies were conducted, including the issues of case study design and the

use of multiple-case studies. Next is a discussion on how the extraneous factors are controlled and how the analysis of innovation potential indicator questionnaire data is carried out. Finally, it shows why this research fulfils various criteria of good qualitative research recommended by Miles and Huberman (1994).

Chapter 4 provides a context to this thesis by presenting an overview of the Scottish food and drinks industry. It highlights the premier role of this industry in the Scottish economy as an employer and as an exporter. It looks at the current trends affecting it and brings out a less discussed aspect of its changing nature. It shows that following a shake up, the number of businesses and employment in this industry has declined considerably whereas the turnover per unit and gross value added per employee has risen in the 7-year period from 1998 to 2005. This makes it obvious that competitiveness is crucial for survival and growth in this industry in the present times, underscoring the importance of innovation for the existing companies and highlighting the timeliness and significance of the present study.

Chapter 5 examines another context of this study, the status of business innovation in Scotland. It charts the innovation performance of businesses in Scotland vis-à-vis other regions in the UK. It analyses a number of documents and statistics including those published by the Scottish Government on the theme. It brings to the fore the fact that in Scotland, UK and EU, innovation is perceived to be synonymous with Research and Development (R&D). Here, evidence from a variety of sources is examined to show that innovation performance of enterprises in the UK regions is independent of their R&D investments and argued that a policy dictated by a R&D driven vision of innovation cannot make any noticeable impact on the economic performance of Scotland as a country. This chapter also draws from the insights gained from the research outlined in this thesis to support the above argument. It can be said that this chapter, though only contextually related to the main theme of inquiry of this research, makes a major contribution by discovering and highlighting a major flaw in current government thinking on innovation in Scotland.

Chapter 6 reports the findings of the case studies. As there are two perspectives to the analysis of innovation, the determinants perspective and the process perspective, the results of this research are, thus, presented and analysed from these two perspectives. In section, 7.1 of this chapter, evidence on presence or otherwise of indicators of various

determinants of innovation in the case study companies is detailed. The chapter provides within-case and cross-case analysis of the several internal determinants of innovation. These are, market orientation, learning processes, technology policy, participation in cooperative networks, managerial efficiency, age, size, human resources, innovative people and financial resources. In section 7.2, the evidence on the nature of the process of innovation in these companies is discussed. It begins by giving a summary of the underlying process of innovation that this research has identified and then goes on to analyse in detail each significant component of that process and shows how they are linked with one another. This chapter presents detailed evidence in support of the assertions made in the findings of this research. This is achieved by interspersing the text with quotes from interview transcriptions and parts from the interview summaries. This allows the reader a basis to judge that the conclusions drawn are in consonance with the evidence.

Chapter 7 presents a report on validation of major case study findings by a panel of six experts from the Scottish food industry. It discusses salient case study results and the panel's views on each of them.

Chapter 8, reports on a survey of Scottish companies that have successfully developed new products, undertaken to triangulate the case study results. It explains survey methodology and presents survey findings both at a rudimentary graphical level as well as in terms of advanced statistical tests. It charts a list of propositions deemed suitable for testing along with rationale for their choice as well as a list of questions that were crafted to elicit response on each proposition. It also explains choice of survey companies, the sectors from where they are chosen and rationale for the sector choice as well as the company choice. It then reports the survey results in two parts, analysis of general information on companies and analysis of information on product innovation. The first part describes the segment, age and size distribution of respondent companies. In the second part, the results are first presented graphically as propositions supported and refuted by the survey, as well as the propositions with a mixed response. It then analyses the survey data in terms of response rate, missing values, data validity, anomaly, reliability of scales and tests for self-selection bias. After presenting results of these initial checks on the data, it reports the result of statistical testing of 18 hypothesised propositions for all 85 companies as well as comparisons of statistical testing of hypothesised propositions between high-tech and low-tech companies, food

and non-food companies, new and old companies and small and large companies. In the end, it gives a summary the survey process and its results.

Chapter 9 presents conclusions of this research. It discusses case study findings, and triangulates them by survey results. An attempt is first made to compare the types of innovation found in this sector with the standard taxonomy of innovation and to show what innovation variants are prevalent and prominent here and what others are absent or marginal. Then it shows what indicators of various determinants of innovation reported in literature are observed in the case study companies and what others do not have much influence here and why. Each case study result on determinants of innovation is further analysed and reconsidered in the light of the survey findings. The implications of the observed underlying process, through which the case study companies develop new products most often, are then discussed and reconsidered in the light of the findings of the triangulation survey.

In Chapter 10, three sets of recommendations are spelt out. First, it is explained how the underlying process of innovation in the case study companies identified in this research can be replicated by other non-innovative food companies. Second, in view of the flaws identified in the innovation policy of Scottish Government, prescriptions for a more realistic and effective policy are presented. Third, suggestions for further research in this field are made.

# 2 Literature review

## *2.1 Innovation and business performance*

Research, over the last 50 years, has consistently linked innovation with business success. Innovation is shown as a major contributory factor in the growth of firms (Mansfield, 1968, 1971); new products and processes, the fastest growing product groups or 'clusters' (Freeman, 1974); rise and dominance of large corporations ascribed to the use of new technology (Temin, 1979); better business performance related to the higher measures of innovation (Cavanagh and Clifford, 1983); levels of competitiveness linked with the levels of innovativeness (Dosi, 1988); firms using innovation to differentiate their products from competitors, *twice* as profitable (Pavitt, 1991); innovation a key element of business success (Nonaka and Takeuchi, 1995); high growth companies getting a higher percentage of sales from new products relative to competitors, (O'Gorman, 1997); new product development leading to greater sales volume and enhanced profitability (Kotler, 1999); innovating firms having lower probability of stagnant or declining employment in comparison to non-innovating firms (Frenz *et al*, 2003) and innovative businesses growing more than non-innovative businesses (European Commission, 2004).

## *2.2 Definition of innovation*

Dictionary definitions of innovation usually focus on the development and successive refinement of inventions into usable products or techniques that are deemed worthy of being launched in a market or used internally within an enterprise (Frenz and Oughton, 2005). Amongst scholars, however, there is a fair amount of noticeable disagreement on the definition of innovation. This is attributed to the heterogeneity of sources and outcomes of innovation, which makes it difficult to identify and analyse (Dosi, 1988) and is partly responsible for often-conflicting outcomes of research on innovation (Le Bars *et al*., 1998 and Grunert *et al.,* 1997).

As inventions and innovations are associated phenomena, innovation scholars make it a point to clarify the distinction between the two. It is explained that though invention is a prerequisite for many innovations, it is only when an invention is exploited commercially that it results in innovation (Brenner, 1990). Another, though less popular approach to distinguish innovation from inventions has been to claim that inventions

relates to new ideas in general whereas innovations are ideas that are new within a specific context (Van de Ven *et al.*, 1989; Damanpour and Evan, 1984 and Damanpour, 1987).

From yet another perspective, a distinction is made between innovation and R&D, where R&D is shown to be concerned with the commitment of resources to research and the refinement of ideas aimed at the development of commercially viable products and processes whereas innovation is concerned with subsequent product (or service) development process. From this perspective, the following linear model of the process of innovation is visualised

**Research** ⟶ **Development** ⟶ **Innovation**

Innovation, however, is considered a nebulous concept. Godin (2002) believes that the ambiguity in meaning is caused by the following factors

1. Depending on the analyst's research focus and convenience of data availability, it is defined as an *outcome* or as an *action*.
2. There is no settled opinion on whether an innovation should be new to the world, to the nation, to the industry or to the firm.
3. With reference to process innovation, a firm can be innovative both by inventing new production processes, as well as by using new technologies invented by others.
4. Conducting R&D as well as acquiring advanced technologies and employing highly skilled workforce both are perceived as being innovative.

Factors 2 and 3 in the above do not appear to be valid as the taxonomy of innovation described later in this chapter clarifies these issues. The precarious link between R&D and innovation, however, is indeed not understood adequately and its consequences in Scotland in the shape of a flawed government policy are discussed in this thesis in some detail in Chapter 5. The more important point, however, is that the seeming ambiguity in meaning of innovation is superficial and as will be explained later in this chapter, it is possible to accommodate all notions of innovation within a unifying concept of innovation-span.

The earliest definitions of innovation are credited to Joseph Schumpeter (1934), who arguably is the most influential early writer on entrepreneurship and innovation and their pivotal role in the process of economic change. He includes five manifestations of innovation in its definition:

1. Creation of new products or qualitative improvements in existing products
2. Use of a new industrial processes
3. New market openings
4. Developing of new raw-material sources or other new inputs
5. New forms of industrial organisations

The influence of the Schumpeterian vision of innovation persists to this day and can be seen in the European Commission's Green Paper (1995) on innovation that defines it as *"…renewal and enlargement of a range of products and services and the associated markets, the establishment of new methods of production, supply and distribution, the introduction of changes in management, work organisation and the working conditions and skills of the workforce"* and in Edquist's (2001) summary description of innovations as new creations of economic significance normally carried out by firms (or sometimes by individuals).

OECD (1981), however, takes a more restricted view of innovation and limits it only to new product and/or process development effort, though it has a more comprehensive vision of *product,* in which it also includes *social services*. It defines innovation as *"the transformation of an idea into a new or improved saleable product or operational process in industry and commerce or into a new approach to a social service"*. This view of innovation thus consists of:

1. The whole gamut of technical, scientific, financial and commercial activities that are needed to create and market new or improved products,
2. The commercial utilization of new or improved production methods and equipment and
3. New ways to deliver a social service

The Oslo Manual (OECD, 1997), on which Europe-wide Community Innovation Surveys are based, limits its view of innovation to technological products and processes (TPP) which are defined as *"all those scientific, technological, organisational, financial*

*and commercial steps, including investment in new knowledge, which actually, or are intended to, lead to the implementation of technologically new or improved products or processes"*. For the purpose of measurement, it considers a firm innovative *"if it produces one or more technologically new or significantly improved products or processes in a three-year period"*.

Some analysts also emphasise the beneficial effects of innovation. In one such view, innovation is described as *the "intentional introduction and application within a role, group or organisation of ideas, processes, products or procedures new to the relevant unit of adoption designed significantly to benefit the individual, the group, the organisation or wider society"* (West and Farr, 1990).

The UK government's Department of Trade and Industry has probably the broadest and most comprehensive definition of innovation. It describes it as *"the successful exploitation of new ideas"* and explains that it *"involves new technologies or technological applications, which can deliver better products and services, new, cleaner and more efficient production processes and improved business models. For consumers, it means higher quality and better value goods, more efficient services and higher standards of living. For businesses, it means sustained or improved growth. For a company or organisation, innovation delivers higher profits for its owners and investors. For employees, innovation means new and more interesting work, better skills and higher wages"* (Department of Trade and Industry, 2003).

## 2.3 National systems of innovation perspective

Scholars working on the *national systems of innovation* have a different strand of definitions than of those analysing innovation at the firm level. In Lundvall's (1992) narrow definition, innovation is defined in the context of its facilitators R&D departments, technological institutions and universities whereas in his broader definition, the system of innovation includes all parts, structures and institutional set-ups influencing learning, searching and exploring. Nelson and Rosenberg (1993) believe that innovation is not restricted only to the acts of firms creating cutting edge technology or to organisations operating at the frontiers of scientific knowledge, but also more generally on the factors affecting national technological capabilities. In their worldview, thus, the study of innovation should include both its generation as well as its diffusion. Carlsson and Stankiewicz's (1991) definition is confined to technological

innovation, though they also consider the emergence and development of new organisational set-ups as innovation.

## *2.4 Taxonomy of innovation*

A parallel and overlapping effort to define innovation is to construct taxonomy of innovations. The creation of such taxonomy is considered necessary and important, as disaggregation is crucial for progress with regard to identifying the determinants of innovation (Edquist, 2001).

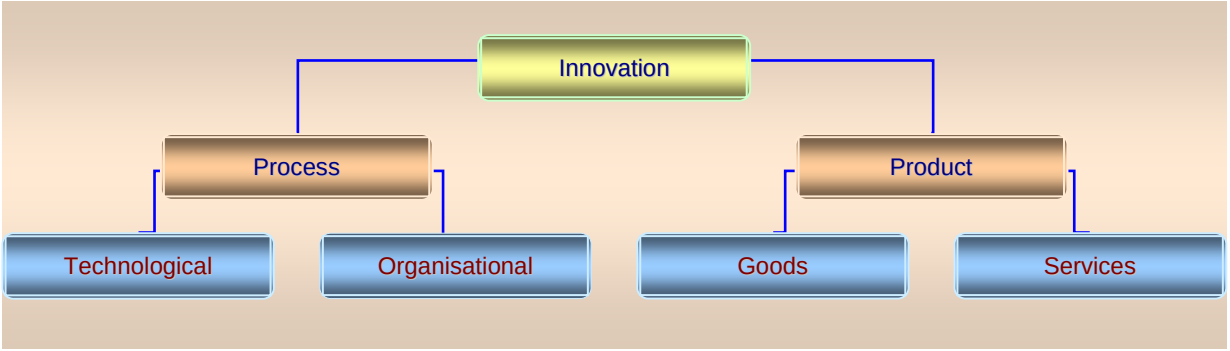



Figure 1: Edquist's Taxonomy of innovation

Source: Edquist, 2001

The following types of innovation emerge from this effort

### 2.4.1 Technical versus organisational innovation

A very common taxonomical effort has been to differentiate between technical and organisational innovation (Daft, 1978). Technical innovation refers to development of new products, services and production processes (Daft, 1978; Damanpour and Evan, 1990 and Knight, 1967). Organisational innovation, on the other hand, refers to innovations that are related to alteration in an organisation's structural and administrative procedures (Daft, 1978; Damanpour and Evan, 1990; Kimberly and Evanisko, 1981 and Knight, 1967). Adam Smith's (1776) analysis of the division of labour is an early example of organisational innovation and the study of its impact on productivity. In the food industry context, the most relevant organisational innovations are those that relate to logistics and supply chain management.

### 2.4.2 Product versus process innovation

Product innovation deals with the production of new products and services to create new markets or to satisfy current customers. Process innovation is reflected in the

improvements or introduction of new production technology (Knight, 1967 and Utterback, 1971).

### 2.4.3 Radical versus incremental innovation

Radical innovation represents a completely new product or process and incremental innovation a significant improvement in an existing product or process. Radical innovations have the power to result in significant and rapid transformation of production whereas the effects of incremental innovation are felt more slowly, though their cumulative impact may be just as significant (Frenz and Oughton, 2005). Radical innovation brings about a non-routine change to the very core on how activities are carried out while incremental innovation is usually part of routine changes that do not deviate much from present organisational activities (Dewar and Dutton, 1986 and Ettlie *et al.,* 1984).

### 2.4.4 New to the firm versus new to the market innovations

This refers to the diffusion of the innovation from innovator to imitators. It is understood that most of the benefits from innovation arise from the diffusion of the innovation rather than its introduction (Vyas, 2005) and as the notion of innovation-span earlier articulated in this chapter explains, the full economic benefits from research are only realised after the processes of invention, innovation and diffusion are complete (Hollander, 1965). The economic effects of innovation are strongly influenced by the speed of its adoption by follower firms and/or consumers (Frenz and Oughton, 2005) which in turn, is determined by network effects, the costs of adopting the new technology, the availability of finance, investment in fixed capital, proximity, cooperation between firms, market size and structure as well as, institutional, social and cultural factors (Hall, 2005)

## *2.5 Determinants of innovation: Internal characteristics of enterprise*

A good deal of innovation literature is focused on identifying the determinants of innovation. The internal factors that have been found to be significantly related to the innovative performance of firms are presented in Figure 2 and explained in detail subsequently.

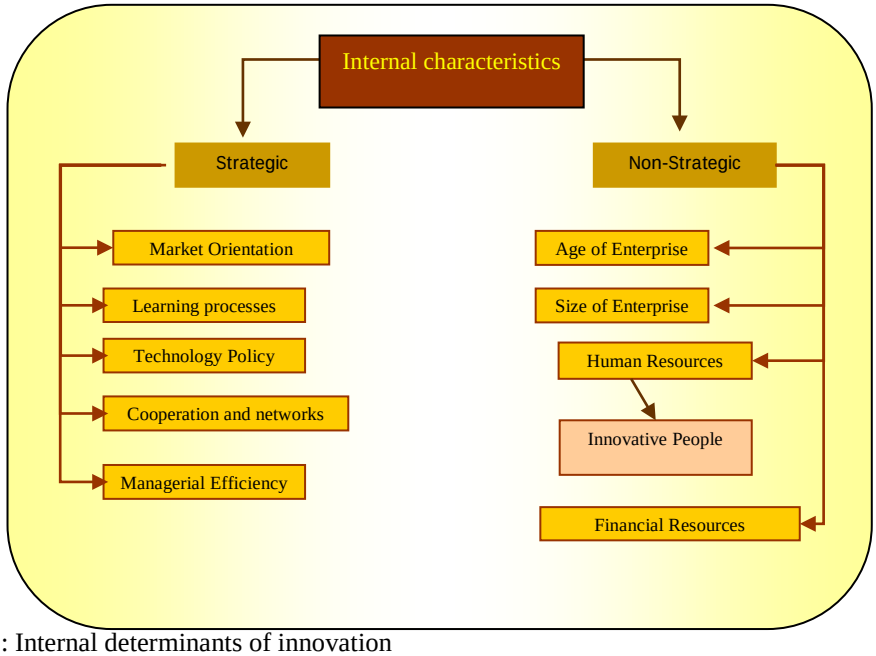


Figure 2: Internal determinants of innovation

### 2.5.1 **Internal strategic factors**

The organisation and processes internal to a firm are considered the most influential in determining its innovative performance. If at a point in time and space, some businesses are more innovative than others are, then they must have something internally distinctive to explain the difference. This notion has a strong intuitive appeal and an impressive array of studies have explored and tried to vindicate it, making it by far the most pursued innovation research theme. The determinants of innovation that emerge from this pursuit can be listed as follows:

#### 2.5.1.1 Market orientation

Understanding and anticipating customer needs and quickly and efficiently incorporating them in new products has been a recurrent conclusion of analysis of large firm innovation. It is shown, for example, that providing significant value to the customer is positively related to successful new products and negatively related to failures (Zirger and Maidique, 1990); firms that are able to reach the market earlier and efficiently with products that meet the needs and aspirations of customers, gain considerable competitive advantage (Wheelwright and Clark 1992); the successful products meet customer needs better than competitive products and reduce the customer's total costs, providing high value-in-use (Cooper and Kleinschmidt, 1993); when product innovators do not learn about customer needs, they often end up

developing products that are seriously flawed (Dougherty and Heller, 1994 and Hopkins, 2001); relative product quality, value-for-money and greater end-user benefits have significant roles in the financial performance of new products (Montoya-Weiss and Calantone, 1994) and product superiority -defined by the customer- is the most important aspect of a successful product development project (Cooper and Kleinschmidt, 2000). Jensen, (2001) cites Webster (1988), Day and Wesley (1988), Deshpandé *et al*. (1993), Jaworski and Kohli (1993), Gale (1994), Day (1994), Slater and Narver (1995) and Woodruff (1997) to argue that to succeed, organisations ought to re-orient their strategies towards superior customer value.

Scholars trying to ascertain whether the insights gained by researching large business innovation have validity for SMEs have found that in terms of market orientation successful SME innovators are no different from successful large firm innovators. In an analysis of 150 Greek SMEs, Salavou *et al.*, (2004), for instance, identify market orientation as one of the strategic determinants that improve SMEs innovative performance. They measure market orientation by using a variant of Ruekert scale (1992). This scale is akin to the instruments developed by Shapiro (1988), Kohli and Jaworski (1990) and Narver and Slater (1990). Salavou *et al.*, (2004) define their adapted instrument, as a set of distinct actions and conduct, which reflects the degree of a business' appreciation and responsiveness to user needs. This instrument incorporates various aspects of customer orientation and implementation of its market-led strategy. Lindman too (2002) uses a similar measure of market orientation to gauge the innovative efficiency of SMEs in the Finnish metal industry.

Heydebreck (1997) shows that the integration of customers into the product innovation processes leads to a higher degree of success in achieving company objectives. In the success of small high-tech firms, the role of market orientation and effective strategy formulation is often stressed (Oakey and Cooper, 1991, Roberts, 1991 and Dodgson and Rothwell, 1991). The crucial aspects of a heightened market orientation in these studies include competition analysis, co-operation, partnerships, speed and flexibility, among others (Soderquist *et al.*, 1997). Lindman, (2002) lists, ability to explore and reach potential markets, fit between the market needs and firm's resources, product planning from the inception, targeting the international market, span of market experience, pioneering attitude and the understanding of customer needs and user circumstances amongst the factors that mark the state of a firm's market orientation.

In the analysis of new service development too, it is found that successful service companies judge the potential of a proposed new service through Market tests and deploy user feedback extensively to modify a service innovation (De Brentani, 2001) and market research has a role in understanding customer needs and preferences and it provides useful inputs to create new goods to suit a diverse set of end-users (Edgett and Parkinson, 1994). A successful product launch begins with front-line work force training, effectual marketing and assessment of the product launch outcomes. A good fit between a firm's marketing capabilities and the sales force calibre, promotion and distribution methods and the quality of customer service is needed (Storey and Easingwood, 1996).

#### 2.5.1.2 Learning processes

Innovation involves the creation of new products and processes, needs a set of skills and orientation different from one sufficient for rote manufacturing and depends crucially on the quality of an organisation's learning ability. Organisational learning, in turn, depends on how the knowledge formation process works and drives the innovation strategically in an organisation (Stata, 1989). It fosters creativeness and ability to spot opportunities for innovation (Angle, 1989). It is applicable to both process and product innovation (McKee, 1992). Learning orientation is an indication of an appreciation of and need for absorbing new ideas (Hurley and Hult, 1998). Organisational innovation is dependent on learning (Mezias and Glynn, 1993) and is related to the firm's knowledge base (Cohen and Levinthal, 1990). Continuous learning is a way to attain and expand competitive advantage (Morgan *et al.*, 1998). Salavou *et al.* (2004) measure the quality of an organisation's learning processes through a seven-point Likert scale using the works of Dewar and Dutton (1986), Doyle (1989), Morgan *et al.* (1998) and Hurley and Hult (1998).

#### 2.5.1.3 Technology policy

Technological change is at the heart of innovation. It is true that organisations involved in innovation sometimes get the signals from the market on what kinds of products to develop, how to create them is, on most occasions, a technological issue. An organisation's ability to answer the question 'how can the technology at our command be marginally moulded to create a slightly different variant of the product to cater to an

emerging or hitherto unfulfilled need' is a measure of the state of its technology policy (Vyas 2005). Ettlie and Bridges (1982) explain, "*Technology policy reflects the innovative attitude of an organisation and its commitment to innovation. It involves such things as recruiting technical personnel, committing funds to new technology development and building or maintaining a tradition of being at the forefront of a technological area in a particular industry*". Soderquist *et al.* (1997) quote several empirical studies relating to a firm's innovative performance with the existence of a well-developed technology policy and claim that the presence of an explicit policy to deal with the issues of development of new ideas, products and processes points to the firm's technology orientation. An organisation's strategic stance incorporating a defined technology policy has been often analysed as a determinant of innovation (Wilson *et al.*, 1999). Lindman (2002) too uses a measure of technology policy to gauge the innovative efficiency of SMEs in Finnish metal industry. He suggests strong R&D orientation, active search for new technological knowledge, product uniqueness and products with technological newness and large application scope as indication of high technology orientation. It is also believed that an organisation's active acquisition of new technologies in itself should be considered innovative, as they can then employ them to develop new products (Cooper, 1984, 1994) and integration of innovation and technological considerations with strategic development is beneficial (Adler *et al.*, 1992; Erickson *et al.*, 1990; Fusfeld, 1989; Pavitt 1990 and Soderquist *et al.* 1997). Heydebreck, (1997), however, finds that a technology-oriented relationship with suppliers does *not* improve the process innovation success of a manufacturing company.

#### 2.5.1.4 Cooperation and networks

One of the more recent advances in understanding the SME sector has been the role of networks in their functioning. It is widely believed that successful SMEs use cooperative networks to compensate for their individual weaknesses. It thus seems natural that successful innovators amongst SMEs may also be using such networks to accomplish the tasks associated with innovation, which are generally more difficult for them in comparison to the large business. Dickson and Hadjimanolis (1998) argue, "*Since small firms typically lack some of the essential resources for innovation, such as specialist skills and research equipment, they have to acquire them from external sources, such as other firms, technical institutions, etc. Thus, the management of inter-organisational relationships and networking in general is critical for successful innovation by small firms*". Quoting Teece, (1986) they further argue that cooperative

phenomenon "*such as joint R&D activities, joint ventures, strategic alliances, etc. are particularly relevant to SMEs since their innovation activities may often extend beyond the boundaries of the single firm and its market, as they require relationship sources and information such as complementary assets, specialist equipment, know-how, etc. not available within their own organisation*" and claim that "*Innovative firms that cannot rely on their own internal capabilities and resources may therefore seek to establish formal or informal links and networks with external organisations possessing the appropriate resources and expertise*."

The network perspective provides a more complete account of the innovation activities of small firms as shown by Rothwell in his Systems Integration and Networking Model of the innovation process (Rothwell, 1992). This perspective clearly demonstrates that a firm's innovation strategies influence and are in turn influenced by the conduct and strategic stance of other agencies in the network (Bull, 1993).

Barnett and Story (2000) believe that to gain and maintain global competitive advantage small firms should possess certain specific assets which most of them usually lack. They, however, can compensate for this using various modes of collaboration with a wide range of players in the environment. This is how the advantage of collaboration can neutralise the adverse outcomes of throttling competition and diseconomies of scale (Raco, 1999). In this context, it is noted that high-tech firms are more likely to have an explicit and planned strategy of cooperation (Brush and Chaganti, 1996).

Frenz *et al.* (2004) cite the TRACES and HINDSIGHT projects in the US and the SAPPHO project in the UK as examples of importance of co-operation and networks of advice and information for successful innovation and recommend that public policy to promote such co-operation is called for. They claim that innovation by firms depends upon and is enhanced by co-operation and collaboration, both between firms and with other bodies such as universities and networking between firms and their suppliers, customers or even competitors. In high tech sectors, these types of alliances are very common. These alliances enhance the firm's innovative performance through a complex network of people relationships that boost learning, channel information flows and help coordination by creating trust and by redressing conflict of interest (Moss Kanter, 1994). Referring to Kitson *et al.* (2003)'s work on data from surveys conducted by the ESRC's Centre for Business Research (CBR), Frenz *et al.* (2004) report that half of the

innovating firms but just one sixth of the non-innovating ones engaged in collaborative partnerships. From the CBR data, it also appears that the overall impact of increased innovation and collaboration leads to enhanced rates of growth of output and employment both for the individual firm as well as for the whole economy. For the firm, collaboration and innovation result in a rise in both turnover and profitability.

Scotland's good performance as a novel product and process innovator despite low intramural investment in R&D is attributed partly to Scottish innovators' higher propensity to enter into cooperative arrangements for innovation with universities and research organisations (Franz *et al.,* 2004). Though, the validity of such explanation is questioned in Chapter 5 of this thesis in the light of evidence from various sources including this study.

#### 2.5.1.5 Managerial efficiency

Innovation can be seen as one of the managerial functions to be performed, not as frequently for the small firm as manufacturing or marketing but certainly quite often if it wishes to gain and maintain some competitive advantage. For this, the entrepreneur and the key decision makers in the firm must possess a unique and diverse set of managerial skills and capabilities (Beaver and Jennings, 2000 and Jennings and Beaver, 1997).

What makes the demands of innovation more complex is that unlike other managerial functions, not many business schools offer courses on innovation, which is considered a skill difficult to impart. Thus, a business, which has, generally poor managerial calibre is more likely to compromise an innovative project than the one, with high managerial efficiency. Therefore, the search has been on for analysing the skills needed by an SME to be a successful innovator.

Research analysing the inability of small firms to be consistently innovative indicates inadequate marketing and management skills (Moore, 1995). Beaver and Prince (2002) referring to the works of Grieve-Smith and Fleck (1987) explain that small firms have serious problems in obtaining and grooming requisite managerial talent, since they cannot afford the pay and prerequisites that the large firms usually provide. The managerial inefficacy thus obviously springs from financial inadequacy suffered by the small firms. They claim that unless small firms have the functional experts or high internal capabilities, information search and consequent managerial action can be

extremely expensive, misdirected and myopic. Freel (1998) believes that management competency is one of the two main skills constraints affecting SMEs innovation. Works on factors inhibiting small firm innovation consistently indicate low levels of general management particularly, marketing management skills (Adams, 1982; Bosworth and Jacobs, 1989; ACOST, 1990; Moore, 1995). Being a complicated process, innovation presupposes a certain level of management calibre. Managerial inadequacies within SMEs such as poor planning and financial judgement, thus, make innovation impossible (Barber *et al*., 1989). The other indicated managerial deficiencies include insufficient delegation, high turnover of managerial staff (Nooteboom, 1994) and excessive dependence on word-of-mouth sales without any coordinated marketing effort (Oakey, 1991).

### 2.5.2 **Internal non-strategic factors**

#### 2.5.2.1 Age

Schumpeter (1934) initiated the work on influence of age of the enterprise on innovation. For this purpose, he examined the late nineteenth century industrial structure in Europe, where the dominance of small firms was pervasive. He observed that small firms using new technology found it easier to enter an industry. He therefore visualised the small new firms as drivers of innovation and claimed that successful new firms usher in new ideas, products and processes. Their emergence, thus, disrupts existing arrays of organisation, production and distribution and quasi-rents, resulting from earlier innovations, are eliminated. He refers to this dynamics, 'creative destruction'. This is *Schumpeter Mark I* pattern of innovation (Avermaete *et al*., 2003).

#### 2.5.2.2 Size

The work on the relationship between innovation and the size of firm too is pioneered by Schumpeter (1942). In this later work, he takes a position, now popularly referred to as *Schumpeter Mark II* pattern of innovation, diametrically opposite of the one he earlier articulated in 1932 and posits that in relation to small firms large firms have a higher probability of innovation. Using their financial resources large firms engage in R&D projects, accumulating in the process, technical expertise in their areas of specialisation and thus use innovation as a barrier to entry in the industry (te Velde, 2001). Avermaete *et al*., (2003) referring to the subsequent work by Malerba and Orsenigo, (1995), Breschi (1999), Le Bars *et al.*, (1998) and Antonelli and Calderini (1999) on the

relationship between innovation and firm size, note that later empirical works too have thrown up seemingly contradictory outcomes. Citing Le Bars *et al*., 1998 and Grunert *et al.,* 1997 they attribute this to the fact that researchers have used varying measures of innovation and sampling methods. In some, data is taken from different industries to draw general conclusions, whereas, in others, the focus is on industry-specific innovation. Moreover, the firms' size distributions differ from sample to sample and often the very small firms are kept out of analyses.

#### 2.5.2.3 Human resources

Some analysts have advocated a people-centric approach to the analysis of innovation. They claim that success in innovation is people dependant rather than resource dependant (Rothwell, 1983, 1992) and it is the nature and quality of its work force that determines whether a business is able to innovate or not. Freel (1999) has tried to measure skill constraints faced by a small business and its impact on its ability to innovate. He argues *"…skill constraints to innovation within small firms are generally of two principal types, management competency and skilled labour"*. More recently KPMG's *Aiming to Grow in 2005* survey reported that 33% Scottish SMEs believed that skill shortages had a detrimental impact on their new product development efforts (SFDF Manifesto, 2007)

De Jong *et al.* (2003) analysing the works of Scheuing and Johnson, (1989), Bowers (1989), Meyer and DeTore, (2001) and Avlonitis *et al.* (2001) report that much of the new service development literature too analyses methods and techniques that foster and direct staff creativity and screen promising staff ideas and put in place mechanisms for guiding the service development process. This highlights the significance of human resources in service development as well.

##### *2.5.2.3.1 Innovative people*

Probably the most important work recently has been the development of a four-factor confluence model of employee innovation (Patterson, 2000). The model incorporates personality, motivation and intellect aspects of people and uses the factors, (1) Motivation to Change, (2) Challenging Behaviour (3) Consistency of Work Styles and (4) Adaptation. Based on 11 field studies, it demonstrates high predictive validity, where Motivation to Change and Challenging Behaviour are shown to be positively

related to innovation and Consistency of Work Styles and Adaptation negatively related to it. Of these, Motivation to Change has emerged as the best person level indicator of creativity and innovation across a variety of organisations.

#### 2.5.2.4 Financial resources

One of the perennial problems with which a typical small firm grapples throughout its existence and particularly so at inception is inadequacy of resources that spring from financial insufficiency. For a fledgling enterprise even incremental innovation, needs resources beyond its grasp. The ability of a small firm to innovate, thus, depends very crucially on its ability to manage resources needed for innovation. As explained earlier, one of the most direct impacts of financial inadequacy is on ability to recruit the right kind of people, which in turn affects its ability to innovate. It is pointed out in the literature that SMEs face serious constraints in recruiting, training and retaining competent and qualified managerial workforce due to the lack of capacity to compete in labour markets, inability to pay high wages, high costs of staff training and continuous poaching by large firms (Westhead and Storey, 1996; Oakey, 1997). The fact that these demands are made over and above the costs of product and market development prove too prohibitive for SMEs.

The problems are no different in new service development where resource adequacy is crucial during implementation. This is further exacerbated for the service developers as the view of traditional lenders is coloured by their overwhelming experience of dealings with product innovators. Service firms are not able to show tangible assets coming out of their innovative activities and financial institutions find it difficult to visualise what it is in which they are investing (Preissl, 1998).

Beaver and Prince (2002) note that "*SMEs engaged in the innovation process have different and special financing requirements that arise because of the need for seed capital and development capital. The process of research and development can take some time before the firm has a commercially viable product with which to go to market and during this period, there are no returns for the investors who are required to provide long-term patient money. Access to finance and the presence of equity gaps are commonly cited as major barriers to innovation throughout the small business literature. Innovation often requires considerable front-end sunk costs, invariably beyond the scope of the small firm's internal resources. This, allied with the frequent*

*inability of the funding providers to assess adequately either the technological validity or the project viability, often militates against finance provision*". Oakey (1997), in his examination of public policy towards small business innovation particularly innovation by high tech small firms, argues that most policy thinking is implicitly or explicitly, affected by the capital shortage.

## *2.6 Determinants of innovation: External characteristics*

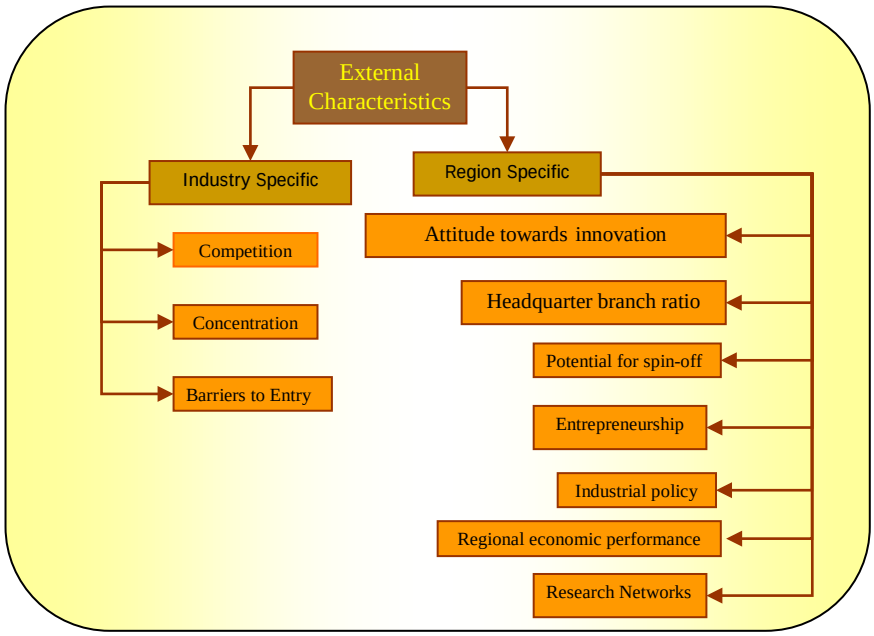



Figure 3: External determinants of innovation

### 2.6.1 **External industry specific factors**

The industry specific factors that have been analysed by scholars relate to the nature of competition in the industry related particularly to concentration and barriers to entry, (Kraft, 1989 and Dijk *et al.*, 1997).

Schumpeter (1942) argues that high barriers to entry and industrial concentration motivate innovation by restricting competitive initiative and enhancing profitability. This in turn provides the requisite financial resources for R&D and gives an impetus to innovation. Subsequent work, however, has generated mixed results on the impact of competitive structure in an industry on the innovative conduct of enterprises within it.

On Schumpeter's side of the argument, though not exactly reiterating the ease of innovation caused by a lack of competition but rather highlighting difficulties of

innovation under stiff competition, it is asserted that too much competition may dampen tendencies to innovate and seriously restrict a firm's innovative action (Kamien and Schwartz, 1982); it would inhibit rather than promote product innovation (Abernathy and Utterback, 1978) and may encourage firms to try and gain competitive advantage through routes other than product innovation (Fritz, 1989).

On the other side of the divide, it is contended that in the absence of competition, innovation becomes unnecessary (Dasgupta and Stiglitz, 1980) and barriers to entry decrease the incentive to be the product pioneer (Kraft, 1989)

### 2.6.2 External region specific factors

SMEs' innovation, very often, has been studied with a regional focus. Recent SME innovation studies include those that analyse the phenomenon in *Portugal* (Fontes and Coombs 1996), *France* (Soderquist *et al.*, 1997), *Turkey* (Burgess *et al.*, 1998), *Cyprus* (Dickson and Hadjimanolis 1998), *Central London*, (Georgellis *et al.*, 2000), *Finland* (Lindman, 2002), *Holland*, (Engelen, 2002), *Belgium* (Avermaete *et al.*, 2003), *Greece* (Salavou *et al.*, 2004), *Northern Ireland*, (McAdam *et al.*, 2004), *UK*, (Boyle 1998, Freel, 1999, Woodcock *et al.*, 2000, Stockdale 2002 and Frenz *et al.*, 2004) and *Wisconsin* US (Blumentritt 2004).

In one of the early works on the regional dimension of innovation, Oakey (1979) reports that in all planning regions of the UK, there was a strong tendency for short distance intra-regional movement of innovations, which highlights the importance of developing indigenous regional innovation potential.

In an analysis based on 300 important innovations introduced by the UK firms between 1956 and 1978 Oakey *et al.* (1980) show that branch plants do not produce their expected share of innovation. They conclude that new techniques are more likely to be developed and manufactured on site if the plant concerned is a headquarter factory while 'branch' plants are more likely to 'import' products developed elsewhere. The location of centres of R&D expertise is clearly a significant aspect in determining the location of a company's first commercial manufacturer of innovations. Significant more plants, both large and small, produce innovations in the southeast than expected, while in the Development Areas, small firms perform well and large firms perform rather

poorly. This might be taken to suggest that small plants are better suited to regional innovations- especially independent small plants – than are larger plants.

In their seminal work on small firm innovation Rothwell and Zegveld (1982) try to address the issue whether innovation and particularly small firm innovation is a regional phenomenon. They report that:

1. A Country's propensity for technological innovation is determined by not only the economic conditions prevailing there and its R&D infrastructure, but also by the society's attitude towards innovation. Cultural differences between different countries and regions strongly affect the rate and direction of technical change as well as government policies set up to foster innovation.
2. Independent small firms might be better vehicles for regional development than the branch manufacturing plants of large firms. Large companies tend to establish centralised R&D laboratories, thus localising innovative effort, often at the site of patent establishment, which can make it difficult for branch plants to innovate in response to local market needs.
3. The markets of independent small firms are often localized thus making small firm innovation largely a local phenomenon; this is well illustrated in the UK.

Oakey *et al.* (1988) in a later work highlight the interaction between the peculiarity of a region and the functioning of high-technology small firms there. Quoting previous research in the field, they explain that:

1. The regional quantity and quality of management of high-technology small firms in the short run is partly caused by the pre-existing local industrial milieu, for example, the potential for spin-off entrepreneurs from local industry and universities, yet it is determined in the long run by the current behaviour of such actors in the local economies. In this sense, a 'vicious cycle' of causality may be at work in which regions with a poor level of entrepreneurship at a given time inherit a poor entrepreneurial environment at a later time because of a continuing impoverished local enterprise culture. Conversely, regions such as Silicon Valley experience conditions where high level of entrepreneurship breeds further entrepreneurship. This is due, both to a conductive resource environment

and because of a 'demonstration effect' where new entrepreneurs learn from their former bosses.

2. Since *indigenous growth* is one of the few viable options for development regions (Ewers and Wettman 1980), the problem of lack of innovation in poor indigenous development-regions should be addressed through appropriate policies. The bottleneck to indigenous growth is particularly severe in the context of high technology small firms since, they have strong growth potential.
3. It is clear both from the implications of agglomeration and from an impressive body of evidence on small firm 'spin-off' from large established corporations that existing high technology large firms are a major source of new entrepreneurs in a local area (Speigelman, 1964; Cooper 1970; Freeman 1982).

In relatively more recent explorations on regional context of small firm innovation, it is found that

1. Apart from economic performance, the political, technological and institutional settings of a region too determine the potential of its innovative milieu (Camagni, 1991).
2. New technology-based firms that are located in science parks grow faster than independent companies (Heydebreck, 1997) do.
3. Beaver and Prince, (2002) claim that "*there is compelling evidence to suggest that innovative SMEs do better when they are part of a community or cluster of like-minded firms that can participate in a supportive infrastructure that encourages their development and prosperity. Successful examples of such concentrations would be Silicon Valley in California, USA and the Cambridge Phenomeno*n"
4. Legislation and Industrial policy in the region, public research institutes, universities, membership of industry wide associations and other forms of networking influence a firm's innovative conduct (Antonelli and Calderini, 1999; Breschi, 1999, Avermaete *et al.*, 2003).

## *2.7 The process perspective to innovation in SMEs*

A fourth strand of scholarly work on innovation, apart from the abovementioned concerning definition, taxonomy and determinants of innovation, is the one that analyses the *process* of innovation. From this point of view, innovation is visualised as

a chain of events, not necessarily chronological, that culminate in successful new product or process development.

Though a major part of analytical writing on innovation involves the examination of determinants of innovation and the writings on the process of innovation have been less prolific and more recent (Wolfe, 1994), it is argued that the process perspective to the phenomenon of innovation, particularly amongst SMEs, is more meaningful and relevant than its determinant based view because of its sensitivity to the 'micro-processes of innovation' and its ability to explain 'the embededness of innovation in SMEs' (Edwards *et al.* , 2005)

The argument is that it is only through a process perspective that one captures the essence of the relationship between management practice at the level of a firm and its external environment, a focus of research, which has remained underdeveloped in the existing literature of innovation in SMEs (Edwards *et al.*, 2005). It also helps in a better understanding of *'the individual entrepreneur, her or his venture and its context by considering them jointly'* (Johannisson and Monsted, 1997).

Nooteboom's (2000) observation that managerial learning leads to the development of structures through application of ideas in evolving contexts too is consistent with a process perspective which explains how *'ideas, innovations and routines settle into a best practice or a dominant design that serves as a prototype for applications and variations in new contexts'*.

The seminal work on product development process by Cooper and his stage–gate® model is the best-known example of this genre (Cooper, 1990). Cooper describes a stage-gate system as *"…both a conceptual and an operation model for moving a new product from idea to launch.'* The basic thought behind the stage-gate approach is that the new product development process passes through many stages, such as, assessment, business case preparation, development, testing, validation and market launch. Before it can enter a particular stage, it must pass through a 'gate' or pass a test of having fulfilled all criteria that are designated to ensure that the project is worthy of going forward. Failing these tests, the project is stopped in its tracks for it to improve enough to pass these tests subsequently and go though the 'gate' to reach the next stage or else it must be killed. The notion behind the stage-gate system is that if a project were tested

for its further potential at every stage of development then ideas without merit would not use up resources only to eventually prove failures. Through such continuous testing of merit of product development projects the company would be able to focus on ideas that will eventually succeed, in the process making the product development process more successful and cost effective.

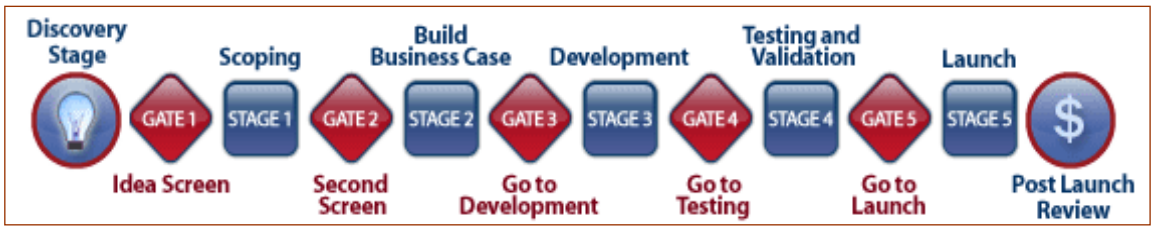



Figure 4: An Overview of the Stage-Gate System
Source: Cooper (1990)

Cooper's work concerns the large corporation and looks at innovation from a high-tech perspective. As will be explained later in this thesis, the process of innovation in small low-tech enterprises is quite similar to the one described by Cooper, the main distinguishing feature being the greater informality in the later case.

## *2.8 Management of innovation*

One further strand of literature on innovation discusses the management or implementation of innovation. McAdam (2005) observes that though there is a substantial body of work on the concept of innovation, the work on management or implementation of innovation is limited and is of recent origins. He argues that such work is equally if not more important as no matter how well versed the entrepreneurs and managers are about what innovation is and what its determinants are, in absence of knowledge about how to manage and implement it, progress on a practical level cannot be made. McAdam (2005) believes that innovation management is influenced by three issues, normative evaluation, legitimisation and conflict. Alvesson and Willmott (1992) define normative evaluation or normalisation as *"comparison against a set of norms, standards and routines which conform to a corporate agenda and require obedience from individual and groups in a structurally prescribed manner."* (The same notion is termed as 'functionalism' by Alvesson and Deetz, (2002) in a subsequent work). It can be understood that there are obvious normative evaluation issues in the management of innovation as the very process of innovation disrupts the 'set of norms, standards and routines'. Legitimisation involves accepting or rejecting a proposed innovation at the group or organisational level. It is easy to see the interplay between legitimisation and

normative evaluation. If the normative evaluation is favourable, legitimisation occurs otherwise not.

The third issue suggested in this context by McAdam is conflict. Innovation by its very nature disrupts the status quo and may cause conflict. Successful innovation may enhance the profile of individuals directly presumed to be responsible for it and may cause a relative decline in status of people not associated with or seen to have been its opponents. Here one can visualise a conflict between the entrepreneur and the leader. If an entrepreneur were to find that one of his employees is taking a leadership role in championing and executing innovation he may feel threatened and this may cause a conflict between two. Another kind of conflict that can be visualised here is where there is a conflict between the two roles of entrepreneur as an innovator and as a leader.

The distinction between 'good and ‘bad’ conflict is also important here (Brown and Duguid, 1999). The former leading to benefits and the later causing disruption and damage, implying that the organisations that are able to manage the conflict resulting from innovation implementation positively, would gain whereas those that fail to do so would not reap the benefits of innovation but and lose organisational cohesiveness.

Carmen et al. (2005) in their work on the influence of top management team visions on innovation outcomes show that vision alone does not result in innovation success. This means that leadership in any organisation cannot usher in a climate of innovation or cause actual innovation to occur just through a strategic vision. They, however, find that organisational autonomy is a good predictor of successful innovation management. This shows that the way forward to avoid a conflict amongst the stakeholders in an organisation whether they are entrepreneurs, leaders, or innovators, is through the independence of decision-making. Autonomy being an antidote to conflict, it can address the issue of damaging consequences of conflict on innovation. Chanal (2004) draws attention to other kinds of conflict the entrepreneur and the managers face while managing innovation. One is between the demands of maintaining a structured organisation needed to satisfy schedules and budgets and the flexibility required for creating innovative goods and services as pointed out by Brown and Eisenhardt (1998). The others are conflicts between change and persistence and between novelty and repetition as discussed by Sztompka (1991). She argues that a discursive rather than an intuitive approach is needed for successful management of innovation if these conflicts are to be redressed constructively.

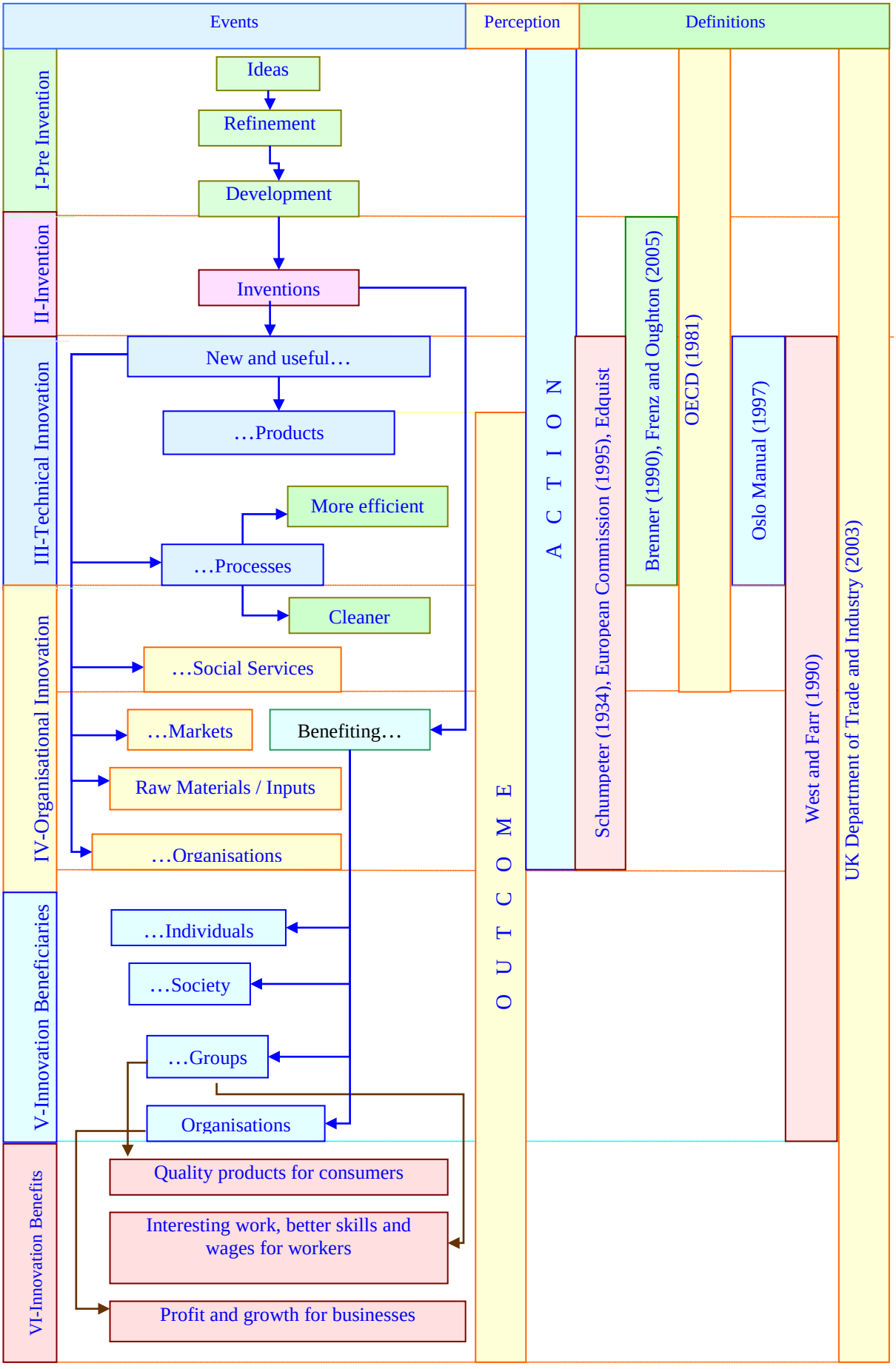
## *2.9 Definition, taxonomy and perspectives of innovation: A Critique*

### 2.9.1 Definition: The innovation-span

The description of innovation in the literature encompasses a wide range of perspectives. A closer examination, however, reveals that the definitional writing on innovation collectively captures several aspects of a large span of innovation related, overlapping actions and outcomes. Through figure 5, a new conceptual construct, the '*innovation-span'*, is presented within which, as will be shown later, all notions and definitions of innovation can be accommodated. This concept of *innovation-span* is based on the premise that all innovation definitions recognise, implicitly or explicitly, that new ideas are at the core of a chain of events that culminate in innovation and deliver its consequent payoffs. It is also generally accepted that during the process of innovation ideas are refined and transformed into useful new products, processes or organisations. The process sometimes steers the business into new markets, or allows it to use new inputs. This transformation delivers potential benefits for individuals, groups, organisations and society. It provides higher profits and growth for businesses, cheaper and better goods for consumers and higher earnings and more interesting work for employees. Despite a plethora of definitions of innovation, there is no real disagreement amongst the scholars on the essential nature and consequences of innovation described above. The apparent lack of settled opinion on the definition of innovation results from scholars and organisations including in their definitions, only certain segments of the full *innovation-span*. For instance, as shown in figure 5, Brenner (1990) and Frenz and Oughton (2005) discuss only segments II and III, Schumpeter (1934), European Commission (1995) and Edquist (2001) focus on segments III and IV, OECD (1981) incorporates segments I, II and a part of segment III, Oslo Manual (1997) considers only segment III, West and Farr (1990) include segments III, IV and V whereas the UK Department of Trade and Industry (2003) in the widest articulation of innovation, incorporates all segments from I through VI.

The idea of *innovation-span* not only clarifies the apparent conflict in the meaning of innovation, it can also provide a wider and yet congruent context to all works on innovation, by identifying at the outset, the components of the *innovation-span*, they are concerned with.

Figure 5: The Innovation Span



The *innovation-span* also provides a mechanism to compare the previous research on innovation and brings into sharp relief the futility of comparison of works concerning non-common segments of the *innovation span*. In addition, it has the flexibility of incorporating any new segments or components emerging from future work, not included here, by linking them to the span at appropriate points.

The utility of the notion of *innovation-span* becomes obvious by the fact that this dissertation concerns segments I, II and III of the *innovation-span as* it explores the refinement and development of ideas into new and useful products and processes in the Scottish food SMEs.

### 2.9.2 Taxonomy

Despite a seeming exclusivity of classification reflected in the taxonomy discussed in literature, there is an overlap between some of the different classes of innovation. For instance, it is generally not possible to create an absolutely new product without a concomitant, albeit sometimes marginal, change in existing processes. Similarly, a new production process usually alters, again sometimes only marginally, the existing products. As the source of competitive advantage is in the product as well as in the process, in most cases, innovative firms bring about simultaneous change in both and therefore innovation at the level of a firm has elements of product as well as process components and the separation between the two suggested by the above taxonomy is not always observed. Similarly, absolutely new products, unrelated, in any way, to the existing ones are created so rarely that almost all innovation, in a way, is incremental.

It should be noted in this context that product and process innovation have been explored more often and in-depth than organisational innovations. The reason is that data on R&D has been easily available to be used as a convenient proxy for product and process innovation. However, as will be explained in Chapter 5, the use of R&D as a proxy for innovation is problematic as R&D investment is not always a good predictor of innovation performance of businesses. Two reasons are apparently responsible for it. Not all R&D results in successful product or process development and all product and process innovations do not necessarily need R&D investments. Another significant issue in this context is that innovative performance of businesses depends on both

volume and efficiency of R&D effort and data on R&D expenditure shows only its volume and not its efficiency.

### 2.9.3 Innovation perspective: Process versus determinants

Despite the arguments listed earlier on the superiority of a process-centric perspective over a determinants based view of innovation in SMEs, it would not be wise to discard completely the voluminous existing work on the determinants of innovation spanning more than three decades. Analysing SMEs innovation first from a process perspective and then linking the results of such effort to the extant literature in terms of the presence or absence of innovation determinants confirmed by the previous research is a more meaningful approach. In this thesis, such an approach is used.

## *2.10 Conclusions*

The above review of literature charts major scholarly efforts on the definition, taxonomy, determinants, process and effects of innovation.

It is obvious that definitional endeavour on innovation has generated a large number of perspectives to the phenomenon of innovation. There has not been, any attempt to unify these diverse notions of innovation. Such an attempt is made here by conceptualising the idea of an innovation-span. It would be churlish to claim that it finally settles the apparent conflict in understanding of innovation but it does represent advancement in our understanding of innovation. As explained above, the notion of innovation-span allows all work on innovation, including the work contained in this thesis, to be juxtaposed in a wider and yet congruent context.

Efforts to ascertain the factors affecting the success of innovation in business organisations too have produced a large number of definite influences. Depending on their research focus and the data availability, innovation scholars have tried to conceptualise a number of determinants and verify their impact on innovation performance of businesses in a region, in an industry or in a group of enterprises chosen, based on some other suitable criteria. Major determinants of innovation reported in literature are classified here, starting with the broad categories of internal and external characteristics of enterprise. Internal characteristics are then divided into strategic and non-strategic variables whereas the external determinants are classified into region and industry specific factors.

This effort allowed crystallisation of this research inquiry. As this inquiry is on innovation and new product development in the Scottish food SMEs, the pursuit of external characteristics of business as an innovation influence is automatically ruled out. The search here, therefore, is for the internal characteristics of case study enterprises that played a role in shaping the direction, pace and outcome of their innovative efforts. It also attempts to discover what part of taxonomy of innovation, discussed in the literature, does the Scottish food SMEs innovations fit into.

This research, however, is more ambitious than what the above discussion would indicate. In fact, if this effort were confined to only to the identification of determinants and taxonomy of innovation in the Scottish food SMEs, the research strategy that used here and the research process that this project passed through, would have been very different.

A research project setting out to understand only the determinants of innovation in the Scottish food SMEs would have been best served by sending out a mail questionnaire designed to judge the presence or absence of determinants already reported in literature to all known small innovative food companies in Scotland. The outcome of such research effort would have been less instructive. Though it would have certainly confirmed the presence or otherwise of innovation determinants in the Scottish food SMEs reported in other contexts and highlighted the distinguishing features of the Scottish food SMEs innovation, it would have fallen short of accentuating the more substantive and interesting issues in the context. As stated above, the phenomenon of SMEs innovation is better understood as a chain of causal events culminating in innovation rather than in terms of a set of discrete influencing variables. The moot question therefore is, if there are a number of businesses in the food sector in Scotland that have successfully created new products then, is there a single identifiable underlying process through which they all have passed. If yes, then what is that process? Alternatively, have they each gone through a different route to reach the same goal (or there are more than one routes but not as many as the number of enterprise)? Then, what are the major points of departure between enterprises in their journeys from ideas to products and what are the influences prompting each departure? Following Bygrave (1989), ‘the enlightened speculation’ here was that there should be one single underlying process, with minor variations. The reasoning was that these companies are

similar on many counts. Each of them is small, Scottish, in the food sector and a successful product innovator. It therefore seems intuitively appealing that they would have similar strengths, drawbacks and scope in their efforts to create new goods. The process that they use to develop new products therefore must have many common threads.

In comparison to a discrete and piecemeal nature of innovation that emerges from an analysis of innovation determinants, this visualisation of innovation as a continuous process is more illuminating as it not merely lists the major influences on the innovation process, it connects them through a succession of logical causality. As there is need not merely to understand what the major influences on innovation process in the Scottish food SMEs are but also to know if the process can be replicated in other presently non-innovative but willing food companies, a discrete determinants based view of innovation is, thus, less useful than a continuous process perception of it.

## *2.11 The research questions*

For the reasons explained above, this research tries to find answers to the following questions.

1. Is there an underlying common process of innovation in the Scottish food SMEs?
2. What are the internal strategic and non-strategic determinants of innovation in the Scottish food SMEs?
3. What part(s) of standard taxonomy of innovation, the successful innovation in the Scottish food SMEs fits into?
4. What aspects of product innovation by Scottish food SMEs can be generalised in the wider Scottish economy?

# 3 Methodology

## 3.1 Background

The aim of this research is to investigate the process of innovation in the Scottish food industry, generate as well as test relevant theoretical propositions and articulate a set of policy prescriptions. It also attempts to see if there is an ascertainable pattern to the innovation process carried out by small food companies in Scotland and to explore possibilities of transplanting these processes in presently non-innovative Scottish food companies and beyond. This research thus is prompted by motives extending past intellectual curiosity. It aims not merely to build a theory of a less understood phenomenon but also to explore its potential for a larger social good. As explained in the literature review, this inclination played a role in shaping the research questions for this investigation and thereby influenced the methodological issues for this research.

In order to achieve this goal an attempt is made in this research to understand and explain how small Scottish food companies organisations generate new product ideas, how are these ideas screened or validated and how are they implemented i.e. how the ideas are converted in saleable products. At the same time, it is also explored if process innovation too has been carried out by these businesses and the nature of their activities on this front. Also investigated is the role of determinants of innovation identified in previous research namely, market orientation learning processes, technology policy, cooperative networks, managerial efficiency, pioneering innovative policy orientation, age, size, human resources (particularly innovation potential of people involved with new product development) and financial resources in the success of innovative efforts of these organisations.

## 3.2 The method

The main body of this thesis and its principal conclusions are derived from case studies of eight innovative Scottish food companies using a qualitative rather than quantitative method or, to use a more contemporary vocabulary, deploying an exploratory rather than a confirmatory research approach (Onwuegbuzie and Teddlie, 2003). The conclusion so derived are subsequently attempted to be confirmed through a survey of Scottish companies who have successfully developed new products.

### 3.2.1 **What is a case study**

According to Yin, (2003), *"A case study is an empirical enquiry that investigates a contemporary phenomenon within its real life context, especially when the boundaries between phenomenon and context are not clearly evident"*. case studies usually deploy a combination of data collection methods such as 'archival searches, interviews, questionnaires and observation' (Eisenhardt, 1989). While quantitative data do sometimes form part of case studies, they are largely qualitative. case studies usually depict an authentic, though summarised record of events, the main players concerned, and other influencing variables, and generally have 'an institutional focus' (Rosselle, 1996). As a research strategy, the focus of case studies is unravelling the nature of dynamics present within situations. They are especially valuable when the laboratory type of controls are not feasible and/or ethically unjustified (Miles and Huberman, 1984; Yin, 1994; Remenyi et al., 1998).

Affording a flexible and often an opportunistic research approach is the obvious strength of case studies, it, however, can also turn out to be its chief drawback, specially, if the research process is not very well documented. If, however, the researchers can link the flexibility allowed by the case study research with the classical research cycle of 'description, explanation and testing' (Meredith, 1993), they can generate useful insights. As stated above 'the case study research investigates a contemporary phenomenon in its real life context' (Yin, 2003), and so as a research strategy, extant theories can always be used as a basis to gain initial understanding of the phenomenon under investigation. Yin (2003) describes three types of case studies:

1. An exploratory case study, which can help the researcher define and sharpen the queries and hypotheses for a later study, which may or may not be a case study
2. A descriptive case study, which provides a comprehensive description of 'a phenomenon within its context' and
3. An explanatory case study which espouses a cause-effect relationship or explains how the known events have happened.

Though principal use of case studies in research is to collect data, their main utility is in building and confirming theories (Eisenhardt 1989; Yin, 1994; Westbrook, 1995; Swartz and Boaden, 1997; de Weerd-Nederhof, 2001). case studies, being the chronicles of real activities at a particular point in time, are of immense value in theory

construction particularly in exploratory case study research. Here it is necessary to emphasise that theory building includes both new theory construction as well as adaptation of existing theories to explain known but ‘previously unexplained empirical generalisations’ (Brewer and Hunter, 1989). Zonabend (1992) states that case studies involve critical focus on ‘complexities in observation, reconstruction, and analysis’ of the phenomenon under investigation and include the views of the players in the case under investigation. The notion that even properly executed case studies are not rigorous enough is not true. In reality, case studies are quite difficult to carry out, and the impression that they are a ‘soft’ research option is misleading (Yin, 1984, Patton and Appelbaum, 2003).

### 3.2.2 **Why case study research**

case study research makes distinct contributions to our understanding of social, political and economic phenomena and fulfils our desire to know and comprehend complex entities (Patton and Appelbaum, 2003). A properly conducted case study captures the holistic and significant features of real-life events as it deals with a variety of evidence (Yin, 1984)

case studies are often based on a limited number of cases. If, however, the researcher has a good analytical ability to understand the nature and consequences of interaction between various components of the systems and the components themselves, he/she can generalise from few or even a single case reasonably well (Normann, 1984). Yin (1984) points out, when a researcher’s goal is to ‘expand and generalise theories (analytic generalisation) and not to enumerate frequencies (statistical generalisation)’, case study research methods can be very useful. case study research in fact may often discover intricate details of subjects under study, show up crucial relationships between core components and is particularly valuable in absence of any strong theory to depend on (Bozeman and Klein, 1999).

Yin (1994) believes that case studies should be the preferred research strategy when answers to "how" and "why" issues are being sought, when the researcher has no or very little control over the events and a ‘contemporary phenomenon within a real-life context’ is being investigated. Westgren and Zering (1998) argue that case study research is better equipped than survey methods to answer the "whys" and "hows" as it can probe more acutely the conduct and motivation of people than structured surveys.

case research has also room for incorporating all relevant factors and an opportunity to portray real-life field practice. Patton and Appelbaum (2003) argue that case study is a valid and reliable method for research in management. They satisfy all core tenets of quality research and inhabit a vital niche in management science.

### 3.2.3 **Limitations of case study research**

Though the case study research has distinct merit particularly for exploratory studies, it has been criticised on certain grounds. This criticism should be taken in account, and appropriate precautions should be taken if a meaningful case study is to be conducted. One of the criticism is that case study research lacks rigour, may be biased and contains a possibility that theory generation may be ad-hock and significant test data may be excluded (Amaratunga and Baldry, 2001; Seuring, 2008). Bromley (1986) cites 'researcher bias' as one of the limitations of case study research. Becker (1986) similarly believes that lack of objectivity could come from researcher's feelings for the subjects under investigation. The findings from multiple case studies, though, are believed to be more convincing and robust. Inability of case study to be a basis of conventional 'scientific generalisation' too is pointed out (Yin, 1994; Remenyi et al., 1998). In defence of this criticism, however, it is argued that case study research aims at creations of generalisation for theoretical propositions (analytical generalisation) but not generalisations for populations or universes (statistical generalisation). Santos (1999) in this context argues that case studies analyse distinct phenomenon in unique settings and their results are not meant to be applied to settings, which are significantly different from those under investigation. Westbrook (1995) believe that case study research lacks efficiency and may be time-consuming as several visits to a host of locations may be required to understand a phenomenon in requisite detail. Swartz and Boaden (1997) draw attention to the fact that only a small number of cases can be practically undertaken, which renders generalisation difficult. Tendencies to build an all-inclusive theory also sometimes make many case studies invalid (Eisenhardt, 1989). Too much description and too little analysis is also cited in this context (Simon et al, 1996). In multiple case studies sometimes a significant number of variables may differ from case to case and no generalised conclusions can be drawn (Westbrook, 1995). There is no guarantee that the informants will reveal the true information, as there can be a large number of reasons for them to be less than forthright (Seuring, 2008)

The following precautions were taken to minimise the impact of above-mentioned drawbacks on the validly of this research:

1. To avoid the bias, lack of rigour and ad-hock theorisation associated with single case studies, multiple case studies of eight companies were conducted.
2. Instead of building an all-inclusive theory, only broad theoretical propositions are spelt out.
3. Analytical generalisations that emerge from work, rather than statistical generalisations, are derived and presented.
4. a more analytical and less descriptive approach to the presentation of results is adopted.
5. To avoid the problem of too many uncommon variables between the cases companies that had many common characteristics are selected.
6. The information that the respondents provided was crosschecked with the prior information gathered on the companies.

### 3.2.4 **How the case studies were conducted in this research**

#### 3.2.4.1 Identification of literature gap

This research started with a review of literature on business innovation particularly small business innovation. From this review, a significant gap in the literature became obvious. It was apparent that the previous work in business innovation is largely focused on innovation in high-tech enterprises and the research on low-tech industries is virtually non-existent. A concurrent review of information on Scottish economy, on the other hand, revealed that the Scottish economy is composed predominantly of low-tech enterprises. This led to the conclusion that a work on innovation in low-tech enterprises would fill a significant gap in literature on business innovation and at the same time would have high practical utility in Scotland. It was thus decided to investigate innovation in one of the low-tech Scottish industries. This is how a gap in literature and the ground realities of Scottish economy together shaped the theme of this investigation.

#### 3.2.4.2 Research objectives

As stated, from a review of literature on small business innovation and the study of composition of Scottish economy, objective of this research was derived and the theme of innovation in low-tech Scottish enterprises was picked up. As one of the supervisors

of this research, Mr. Aidan Craig has significant experience of working in the Scottish food industry as well as good contacts therein, amongst the low-tech Scottish industries; it was decided to investigate the Scottish food industry. The research objective to generate a theory of innovation in low-tech enterprises and produce prescriptive suggestions to make such enterprises more innovative, thus incorporated Scottish food industry as its focus.

#### 3.2.4.3 Research approach or the epistemological foundation of work

Like all human conduct, academic research too is based overtly or otherwise, on some philosophical outlook. Neglecting a philosophical perspective, though not necessarily lethal, can acutely impact the value of management research (Amaratunga and Baldry, 2001). An understanding of the philosophical positioning of research helps researchers in identifying diverse research designs and approaches as well as in deciding which one is the most appropriate for their purpose (Easterby-Smith, 1991).

The four paradigms of research methodology on which much of academic research is grounded are positivism, realism, critical theory and constructivism.

The *positivist* approach, principally a quantitative approach, is based on the belief that a unit of investigation should always be measured objectively and not subjectively. The two chief ramifications of positivist's approach are independence of researcher from the subject and formulation of hypothesis for testing. Positivism is based on the belief in existence of causal relationship and elemental laws, and usually trims down the investigated entity into smaller and simpler components to facilitate analysis (Easterby-Smith, 1991; Remenyi et al., 1998).

The *realistic* approach, also referred to as the phenomenological or inductive research, assumes the reality to be 'holistic and socially constructed' which cannot be determined objectively. The realist researchers attempt to comprehend and elucidate a phenomenon. They do not seek to discover any external causes or elemental laws (Easterby-Smith, 1991; Remenyi, 1998). Most qualitative techniques are grounded in a realistic methodological paradigm.

*Critical theory* presumes that all political, economic, social or cultural reality is comprehensible. It visualises investigators and their subjects to be interactively

interlinked and assumes that the system of belief of investigators influences their inquiry through a discourse between the researchers and their subjects. It thus is based on the notion that all knowledge is subjective and value-dependent and all research outcomes are influenced by the personal values of the researchers (Riege, 2003).

The *constructivist* approach to research is based on the assumption of manifold comprehensible realities, based empirically as well as socially in ethereal intellectual outlook of individuals (Riege, 2003). It aims at enhancing the understanding of the uniqueness as well as diversity of constructions that the researchers and their subjects originally hold (Anderson, 1986). The chief constructivist belief is that all knowledge is 'theory-driven', independence of researchers from their research subjects or objects is not possible and theory and practice are inter-dependent (Mir and Watson, 2000).

The methods of critical theory as well as constructivism are dialectical. They focus on understanding and reconstructing the points of view originally held by individuals, and try to attain a consensus without being oblivious to new explanations as new basic information emerges and the sophistication in its analysis improves (Guba and Lincoln, 1994).

Often the choice of research methods is shaped by the training, antecedents and 'epistemological loyalty' (Onwuegbuzie and Leech, 2005) of the researcher rather than the nature of the research questions. There is a growing realisation that such a parochial approach is not doing any good to the management science (Onwuegbuzie and Leech, 2005) and that research question alone should drive the method used. In this research, therefore the methods used are chosen based on their suitability to answer the research questions, rather than any 'epistemological loyalty'.

As very little work has been done on innovation in low-tech enterprises and none on innovation in the Scottish food industry, there is an obvious need to understand and explain the phenomena of innovation in low-tech Scottish food industry. An exploratory research approach based on a realist-inductive paradigm, therefore, was most suitable amongst the four explained above as the exploratory qualitative research is considered superior to its deductive quantitative counterpart when there is inadequate prior work in the field and when there is need to build theories rather than test them (Seuring, 2008, Jarrat, 1996). Sterns et al (1998) too support the use of exploratory approach when the

researcher's goal is to extend and generalise theories and not to count frequencies. Churchill and Lewis, (1986) in this context argue that in 'a field in which the underlying concepts have not been adequately defined' theory development rather than theory testing should be the principal concern of researchers. As small business innovation is an evolving field, research utilising qualitative methods are likely to be more illuminating (Sexton, 1986; Churchill and Lewis, 1986; Bygrave, 1989 and Aldrich, 1992). Bygrave (1989) argues, *"…at the beginnings of a paradigm, inspired induction (or more likely enlightened speculations) applied to exploratory, empirical research may be more useful than deductive reasoning from them*". In the same context, it is pointed out by Churchill and Lewis (1986) that in the absence of theory generation from close empirical examination, that the 'hypo-deductive approaches' would prevent the development of requisite understanding of processes, activities and outcomes. The qualitative methods have also been contributing significantly to various areas of management research for a long time (Cassell *et al*., 2006a, Cassell *et al*., 2006b), provide the management researcher an array of 'powerful tools' (Gummesson, 2000; Cassell and Symon, 2006) and their calibre in 'understanding phenomenon within their context, uncovering links between concepts and behaviours and generating and refining theory' is well-appreciated (Bradley *et al*., 2007).

A realistic inductive strategy, thus, was chosen to carry out this research. To implement this research strategy the case study method was chosen. a postal survey was not considered appropriate for the purpose as such surveys often create lack of clarity about the questions raised, an inadequate response rate and an insufficient control over who the real respondents are (Seuring, 2008). Supplementary questioning as a follow up to pertinent issues is also not possible nor is crosschecking with other available information. Significant insights that can be gained from actual observation and a visit to the workplace are also ruled out.

#### 3.2.4.4 case study design

Seuring (2008) insists, "…there are no specific rules to follow when designing and conducting case study research." Goffin and New (2001), however, show that case study research can be conducted in four phases - initial contact, site visits for data collection, data analysis and post visit contacts. Simon et al (1994) for the purpose, advise a generative research approach, the generation of critical concepts, the exposition of research theme through semi-structured interviews and the data collection by

appropriate techniques. Sterns et al (1998) in this context argue that the anticipated case study output affects the research design, the extent of details that is obtained through questioning in the field and the general nature of the case study.

Before the case studies were commenced and initial contact with the respondents was made, a theoretical framework was created to base the case studies on. As Perry (1998) recommends the first act in the process of building a theory from case study research is to extract a prior theory from a review of literature. This approach is used extensively in management research. de Weerd-Nederhof (2001), who conducted a study similar to mine on organisation and management of new product development systems, too used the same approach.

To create a theoretical framework to base the case studies on the literature on business innovation in general and small business innovation in particular was considered. This voluminous literature was arranged in four different stands. These included definition of innovation, taxonomy of innovation, determinants of innovation and the process of innovation. A theoretical framework incorporating these four aspects of business innovation was then prepared. This framework was then made available to the team of three supervisors for comments and suggestions and based on their input, the framework was modified and finalised.

As the basic instrument to conduct the case studies was to be semi-structured interview, in the next phase a set of open-ended questions based on the above-mentioned theoretical framework was distilled. These questions then were sent up to the supervisors and were modified and finalised after their comments and suggestions were received (Appendix 12.1). The most difficult yet crucial part of the process was to create a set of questions reflecting a theoretical framework couched in pure academic language into a set of open-ended questions that lay people can understand.

All but one of eight case studies was carried out at the manufacturing sites of food companies identified. During the fieldwork, semi-structured interviews were conducted of the people responsible for new product development in the case enterprises, deputed by the managing directors of identified companies. Prior to interviewing a brief outline of the research project and its overall objectives was provided to the respondents and they were assured that any information that they will supply would not be divulged

without their permission. On each occasion, nearly a day at the site was spent and apart from conducting the semi-structured interviews, a tour of the site was also undertaken to understand how the product development process was being carried out. All but two of the semi-structured interviews were taped on a digital voice recorder and later transcribed verbatim. In case of non-recoded interviews, detailed notes were taken during the interviews.

The raw data thus collocated went into analysis. Analysis included both within case analysis as well cross case comparisons. The insights gained from these two processes were then used to obtain generalised conclusions, which were used to generate broad theoretical propositions as well as policy prescriptions. Miles and Huberman (1984)'s advise on use of devices such as graphs, tables, and diagrams for management and presentation of case study data was employed.

#### 3.2.4.5 Rational for multiple case studies

case studies can involve single as well as multiple cases. Multiple cases were used in order to reinforce the conclusions and generate a more robust theory. Hakim (1987) believes that evidence coming from multiple sources makes case study analysis more complete and rounded. Simon et al. (1996) similarly argue that by examining many cases simultaneously the analysis is enriched as issues are compared, contrasted and elaborated. Similarly, Eisenhardt, (1989) believes that robust and well-grounded findings emerge from corroboration of one source of data by the evidence coming from another. Westbrook (1995) in the same context states that multiple case studies provide more generalisable outcomes than those allowed by single cases and multiple cases research has greater value as a theory-building tool. Room for cross-case analysis in multiple case studies is particularly useful in theory construction.

After deciding to conduct multiple case studies, the number of cases to investigate was to be decided. There are no exact norms on optimum number of cases in multiple case studies (Perry, 1998) and it is not easy to ensure whether the number of cases analysed are enough as a basis for generalisation (Swartz and Boaden, 1997). Eisenhardt (1989) in this context advises analysing between four to ten cases. He argues that it is generally quite arduous to build a theory of adequate complexity from less than four cases. On the other hand, more than ten cases generate so much data that analysing it becomes

extremely difficult. It was thus tentatively decided to carry out case studies of between five to nine Scottish food companies.

#### 3.2.4.6 The control for extraneous factors

As explained in the literature review, the determinants of innovation identified by the previous research can be divided into two groups, the internal determinants of innovation and external determinants of innovation. The internal determinants are, market orientation, learning processes, technology policy, cooperation and networks, managerial efficiency, pioneering innovative policy orientation, age, size, human resources and financial resources. The extraneous factors affecting innovation are of two types; the region specific factors include, society's attitude towards innovation, headquarter branch ratio (in case of Transnational corporations), potential for spin-off within the existing companies, the regional level of entrepreneurship, the regional industrial policy, regional economic performance and the strength and prevalence of local research networks. The region specific factors include competition in the industry, the level of industrial concentration and barriers to entry in the industry. In order to ensure that these extraneous factors did not interfere with the study of firm specific innovation influencing factors, only businesses from Scotland are included in the case study sample. This controlled the regional extraneous factors whereas to control for industry specific extraneous factors, companies only in the food industries were included. This is how the design of this research ensured that all extraneous factors were controlled for.

## *3.3 The case study companies*

The case study companies for this research comprised of eight enterprises, all located within Scotland. They are identified only as Company A, Company B etc. in order not to compromise on the confidentiality of information they provided.

As will be explained in detail in Chapter 4, the Scottish food industry is highly diversified and produces virtually every item of food consumed in the UK.

| The case study companies | | | |
|---|---|---|---|
| **No.** | **Companies** | **Age** | **Products** |
| 1 | Company A | 35 | Pizzas |
| 2 | Company B | 25 | Pate |
| 3 | Company C | 23 | Bakery, confectionery |
| 4 | Company D | 13 | Ice-cream |
| 5 | Company E | 32 | Haggis, soups, candies, jam |
| 6 | Company F | 17 | Seafood, smoked salmon |
| 7 | Company G | 10 | Bakery, confectionery |
| 8 | Company H | 9 | Soups, ready meals |

As Figure 6 and Figure 7 show, the group of companies chosen for case studies, more or less, replicates, this highly diversified product profile of the Scottish food industry. This establishes two facts, each in itself, quite significant. One, this indeed is a representative sample of the Scottish food industry and two, innovation amongst the Scottish food companies does not depend on the nature of their product.

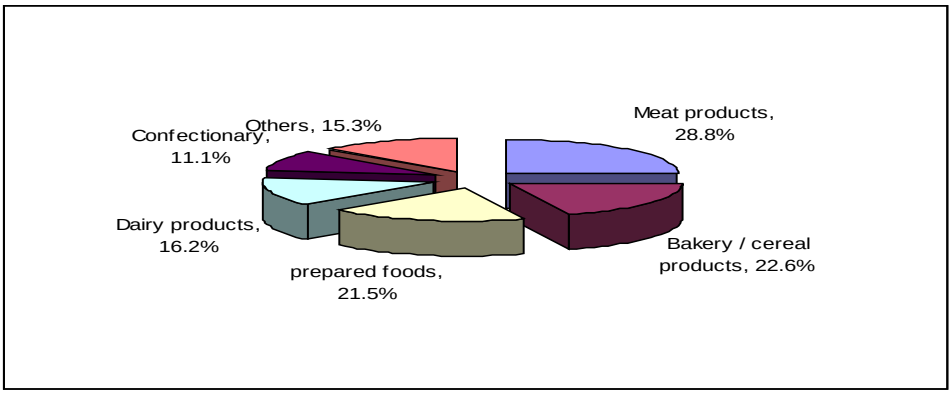



Figure 6: Scottish Food Market, 2004
Source: Leatherhead Food International (2005)

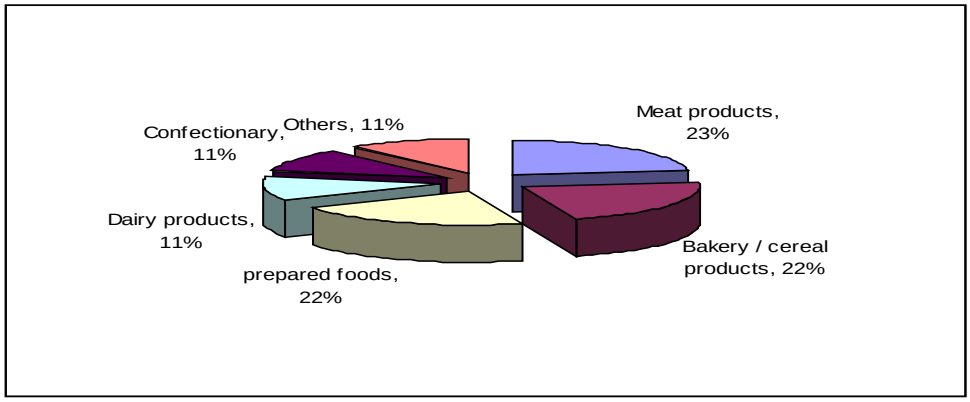



Figure 7: The case study companies

The first of the above two graphics depicts the major Scottish food sector segments and their relative proportions in the country's food industry. The second shows the

proportion of case study companies in each food sector segment as a percentage of all case study companies. Two things become obvious by a cursory comparison of these two graphics. One, the case study companies come from every segment of the Scottish food industry and two; the percentage of case study companies in each segment is quite close to the percentage of companies in the Scottish food industry in the same segment.

## *3.4 The case study research process*

It has been recommended that '*qualitative researchers* (should) *make explicit the process involved in their collection and analysis of data. By failing to do so, small firm researchers employing qualitative methods do little to encourage theory development or progress current knowledge and understanding about small firms*' (Shaw, 1999). All steps of the research process adopted to arrive at the results of this dissertation are thus described here in detail. The description is in shape of a 'true chronology' and not as 'reconstructed logic' (Silverman, 1985). The objective is to underpin the inductive or '*Verstehen'* (Outhwaite, 1975) nature of analysis used here.

Although the initial phase of the research process was focussed exclusively on literature review, it became necessary to return back to the extant literature on many occasions subsequently as issues repeatedly sprang up for which various aspects of previous work in the field was required to be consulted.

The process started with the identification of a number of innovative small food companies in Scotland. There were two separate sources of information on this; people working within Scottish Enterprise to promote innovation in the food and drinks sector and two of the supervisors of this research, Susan Laing and Aidan Craig who have a long and distinguished records of work with Scottish SMEs. From these two sources, names of companies, which were known to be innovation active were obtained, i.e. they had successfully created new food products in the recent past. As stated above, investigating a large number of companies within a limited time does not allow room for an in-depth investigation as well as creates a data overload, as stated above, following Eisenhardt's (1989) recommendation, the plan was to restrict the study to less than ten but more than four companies. As not all companies chosen to be investigated might have agreed to participate in the research, about twelve companies were short-listed in the hope that from these twelve it should be possible to secure permission from more than four. To choose twelve from the names suggested as being

worthy of investigation products that they had recently developed were closely looked at. The organisations that have been coming out with new products on a regular basis were selected and the organisations that had developed products only sporadically were screened out. The rational for this approach was that companies that have been able to come out with new products constantly should have created enduring structures to sustain the process of innovation whereas those that developed new products only occasionally may have an element of chance in their innovation process which will then be difficult to capture and articulate through this research. The selection presented with a list of truly innovative organisations and the fact became increasingly clear as this investigation was started and continued.

This list of twelve companies was then forwarded to Professor Masson, the former director of this research with a request to send a letter (Appendix 12.2) in his name to the Managing Directors of each company explaining the nature of this inquiry and requesting for permission to interview the people who had a good understanding of the process of innovation in their enterprises. The logic of sending such a letter was that companies would respond more favourably to a request from a university professor than from a research student. This strategy worked as nine[1] out of twelve companies approached agreed to let us interview the people directly involved in new product development, the key informants to the inquiry. Gummesson, (1991 in this context mentions that a researcher has to confront two types of people, 'gatekeepers' and 'informants', in order to gain access to the information essential for his / her research. Gatekeepers open the door and informants provide vital information. In this case, managing directors of the companies were the gatekeepers and people responsible for new product development were informants. Professor Masson's high profile approach to the managing directors created access to both of them. Targeting 'key' informants sharpened the focus of the investigation by 'not randomly sampling from the universe of characteristics under study' but by 'selectively sampling specialised knowledge' (Tremblay, 1982).

As stated above, out of twelve short-listed companies, nine agreed to participate in interviews. It is not known why some companies did not agree to the request but it can be surmised that they were perhaps not convinced that they could gain something from

[1] In case of one of the companies, only a telephone interview could be conducted and in an earlier draft of this thesis, details of this company were included. During the writing of the present draft however, I decided to omit this company, as the degree of details required to carry out some of the later analysis is not possible in case of this company.

the exercise. It may also be so that there are elements in their new product development process that they did not want to divulge. As the case study companies were willing to discuss every aspect of innovation in their organisations quite openly, it is difficult to understand a reason for that, if at all, this was the case. The fact that most of the companies approached, agreed for interviews, does give confidence to believe that this research presents a good snapshot of innovation in the case study companies at a point in time.

For the purpose of interviews, the Managing Directors deputed one or two people from their companies who were interviewed, over a six-month period. In most cases, interviewees were the owners/entrepreneurs themselves and in some, these were senior executives, but in either case, these were people directly involved with new product development in their organisations in leadership roles, the 'key informants', as pointed out above.

In one case, however, only a telephone interview was possible and though it did confirm most of the generalised findings generated by other case studies, the information that could be recorded was not in sufficient detail to be included in the final thesis.

## *3.5 Data collection*

Background information on the companies was gathered through sources in public domain such as company websites, UK government's business information service 'company house' and subsequently through interviewing. The understanding of the process of innovation in Scottish food industry was completed through fieldwork involving multiple cases where people directly responsible for new product development in eight Scottish food companies were interviewed. Data analysis was done both in terms of within case analysis as well as multiple case comparisons. A questionnaire to test for innovativeness of key people involved with new product development in investigated organisations was also served and analysed.

As stated above the data for this research is collected principally using the instrument of semi-structured interviews. The interview is widely accepted as an established data collection instrument and a primary source of information in qualitative research (Yin, 1989). The interviews were designed to capture 'the process, content and context' (Carter, 1999) of innovation in the Scottish food companies. The semi-structured and flexible nature of the interviewing allowed to incorporate in subsequent analysis fresh

themes that surfaced during conversation with respondents. As a result, though most themes of sustentative inquiry were already shaped by the literature review and consequent thinking triggered by it, many new themes emerged as investigation progressed, an experience previously reported by other qualitative researchers (see for instance, Carter, 1999).

The first interview occurred in an open space at Napier University's Craiglockhart campus. The experience was enlightening not merely from a learning perspective on food sector innovation in Scotland but also in terms of the broad prospects of this research and in shaping the future interview strategy.

The person interviewed had such a distinctive personality that it became obvious that the personality of entrepreneur dimension to the research must be added if all the forces that collectively shape innovation in the food industry in Scotland are ascertained. To confirm the existence or otherwise of a possible innovative trait in personalities of respondents, a questionnaire from Dr. Peterson (Peterson, 2000; Appendix 12.3) was obtained. This questionnaire is extensively validated to test the innovation potential of individuals. It was administered on people responsible for new product development in enterprises in the sample. Twelve individuals who had played crucial roles in the innovation process in these eight organisations were identified and provided the above questionnaire. Of these, six filled and useable questionnaires were returned.

It was also decided not to conduct any further interviews at public places as the background noise made conversation difficult. All subsequent interviews were attempted to be recorded on a digital tape recorder so as to listen to conversation many times over in order to 'penetrate (the) internal logic' and 'interpret the subjective understanding of reality' (Shaw, 1999) as narrated by the 'key informants'.

All remaining interviews were thus conducted at the manufacturing sites of the companies. This had added advantage that the respondents did not have to spend time travelling to the venues of interviews and first-hand experience of the nature of organisations, their products and live illustrations of their innovations was gained, which indeed was quite instructive. All remaining interviews were digitally recorded except one, when the digital recorder failed to function at the last minute. On this occasion, detailed notes during the interview were taken and a report of the interview immediately afterwards was written down, which was corroborated by the supervisors

who were present and was modified accordingly. All digitally recorded interviews were also transcribed. Depending on the needs of research, the style of transcription of interviews falls somewhere between two terminal types "*naturalism, in which every utterance is transcribed in as much detail as possible and denaturalism, in which idiosyncratic elements of speech (e.g., stutters, pauses, nonverbals, involuntary vocalizations) are removed*" (Oliver *et al.* 2005). As the interest was in 'informational content' (MacLean *et al.,* 2004) of conversation, a denaturalistic transcription style was followed and 'idiosyncratic elements' were ignored.

This raises a question. Are the conclusions drawn from the information from six interviews that were recorded, listened to and transcribed and remaining two interviews that were written down from the notes taken during interviews, based on two different methods of data collection and therefore non-comparable in terms of conclusions drawn from them? This certainly is not the case. The interviews were semi-structured. In each interview, the same basic questions were asked, each modelled on an identified theme of investigation. These themes, in turn, sprang from a review of literature on business innovation. In answer to the questions, the respondents were allowed to speak uninterrupted and were interrupted only when it become necessary to gain further clarity on the issues being discussed. Even when respondents strayed way from the main theme to which the questions related, care was taken not to interrupt them in order to let them converse on the broad theme of innovation as they understood and practised it, to make this exploratory study appropriately revealing. This strategy paid off by highlighting many aspects of small business innovation not reported anywhere in literature. The interviews, thus, included some talk unrelated to innovation. the transcribed interviews were subsequently coded and arranged according to the broad themes of inquiry. each theme was then analysed in view of the totality of evidence from all investigated enterprises. In the case of non-recorded and non-transcribed interviews, detailed notes were during interviews. Therefore, exclusion of any substantive information is ruled out. the summary of non-transcribed interviews was written in as much detail as possible with a clear idea that only issues completely unrelated to the innovation process were omitted. In essence, all interviews were processed in identical manner. The only difference was that in six, the record was kept digitally and in two, it was kept as hand-written notes. After transcription when the details were coded, the noise in the data, in the form of text unrelated to any theme of substantive inquiry, was filtered out. The data thus purified went into analysis. In the second case, the noise was filtered out

during the interview itself when the notes were taken. Thus despite being different at one stage, the nature and intent of data collection was identical in all the cases and so the findings emerging from each of these two processes are comparable. During the course of transcribing and writing of summary of interviews, it happened often that information available appeared somewhat incomplete or unclear. The respondents thus had to be contacted again to seek clarification. When summaries of all interviews were completed, a copy was made available to respondents to confirm that the record of investigation is consistent with the information that they believed they had provided.

Though, only eight companies are investigated, in transcribed and summarised form, the collective evidence provided a unique insight not merely into the process of innovation in these companies but also a look into the world of some exceptionally creative individuals and the functioning of their organisations. Though, the broad themes of this research came from the literature review and the consequent 'enlightened speculation' (Bygrave, 1989), many other themes emerged during the process of interviewing itself. The final set of themes became evident during the process of reading and rereading of this document. This is an experience previously reported by other qualitative researchers such as Bradley *et al*., (2007) who explain, "*...reviewing data without coding helps identify emergent themes without losing the connection between concepts and their context*"

## *3.6 Data analysis*

As there are no set rules of 'inductively analysing qualitative data' (Patton, 1980; Yin, 1994; Shaw, 1999), a distinct method was used to extract the crux of findings, which is explained now as Carter (1999) warns "*one of the potential dangers of adopting a predominantly qualitative research approach would lie in not explaining how the researcher turned the raw data into findings*".

As all respondents answered the same set of open-ended question that formed the semi-structured interviews, within case analysis has not been difficult. The only issue has been a lack of detail in two interviews that were hand recorded where the opportunity to quote the respondents verbatim has been lost. The process in within casa analysis has essentially been of distilling the discussion to filter out information unrelated to any form of substantive inquiry and colleting all relevant information under various strands of inquiry.

For cross case analysis, several documents titled by each theme that emerged from three phases of gradual building up of understanding of the phenomena, as blank Microsoft Word files were created and kept them simultaneously open on a pc desktop. Each interview transcription was then carefully read and each interview summary one at a time and copied and pasted anything mentioned that related to any specific theme of inquiry in the file on the theme. When the process was complete, each file contained all the raw cross-case comparison data that the investigation had generated on each theme. All evidence collated on each theme was then read together to see what was the nature of evidence and if all evidence pointed to a single pattern or there were more than one pattern. In case of differing patterns, presence of any explanatory influence was then searched for. After the process was complete the files were converted into a coherent text explaining the themes in terms of who, what, how and why of it. The text with the quotes from transcriptions as well as phrases from interview summaries were also liberally interspersed for subsequent readers to verify that the assertions made are consistent with the actual evidence from the interviews to '*explicate how we claim to know what we know'* (Altheide and Johnson, 1994). One single document, summing up all the themes thus analysed was then made available to members of the supervisory team for review and comments.

The process explained above yielded a definitive and previously largely unknown picture of small business innovation in food industry in Scotland. This makes one thing obvious. There indeed is a definitive pattern of innovation in the Scottish food SMEs because no research, howsoever carefully orchestrated, can find out a pattern where none exists.

## *3.7 Validation of findings*

To validate the main findings of this research, a panel of six experts from the Scottish food industry was constituted and its members invited to attend a presentation. These experts have significant entrepreneurial experience and first-hand knowledge of the innovation process in this industry. The panel attended a 90-minute validation session at the Craiglockhart campus of the Napier University on March 12, 2008. During this session, the panel members were apprised of the main findings of this research and were requested to give their views. The proceeding of the validation session was digitally recorded and later transcribed.

The panel in general, validated all findings of this research. The discussion, however, highlighted the fact that some of the personal experiences of the individual members differed from one another and not all members concurred completely with the findings on each count. This is not a surprise, as the innovation process that this research has identified too varies in bits and pieces from company to company and only the underlying common innovation process that was observed in the most investigated businesses was presented to the panel.

## *3.8 Analysis of innovation potential indicator questionnaire data*

As stated above to test the innovation potential of respondents with high-suspected innovation proclivity, Dr. Peterson's (Peterson, 2000) innovation potential indicator questionnaire (Appendix 12.3) was used. The instrument has 36 questions which are used to rank innovation potential of respondents through a test of four attributes namely motivation to change, challenging behaviour, adaptation and consistency of work styles. Here *motivation to change* and *challenging behaviour* are indicators of presence of innovation potential whereas *adaptation* and *consistency of work styles* reflect a lack of innovativeness. The fifth attribute *social desirability* is innovation potential neutral and used here as a masking influence on order not to make the statements in the questionnaire too obvious for respondents. Low or high scores for these attributes are interpreted in the following manner.

| **Attribute** | **Low score implies** | **High score implies** |
|---|---|---|
| Motivation to change: | Enjoys reflection, seeks clarity persists to completion of tasks, may need support to try new ideas | Seeks change and stimulation; tolerates ambiguity; easily bored |
| Challenging behaviour | Promotes and maintains harmony, not contentious; acceptance of authority; socially conforming | Independent; assertive; challenges authority; non-conformist; headstrong and rebellious |
| Adaptation | Seeks originality; dares to be different; uninhibited by the current practice; radical; decides on instinct not facts | Keen to refine available approaches; values experience and evidence; accepts boundaries of operation |
| Consistency of work styles | Uses a range of work styles; flexibility; welcomes variety; comfortable with incomplete instructions; less detail conscious | Methodical; efficient; planful in approach; adheres to procedures; attends to detail; prefers structured tasks |

The respondents were asked to rate each of the 36 statements in the questionnaire on a scale of 1 to 5 with the following specification:

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree

### 3.8.1 **Measurement of motivation to change**

The following nine statements in the questionnaire are designed to test the respondent's level of *Motivation to change*. For Statements 2, 7, 13, 15, 27 and 32 higher score indicate higher *Motivation to change* whereas for statements 6, 17 and 19 the inverse is true i.e. lower the score *higher* the respondent's level of *Motivation to change*.

| No. | Statement |
|---|---|
| 2 | I tend to reset the goals and objectives of the work regularly. |
| 6 | I find it difficult to cope with shifting work goals. |
| 7 | I find it easy to generate enthusiasm to complete tasks at work. |
| 13 | If I had a new idea, I would find it easy to influence others in the department. |
| 15 | I have ideas that would significantly improve the way the job is done. |
| 17 | I like to tackle one problem at a time. |
| 19 | I try to avoid getting caught up in problems that have no clear-cut answers. |
| 27 | I like to have frequent changes in the way I do the work. |
| 32 | I require a positive feedback from others to persist with a new idea. |

### 3.8.2 **Measurement of challenging behaviour**

The following eight statements in the questionnaire are designed to test the respondent's level of *Challenging behaviour*. For Statements 4, 5, 24, 29, 30, 31 and 35 higher the score higher the *Challenging behaviour* whereas for statements 8 the inverse is true i.e. lower score indicates the respondent's higher level of *Challenging behaviour*.

| No. | Statement |
|---|---|
| 4 | I believe it is better to ask for forgiveness than to ask for permission. |
| 5 | I would describe myself as a risk taker in the work that I do. |
| 8 | I would never try out new ideas without proper authority. |
| 24 | I feel constrained by the work culture and the way "the things are done around here". |
| 29 | The peers describe me as a non-conformist. |
| 30 | I would always challenge a decision at work if I thought it was necessary. |
| 31 | It does not bother me if people around me at work disapprove the work methods. |
| 35 | I am better at thinking up new ways of doing things than actually carrying them out. |

### 3.8.3 **Measurement of adaptation**

The following seven statements in the questionnaire are designed to test the respondent's level of *Adaptation*. For statements 1, 9, 14, 22, 23 and 28 higher score reflects higher *Adaptation* level whereas for statement 36 the reverse is the case i.e. lower score means the respondent's higher level of *Adaptation*.

| No. | Statement |
|---|---|
| 1 | I would always evaluate an idea before putting it into practice. |
| 9 | I only suggest new ways of doing things if they are really necessary to get the job done. |
| 14 | I prefer to use tried and tested methods to get the job done. |
| 22 | I try to adapt older methods of doing things rather than dream up totally new ideas. |
| 23 | I try to improve the way I do the job rather than try ways that are totally new. |
| 28 | Others would describe me as predictable in the way I do the work. |
| 36 | To make significant improvements I need to be creative in reaching solutions |

### 3.8.4 **Measurement of consistency of work style**

The following six statements in the questionnaire test the respondent's level of *Consistency of work styles.* For statements, 10, 21, 26, 33 and 34 higher score means higher *Consistency of work styles* whereas for statement 18 lower score indicate higher level of respondent's *Consistency of work styles.*

| No. | Statement |
|---|---|
| 10 | I follow a strict system in the way I do the work. |
| 18 | I sometimes get criticized for lacking discipline in m work methods. |
| 21 | I tackle the work methodically. |
| 26 | I am consistent in the way that I tackle work. |
| 33 | I try to analyse new ideas carefully before using them for work. |
| 34 | I find it difficult to gain a fresh perspective on old problems at work. |

### 3.8.5 **Measurement of social desirability**

The following six statements in the questionnaire are designed to test the respondent's level of *Social Desirability*. For statements 3, 11, 16 and 25 higher the score higher the *Social Desirability* whereas for statements 12 and 20 the inverse is true i.e. lower the score higher the respondent's level of *Social Desirability*.

| No. | Statement |
|---|---|
| 3 | I look forward to taking part in brainstorming sessions. |
| 11 | I find it easy to look at a problem from many different perspectives. |
| 12 | I am aware that I am one of the last persons in the workgroup to accept something new. |
| 16 | I often contribute to changes in the way the department works. |
| 20 | I find it difficult to persuade others into the way of thinking. |
| 25 | If I felt strongly about a proposal, I would take a stand against others. |

Following is a completed questionnaire that illustrates the calculations.

| | STATEMENT | Strongly disagree | Disagree | Neither agree nor disagree | Agree | Strongly agree | Adaptation | Motivation to change | Social Desirability | Challenging Behaviour | Consistency of work style |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | I would always evaluate an idea before putting it into practice. | ① | ● | ③ | ④ | ⑤ | 2 | | | | |
| 2 | I tend to reset the goals and objectives of the work regularly. | ① | ② | ③ | ● | ⑤ | | 4 | | | |
| 3 | I look forward to taking part in brainstorming sessions. | ① | ② | ③ | ● | ⑤ | | | 4 | | |
| 4 | I believe it is better to ask for forgiveness that to ask for permission. | ① | ② | ③ | ④ | ● | | | | 5 | |
| 5 | I would describe myself as a risk taker in the work that I do. | ① | ② | ③ | ④ | ● | | | | 5 | |
| 6 | I find it difficult to cope with shifting work goals. | ⑤ | ● | ③ | ② | ① | | 4 | | | |
| 7 | I find it easy to generate enthusiasm to complete tasks at work. | ① | ② | ③ | ④ | ● | | 5 | | | |
| 8 | I would never try out new ideas without proper authority. | ⑤ | ● | ③ | ② | ① | | | | 4 | |
| 9 | I only suggest new ways of doing things if they are really necessary to get the job done. | ① | ● | ③ | ④ | ⑤ | 2 | | | | |
| 10 | I follow a strict system in the way I do the work. | ① | ● | ③ | ④ | ⑤ | | | | | 2 |
| 11 | I find it easy to look at a problem from many different perspectives. | ① | ② | ③ | ④ | ● | | | 5 | | |
| 12 | I am aware that I am one of the last persons in the workgroup to accept something new. | ⑤ | ④ | ③ | ● | ① | | | 2 | | |
| 13 | If I had a new idea, I would find it easy to influence others in the department. | ① | ② | ③ | ④ | ● | | 5 | | | |
| 14 | I prefer to use tried and tested methods to get the job done. | ① | ● | ③ | ④ | ⑤ | 2 | | | | |
| 15 | I have ideas that would significantly improve the way the job is done. | ① | ② | ③ | ● | ⑤ | | 4 | | | |
| 16 | I often contribute to changes in the way the department works. | ① | ② | ③ | ● | ⑤ | | | 4 | | |
| 17 | I like to tackle one problem at a time. | ⑤ | ④ | ● | ② | ① | | 3 | | | |
| 18 | I sometimes get criticized for lacking discipline in m work methods. | ⑤ | ④ | ③ | ● | ① | | | | | 2 |
| 19 | I try to avoid getting caught up in problems that have no clear-cut answers. | ⑤ | ● | ③ | ② | ① | | 4 | | | |
| 20 | I find it difficult to persuade others into the way of thinking. | ⑤ | ④ | ③ | ● | ① | | | 2 | | |
| 21 | I tackle the work methodically. | ● | ② | ③ | ④ | ⑤ | | | | | 1 |
| 22 | I try to adapt older methods of doing things rather than dream up totally new ideas. | ① | ● | ③ | ④ | ⑤ | 2 | | | | |
| 23 | I try to improve the way I do the job rather than try ways that are totally new. | ① | ● | ③ | ④ | ⑤ | 2 | | | | |
| 24 | I feel constrained by the work culture and the “way things are done around here”. | ① | ② | ③ | ● | ⑤ | | | | 4 | |
| 25 | If I felt strongly about a proposal, I would take a stand against others. | ① | ② | ③ | ● | ⑤ | | | 4 | | |

| | STATEMENT | Strongly disagree | Disagree | Neither agree nor disagree | Agree | Strongly agree | Adaptation | Motivation to change | Social Desirability | Challenging Behaviour | Consistency of work style |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 26 | I am consistent in the way I tackle work. | ① | ② | ③ | ④ | ⑤ | | | | | |
| 27 | I like to have frequent changes in the way I do the work. | ① | ② | ③ | ● | ⑤ | | 4 | | | |
| 28 | Others would describe me as predictable in the way I do the work. | ① | ● | ③ | ④ | ⑤ | 2 | | | | |
| 29 | The peers describe me as a non-conformist. | ① | ② | ③ | ● | ⑤ | | | | 4 | |
| 30 | I would always challenge a decision at work if I thought it was necessary. | ① | ② | ③ | ● | ⑤ | | | | 4 | |
| 31 | It does not bother me if people around me at work disapprove the work methods. | ① | ② | ③ | ④ | ● | | | | 5 | |
| 32 | I require a positive feedback from others to persist with a new idea. | ⑤ | ④ | ● | ② | ① | | 3 | | | |
| 33 | I try to analyse new ideas carefully before using them for work. | ① | ● | ③ | ④ | ⑤ | | | | | 2 |
| 34 | I find it difficult to gain a fresh perspective on old problems at work. | ● | ② | ③ | ④ | ⑤ | | | | | 1 |
| 35 | I am better at thinking up new ways of doing things than actually carrying them out. | ① | ② | ③ | ● | ⑤ | | | | 4 | |
| 36 | To make significant improvements I need to be creative in reaching solutions. | ⑤ | ④ | ③ | ● | ① | 2 | | | | |
| | TOTAL SCORES | | | | | | 14 | 36 | 21 | 35 | 10 |
| | | | | | | | **AD** | **MTC** | **SD** | **CB** | **CWS** |

As the scores for attributes *Motivation to change* and *Challenging behaviour* are 36 and 35 respectively, which are much higher than the scores for *Adaptation*, and *Consistency of work styles* (14 and 08 respectively) the conclusion is that person who has filled in this questionnaire has high innovation potential.

## *3.9 A critique of the case study research method*

The basic information that forms the core of analysis in this thesis comes from the 'key informants', people who have personally developed new products in the Scottish food industry over a long period. Coming from the 'horse's mouth', to use a cliché, the information is first-hand and uncontaminated. As the principal instrument to generate information is interview, the research uses 'a modus operandi', which is suitable to 'construct a situation which was quite familiar to the individuals involved' (Carter, 1999).

When the data was collected through fieldwork, one of the supervisors was usually present. All the supervisors looked at the data in several forms. They came across it as the persons present during the interviews, as listeners to recorded interviews, as readers of transcriptions and summaries and as readers of the final findings. Any inconsistency between the conclusions drawn and the basic evidence, therefore, could not have been overlooked.

Academic research is often evaluated on three counts, validity, reliability and generalisability (Easterby-Smith *et al.*, 1991). It is argued, however, that these criteria come from assessment of quantitative research (Kirk and Miller, 1986) and are inappropriate to judge the qualitative research efforts. Patton (1980) in this context recommends that the qualitative analysis should deliver 'useful, meaningful and credible answers'. An attempt to provide such answers is made in Chapter 8 of this thesis. Carter (1999) analysing Miles and Huberman's (1994) set of criteria to assess qualitative research explains how researchers can claim that these are met by their work. He argues, that by presenting 'as full as possible a description of the methods used in the study', one can establish that the 'objectivity/conformability' criterion is met. By explaining that research systematically studied what it claimed to study, the 'reliability/dependability/Auditability' yardstick is tested. If the findings have meaning for those interested in them 'internal validity/credibility/authenticity' is met and the claim of 'external validity/transferability/fittingness' is established by putting the research within a broader analytical framework by connecting it with the extant theory.

Presented above is a description, as complete as possible, of methods that are used in this research and it is also explained how the process of innovation in the case study companies is systematically studied in this research. It can be, thus, said that the 'objectivity /conformability' and 'reliability /dependability /Auditability' criteria are satisfied. In Chapters 6, 8 and 9 of this dissertation, how the findings of this work have meaning for those interested in the phenomenon of small business innovation in Scottish food sector is explained. This satisfies the criteria of 'internal validity /credibility /authenticity'. In Chapter 8, the research is put within a broader analytical framework by connecting it with the extant theory and by pronouncing major theoretical propositions that emerge from this work. This explains how this research also meets the norms of 'external validity /transferability /fittingness.

## *3.10* ***Triangulation survey***

A positivist quantitative verification of the model of product innovation derived from the case studies was subsequently carried out through a triangulation survey of Scottish companies that have successfully developed new products. The details of the survey process, methods used and survey results are provided in Chapter 8 of this thesis.

# 4 Context of Study I

## *The Scottish Food and Drinks Industry: An Overview*

### *4.1 Introduction*

The Scottish food and drinks industry comprises of several distinctive segments. These include *beverages* principally alcoholic drinks but also in significant proportions, soft drinks, coffee, tea, fruit juices and bottled water; *meat and seafood* that includes both raw and processed varieties sold in fresh as well as frozen conditions; *milk and milk derivatives* including butter, cream, yoghurt, desserts and ice-cream; *bakery products* like bread, rolls, biscuits and cakes; *breakfast cereals*, *savoury snacks*, *confectionary* and *prepared foods* such as ready-to-eat meals, soups, sauces, spreads and pizzas. The alcoholic beverages segment, as shown in the figure 8, however, dominates the industry.

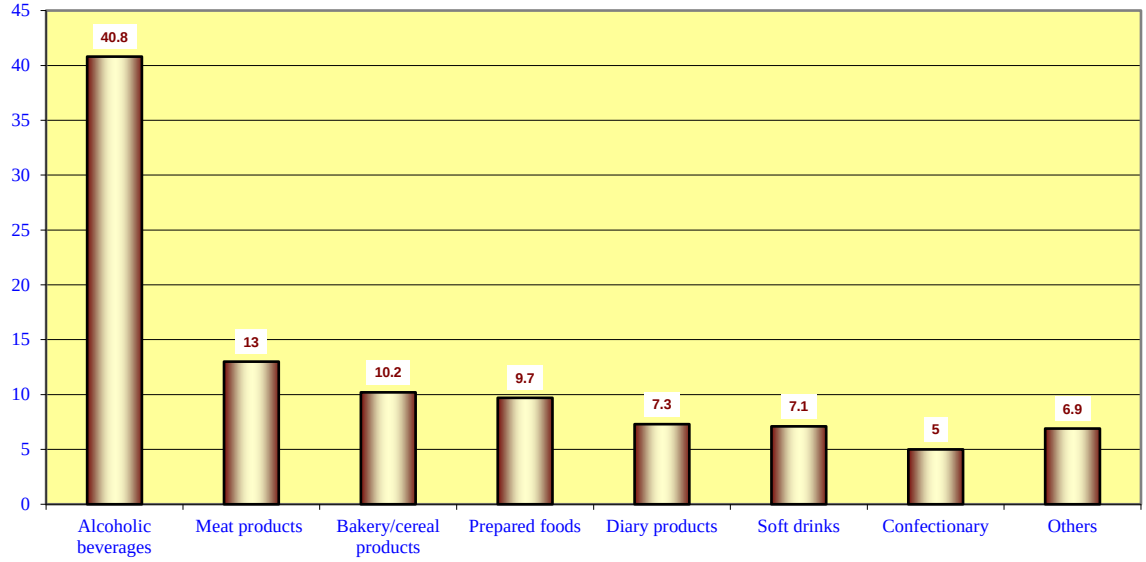



Figure 8: The Scottish Food and Drinks Market, 2004
Source: Leatherhead Food International, 2005

It can, thus, be seen that the food and drinks industry in Scotland manufactures and markets practically every variety of food item consumed in the UK and other developed countries. Apart from being a producer and exporter of some iconic products like Scotch whisky, it also produces and exports many characteristically Scottish dishes such as haggis.

### *4.2 Employment*

The food and drinks sector is one of the biggest employers of people in Scotland. In year 2005, it employed 3% of total and 21% of manufacturing workforce in Scotland. If

we consider employment in the entire food and drink supply chain (including primary, manufacturing, processing, retail, wholesale and food service) then employment in this sector rises to about 15% of total employment in Scotland (Leatherhead Food International, 2005). Employment in the food and drinks area, however, along with that in the rest of manufacturing, has been falling in the recent years in Scotland and the trend is forecast to continue. As the decline is likely to be significantly less in food and drinks than in other manufacturing sectors, the ratio of employment in this sector to the total Scottish manufacturing employment should increase further in years to come.

## 4.3 Businesses

The manufacture of food products and beverages in Scotland comprises of about 1200 businesses dominated by SMEs, 80% of these employ less than 50 workers. Most of these are family businesses that supply quality, niche products and use locally sourced ingredients. All but one of the companies that are investigated in this research fall in this category. Scotland also has a thriving agricultural sector, with substantial share in national agricultural output. It produces 80% of UK's fish catch, holds 30% of its beef herd and supplies 10% of its liquid milk.

## 4.4 Exports

In 2005, the industry had yearly sales of £ 7.5 billion of which about £ 3.57 billion, nearly 48%, was exported, making it the most export intensive industry in the country. This also constituted 20% all Scottish exports in the year. The Scottish food and drinks exports go to a wide range of destinations in nearly 200 countries. USA is its biggest export market followed by France and Spain. Regionally, 72% of Scottish exports go to other EU countries. This is down from 80% in 1996. Since 1996, however, exports to Eastern Europe has been rising making it go up from the sixth to the second most popular region for exports of the Scottish food and drinks. Export of its renowned shellfish, smoked salmon, game and other foods is worth £500 million annually. The major part of its exports, over 80% of total, however, is alcoholic beverages, principally whisky, with fish accounting for a further 11%. Food and drink manufacturing exports from Scotland have been growing exponentially recently, as shown figure 9. In 2005, food and drinks was the top exporting industry in Scotland and at 12% plus, exports from the sector were second fastest growing in real terms in the first quarter of 2007.

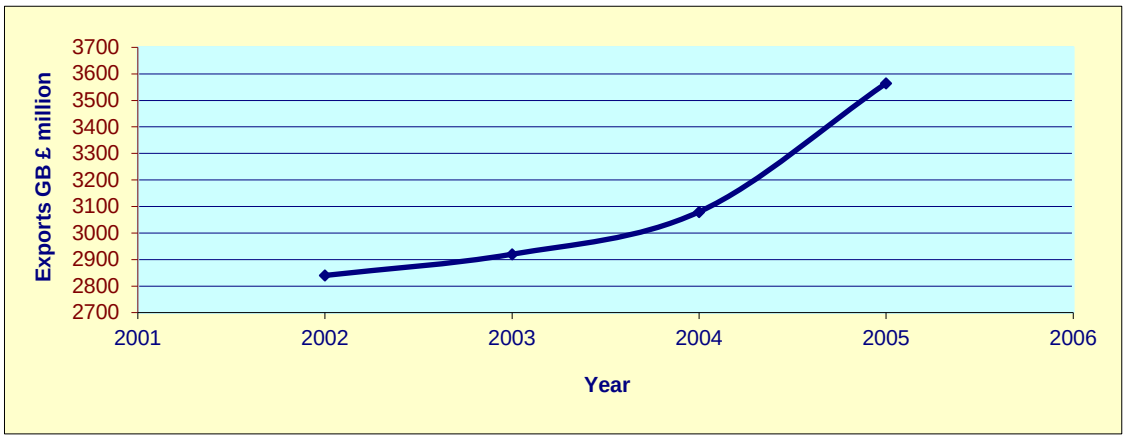



Figure 9: Food and Drink Exports from Scotland

Graphic generated from Global Connections Survey, 2006

## 4.5 Retailing

Estimated by the UK/Scotland ratio, total turnover of food and drink retailers in Scotland comes to be £8.1 billion in 2005. The retailing of food in Scotland is principally through grocery multiples, convenience stores and corner shops. The country has about 500 grocery multiples that have a turnover nearly of £6 billion whereas the sale through convenience stores is worth about £1 billion. The massive sales potential of grocery multiples in Scotland (and in The UK) represents a significant opportunity for innovative food companies in Scotland and elsewhere as will be subsequently explained in this thesis. According to the Expenditure and Food Survey conducted by the Office of the National Statistics, in the 2003-04 to 2005-06 period food and drinks was the single largest item of household expenditure in Scotland constituting 15% of total of which 11% was on food and non-alcoholic drinks and a further 4% on alcoholic drinks, tobacco and narcotics.

## 4.6 Foodservice

Scotland has a foodservice market valued at over £2 billion, out of which nearly £1 billion worth comprises of the meals sold in cafes and restaurants. Food service is currently the fourth largest consumer market in the UK, which is topped by the retail food.

## 4.7 Recent Trends

A shake up has been recently observed in the Scottish food and drinks industry. In the post-1998 period, there has been a steady decline in number of businesses and employment in this sector.

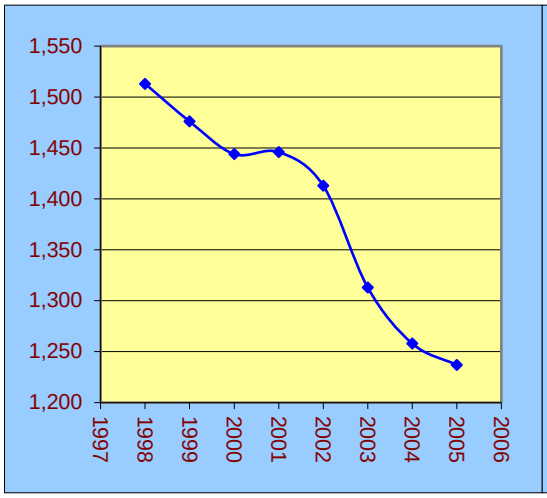



Figure 10: No. of Units, Food and Beverages, Scotland

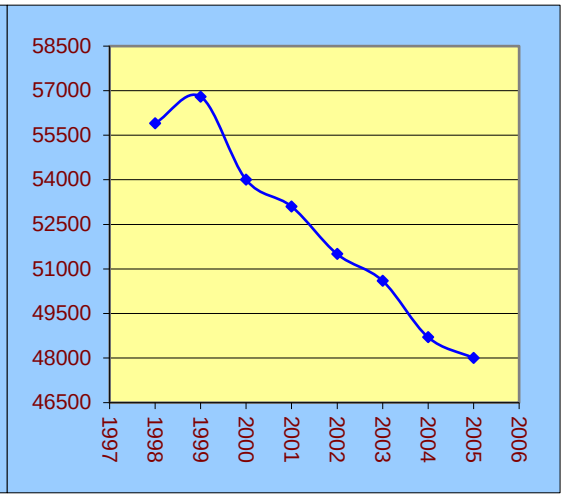



Figure 11**:** Employment, Food and Beverages, Scotland

Graphics generated from Scottish Business Statistics, 2007

This trend, however, is not a mark of weakening of this sector. It, on the contrary, reflects its rising strength and productivity. It is appears that the businesses that have closed down and caused a loss of employment in this sector lacked competitive vigour as in the wake of their disappearance both total and per unit turnover, as well as gross value added per employee has increased. Against 18% and 14% fall in number of businesses and employment respectively during 1998-2005; business turnover in food and beverages manufacturing has grown by 11% and turnover per unit by a good 35%. The best indicator, however, of the improving productivity of the sector is a 62% rise in gross value added per employee.

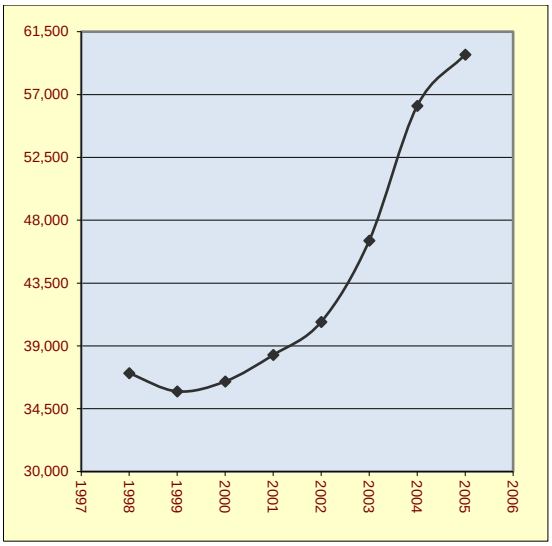



Figure 12: Scottish Food and Drinks, Turnover per unit in GB £

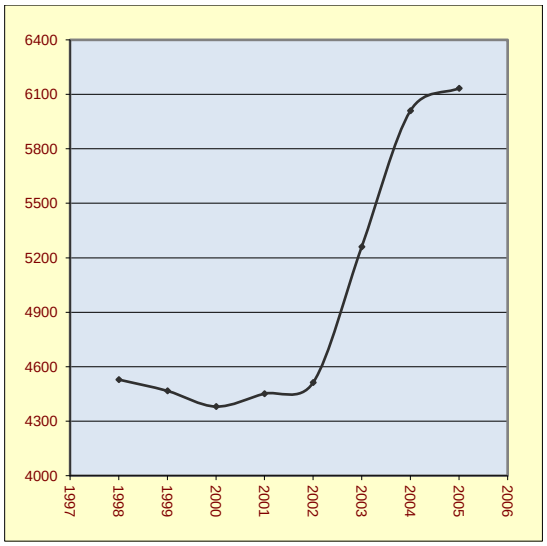



Figure 13: Scottish Food and Drinks, Gross Value Added per Employee in GB £

Graphics generated from Scottish Business Statistics, 2007

## *4.8 Conclusions*

Food and drinks is one of the most diversified manufacturing sectors in Scotland that produces virtually every variety of food consumed in the UK. It is also one of the biggest employers of people in Scotland, its most export intensive industry, its top exporter and second fastest growing export sector. Moreover, food and drinks constitute the single largest item of household expenditure in Scotland.

In this industry, principally made up of SMEs, a shake up in the post-1998 period has been observed whereby both the number of businesses and employment has declined. This decline is caused by a combination of factors. The marauding advance of supermarkets in Britain has eliminated the food companies whose products were in direct competition with the supermarkets. In addition, some companies were not able to cope with increasing regulation of food industry and related stringent standardisation norms such as Hazard Analysis and Critical Control Points (HACCP)[2]. These two factors collectively imposed huge cost and quality demands on the Scottish food companies and the relatively weaker amongst them closed down. Those that survived this onslaught, however, were able to grow into the space

[2] Food companies suffered a similar fate in the wake of introduction of HACCP in other countries too; see for instance Khatri and Collins (2007) for an analysis of impact of HACCP on the Australian meat industry.

vacated by the closing companies. As a result, during 1998-2005, the turnover per unit grew by 35% and gross value added per employee by 62%. Competitiveness and adaptability thus seems to have paid off for the surviving manufacturers in this industry. As there are no signs of let up in the competitive pressures unleashed by the growth of supermarkets and as the role of innovation in raising competitiveness is now well established, the food companies in Scotland will have to pay greater attention to innovation if they wish to continue to survive and grow. Study of innovation in this sector now is thus more critical than ever before.

As will be explained later in this thesis, the growing hold of supermarkets on the grocery traded in United Kingdom is both a challenge and an opportunity to food companies and the enterprises investigated in this research have used innovation as an instrument to seize this opportunity to their advantage.

# 5 Context of Study II

## *Business Innovation in Scotland*

## *5.1 Introduction*

There are two ways to assess innovation performance of businesses in a region. One, through an indirect approach where innovation inputs such as R&D expenditure are used to gauge the level of innovative effort and two, through a direct approach where innovation outputs, such as number or proportion of enterprises that develop new products, are used. For a long time the indirect approach was the only accessible route to this end, as data on innovation output was not available. From 1992 onwards, however, innovation output data emerged from the EU-wide community innovation surveys that have since been carried out four times. These new statistics not only sharpen the focus on the level and content of innovation in European nations and regions, they also bring to light, as the following analysis shows, the fact that innovation inputs have not been telling the true story. Governments in Europe, however, have continued to look at innovation performance of their enterprises through the tinted glass of indirect methods. This has had unwelcome consequences, particularly in Scotland where the Scottish Government's vision of innovation remains clouded and flawed due to a persistence to see and understand innovation largely in terms of R&D investments.

## *5.2 Innovation vision of the Scottish Government*

Annual Scottish Economic Statistics and the periodical surveys of Scottish Business Attitudes to Research, Development and Innovation (for instance, Scottish Government, 2005) provide information on innovation in Scotland largely in R&D terms. The Scottish Government's recent consultation paper on Science and Innovation Strategy for Scotland (Scottish Government, 2006b) too projects the volume of R&D expenditure as being synonymous with the level of innovation. The Framework for Economic Development in Scotland (Scottish Government, 2004) identifies 'R&D and innovation' as one (and not two) of its key priorities, reinforcing the impression that the Scottish government does not consider R&D and innovation as two different phenomena but recognises them as two diverse measures of the same

entity. The apparent assumption behind this approach is that R&D is the principal and the most influential input for innovation.

## 5.3 R&D in Scotland

Three measures of R&D are currently used, business enterprise R&D (BERD), government R&D (GovRD) and R&D by institutes of higher education (HERD). A fourth measure, Gross Expenditure on R&D (GERD), which is the sum of the first three is used to reflect the general state of R&D in a country or a region. In 2004, GERD in Scotland was £1,379 million, 7% of its UK level. It constituted 1.46% of GDP of Scotland, which was lower than its UK value at 1.72% of GDP. BERD in 2005 was £584 million in Scotland, 4.4% of its UK value. The Scottish BERD constituted 0.59% of the Scottish GDP whereas its UK value was 1.08% of GDP. BERD/GDP ratio for OECD was even higher, as shown in the figure 14.

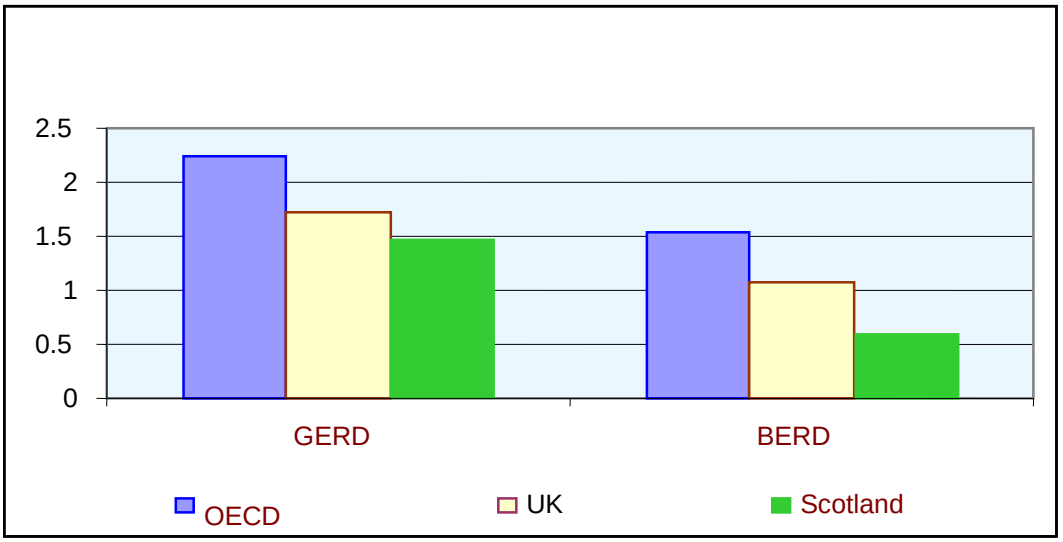



Figure 14: R&D as a percentage of GDP
2004 for OECD, 2005 for UK and Scotland

Documents published by the Scottish Government reflect its concern over low BERD in Scotland as well as its belief that high BERD is required for innovation and economic growth. One such documents state, *"The level of business investment in research and development as a proportion of GDP has been adopted by the Executive as a key target for improving Scotland's long-term economic performance"* (Scottish Government, 2003).

Scotland's low BERD/GDP ratio, which is around half of that for the UK, is augmented by its relatively high GovRD and HERD. It appears that the Scottish Government is trying to prop-up low R&D by the Scottish businesses to make Scotland more innovative. Though, such intention is certainly commendable, the potential efficacy of this strategy is questionable as there is no evidence of a causal relationship between the volume of R&D expenditure in a UK region and the innovation performance of its businesses. For instance, though BERD as a percentage of GDP in Scotland is half of its UK value, as will be shown subsequently in this chapter, innovation performance of Scotland is nearly as good as the UK average. Even more importantly, Scotland, despite its relatively low BERD and low overall R&D, has done exceptionally well as a novel product innovator during the last two Community Innovation Surveys, $CIS_3$ and CIS4 and as a novel product innovator during $CIS_3$ than any other UK region (European Commission, 2004, Scottish Government, 2007).

## *5.4 R&D and innovation in the UK regions*

Table 1: Innovation and R&D in UK regions, 2004

| GOR | Selected innovation indicators by GOR, weighted data | | | | R&D expenditure as a percentage of GDP | | | |
|---|---|---|---|---|---|---|---|---|
| | Innovation Active | Product Innovation | Process Innovation | Wider Innovation | BERD | HERD | GovRD | GERD |
| **Scotland** | 56.3 | 22.1 | 16 | 31.8 | 0.52 | 0.65 | 0.29 | 1.46 |
| **North East** | 57 | 25.4 | 16.1 | 29.9 | 0.39 | 0.43 | 0.01 | 0.82 |
| **North West** | 58 | 24.1 | 14.8 | 32.9 | 1.5 | 0.34 | 0.07 | 1.91 |
| **Yorkshire & Humberside** | 58.3 | 25.2 | 14.8 | 32.1 | 0.41 | 0.43 | 0.06 | 0.89 |
| **East Midlands** | 57 | 27.2 | 15.7 | 32.8 | 1.24 | 0.3 | 0.1 | 1.64 |
| **West Midlands** | 55.5 | 24 | 16.1 | 30.5 | 0.83 | 0.28 | 0.05 | 1.15 |
| **East England** | 55 | 26.2 | 16.8 | 33.2 | 2.64 | 0.43 | 0.36 | 3.42 |
| **London** | 56.5 | 27 | 16.5 | 37 | 0.36 | 0.51 | 0.13 | 1 |
| **South East** | 59.6 | 27.5 | 15.9 | 36.3 | 1.88 | 0.38 | 0.3 | 2.57 |
| **South West** | 57.4 | 24.8 | 15.5 | 32.7 | 1.4 | 0.23 | 0.34 | 1.97 |
| **Wales** | 56.6 | 24.2 | 16.1 | 29.5 | 0.51 | 0.42 | 0.11 | 1.04 |
| **Northern Ireland** | 56.5 | 27 | 16.5 | 37 | 0.43 | 0.44 | 0.08 | 0.95 |

Table created from $CIS_4$ data (Scottish Government, 2007)

Table 1 depicts values of four indicators of innovation in twelve UK government regions in terms of percentage of innovation active enterprises and four measures of R&D in terms of R&D expenditure as a percentage of GDP.

If innovation is indeed R&D dependant, we should find businesses in regions spending proportionally more on R&D in various forms, exhibiting correspondingly high innovation. This, however, is not the case and as shown by the correlation matrix in Table 2, correlation between various measures of R&D and innovation is less than benchmark 0.5 in all the cases and negative or near zero, in most. What is most important, however, is that not a single set of correlation from the possible 16 parings is statistically significant either at 1% or at 5% level. This means unequivocally that regional innovation performance of businesses in U.K. does not depend on the corresponding extent of R&D investment.

Table 2: Innovation versus R&D Correlation Matrix

| | | **BERD** | **HERD** | **GovRD** | **GERD** |
|---|---|---|---|---|---|
| **Innovation Active** | Pearson Correlation | 0.06 | -0.19 | 0.00 | 0.03 |
| | *Sig. (2-tailed)* | *0.86* | *0.55* | *0.99* | *0.92* |
| **Product Innovation** | Pearson Correlation | 0.42 | -0.28 | 0.17 | 0.38 |
| | *Sig. (2-tailed)* | *0.17* | *0.38* | *0.60* | *0.23* |
| **Process Innovation** | Pearson Correlation | -0.14 | 0.24 | -0.01 | -0.10 |
| | *Sig. (2-tailed)* | *0.66* | *0.44* | *0.98* | *0.77* |
| **Wider Innovation** | Pearson Correlation | 0.41 | 0.01 | 0.43 | 0.45 |
| | *Sig. (2-tailed)* | *0.19* | *0.98* | *0.17* | *0.14* |

## *5.5 Innovation performance of businesses: Scotland versus UK*

As mentioned earlier in this thesis, the only credible direct evidence on regional and national innovation performance of enterprises in output terms comes from the Community Innovation Surveys. The Fourth Community Innovation Survey gives details of innovation performance of businesses in the UK for the period 2002-2004 (Scottish Government, 2007). It shows that 56% of Scottish firms are innovation active. In the UK, in comparison, the proportion of innovation activity firms in $CIS_4$ is 57%. 28% of businesses in Scotland are either product or process innovators whereas there are 30% such enterprises in the UK. Scotland continues to have the highest proportions of novel product innovators in the UK. Amongst the Scottish product innovators, 65% introduced products that are new to the market, compared to

59% in the UK. Scotland also has a higher rate of turnover from sales of novel products. As figure 15 shows innovation performance of enterprises in Scotland is on par with the UK average on two counts, on one measure of innovation, it outperforms the UK, whereas on four others, it underperforms the national average by small margins. This reinforces the argument that substantial differences in R&D spending do not result in very dissimilar innovation performance of enterprises between the regions and R&D investment in a region is a poor predictor of innovation outcomes.

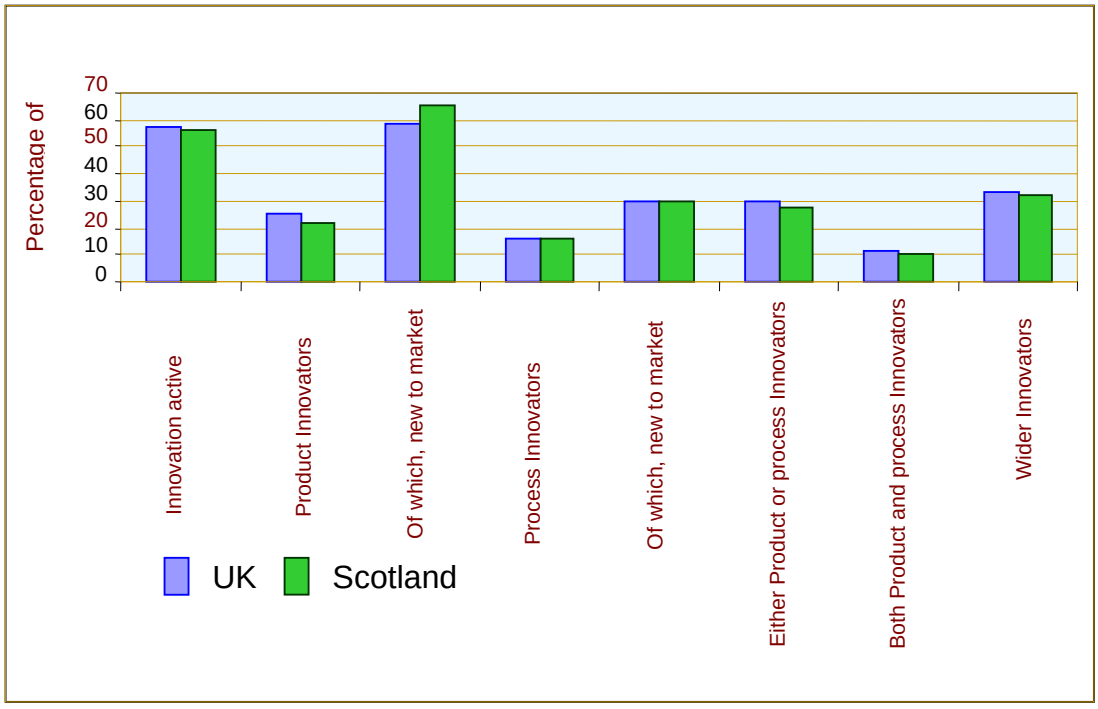



Figure 15: Innovation Performance Scotland versus UK
Graphic generated from the CIS4 data (Scottish Government, 2007)

Another important aspect of innovation in Scotland against its occurrence in the UK is that the relatively marginal underperformance of the Scottish business in relation to the UK average is confined to its smaller firms. During CIS3, large Scottish enterprises outperformed or performed as well as their U.K. counterparts in innovative activities, as shown in Table 3. As business enterprise R&D is undertaken proportionately more by larger firms, this raises further doubts on plausibility of relationship between R&D and innovation.

Table 3: Large Firm Innovation: UK and Scotland, 1998-2000

| **Innovations during 1998 to 2000** | **All firms** | | **Large firms*** | |
|---|---|---|---|---|
| | **Scotland** | **UK** | **Scotland** | **UK** |
| Percentage of enterprises undertaking innovation | 44% | 46% | 73% | 67% |
| Product innovations new to the market | 9% | 8% | 24% | 18% |
| Process innovations new to the market | 5% | 5% | 12% | 12% |

Source: DTI Innovation Survey 2001 * Employment of 250 or more in the UK

## 5.6 R&D and innovation in Scotland

Nearly two thirds of business R&D in Scotland occurs in pharmaceuticals, radio, TV & communications equipment (including electronic components) and precision instruments firms (Scottish Science Advisory Committee, 2006). In both output and employment terms these sectors constitute a very small fraction of the Scottish economy. In 2005, employment in these sectors was less than 3% of the total Scottish employment (Scottish Business Statistics, 2007). It is difficult to understand how business R&D, 67% of which occurs in 3% of Scottish economy can significantly influence innovation in the rest of its 97%. The fact that 56% of all Scottish enterprises are innovation active, makes it obvious that a significant proportion of Scottish businesses innovation is not R&D driven. The fallacy of equating R&D with innovation, nonetheless, continues. The Consultation Paper on Science and Innovation Strategy for Scotland (Scottish Government, 2006b) discusses innovation solely from an R&D perspective. What is surprising is that though the consultation paper explicitly admits that, *"…business innovation covers a wide spectrum of activity, from at one end, innovation building on scientific advances, through to, at the other end, less science-based activity such as adoption of new business processes and new design. All can lead to competitive advantage, and we do not seek to value one more than another"*, it nonetheless continues to discuss innovation from a strict R&D outlook and goes on to advise that Scotland should *"…maintain or grow R&D in sectors where Scotland is strong, attract investment into Scotland from multi-nationals willing to carry out R&D, increase R&D intensity in firms or sectors that are lagging behind, develop new R&D intensive sectors and create R&D intensive SMEs* …and … *increase involvement in the EU Framework Programmes for collaborative R&D"*.

It is not that the scientific community in Scotland is not aware of the precarious nature of relationship between R&D and innovation and that it has not brought this out to the notice of the Scottish Government. A working paper prepared for the Scottish Science Advisory Committee categorically states that *"Innovation … is not restricted in terms of process or of outcome to science and technology matters, and not to R&D. R&D is but one possible input to innovation."* (Scottish Science Advisory Committee, 2006)

Yet the naïve belief, *"R&D leads to innovations in the economy through the development of new products, services and processes"* (Scottish Government, 2003) persists. It is obvious that the Scottish Government's efforts to promote innovation in Scotland are handicapped by its focus on R&D and high-tech.

The fact is that the vast majority of enterprises in Scotland use low-tech manufacturing methods driven not by tradition but by sound economic logic. As this research shows, the competitive advantage of innovative small food companies in Scotland stems from the fact that, they use a labour intensive technology and that their products are hand finished. This combination gives them agility to alter quickly their products in face of changing customer needs. Being low-tech thus is the essence of their innovation and making them high-tech and R&D driven would only compromise their innovative potential.

Interestingly, Scottish Business Attitudes to Research, Development and Innovation (Scottish Government, 2005) at one stage concedes that in Scotland "*…excessive attention has been paid to raising high-tech industries, and …more effort should be put into reviving low-tech and 'maturing' industries"*. There, however, are no indications of any policy initiative reflecting this.

## *5.7 Commercialisation of research by higher education institutes*

Another field in which the Scottish Government mistakes inputs as outputs is commercialisation of research by higher education institutes. Higher Education-Business Community Interaction Survey for Scotland shows that in 2003-2004, the Scottish HEIs set up 14 spin-off companies. This made the number of active Scottish spinouts 123. These enterprises gave employment to 1,113 people and had an annual

turnover of about £32 million (Scottish Government, 2006a). Based on these statistics the Survey claims, *"…universities and colleges contribute to the competitiveness of Scotland's economy through the commercialisation and transfer of knowledge. This activity is more intensive in Scotland than would be expected based on its population size… Scottish expenditure on Higher Education Research and Development as a percentage of GDP is among the highest of all OECD countries"*.

It is difficult to understand how the claim of contribution of commercialisation and transfer of knowledge by the Scottish universities to the competitiveness of the Scottish economy can be supported by the above statistics. As shown earlier, there is no relationship between money spent in a UK region on R&D by universities and innovation by its businesses. Much of the university research, moreover, is basic and its evolution into commercially successful products or technologies is a long, complex and uncertain process. A minuscule proportion of all university research is commercialised. Often researchers would carry away with them their research output and the fact that Scotland has one of the highest rates of PhD graduates working outside the UK provides no solace. Most importantly, as Table 4 shows, in the economy of Scotland, university spin-off's economic contribution is almost zero.

Table 4: University spin-off's Economic Contribution, Scotland, 2004

| | **No. of Units** | **Employment** | **Turnover**, £ million |
|---|---|---|---|
| Scotland, Total | 270,430 | 2,429,420 | 198,000 |
| HEIs Spin-offs | 123 | 1113 | 32 |
| HEIs Spin-offs as a percentage of total | 0.045% | 0.046% | 0.016% |
| HEIs Spin-offs as a percentage of total, rounded to one decimal place | 0.0% | 0.0% | 0.0% |

Based on data in Higher Education-Business Community Interaction Survey 2003-2004 and Scottish Business Statistics, 2004

## *5.8 Small business innovation in Scotland*

The final report of DTZ Pieda consulting on Scottish Business Attitudes to Research, Development and Innovation (Scottish Government, 2005) describes cases of small innovative companies in Scotland. It reports, *"There are two types of small innovative companies in Scotland, the university spin out and the single site*

*manufacturer or technical consultancy. The University spinouts interviewed appeared to be more of a source of innovative ideas than the single site manufacturer. The single site companies interviewed tended to be undertaking lower level adaptation of existing technology mainly for particular customers to distinguish themselves from the competition and to assist in reducing their costs so that both their products and their service provision can be seen to be competitive. This type of innovation tends to be relatively low risk compared to research being undertaken where an end customer has not been identified."*

This report, thus, identifies two kinds of innovative small companies in Scotland, the R&D driven high-tech university spinouts, and the low-tech single-site manufacturers, involved in 'lower level adaptation of existing technology'. The Annual Survey of Small Businesses for Scotland in 2005 (Scottish Executive Social Research, 2006) reveals that a quarter of all small businesses in Scotland introduced new or significantly improved products or services circa 2004. As the calculations above show, university spinouts in Scotland constitute less than 0.05% of its firms. As small firms constitute 99% of all Scottish firms, we can say that university spinouts in Scotland constitute around 0.05% of its small firms. The remaining 24.95% of small Scottish companies that innovated in 2004 therefore must fall in the second category. This is corroborated by the research outlined in this thesis, which shows that all the case study companies more or less fit the description of the second type. This means that 99.95% of innovation-active small firms in Scotland carry out low-tech innovation without any conventional R&D and the Scottish Government's perception of R&D driven high-tech innovation in Scotland is a myth.

## 5.9 European innovation scoreboard

Equating innovation inputs with innovation output is not confined to Scotland. It is an EU-wide phenomenon. The European Commission's agency, PRO INNO Europe, publicises innovation performance of nations and regions in Europe. In its recent report, it ranks Scotland, as shown in Table 5, at 89th amongst 203 EU, and at 11th amongst 12 UK, regions (European Commission, 2006).

Table 5: UK regions in European Innovation Scoreboard, 2006

| Rank | Region | Innovation Score |
|---|---|---|
| 12 | South East | 0.72 |
| 17 | Eastern | 0.69 |
| 35 | London | 0.59 |
| 37 | South West | 0.58 |
| 42 | West Midlands | 0.57 |
| 47 | East Midlands | 0.57 |
| 56 | North West | 0.54 |
| 72 | Yorkshire and The Humber | 0.49 |
| 78 | North East | 0.48 |
| 80 | Wales | 0.48 |
| 89 | Scotland | 0.45 |
| 113 | Northern Ireland | 0.41 |

Source: European Innovation Scoreboard 2006

As mentioned earlier, the last two Community Innovation Surveys (European Commission, 2004; Scottish Government 2007) have shown that Scotland's innovation performance is more or less on par with the UK average on most counts of innovation outputs and better than most regions on some of them.

Why then in this analysis does it turn out to be such a poor performer? The reason is that European Innovation scoreboard does not take into account innovation outputs but considers only innovation inputs to measure the innovativeness of a region. The scoreboard is based on the following seven criteria.

REGIONAL INNOVATION SCOREBOARD INDICATORS

1. Human Resources in Science and Technology – Core (percentage of population)
2. Participation in life-long learning (per 100 population aged 25-64)
3. Public R&D expenditures (percentage of GDP)
4. Business R&D expenditures (percentage of GDP)
5. Employment in medium-high and high-tech manufacturing (percentage of total workforce)
6. Employment in high-tech services (percentage of total workforce)
7. EPO patents (per million population)

These criteria make it obvious that within EU too, innovation is visualised from a narrow high-tech, R&D centric perspective and perhaps the Scottish view of innovation is a legacy of Scotland's pan-European existence. However, as CIS3 and

CIS4 clearly demonstrate, innovation is not confined to high and medium tech sectors and the calculations above show that amongst the Scottish SMEs it predominantly occurs in low-tech enterprises. There is therefore no logical reason to persist with a high-tech and R&D centric view of innovation in Scotland.

## *5.10 The previous research*

It is interesting to note in this context that as early as in 1970s innovation research has shown that R&D is a misleading indicator of innovation, particularly in small firms. Many reasons are cited for this. One, R&D is only one of the (that too a minor part of) innovation costs and outcomes (Stead, 1976), two, small enterprises usually have no formal R&D departments (Kleinknecht, 1987; Santarelli and Sterlacchini, 1990; Kleinknecht and Reijnen, 1991) and three, in small firms R&D has a 'developmental, rather than a fundamental, focus' and is 'spread across a number of functional units, rather than captured (largely) within a single R&D function' (Sterlacchini, 1990). Despite this and despite its candid admission, *"…the paucity of formal R&D need not inevitably equate to low levels of innovation"* and *"…the Scottish economy is disproportionately composed of low R&D intensity sectors (such as knitwear, food processing, tourism and so on)…"* (Scottish Government, 2005), for some inexplicable reasons, the government in Scotland continues to hold and act on a R&D centric high-tech focussed stance on innovation.

Even amongst some academics the R&D-innovation connotation persists. Frenz et al., (2004) have tried to explain the higher incidence of novel product and process innovation in Scotland despite low R&D per employee, purely from a high-tech perspective of innovation. They believe that four factors explain this. These are, higher proportion of science and engineering graduates as employees, greater use of the science base as a source of knowledge and information, higher propensity to enter into cooperative arrangements for innovation with universities and research organisations and higher proportion of Scottish innovators receiving public policy support for their innovation activity.

As explained above, much of business innovation in Scotland is in low-tech sectors, which form the core of Scottish economy. The findings of this research later explained in this thesis show that the innovative small food companies in Scotland do

not hire science and engineering graduates, they do not use science base as a source of information and do not have cooperative arrangements for innovation with universities and research organisations. Frenz et al.'s above explanation, thus, does not reflect the true nature of innovation in Scotland. The reason for Scotland's good innovation performance despite its proportionately low R&D is due to the fact that formal R&D has no role to play in the process of innovation in the majority of low-tech SMEs of which the Scottish economy mainly comprises.

## *5.11 Conclusions*

The Scottish Government pays great attention to monitoring innovation performance of Scottish businesses and is determined to make Scotland a much more innovative region than what it is. There is overwhelming consensus in government circles in Scotland that innovation is a precursor to both competitiveness and growth (Scottish Government, 2004). To this end, several initiatives are taken by the Scottish Government. Many studies on these concerns are also commissioned, compiled and made public at considerable costs (Scottish Government, 2003, 2004, 2005, 2006a, 2006b, 2007 and Scottish Government Social Research, 2006). These efforts, however, are largely misdirected as the approach of the Scottish Government reflects a fallacious notion of innovation. It is presumed that innovation is always science led, occurs mostly in high-tech sectors and is caused principally by the investments in R&D. As Scotland has a poor record of business enterprise R&D, the focus, thus, is to encourage businesses into spending more on R&D and maintain high levels of government R&D to augment low spending by businesses on this count (Scottish Government, 2006b). This, as explained above, reflects an imperfect understanding of the innovation process in general and its nature in the Scottish economy. The fact that in low-tech and traditional sectors, which are the mainstay of the Scottish economy, R&D in the conventional sense has no role, must be understood and embedded in policy. The findings of this research explained later in this thesis show that the process of innovation in the Scottish food industry, one of the largest segments of the Scottish economy, is informal, concurrent and cross functional . There are no airtight compartments separating R&D activities from routine manufacturing and businesses find it difficult to pinpoint what part of their daily routine fits a stereotype R&D act. This work also shows that it is possible to comprehend the true nature of innovation process through intensive one-to-one

interaction with people involved in it rather than through large-scale impersonal telephone surveys. The most important need is to break free from a R&D-centric high-tech view of innovation and search for innovation in the heart of Scottish manufacturing which is quite innovative not despite being low-tech but because of it.

# 6 Results

As explained in the literature review, there are two perspectives to the analysis of innovation, the determinants perspective and the process perspective. The results of this research are, thus, presented and analysed from these two perspectives. In section, 7.1 of this chapter, evidence on presence or otherwise of main determinants of innovation in the case study companies is detailed and then in section 7.3 the evidence on the nature of the process of innovation in the these companies is discussed.

## *6.1 Internal strategic determinants of innovation*

As outlined in the literature review, the internal strategic determinants of innovation identified by previous research include market orientation, learning processes, technology policy, participation in cooperative networks, managerial efficiency, financial resources, human resources, particularly innovative people and age as well as size of enterprise. As shown earlier, some of these determinants are strategic and others non-strategic. The within-case and cross-case analysis of internal determinants of innovation in the case study companies is as follows:

### 6.1.1 Market orientation: Within-case analysis

Research in the field identifies the level of market orientation of a firm based on certain indicators. These include, integration of customers into product innovation processes, ability to explore and reach potential markets, fit between market needs and firm's resources, product planning from inception, targeting the international market, span of market experience, understanding of customer needs and user circumstances, competition analysis, speed and flexibility, market research, market tests and deployment of user feedback to modify an innovation (Edgett and Parkinson, 1994; Storey and Easingwood, 1996; Soderquist *et al.*, 1997; Heydebreck 1997; De Brentani, 2001; Lindman, 2002).

Given below is an analysis of market orientation of the eight enterprises that formed this investigation in terms of the above-mentioned indicators.

### 6.1.1.1 **Company A**

#### *6.1.1.1.1 Ability to explore and reach potential markets*

When asked how does he know what his true market is and how does he reach out to it, the response of the owner of Company A was *"… we look at our competitors' products. We see what's out there, what's the price and we take the product off the shelf and bring it back here and we try and evaluate and perceive what is the value of it. What is the quality of the product, and based on the quality of the product, we always endeavour to make a product that is better than the original product…"* In the context of his food service business, the entrepreneur informed that the search in the enterprise is for developing healthier versions. He said, *"The other thing at the moment that concerns us is that in the traditional restaurant, the demand of the consumer is more on the more wholesome and healthy products, not just in supermarkets. We get them in schools and so…we try to sell the food stuff in the pizza that doesn't have E-numbers and additives."* In response to a query on what markets he thinks his business would reach in future, he replied, *"I believe we would do business with Rachel's. At the moment, it is in the East but very much based in London, but I think they have a customer base that will appreciate what we have to offer and they have the brands, I'd be quite interested in doing those brands, because our brands do not have much significance in London although we did supply them in the market for a while. Seriously, I think we'll be in Scotland only for a while. Tesco I am not sure about but I'd be quite happy if I get on with Sainsbury's and ASDA next year and develop a bit more in the food service."*

Company A thus has been exploring and reaching potential markets by analysing the relative value of its competitors' products and then creating versions that outsmart them. It is reaching out to health conscious customers and is also exploring markets outside Scotland.

#### *6.1.1.1.2 Fit between market needs and firm's resources*

Company A has always tried to develop its market by a careful evaluation of its resources. When asked why it developed its market for pizza the reply was *"…it was purely a decision based on resources and the effort that we can put and to which*

*direction to take the business, so we decided to look after pizza especially in frozen and chilled variety."*

#### *6.1.1.1.3 Targeting the international market*

At the time of investigation, Company A did not target the international market. When asked why they do not do it, the response was *"We haven't done that,* (targeted the international market) *and the reason we haven't done that is because there's more than enough to feed on in this country at the moment without having to go abroad, as there is a massive market that is untapped as far as we are concerned, and we have got more than enough ammunition to tap into market places over here, with what we have, in terms of the size of our business and the size of the UK market through retail and catering, we are still, just a drop in the ocean … but we do export the Gluten free products, because they are frozen, but what we don't export is because we aren't big enough to export to European markets and there's enough satisfaction* (here)*."* Subsequently, however, the company has been able to target international market successfully and now annually exports half a million pizzas to Italy and Germany.

#### *6.1.1.1.4 The span of market experience* for Company A is 35 years.

#### *6.1.1.1.5 The understanding of customer needs and user circumstances*

Company A is quite focussed on understanding customer needs and moulding their products to suit customer requirements. The entrepreneur explained, *"…at the end of the day it is a consumer who drives any business and the consumer trends are changing very quickly from one product range to another. We deal with clients that aren't big enough to well customize our stock…. the big supermarkets can go to really big manufacturers and say this is what we want, and the big manufacturer can customise their process for them. We on the other hand understand the need for quality products in the pizza market and that is how we have gone forward in innovation as a brand and as one of the market leaders. Well, certainly* (our products are) *not the most expensive, but maybe the second most expensive, e.g. We've got ASDA and they've their range which is called the extra special which is sort of the gold standard and their retail price is 3 times our. So we offer good value, and we are trying, and we are consciously trying to keep under the price of 3 pounds*

*because once you go above the price of 3 pounds it becomes a price point after which, even if its 20p over 3 pounds the consumers will consider it a large thing, and you have the risk of letting your sales volumes dropping."*

His response to a question in another context too shows a high level of understanding of customer needs and circumstances *"…..there is a lot of opportunity in that market that's probably growing faster than a retail market and there are demands for better and better quality as people demand better and better quality and the market is continuously descaling and good chefs are harder and harder to find and they cost a lot, so companies look to find answers for products which are as good as replicable as hand made products made by chefs in a factory environment and that is again and that we have the ability to create these kind of products for the service market. So we deliberately got involved in the food service sector and we have done a year's plan worth."*

#### *6.1.1.1.6 Speed and flexibility*

Company A has high product development speed. One of its major innovations is a microwave pizza. When asked on how long it took to develop it, the entrepreneur informed, *"It took us on and off about a year."* The enterprise has a high flexibility in product development too, the entrepreneur attributes it to it labour intensive technique and to its small size, the entrepreneur explained, *"…in terms of innovation we have a distinct advantage over the big manufacturers, because our ability to change and to change quickly is far greater than of the larger manufacturers who tend to be heavily geared up and plan equipment for specific products, and to make a change is quite a dramatic problem for them and hence the way we're settled here, more intensive but we're less mechanized, the ability to innovate our technology or products is a far crucial process than for the big manufacturers, so ...a big thing for us is our size…"*

#### *6.1.1.1.7 Competition analysis*

Company A visualises big food manufacturers as their chief competitors and has the strategy of using its flexibility to outsmart the large corporation. The entrepreneur explained, *"…there are gaps in innovation where we can very quickly score,*

*sometimes years before many of the big companies can start them even as a mere plan"*

#### *6.1.1.1.8 No Market research*

Company A does not carry out formal market research, the entrepreneur here is convinced that in his line of business quality is most important and if you can deliver good quality at an affordable price, you product is sure to sell and you do not need to do market research to know this. He said, *"…you don't need masses of data and research and hire these research companies to go in and get the product to the market. We know the quality in terms of what we need and what we lack in comparison and we go far and ahead of the game in the far side of the quality of the products, and the consumer sees the quality side of the products."*

#### *6.1.1.1.9 No Market tests*

Company A does not conduct any market tests to gauge the market potential of its products. The entrepreneur informed, *"We just get an idea, stick it together, put it in the market and see how it succeeds. That's basically how we do it, and we don't market test it anyway…"*

## Conclusion

Company A possesses an ability to explore and reach potential markets; it tries to attain a good fit between market needs and firm's resources, undertakes competition analysis, has a long span of market experience (35 years) and exhibits a good understanding of customer needs and user circumstances. Though it did not target the international market at the time of investigation, it does it now. The company, however, does not carry out market research or deploy market tests. Here it should be understood that the absence of some of the indicators of market orientation does not necessarily mean that the company is less market oriented. It only shows the nature of its market orientation. For instance, non-use of market research and market tests are not a mark of weak market orientation in case of company A. Because of its understanding of customer needs and user circumstances the company has been able to market successfully innovative products even without market research or market tests.

### 6.1.1.2 **Company B**

#### *6.1.1.2.1 Integration of customers into product innovation processes*

Company B has Waitrose as one of its biggest customers. The company hit a trajectory of high growth only after Waitrose recognised the quality of its products, gave it a large order and encouraged it for innovation. It was on Waitrose's prompting that it invested in substantial capacity, which seems to have paid off. Today, Waitrose is very much integrated in the product innovation process at Company B. The company's product development executive informed, *"…one day a Waitrose buyer came through on holiday, came to the* (local) *shop and asked where it* (one of our products) *was made and then it grew from there. We started on the larger scale round about '83, '84 producing for Waitrose and we've gone over producing something different from the traditional pates, pates that have a Scottish flavour, Scottish family and Royal Scottish Garrison Brandy and Highland pate soaked in red wine and such things which were quite different from what was available in the UK."*

Company B, once prompted by Waitrose, made significant effort to enact a 'sales theatre' inside a Waitrose store to create a buzz about its products. The idea was explained by the company executive in the following manner. "*It* (theatre) *means that you're looking for a bit more excitement, for consumers going into a shop and so that the delicacies attract them, around the free pack. It is something that is eye-catching, a lovely decoration, a bit more like a traditional delicatessen shop inside a supermarket. That was something that they* (Waitrose) *were looking for, and that's what we worked along, and I suppose Waitrose is to be thanked for getting us kick-started, and our business grew from there till '89 when we were outdoor now, in town, in the centre of the town and built this factory here in 89."*

Explaining the role of customers in their product development process, the executive said, *"…so he's* (the executive chef) *got some fantastic ideas, and then it's a case of us making them feasible and taking them away and presenting them to other people, to customers and taking it from there really"* When asked on how do they convince themselves that a product idea is worth perusing, the executive said, *" …by getting a customer on board with it...I mean if you don't go to the customer with new ideas,*

*then somebody else will, and it is that proactivity that has kept us ahead of the competition in innovation."*

#### *6.1.1.2.2 Ability to explore and reach potential markets*

Company B has continuously tried to expand its market in terms of the kind of people who buy its products. The product development executive of the company said at one stage, *"What we try to do is to encourage people to use it* (the pate) *in different ways, so if you produce just purely pates, only for knifing onto a cracker then you limit your market so, so we've introduced dinner pates and … to broaden the appeal, and we've kind of flavoured them so that they appeal to the younger people, so we did a bit of research on what younger people would like and we got people from the agency confirm that…"* The enterprise has been able to reach most of the superstores that sell pate, the company executive said, *"We supply Morrison's the best, ASDA extra specials, we supply Sainsbury's, we supply everyone except M&S, to almost everyone across the board, and that's quite difficult, to try to keep everybody happy, and keep it different, that's the difficult part, and there's only so many proteins and vegetables that you can access, therefore if we are trying to get business with all those customers during Christmas, and we try to keep everybody different, that's a job and an act."*

#### *6.1.1.2.3 Fit between market needs and firm's resources*

Innovation at Company B is equally contributed by the needs of the market expressed by the customers and firm's resources reflected in its ability to innovate new products successfully. The product development executive of the company said. *"…he* (the executive chef) *might come up with an idea and bring up to people and say, what do you think of that? or we might get a briefing from a customer who would say that we've got a rough idea of what we want to do and so can we go away and look at it, so sometimes it can be customer led, and so I will say roughly 50-50 between the customer led and our own team leading the innovation. It depends on what the customer wants and what we can do."*

#### *6.1.1.2.4 Product planning from inception*

Product planning process in Company B is quite different now than, what it used to be previously as explained by its product development executive. *"...it used to be in the past, if you had ideas, or if there was a customer wanting a range change, you could go down there, 10 or 15 products to show them, concepts, ideas and talk to the customer and come back.*" This, however, has changed now. The fact that their biggest customer is Waitrose and is on board from the very beginning, when the new products are planned means that they have to use very meticulous planning from inception. The executive explained that. *"…now the customers have introduced a new product development form for every single presentation. So you can spend nearly two weeks preparing paper work before you can go to a concept meeting, and they want to know the problems of all the ingredients at that stage, they want to know, all the information, sometimes even the nutritional information for it."*

***6.1.1.2.5 The span of market experience*** of Company B is 25 years**.**

***6.1.1.2.6 The understanding of customer needs and user circumstances***

Company B does not merely try to understand the needs of its customers. It has proactively made investments to accommodate its customers' requirements in its product development process. The company executive informed. *"…if they* (Waitrose) *want something, then they'll say, this is where were going, and if you don't want to come along then we'll go elsewhere. So we've invested heavily in this factory to keep up with what Waitrose want, but it paid off. And we've got over a million pounds worth of sales this year and over £1.8 million worth of sales in Tesco. So any investment that we've made, nearly half of that has worked for what we can say is a very demanding customer."*

***6.1.1.2.7 Speed and flexibility***

Company B develops its products quite fast. The company executive informed, *"It takes only 3 months to 6 months, to develop a new product although if it is new recipe and new technology, it can even be longer. If it's just a changeover of a recipe, one in, one out, you can do it in about 3 months or so."* Regarding its flexibility, the executive believed is due to its labour intensive production methods, which give it more flexibility, than large manufacturers who use automatic

techniques. The executive said, *"…The large factories have automated equipment, and they just couldn't do it"*

#### *6.1.1.2.8 Market research*

Market research at Company B is quite informal but distinct. The executive chef, the creative spearhead of the organisation travels around the world eats out and tries to come out with new product ideas. The company executive informed, *"he* (the executive chef) *has travelled extensively over the years and he's worked in many countries and he's travelled over the years and he's worked in larger organisations as well, so he's got a wealth of experience and with his background, and with this job he still travels a lot and eats out and watches all the trends and just keeps his nose in the food world…."*

## Conclusion

Company B demonstrates integration of customers into the product innovation processes, an ability to explore and reach potential markets, a fit between market needs and firm's resources, product planning from inception, a long span of market experience, an understanding of customer needs and user circumstances and high speed and flexibility in new product development and informal yet distinct market research. There, however, is no evidence of targeting of international market, use of competition analysis, or deployment of market tests. The reason for absence of the last two indicators is understandable. Having developed an enduring relationship with a major food retailer the company has made itself immune from its competitors. Another reason for its lack of interest in competition analysis is that in its niche it is very well placed in UK. Though it is a small company, in the pate market it is considered the market leader. The reason for non-use of market tests appears to be the fact that as it sells its products through large grocery multiples it does not need to depend on such tests which are crucial to companies selling directly to final consumer.

### 6.1.1.3 Company C

#### *6.1.1.3.1 Ability to explore and reach potential markets*

Company C started as a supplier to corner shops. The transformation of the retail food market in UK, which marginalised the corner shops and ushered in the era of dominance of superstores, caused a rethink in Company C and the company embarked on pursuit of the new giants of the food market and successfully established itself as a supplier to them. One of the interviewed entrepreneurs informed, *"What has happened* (in the last 3 years) *is this. Our company was predominantly a corner-shop supplier ok, in the last 3 years we have concentrated a lot on the supermarkets. We now supply ASDA, Morrisons-cum-Safeway, Aldi stores, Scotmid, Sainsbury and Waitrose."*

#### *6.1.1.3.2 Product planning from inception*

Company C people work hard to make their ideas work and plan the innovation process meticulously. One of the interviewed entrepreneurs informed. *"We meet at lunch time every day. If I have an idea or if someone else had an idea, we talk if we can do this or we can do that. To be honest with you, it normally comes from me not fully developed the first time; you have to make it work. And these guys make it work. And there are able to do it because we plan the whole thing from the beginning."* In another context, he explained, *"We always do surveys. We check the pricing. We found out the multiples. Honestly, we try to control the market. We check out what these guys were doing. What everybody else was selling? Type of products etc…"*

#### *6.1.1.3.3 Fit between market needs and firm's resources*

As stated above, previously Company C was predominantly a corner shop business. In the three years prior to this investigation it changed its market focus to grocery multiples. It has been able to achieve this by redirecting its resources from those that served the corner shops to those that catered to grocery multiples. The entrepreneur informed. *"…we also do less products now then what we used to do because in last 3 years we are more into supermarkets. The corner-shop business has changed a lot. In the same corner-shop business that we used to have 17 vans on the road doing corner-shops, we are now down to seven doing the corner shops because a lot of them have closed down and a lot of them have been taken over by Spar etc. So these are all changes."*

***6.1.1.3.4 The span of market experience*** of Company C is 23 years.

#### *6.1.1.3.5 The understanding of customer needs and user circumstances*

Entrepreneurs in Company C have a good understanding of the behaviour of their main customers, the grocery multiples. The company understands that the superstores are facing stiff competition from one another and need to source their products at the lowest possible prices. The company, however, has made it clear to them that high quality cannot come at low prices. The entrepreneur said, *"What is happening now is that supermarkets are lusting now as well. If ever supermarkets want this, they have to pay for it. If they don't pay for it, we don't give them it. It is as simple as that. And so what the supermarkets are getting from us now is what you may call cannon fodder. It looks terrible. It is rubbish. What we manufacture is what they pay for..."* The company's viewpoint is now shared by its customers. The entrepreneur informed, "*They* (the superstores) *are, though, beginning to realise what we have been telling them that the way forward is to premiumise things and to make them a bit different from the guy next door."*

#### *6.1.1.3.6 Speed and flexibility*

From idea to market, Company C takes about 6 months' time to develop its products. This is an indicator of its high product development speed. Company C too, like many other companies in this investigation, attributes its flexibility to its labour intensive methods. One of the respondents said, *"…Morrisons said they like lemon drizzle, but did not want drizzle at the top. They would just like sugar and something with it like sugar and lemon pieces. You cannot do it that easily. Whereas we did it because of our flexibility … it is a different ball game, down the road* (for the large manufacturer)*."*

#### *6.1.1.3.7 Market research*

Though Company C does not hire consultants to carry out formal market research they do try to research the market using their own people and resources for relevant information. One of the respondents informed. *"We always do surveys. We check the pricing. We found out the multiples. Honestly, we try to control the market. We checked out what these guys were doing. What everybody else was selling? Type of products etc."*

## Conclusion

Company C shows an ability to explore and reach potential markets, product planning from inception, has a long span of market experience (23 years), has an understanding of customer needs and user circumstances, possesses high speed and flexibility in product development and undertakes market research. The company, however, does not integrate its customers into its product innovation processes and does not target the international market. Similarly, there is no evidence that the company undertakes any competition analysis, uses market tests, or deploys user feedback to modify an innovation.

### 6.1.1.4 Company D

#### *6.1.1.4.1 Integration of customers into product innovation processes*

In Company C, customers are very well integrated into the product innovation process. There is a distinct reason for this. Around 40% of its ice cream is sold at the point of manufacturing at its adventure centre. The enterprise very cleverly involves the customers who are staying at the adventure centre into its product innovation process, using an ingenious method. The entrepreneur explained it the following way. *"One of the events that we do at adventure centre is a contest. In this public can come along and we give them milk, cream, sugar and an ice-cream freezer and we also give them flavours, strawberry, ginger, chocolate, toffee. If they want, they can bring their own flavours too and they can make ice-cream and so we get a huge amount of ideas from the general public on what kind of ice-cream they would like and so we quickly see what is popular. Kids go for sweetest things possible. They like toffee and honeycomb and chocolates and likes. So it is sweet, sweet, sweet. We have got other parents as well who make things that are more sophisticated."*

#### *6.1.1.4.2 Ability to explore and reach potential markets*

Two areas in which Company D has explored and developed completely new markets is organic ice cream and fair trade ice cream. At the time of investigation, the company had just undertaken a major UK wide initiative in developing and marketing the organic ice cream. The results were, however, not encouraging and the company decided to abandon the idea for the time being. The entrepreneur explained, *"…We launched the organic range in 1999 and we thought that by this time*

*everything that we will be doing would be organic but the only information that we got at that time was that the organic were growing exponentially up. We were the second organic ice-cream company in the whole of UK. So we were the early starters but now we know that Scotland has not got the income where people can afford it. Scotland has not got the pollution where people would feel that they must buy organic and we* (the Scottish people) *are not as trendier or trend setters and so all the information that we had that organic were going skywards wasn't true for Scotland. So supermarkets said you test market it for Scotland. We tried it and it did not work and now it sells in London in independent stores, the vast majority of it so we had half hearted success."* (The more recent inquiry in the company's product profile, however, shows that company has now relaunched its organic ice-cream and it has been a success).

The entrepreneur also talked of her plans to launch a fair trade ice-cream and informed, *"…so I am in my next phase and these are early days and we are looking at fair trade."* When asked what is meant by fair trade ice cream, she explained. *"Well… 20% of the ingredients* (in it) *at the minimum should be fair trade registered. With our sugar along with the cocoa powder reaches 20%. And the company that we are talking to has a fair trade shop in the market and again they are keen that it will be in their name and not ours and they are largely chocolate and so whatever we do it must have chocolate."*

#### *6.1.1.4.3 Fit between market needs and firm's resources*

Company D has pursued an ambitious plan of developing its market. This is evident not only in case of its food business, which is entirely ice-cream but also in developing the associated business of an adventure centre. In order to fulfil this ambition, it has stretched the firm's resources to the maximum. The enterprise has been able to achieve a fit between the needs of its market and firm's resources as the entrepreneurs have put everything at their command into the business. Very remarkably, the owners do not take any money from the business for their personal use. The entrepreneur informed, *"John*[3] *and I are people who do not work for money. We don't want money at all. John doesn't want an iota of it. I would like a*

[3] All names have been changed for reasons of confidentiality.

*reasonable amount of money for living very-very basically. I would like a reasonable living standard and I would like a pension and both of these things* <laughs> *are not looking achievable at the moment."*

***6.1.1.4.4*** Company D's ***span of market experience*** at the time of investigation was 13 years.

#### *6.1.1.4.5 The understanding of customer needs and user circumstances*

The Company D entrepreneur is well versed with the needs and circumstances of their customers. This is quite evident in her analysis of the initial failure of Company D's organic range. *"… Scotland has not got the income where people can afford it. Scotland has not got the pollution where people would feel that they must buy organic and we were not as trendier or trend setters…"* She similarly has a good understanding of how one of the major outlet of their ice-cream, the supermarkets function. She informed, *"…we are at Tesco, Sainsbury and Morrisons. The super markets will go for their full range there then they will have Haagen-Dazs and probably Ben and Jerry and two top of range and they will go for a few things by Walls and the next things they will have will be local ice-cream. And so in Scotland it will be us or MacKinnon's. In Yorkshire it would be Yorkshire Cornwall ice-cream."*

#### *6.1.1.4.6 Competition analysis*

Company D entrepreneur appears very well informed of methods used by her competitors. She gave us the following story on one of her competitors. *"…Ben & Jerry? Have you heard of? American company now owned by Unilever. They go for whacky ice-creams. They launched an ice-cream in UK 5 years ago called Phish Food. I thought nobody is going to buy that and they paid to supermarkets for shelf space to let it be there for 3 years. And in the meantime, what they were doing. They were going to every fresher's' week and stand at the bottom of escalators in the underground and giving away 300 ml for people to discover what Phish Food was because in States phish is p-h-i-s-h and in States Phish Food is chocolate with fish. Young people buy it and so in States people know that Phish Food is the ice-cream that Ben & Jerry are offering. Nobody in UK knew Ben & Jerry or Phish Food so they had to spend a lot of money. A. to persuade supermarkets not to delist them and*

*B. to create the awareness of general public and mainly teenagers of what Phish Food ice-cream was. And so you need deep pockets."*

#### *6.1.1.4.7 Speed and flexibility*

The speed and adaptability of Company D is evident in the way in a span of 15 months they become a successful ice-cream company when at the beginning of that period nobody in the enterprise even knew how to make ice-cream. The entrepreneur explained, *"It was in January 93 that we decided that we were going to do ice-cream and in December, we finalised packaging… the stuff was in the shops in June the following year… I did not know how to make ice-cream so I went to do a course probably about April which was how to make ice-cream…"*

#### *6.1.1.4.8 Market research*

Company D depends on formal market research to understand its market and know what sells and what does not sell. The entrepreneur informed. *"…Yes we did that and in fact we brought in a market research company in the very-very beginning and it is a story to tell. We asked all our friends what a pudding should be in a party and we had 50 suggestions. We got all them done and sent them to all our friends again and we had a feedback and we got that down to may be 24 and then we pruned it to 8 and we thought 8 would be practical. So we got this market research company to go out and do that and around the same time when it was going on, we discovered. We were in north east and we were starting planning and by the time we had just about finished our building they were in local supermarkets and oops there is already farm ice-cream which is very good. At that point, they were only lower. So we thought we had only to concentrate on natural flavour, on luxurious flavours."*

#### *6.1.1.4.9 Market tests*

Company D uses a mix of formal and informal market tests to be successful in its market. The entrepreneur informed, *"…we had this company doing market research and what came back was that they will buy chocolate and they will buy strawberry. And all these wonderful flavours that we had nobody will buy...As it turned out, as we ourselves become more sophisticated and we would go to other market reports. 70% is vanilla, 10% is chocolate and in remaining every other flavour in the world.*

*So if you think of something like coffee or mango or whatever all those together are final 10% and that was what we were targeting. It wasn't a sensible strategy...Next after we looked at the comments. What people had said. And we had one flavour, which everybody who had tested it loved it and that was banana and toffee. And I think 84% said that they would buy banana and toffee and amongst those who had not tested it 0% said they would buy banana and toffee ice-cream and we talked to the consultant and he said you have to make them taste it so that they would buy it. And so we had two options. Spend 2 million pounds to market it in such a way that people get to taste so that they buy it or give it a different name a more interesting name and give it a very attractive packing so that they are drawn to it and it has a name that they find attractive. So we got this market research company and they gave each respondent 4 names and so instead of being called banana and toffee, we tried banana and fuzz, banana and tofllet and the Banoffee and the result? Banana and fuzz- zero, banana and tofllet- zero and Banoffee- 60"*. It, however, understands that no matter how elaborate the tests are the eventual customer response can be different from the one reflected in market tests. When asked if the company tried to test market Heather Cream, one of its promising creations that did not succeed, she said. *"Yes we did it. We could do it in only 20 stores in Scotland. So it was not very big…*(and the response*) was positive. There were few but not many negative reactions. But the vast majority of people really liked it."*

## Conclusion

Company D is a highly market oriented enterprise and it exhibits all indicators of market orientation except targeting the international market and deployment of user feedback to modify an innovation.

### 6.1.1.5 **Company E**

#### *6.1.1.5.1 Ability to explore and reach potential markets*

Company E has shown a great ability to search and reach potential markets. Though it is a small Scottish food company, it has pioneered exports of characteristic Scottish food products to USA and Canada. Its success in these countries is due to its ability to find the most appropriate outlets of its products in these countries. When asked

about the outlets of his product in these countries, the entrepreneur informed. *"…it is very much the Scottish shops and the Irish shops. It is not in general shops or supermarkets. We are targeting catering and restaurants and bakeries. For instance, bakeries make haggis, pies and so we are looking at the catering side to develop business. That again depends on people eating* (our products) *and then coming back* (for more)*."*

#### *6.1.1.5.2 Fit between market needs and firm's resources*

Company E has had modest beginning and has slowly and gradually grown to come in its present position. It has always tried to match its market need with its resources. A brief history of the enterprise as narrated by the present owner shows this. He said, *"…going back to 1923, my grandpa started as a butcher. He opened a butcher shop. My parents joined the business in year 1975 and to the butcher shop they added a factory, producing haggis, puddings, pies and all that sort of stuff and that is what they were doing. In 1994, my parents retired and at that time meat industry was going downwards and I saw no future in butcher shop and in making things like pudding and pies. The factory, that we had, was needed to be knocked down and rebuilt. To build a new factory the cost was just horrendous but we developed haggis on an innovative basis. The problem was that we could not justify the factory just to make haggis, as the volume was not that high. So I started operating from the back of my house. We moved to this place in 1995-96. We have been going different tracks doing different things. We did confectionary, jams, haggis, Christmas hampers and things like that and so here we are."*

#### *6.1.1.5.3 Targeting the international market*

Company E is the most outwardly oriented case study company and has targeted the international market most successfully. When asked why it decided to target North America, the entrepreneur informed. *"That was forced upon us because of restriction on what we were doing here. It has been a pretty hard struggle but again it paves the way. Now there can be 100 more businesses but we paved the way."* When asked how he went through the process of internationalising his business, he explained. *"…Canada actually came up first. It was way back. It was Jim McDonald the guy who is dead now. We managed to sell in Canada first using different labels. Later on*

*we had other arrangement. There was one guy in Bristol and other in US and we were sending it to Bristol and he was shipping it across. We never knew how he was doing it but it was growing bigger and bigger. The last we did was four or five pallets in UK. He had an office in Washington DC and he was not using correct documentation and was caught and fined 500$. For us that was the end of it. Then we met this guy in Birmingham Spring Trade Fair. Then we contacted him again through British Chamber of Commerce…They wanted to give it some ridiculous name but we insisted that it should be called Scottish haggis…***"*** When asked if his associates are happy with the volume that he trades the entrepreneur informed *"I have told them. It is a niche. It can never become too big and they understand this. They stipulated that we should do at least 1000 cases. Last year we did it 3 times."*

#### *6.1.1.5.4 The span of market experience* of Company E is 10 years.

#### *6.1.1.5.5 The understanding of customer needs and user circumstances*

Company E, which targets the North American market overseas and Scottish gift trade in UK, understands the needs and circumstances of the expatriate Scottish community aboard and makes and moulds its product accordingly. As a result it hopes that its business in these quarters would grow significantly. The entrepreneur explained. *"I don't think that UK business will be dramatically different from what it is. There may be a few percentage rise but that is not we are looking for. We think our US business would grow and touch half a million mark over there. In 3 years time it is there that I see the growth to occur."*

#### *6.1.1.5.6 Competition analysis*

Company E realises that its successful products are copied by its rivals. It also understands that legal protection such as patent and copyrights are of no use to safeguards its products from competitor imitation. It relies on inimitable high quality of its products to safeguards itself. The entrepreneur informed. *"What we did was when we created a new sweetie we registered the design but made no difference. When we realised it was being copied we were told that if we go after them there is 50-50 chance that we can stop them. So we leave it at that. Haggis is haggis what we do is that we try to build the market and we try to build the brand and hope that people will buy yours and not a copy. It is a small market and everybody knows what*

*everybody else is doing and we know the one who copied our sponge is also making a copy of our haggis, same colour same flavour but we can't do anything about it. It is very difficult to stop it. So what you do is to give good quality, good service and be confident that people will keep coming back."*

#### *6.1.1.5.7 Speed and flexibility*

Company E has a fast new product development pace. When asked how long it takes from having an idea to develop a product for the customer, the entrepreneur replied *"…about 5, 6 months."*

#### *6.1.1.5.8 Market tests*

The methods used by Company E to judge what kind of products would succeed in its market are quite informal. The entrepreneur informed. *"You are watching the market all time. You are talking to the customer all the time but also by looking at your own sales. What is making money? What is not making money? What can you do to better that? My best inspiration is usually in the shelves. There is no science to it really. In the States for example we look at our products here and what is doing well here and we try to develop them for the States though there is no guarantee that they will be as successful there as they are here. We try to create a variation keeping in mind the US market. We put one of products in show there and there was great feedback but how many will buy it off the shelves we do not know."*

## Conclusion

The indicators of market orientation exhibited by Company E are, ability to explore and reach potential markets, fit between market needs and firm's resources, targeting the international market, long span of market experience, understanding of customer needs and user circumstances, use of competition analysis, high speed and flexibility and use of market tests. The indicators on which it has not shown much evidence are integration of customers into product innovation processes, product planning from inception, market research and deployment of user feedback to modify an innovation.

### 6.1.1.6 Company F

#### *6.1.1.6.1 Integration of customers into product innovation processes*

Company F has a very high rate of success, almost 100% as the product idea and product samples are vetted very rigorously by the customers. It has big customers like M&S and Waitrose and once a new product has been approved by them, it generally does not happen that it would not sell. All candidate new products are shown by the product development manager to representatives of its major customers. Only when they approve of it that a product is developed seriously and so the customers are very much integrated into the product innovation processes at Company F.

#### *6.1.1.6.2 Ability to explore and reach potential markets*

Company F demonstrates high calibre in exploring and reaching potential markets. The company had for long good understanding and relationship with Waitrose and M&S. After the advent and growth of superstores it has been exploring and reaching this new fast growing market as well. At the time of investigation, it was supplying to many of these grocery multiples. Tesco in particular was its major new customer.

#### *6.1.1.6.3 Fit between market needs and firm's resources*

The enterprise has been able to achieve a good fit between market needs and its resources essentially because it is part of a growing multi-site organisation, which is financially well endowed. In order to meet its growing market it moved its location and built 'one of the most modern seafood production facilities anywhere in Europe'. Its website describes at as, *"…The £10M facility at --- has allowed* (the enterprise) *to double its production capacity. The new site now employs about 230 people, most of whom moved with the business from its former premises at ---."*

#### *6.1.1.6.4 Product planning from inception*

Product planning at Company F is simple yet meticulous. Once the product development manager gets an idea, he produces a sample himself. He then makes a presentation to production, technical, marketing and finance people. After this internal presentation, the new product, is next shown to the buyers from major superstores such as M&S or Waitrose. After their concurrence, the best possible

route to manufacture it, in initial smaller quantities, is decided. As the demand for the product grows, production is scaled up to take advantage of economies of scale.

#### *6.1.1.6.5 The span of market experience* of Company F is 17 years.

#### *6.1.1.6.6 The understanding of customer needs and user circumstances*

At Company F, it is generally understood that new product development is essential for growth and survival as the food industry has fair amount of turnover of products due to changing public habits, tastes and preferences and emerging new information on effects of food on health. Many of Company F's products begin to decline in sale over time and it is necessary to try and come up with new products on a regular basis to survive as a company. The company's product development executive believes that it is not possible to visualise cheap seafood particularly in his line of products, as the basic ingredient itself is very expensive. He does not seem to bother about low acceptability of his products on the supermarket shelves as he gets enough business from up market retailers like M&S. Like the other parts of food market in the seafood segment too, there is growing realisation of healthy eating. As the final customers of Company F are quiet affluent, apart from the requirements of tests, the health consequences of company's products are also considered and the company has been trying to incorporate that in its new product development agenda. For instance, it imports wild Salmon from Alaska and includes it in some of its more expensive varieties as Salmon grown in a fish farm is considered less healthy to eat than wild Salmon.

#### *6.1.1.6.7 Deployment of user feedback to modify an innovation*

Company F receives user feedback from the buyers of Waitrose and Marks & Spencer. These are the people responsible for sourcing food products for their organisations. The comments that these people make are taken on board when the products unacceptable to them are to be modified.

#### *6.1.1.6.8 Market research*

Market research carried out at Company F is quite rudimentary. The product development manager gets his new product ideas from trade journals, food and drinks magazines, customers and suppliers and works on them.

## Conclusion

Company F shows high market orientation evident in its integration of customers into product innovation processes, its ability to explore and reach potential markets, a good fit between market needs and firm's resources, product planning from inception, its long span of market experience, understanding of customer needs and user circumstances and deployment of user feedback to modify an innovation and uses a rudimentary market research. The company, however, does not carry out competitor analysis or use market tests nor has it targeted the international market.

### 6.1.1.7 Company G

#### *6.1.1.7.1 Fit between market needs and firm's resources*

Company G has grown very rapidly in recent years. It has always tried to achieve a good fit between its resources and the needs of its market. The product development executive from Company G informed. "*We have a good market in UK and massive growth potential in Europe but we need to plan it properly in terms of capacity and labour and we are in early stage of that. Let us see how it develops.*"

#### *6.1.1.7.2 Ability to explore and reach potential markets*

Company G has exhibited a great ability to explore and reach potential markets. As is shown below in how it has targeted international market, the company has been able to reach markets in France, Italy, Spain, Belgium, China and is on the verge of breaking into USA.

#### *6.1.1.7.3 Product planning from inception*

Company G has always planned its new products very well. It has recently added to its capacity in Scotland by planning further manufacturing in Czech Republic to supply to its growing market in Europe. When its factory was built in Scotland, it took technical advice from its major customers. Company's product development executive informed. "*The money that he* (the present MD of the organisation) *got from there* (the sale of his retail shops) *he invested in this factory here. We have a space of over 25000 square feet. He called …ASDA and Safeway…and they sent up a technical team and they assisted with the planning of the original factory and mainly*

*we were up to the standard they require. We learnt a lot from them as you can imagine that we were starting from scratch and we planned two product lines."*

#### *6.1.1.7.4 Targeting the international market*

Company G has targeted the international market consistently and quite successfully. It has developed a big market in France and it has also entered Italy, Spain and Belgium. The other potentially huge markets that it is developing are China and USA. The product development executive explained these developments. *"For 3 years we are exporting celebration cake to France. When we started that, our French food director who has worked for a number of years in France said that there is no birthday cake market in France...It made sense to export from here. It is early days we have been supplying to France for 3 years. It is still a very very small market but we are the only operator in that market. That has got fantastic growth and we have learnt a lot of thing along the way. Originally, we shipped the UK recipe but then we realised that the French people like different stuff. They do not like sweet stuff and so we had another look at the process and we have in a way reinvented the cake...We are in Spain and I can say we are still there on trial honestly and Belgium and it sells very well there. We are in Italy but Italy is only on trial. And so you can see this Western European market...So we have commissioned a factory in Prague, which is outside Prague at a town called Loni. We researched a number of countries, mostly Central European countries because of variety of reasons for example government funding assistance there. Prague has a good history in food. There has been no birthday cake market there. You have to teach people from scratch and you can do that. But you have to take people from higher education and you have seen what kind of food heritage people have had there. So, Czech Republic for a variety of reasons, we have a sales guy and an operations guy who are coming here for training and we will be up and running probably by January 2007. We just completed a deal so we will break ground shortly. It is only putting fabric up the building. ...We are selling to retail in China but also having someone on the ground makes it much easier to source. It won't actually be celebration cake associated with something like soft drink and cookies. Some other stuff we are looking at to sell with that in the supermarkets that are emerging there. This problem in China has been there. Because of the speed with which people copy you and rip it off you need a customer who would stop that and supermarkets give you that control that says ok we will*

*strike a deal with your company ... So this is how we are in China. And some of the big guys are in China. One of our sales guys are going there and looking at possibilities of creating a company there. We are looking at if we could take that model to America as well. We had some very early talks with somebody in America on to replicate that in States."*

***6.1.1.7.5 The span of market experience*** of Company G is 10 years.

#### *6.1.1.7.6 Speed and flexibility*

Success of Company G is due to its tremendous product development speed. The product development executive of the company claimed, *"A cake that does not exists as an idea today in 3 weeks time a consumer can buy it is fantastic and that is our strength…"*

#### *6.1.1.7.7 Market research*

Company G undertakes formal market research. Its basic product, the celebration cake was developed after considerable market research. The product development executive of the company informed. *"… in one of our meetings, someone told our MD why you not consider supplying to the supermarkets. So that is how he got the idea and then he researched the market and looked at the supply base for what we call the celebration or birthday cake market which was very small, it is a niche now but that time it was very small. And aside from Marks and Spencer, he felt that the supply base was very small, the quality was not very creative and it was not innovative."*

#### *6.1.1.7.8 Market tests*

Along with market research Company G also conducts focus groups and carry out gap analysis to gauge the potential of its products and to educate the superstores on what they should be selling. The product development executive of the company informed. *"About half the business* (in France) *is licence type and that is the business modal that we took to France. Our theory was that a French child would like a Spiderman or a Mickey Mouse or Winnie the Pooh as someone in Britain. So we did a number of focus groups in which that came thorough, also what came through was that the value that French consumer puts on cake was significantly higher and high*

*enough for us to make here...We have constantly got to do gap analysis, market research and we have been showing them what we think they* (the superstores) *are missing."*

## Conclusion

Company G is a highly market oriented organisation as it exhibits most of the indicators of market orientation. It shows a good fit between market needs and firm's resources, an ability to explore and reach potential markets, product planning from inception, targets the international market, undertakes market research and uses market tests to gauge the customer reactions to its products. Despite a moderate span of market experience, it has been able to achieve a high speed of new product development.

### 6.1.1.8 **Company H**

#### *6.1.1.8.1 Integration of customers into product innovation processes*

Company H has not tried to integrate its customers into product innovation processes. Organic food being a new concept, which has only recently caught up public imagination, the enterprise, sees its role as a shaper or moulder of public taste rather than being driven by the preferences of its customers.

#### *6.1.1.8.2 Ability to explore and reach potential markets*

Having built a business model on health and organic food segment, the two founder entrepreneurs behind the enterprise have gained considerable knowledge of the field. During the investigation, it became obvious that the responding entrepreneur was quite a pundit on health food and has been using this considerable knowledge to explore and reach potential markets.

#### *6.1.1.8.3 The span of market experience* of Company H is 9 years.

#### *6.1.1.8.4 Competition analysis*

Organic food is a newly emerging market in the UK and elsewhere. Company H has carved a niche with little or no competition in this growing market. The entrepreneur is quite aware of this situation. During the interview, she gave many examples of her

products for which there are no other competitors because there are no other similar products. The particular example of this was a health drink that did not contain lactose. She also gave other examples such as healthy ready meals.

#### *6.1.1.8.5 Speed and flexibility*

Company H attributes its remarkable success as an innovator and as a business to being small and flexible.

#### *6.1.1.8.6 No Market research*

In case of Company H, there has been no market research to identify market needs and there is no budget for marketing

#### *6.1.1.8.7 Deployment of user feedback to modify an innovation*

Company H uses customer feedback to modify its offerings. The new products that it develops are put in the market, often in very small quantities to begin with to see if they sell and then ramped up, modified or discontinued according to how the sales occur.

## Conclusion

Company H has a reasonably good market orientation. It demonstrates ability to explore and reach potential markets, a moderate span of market experience, use of competition analysis, high speed and flexibility in product development and deployment of user feedback to modify an innovation.

### 6.1.2 Market orientation: Cross-case analysis

#### 6.1.2.1 Company analysis

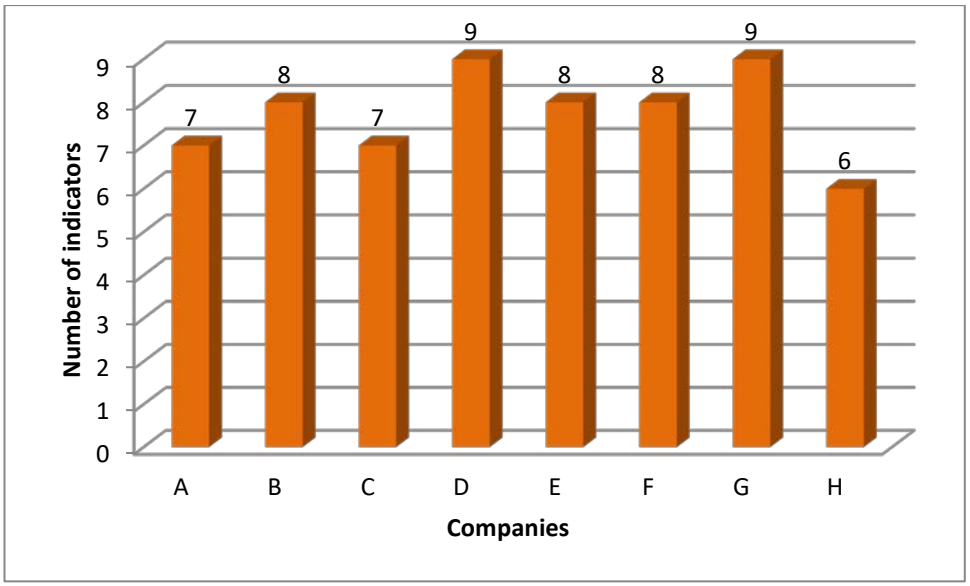



Figure 16: Market Orientation in the case study companies

Out of twelve indicators of market orientation considered in this research, these companies show evidence on an average of eight indicators. We can thus say that these innovative food companies are highly market orientated. Amongst these, companies D and G are the most market orientated, as they shows evidence on nine indicators. The rest of them are slightly less market orientated. Companies B, E, and F exhibit presence of eight indicators and Companies A and C show evidence on 7. Company H is the least market-oriented of all case study companies.

#### 6.1.2.2 **Indicator analysis**

Ability to explore and reach potential markets is visible in all eight case study companies. They also show a long span of market experience, minimum being nine years. Fit between market needs and firm's resources, understanding of customer needs and user circumstances and speed and flexibility in new product development is shown by seven out of eight companies. Relatively less frequent are product planning from inception, competition analysis and market research. The least observed indicators of market orientation are integration of customers into product innovation processes, targeting the international market, use of market tests and deployment of user feedback to modify an innovation.

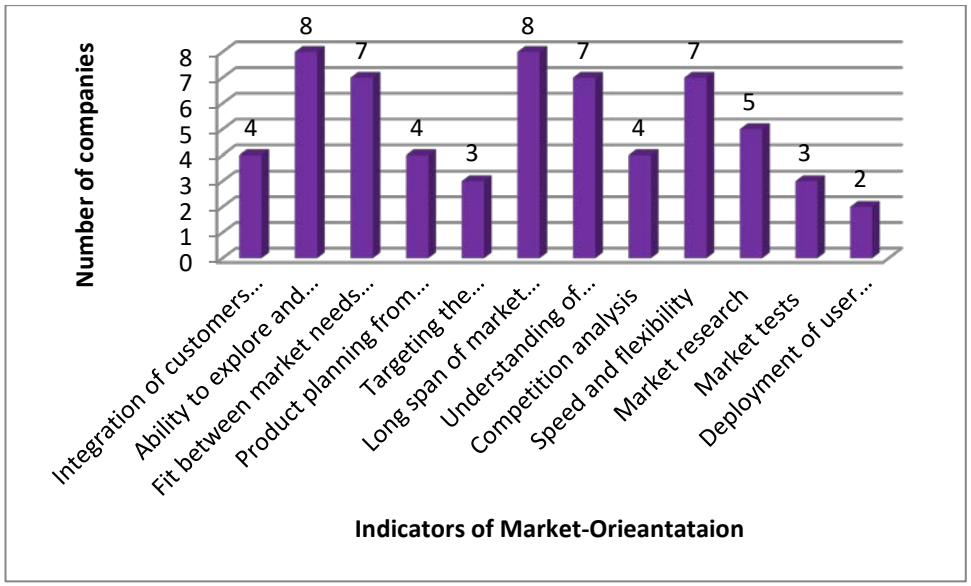



Figure 17: Market orientation indicators in case study companies

### 6.1.3 **Learning Processes: Within case analysis**

The previous research in the field identifies innovation-influencing learning processes in a firm as, knowledge formation to drive innovation strategically, fostering creativity, ability to spot opportunities for innovation, appreciation of and need for absorbing new ideas and continuous learning (Stata, 1989; Angle, 1989; Hurley and Hult, 1998 and Morgan *et al.*, 1998).

An analysis of learning processes in the eight investigated enterprises is as follows:

#### 6.1.3.1 **Company A**

##### *6.1.3.1.1 Knowledge formation to drive innovation strategically*

Company A creates the knowledge needed to drive strategically its innovation by building a clear understanding of what the competitors have offered and then creating products, which are clearly superior to their competitors' products. The knowledge thus is formed at two levels. One, unravelling the rival products in terms of their value and quality and two, building know-how to deliver better quality. The entrepreneur explained the process in these words, *"… we see what's out there, what's the price and we take the product off the shelf and bring it back here and we try and evaluate and perceive what the value of it. What is the quality of the product, and based on the quality of the product, we always endeavour to make a product that is better than the original product…"*

#### *6.1.3.1.2 Ability to spot opportunities for innovation*

Company A visualises new opportunities for innovation in terms of 'premiumisation' or opportunity to create higher value products than what is currently available. This approach is evident in how the knowledge formation occurs in the enterprise as described above. As the company has perfected its methods to ensure high quality through hand made products, the enterprise recognises that its future challenge and opportunity are in creating high quality goods using mechanised processes. The entrepreneur explained, *"There is a lot of opportunity in that market that's probably growing faster than a retail market and there are demands for better and better quality as people demand better and better quality… so companies look to find answers for products which are as good as replicable as hand made products made by chefs in a factory environment and that is again where we have the ability to create these kind of products for the service market."*

#### *6.1.3.1.3 Appreciation of and need for absorbing new ideas*

Company A has a distinct way in which it absorbs new ideas. The company's main product is pizza. It has developed a pizza base and a pizza sauce that are of exceptional quality and are virtually inimitable. During new product development, no attempt is made by the enterprise to change these two parts of the pizza, responsible for the unique flavour and taste of its pizzas. All effort is focussed on searching for and utilising ideas about the pizza toppings. It is also understood that blanket copying other company's pizza toppings would compromise the brand image that the company has carved out for itself and so toppings ideas are carefully moulded to blend them with the unique base and sauce of the enterprise's pizzas to create a distinct overall impact. The entrepreneur explained the process, *"…say for instance pizza, the components of the pizza, we know that the heart of the product is the bread base and the pizza sauce which is specifically made for our recipe and it is stark different from anything else and is really the heart of the product. So we in development in terms of product innovation have to think only what is on the top. It can be a type of vegetable or a mix of meat and vegetables… we tend to try not to copy anybody, in any of our own creations in terms of products. So somebody has got ham and potato with you, while having peach or we do mixed peppers and onions…we do it in a way that offers quality. So if somebody comes back to*

*associating with the kind of brand with the quality, and the innovation comes from the chef's lair in terms of new ideas presented to the market. That is the key to how we innovate. We have a workload of shelves and see what's there, but we don't copy others. We could never do that. We just take bits and pieces of ideas from different products stick it together in a totally different way and present it as a totally new concept."*

#### *6.1.3.1.4 Continuous learning*

The best illustration of continuous learning at Company A is the way it developed its microwave pizza. Early on in the development process, it realised that the most serious problem in creating a microwave pizza is that the microwave heat, which tends to be focussed at the centre, melts the centre of the pizza without other parts being properly cooked. Through continuous trial and learning from the outcome of experimentation at each stage, the enterprise finally perfected a microwave pizza, which now sells very well. The entrepreneur informed, *"…our technical people started working on the project. In the beginning, it just sort of melted up in the middle. But they developed it from there and they set us up with the material which was protein based and we took that mixed that with <inaudible> with the kitchen and formulated a sauce which would work well with the pizza and developed the microwave pizza and it is an innovative product at Morrisons at the moment at Morrisons Super market."*

## Conclusion

Company A's learning processes are evident in knowledge formation to drive innovation strategically, ability to spot opportunities for innovation, appreciation of and need for absorbing new ideas and continuous learning. The only indicator of which there is little evidence is fostering creativity. The present MD and his septuagenarian father are both very creative. They, however, have not tried to foster creativity in their staff. This in the long run may create problems for the enterprise.

### 6.1.3.2 **Company B**

#### *6.1.3.2.1 Fostering creativity*

Creative task at Company B is spearheaded by its executive chef. The impression at the enterprise, however, is that creativity cannot be fostered and if the present executive chef is to leave, they will have to find somebody else who is equally creative. That there should be attempt to foster creativity in the organisation is apparently not understood. When asked if the company is not totally depended on one creative individual and what would happen if he were to quit, the product develop executive answered, *"Well yes we have to find another William[4]. He has to be as good. He goes to all these presentations at Waitrose, at Tesco. All these 20, 25 years' olds, they really love him and that goes a long way as well. He is quite charismatic"*

#### *6.1.3.2.2 Ability to spot opportunities for innovation*

As stated above the organisation's ability to spot opportunities for innovation is concentrated in ample measure in its executive chef. The interviewed executive described it in the following words. *"William has travelled extensively over the years and he's worked in many countries and he's travelled over the years and he's worked in larger organisations as well, so he's got a wealth of experience and with his background, and with this job he still travels a lot and eats out and watches all the trends and keeps his nose in the food world."*

#### *6.1.3.2.3 Appreciation of and need for absorbing new ideas*

Ideas that its creative executive chef brings to the organisation from around the world are well appreciated and attempted to be converted into sellable products by the enterprise. The fact that this individual is given a very high status in the organisation and is given freedom to roam the world at company expense makes it obvious that enterprise has very high appreciation of and need for absorbing new ideas that he brings in. Company B has also shown openness to absorb ideas that have come from other sources such as customers. The company spent considerable money and energy on enacting a theatre within the Waitrose superstore on their suggestion. The idea was explained by the company executive in the following manner. "*It* (theatre) *means that you're looking for a bit more excitement, for consumers going into a shop and so that the delicacies attract them, around the free pack. It is something that is*

[4] All names have been changed for reasons of confidentiality.

*eye-catching, a lovely decoration, a bit more like a traditional delicatessen shop inside a supermarket. That was something that they* (Waitrose) *were looking for, and that's what we worked along…"*

## Conclusion

Learning processes at Company B are overshadowed by the unusual certainty of its executive chef. There is overwhelming appreciation for his creative genius and genuine acceptance of his ideas. He also has a unique method to generate rich ideas and has a role in implementing them as well. There is no attempt, however, to try to pass on his methods to other individuals in the organisation, which could prove costly if he were to leave the organisation.

### 6.1.3.3 Company C

#### *6.1.3.3.1 Knowledge formation to drive innovation strategically*

Entrepreneurs at Company C have significant experience in the bakery industry. Their collective wisdom drives innovation in Company C. They are aware of a product life cycle in their industry where new products appear in the market, are popular for some time, then decline and disappear. They however, are also aware that the same products often reappear after sometime with some variation. The strategy of the company thus is to create a new product, which is a variant of an earlier product at the right time in this innovation-cycle. The entrepreneur explained the idea in the following words, *"One of the things I have understood is this, and I have been in the bakery industry for over 5 years. Thomas has been for years and years, so has been Colin. Phil has been there for a long time. You tend to find that they come around in circles and to trick is to go and talk at the right time in circle."*

#### *6.1.3.3.2 Fostering creativity*

To foster creativity, Company C trains the staff and rewards them when they learn these skills and use them. The entrepreneur informed, *"We have trained our staff well. We have the policy that as you learn new skills your wage goes up. We must be rated as an A grade company, I think,* (because) *we created all this* (kind of incentive scheme)*... Unfortunately, in UK 80% people do not care but 20% should come in and be able to go up here, if they do something. And so instated to creating grades 1*

*to 3 we have created eight grades. So after 3 months they get it. It is something that looks crazy...It also gives them incentive."*

#### *6.1.3.3.3 Ability to spot opportunities for innovation*

Company C realised that they had a great opportunity to market their innovative products when Waitrose opened its stores in Edinburgh. Waitrose is not just one of the biggest food retailers in UK, it is also known for supporting innovation in its suppliers. In order to seize this opportunity, the company when invited by Waitrose to showcase its products, not merely showed them their own but also their rivals' products to emphasise how their products are superior to their competitors' products. This impressed Waitrose and the company got business and a chance to use their innovation potential. The entrepreneur narrated the events in the following words, *"When Waitrose opened in Edinburgh we had never seen them. When they came here they called all the suppliers from Scotland down there to talk to them and what we showed to them was not only our products but also our competitors products and they asked why you are showing us not just your samples but everybody else' samples also and we said we want to show you that we are the best and unless you see our products with other guys' products you cannot make that and the guy smiled and went away. It was only after we got the business that he told us that everybody else was showing only their products. They did not have guts to show other's products but you had it and so you got the business."*

Another example of this knack showed up when the entrepreneur with his team went to Germany, came across a Japanese pancake making machine and was able to visualise an opportunity to make Scottish pancakes on it. The entrepreneur explained, *"I, a guy from sales and the bakery manager Jim went to Germany to what they call e-box, an exhibition for bakery where you get all the new ideas, new equipment and things like that and so we went over for 3 days to have look over for some equipment. First day we arrived in the morning, we went to Eva, which is a big place for equipment, and we walked through this door and we were looking at travelling hot plates and things like that. It was at that point that I saw this machine and thought I like that. It looks nice. I was shown it and shown how it works and what happened was that we had two pancakes filled. And I told Thomas it is not like that in UK. We go for that. That was it."* After a series of trials and errors, in about a year's time the

company succeeded in making Scottish pancakes on the machine. Today it has a complete factory dedicated to making pancakes on these machines.

#### *6.1.3.3.4 Appreciation of and need for absorbing new ideas*

Most products at Company C embody new thinking and new ideas. For instance for its corner shops business, the company has created very small packs to reflect the difference in quantity preference of corners shop buyers from that of buyers at superstores. The entrepreneur informed, *"…the big boys are selling four packs or 6 or 8 but the people buying from corner shops do not want to buy such large quantities. They want to buy one or two. So what we have done is to create different ranges for different people."* In order to reflect the healthy eating trends the company pioneered a low calorie pancake. The entrepreneur informed, *"We manufactured the first pancake with less than 3% fat, high fruit content, good and healthy…"* The company not only appreciates and implements new ideas that are internally generated it also often invites people from other organisations to come at its manufacturing site, work there for short periods and try their ideas. The entrepreneur explained, *"The technical guy from another company has actually made that cake. We let them in our bakery and they created it."*

The entrepreneur is very proud of quality of its products such as cakes, which are made using methods, which they do not divulge, to outsiders. And so when they invite people from outside to learn new recipes they let the outsiders make the product using their own methods. Subsequently the company makes the same product using the company's distinct methods. The people from whom the basic idea come even when know what the recipe is cannot copy it as they do not know the process. The entrepreneur explained the approach in the following words, *"When people make cake, it is to take a mix, put in a bowl, add egg and water and spin around and bake. When we do a cake what we do is we take a base... That is why when we take technical guys from other companies we make sure they cannot see our process and make out how it should be done basically against the practice done. Then we take the recipe and we change that to our way. What they do is to tell some recipe but what we do is that we change it through our process"*

#### *6.1.3.3.5 Continuous learning*

To transform itself from a corner shop supplier into a supplier to superstores, Company C had to learn continuously and it has been a quick learner. As it now supplies to both of these two distinct markets, its knowledge base consists of methods and processes to deal with both. The entrepreneur informed, *"…we also do less products now then what we used to do because in the last 3 years we are more into supermarkets. The corner-shop business has changed a lot. In the same corner-shop business that we used to have 17 vans on the road doing corner-shops, we are now down to seven doing the corner shops because a lot of them have closed down and a lot of them have been taken over by Spar etc. So these are all changes. In the corner shops, once you could go to a corner shop and buy a fuzz doughnut or buy a cream doughnut. This is not allowed now. The health board would not allow you to sell things loose now so the supermarkets have created this pre-packed business unfortunately and so the corner shops have suffered."*

Continuous learning is also reflected in way the company learnt to make Scottish pancakes on a machine designed to make Japanese pancakes. The entrepreneur explained, *"…And so basically we got this machine organised. There was a 7-month waiting list for it. We eventually got it here. It took us 10 months. We had ups and downs as well because we tried to copy the Japanese, which was wrong. In one country if you copy another country, it does not work. So it took us about a year to manufacture a pancake on it.* (Earlier) *we could manufacture a Japanese one; we could manufacture a French one but could not manufacture a Scottish pancake."*

As a cumulative effect of continuous learning, entrepreneurs at Company C have accumulated a great deal of knowledge, particularly on the manufacturing side, the entrepreneur informed, *"We know a lot about plant and an awful lot which is a good sign. In other words what you said that is right. What I would say now that we have more experience on the plant then the product because we had a chance to do that and that is a good sign and so everybody knows that if any of things goes wrong then you will never found out before but now we know about it. We know a lot of things that causes a problem and we knew what to do and we would not have known if we had wasted our time. We have learnt from our experience because we look at new things now. We actually look at pilot plants rather than buying machines through and we can actually apply that"*

## Conclusion

Company C is most rounded learning organisation for innovation. It presents evidence on all 5 indicators of innovation-influencing learning processes, knowledge formation to drive innovation strategically, fostering creativity, ability to spot opportunities for innovation, appreciation of and need for absorbing new ideas and continuous learning.

### 6.1.3.4 **Company D**

#### *6.1.3.4.1 Knowledge formation to drive innovation strategically*

Company D initially used external experts to drive its innovation but with the passage of time it has been able to form its own knowledge base the do so. The entrepreneur informed, *"…we had this company doing market research and what came back was that they will buy chocolate and they will buy strawberry. And all these wonderful flavours that we had nobody will buy...As it turned out, as we ourselves become more sophisticated and we would go to other market reports.* (We realised) *70%* (of market) *is vanilla, 20% is chocolate and in remaining every other flavour in the world. So if you think of something like coffee or mango or whatever all those together are final 10% and that was what we were targeting."*

When Company D employed the market research experts, the entrepreneurs looked at the information that they had generated and tried to draw their own informed conclusions. This is how the internal knowledge within the enterprise is built. The entrepreneur explained, *"…next we looked at the comments. What people had said. And we had one flavour, which everybody who had tested it loved it and that was banana and toffee. And I think 84% said that they would buy banana and toffee and amongst those who had not tested it 0% said they would buy banana and toffee ice-cream and we talked to the consultant and he said you have to make them taste it so that they would buy it. And so we had two options. Spend 2 million ponds to market it in such a way that people get to taste so that they buy it or give it a different name a more interesting name and give it a very attractive packing so that they are drawn to it and it has a name that they find attractive. So we got this market research company and they gave each respondent four names and so instead of being called banana and toffee, we tried banana and fuzz, banana and tofllet and the Banoffee and the result? Banana and fuzz- zero, banana and tofllet- zero and Banoffee- 60 ...And that*

*was number one. And name like that and packaging like that. And for a long time Banoffee ice cream has sold a lot."*

Another unique method of knowledge formation at Company D has been to use the opportunity of direct customer contact at its adventure centre to run an ice-cream making contest amongst the guests by giving them a chance to make their own flavours of ice-cream. This gives the enterprise a diverse and varied knowledge on various ice-cream flavours and the once that have the most appeal to buyers. The entrepreneur explained the approach in these words, *"One of the events that we do at adventure centre is…. In this public can come along and we give them milk, cream, sugar and an ice-cream freezer and we also give them flavours. Strawberry, ginger, chocolate, toffee. If they want, they can bring their own flavours too and they can make ice-cream and so we get a huge amount of ideas from the general public on what kind of ice-cream they would like and so we quickly see what is popular. Kids go for sweetest things possible. They like toffee and honeycomb and chocolates and likes. So it is sweet, sweet, sweet. We have got other parents as well who make things that are more sophisticated."*

Another approach to knowledge formation is to learn from what is happening in the industry, what other companies are doing and if the enterprise can emulate that, the entrepreneur said, *"...We have another ice-cream story. Ben & Jerry? Have you heard of? No, you are not ice-cream fan. <Laughs> American company now owned by Unilever. They go for whacky ice-creams. They launched an ice-cream in UK 5 years ago called Phish Food. I thought nobody is going to buy that and they paid to supermarkets for shelf space to let it be there for 3 years. And in the meantime what they were doing. They were going to every fresher's' week and stand at the bottom of escalators in the underground and giving away 300 ml for people to discover what Phish Food was because in States Phish is p-h-i-s-h and in States Phish Food is chocolate with fish. Young people buy it and so in States people know that Phish Food is the ice-cream that Ben & Jerry are offering. Nobody in UK knew Ben & Jerry or Phish Food so they had to spend a lot of money. A. to persuade supermarkets not to delist them and B. to create the awareness of general public and mainly teenagers of what Phish Food ice-cream was. And so you need deep pockets."*

#### *6.1.3.4.2 Ability to spot opportunities for innovation*

Company D has gone through a series of milestones when at each stage a significant opportunity for innovation was spotted and exploited. The first was when it was decided to convert the large quantity of milk that was produced at the farm into to high value-added ice-cream. Then it was to create an adventure centre to take advantage of pristine environmental ambiance of the farm to attract people who wish to spend their holidays close to nature. The two innovations had high synergy as people interested in environmental tourism also had a taste for farm ice-cream. The next opportunity was identified in terms of organic ice-cream as the company already had an organic farm. The entrepreneur informed, *"We also tried our organic range because we have an organic farm. We launched the organic range in 1999…we were the second organic ice-cream company in the whole of UK."*

The most recent innovation opportunity identified and exploited by the enterprise is its range of fair trade ice-cream.

#### *6.1.3.4.3 Appreciation of and need for absorbing new ideas*

Farm ice-cream, adventure centre, organic ice-cream and fair trade ice-cream are the four big ideas that Company D has recognised and absorbed. In none of these areas it was the first enterprise to think about it. There were other enterprises that were already doing each one of these in parts. The genius of entrepreneurs at Company D is therefore perhaps not in idea generation. It is in appreciating and absorbing useful ideas that had powerful synergy with its existing business. This is how it rose from a non-descript subsistence farm into a model of substantial innovation.

The enterprise also paid huge sums to Scottish enterprise for marketing reviews and the entrepreneur initially was sceptical of their value, as they seem to reflect just what she had told the reviewers. But she was appreciative of their role in clarifying the issues that confronted her. This again shows that the entrepreneur has willingness to appreciate and absorb ideas. The entrepreneur informed, *"We just have done 2 marketing reviews actually with help from Scottish Enterprise. And what seems to happen is that that they constantly probing you for information and what they finally give you just what you told them in kind of consultant speak. And that goes in name of report. Ok may be going through the process you become clear in your mind why*

*you want to do it. It certainly clarified to me why I wanted to do fair trade ice-cream."*

#### *6.1.3.4.4 Continuous learning*

For a couple of individuals who had no experience of farming, country life or agri-business, setting up and running of a successful innovative enterprise has been a travel along a steep learning curve. For an enterprise, where at one point nobody even knew how to make ice-cream, to market successfully its ice-cream range within 15 months is a testimony to how much the enterprise has learnt and how fast. The entrepreneur explained, *"…it was January 93 that we decided that we were going to do ice-cream… I did not know how to make ice-cream so I went to do a course probably about April which was how to make ice-cream."* When the company learnt that 'organic were going skywards' it launched its organic range which was not a success. It then realised that *"Scotland has not got the pollution where people would feel that they must buy organic and we were not as trendier or trend setters and so all the information that we had that organic were going skywards wasn't true for Scotland. So supermarkets said you test market it for Scotland. We tried it and it did not work."* More recently, however, when it became apparent that organics now had a growing market in Scotland, it relaunched its organic range and ultimately achieved success. And so company has not only been learning contentiously, it is refocusing its strategy in light of new knowledge to achieve success.

## Conclusion

Company D's learning processes are evident in knowledge formation to drive innovation strategically, ability to spot opportunities for innovation, appreciation of and need for absorbing new ideas and continuous learning. The only indicator of which there is little evidence is fostering creativity. Entrepreneurs behind the company are a very committed couple, committed to a host of causes principally to sustainable innovation. Husband in this team is very creative and wife is very practical. The complementariness of their talents have helped the enterprise and its innovative processes immensely. They, however, do and not seem to have tried to foster creativity in their staff, which does not bode well for the long run sustainability of innovation in the enterprise.

### 6.1.3.5 **Company E**

#### *6.1.3.5.1 Ability to spot opportunities for innovation*

Entrepreneur at Company E remains on high alert in search of innovation opportunities. The method that he uses is simple but effective. The enterprise's approach was explained by the entrepreneur in the following words, *"You are watching the market all time. You are talking to the customer all the time but also by looking at your own sales. What is making money? What is not making money? What can you do to better that? My best inspiration is usually in the shelves. There is no science to it really. In States for example we look at our products here and what is doing well here and we try to develop them for States though there is no guarantee that they will be as successful there as they are here. We try to create a variation keeping in mind the US market. We put one of products in show there and there was great feedback but how many will buy it off the shelves we do not know."*

#### *6.1.3.5.2 Continuous learning*

Company E has pioneered making of Scottish food products for the North American Market. In absence of any previous successful attempt in the direction, entrepreneur had to learn everything from scratch. The entrepreneur was forced to look outside UK due to the restrictions that were put on his business here. He explained the experience, *"That was forced upon us because of restriction on what we were doing here. It has been a pretty hard struggle but again it paves the way. Now there can be 100 more businesses but we paved the way."* The first opportunity to export came up for Canada. The lessons that he learnt from his Canadian experience were then used to make a foray into USA. The entrepreneur informed, *"Canada actually came up first. It was way back. It was James, the guy who is dead now. We managed to sell in Canada first using different labels. Later on, we had other arrangement. There was one guy in Bristol and other in US and we were sending it to Bristol and he was shipping it across. We never knew how he was doing it but it was growing bigger and bigger. The last we did was four or five pallets. He had an office in Washington DC and he was not using correct documentation and was caught and fined 500$. For us that was the end of it. Then we met this guy in Birmingham Spring Trade Fair. Then we contacted him again through British Chamber of Commerce."*

## Conclusion

Company E's learning processes are evident in ability to spot opportunities for innovation and continuous learning. There is not much evidence of knowledge formation to drive innovation strategically, appreciation of and need for absorbing new ideas and fostering creativity. The enterprise thus has limited learning processes to drive innovation. The impact of this on the innovation process is reflected in company's focus on incremental innovation and its inability to create break-through products.

### 6.1.3.6 Company F

#### *6.1.3.6.1 Fostering creativity*

Company F is a part of a multi-site food company. Innovation is the group policy and each unit of the group is encouraged to be creative and to innovate constantly. This creative urge is spearheaded by five powerful individuals at the group headquarters who ensure that all companies in the group continue to remain innovative and develop new products on a regular basis.

#### *6.1.3.6.2 Ability to spot opportunities for innovation*

The product development manager of Company F said that he gets his successful new product ideas from the trade journals, food and drinks magazines, customers and suppliers. As these sources are all in public domain and accessible to all interested the unusual creativity of this enterprise can only be attributed to its ability to spot opportunities for innovation from the same sources from where others are not able to spot similar opportunities.

#### *6.1.3.6.3 Appreciation of and need for absorbing new ideas*

Ideas that the product development manager gathers from the sources mentioned above are well appreciated and systematically attempted to be converted into useful products by the company. There is a formal mechanism to do so. Once a product idea has been identified by the product development manager he personally prepares a food dish and makes a presentation to a team of managers that consist of people from production, technical, marketing and finance departments. Input from these people

moulds both the product and the production process leading to the final absorption of idea into the organisation.

#### *6.1.3.6.4 Continuous learning*

At Company F it is generally understood that new product development is essential for growth and survival as food industry has fair amount of turnover of products due to changing public habits, tastes and preferences and as new information on effects of food on health continues to emerge. The product development manager of the enterprise keeps a constant tab on these trends and tries to come out with new products that reflect them.

Like other parts of food market in seafood segment too there is growing realisation of healthy eating. As the final consumers of company's products are quiet affluent, apart from requirements of taste, its health consequences are also considered and Company F has been trying to incorporate that in its new product development agenda. For instance, they import wild Salmons from Alaska and include it in some of their more expensive varieties as Salmon grown in a fish farm is considered less healthy to eat than wild Salmon.

### Conclusion

Company F shows evidence of fostering creativity, ability to spot opportunities for innovation, appreciation of and need for absorbing new ideas and continuous learning. Company F thus is a well-rounded learning organisation. The only indictor, which is not exhibited by Company F, is knowledge formation to drive innovation strategically.

## 6.1.3.7 Company G

#### *6.1.3.7.1 Knowledge formation to drive innovation strategically*

In Company G the basic knowledge to drive innovation strategically was gained by the present MD of the enterprise by training in a score of other businesses across Europe, in the process, bringing in a rich repertory of knowledge to the enterprise and then using it to drive innovation in the organisation. The product development executive of the enterprise explained, *"…our current managing director, …joined*

*the business in late 80s and the best thing that his father did was that he insisted that he did not train in the business. He trained outside, … He trained in some the finest café groups across Europe. He trained in Belgium, Switzerland, and France. Then he spent some time in Manchester in what we call celebration cake retail shops. Where you go for specialist weeding cakes and high-end corporate stuff, you pay several hundred pounds for very fancy wedding cakes which go for 300£. So he trained there, his father basically paid, and he plagiarised some of the ideas and took them back to family business..."*

Today, the enterprise continues to actively search for information, uses it to visualise new products and approaches the superstores to tell them what new products it can make for them. The company executive said, *"We have constantly got to do gap analysis, market research and we have been showing them what we think they* (the superstores) *are missing."*

#### *6.1.3.7.2 Fostering creativity*

Techniques such as idea boxes are used by the product development department in Company G to foster creativity. When asked on how they foster creativity in the organisation the executive informed, *"I think that is so in development* (Product Development Department)*. I do not think it is anywhere else in the factory. I think it is in Development because it has always been our MD's baby anyway. Sales and development side is something it has always been from...We have had a number of initiatives over the years. Idea boxes, suggestions with some success…But I think within the development area within sales a lot of ideas do percolate up the way to us..."* It is, understood, however, that constantly creating new cakes is not an easy task. The executive said, *"The hardest thing that I ask my team to do is to constantly come out with fresh ideas for something like a starter party cake that would always have blooms on it, how many times we need to redesign it for every multiple once a year."*

One of the approaches that the company uses to foster creativity is to send out its design and decorator teams for a day or so outside, just to look around, and come back with ideas. One of the interviewed executive informed, *"We have found that we get the best results if we allow out cake decorators, our designers to go outside for a*

*half day, full day whatever and look around the shops. Look at things that stimulate them and bring them back in the ideas that they will work on the next morning will be better than if we try to just brainstorm them when nowhere to go."*

#### *6.1.3.7.3 Ability to spot opportunities for innovation*

As stated earlier Company G started its innovative streak after the current MD returned to family business farm with a rich collection of ideas that he accumulated by working in a score of businesses across Europe. He continued to look around for more ideas even as his business was taking this new direction. He spotted a new opportunity when as a winner of a celebration cake contest he received a suggestion that he should consider supplying to superstores. One of the company executive informed, "(Once) *we submitted a celebration cake in a contest, which ASDA judged. They were judging just to understand what was happening in the independent trade. And in one of our meetings, someone told our MD why you not consider supplying to the supermarkets. So that is how he got the idea and then he researched the market and looked at the supply base for what we call the celebration or birthday cake market which was very small, it is a niche now but that time it was very small. And aside from Marks and Spencer, he felt that the supply base was very small, the quality was not very creative and it was not innovative. With that he persuaded his father. They sold-out all of his retail side of business..."*

Another opportunity was spotted when it became known that there was no birthday cake market in France. The company executive informed, *"…our French food director who has worked for a number of years in France said that there is no birthday cake market in France. When you go to supermarkets, your child cannot get anything. We can get it now but that that time you couldn't. And largely there is no licence offering and about half of our business is licence. So if you go to supermarkets there would be a few cakes that would say happy birthday but the rest of it would have Spiderman or Disney characters. About half the business [in France] is licence type and that is the business modal that we took to France… our theory was that a French child would like a Spiderman or a Mickey Mouse or Winnie the Pooh as someone in Britain. So we did a number of focus groups in which that came thorough, also what came through was that the value that French consumer puts on cake was significantly higher and high enough for us to make here. It made*

*sense to export from here. It is early days we have been supplying to France for 3 years. It is still a very very small market but we are the only operator in that market. That has got fantastic growth…"*

In order to supply to its growing overseas market in Europe, the enterprise looked for a manufacturing site across Eastern Europe and decided to build it near Prague. The executive explained the process in the following words. *"We researched a number of countries, mostly Central European countries because of variety of reasons for example government funding assistance there. Prague has a good history in food. There has been no birthday cake market there. You have to teach people from scratch and you can do that."* Opportunities to do business in China and USA have been similarly spotted and exploited, the executive said, *"...ethically the way Chinese companies are emerging, supermarkets are much happier by their practices which are much fairer and the quality is much better...We are looking at if we could take that model to America as well. We had some very early talks with somebody in America on to replicate that in States."*

#### *6.1.3.7.4 Continuous learning*

Starting from a chain of retail shops selling bakery goods, Company G has come a long way to become such a successful enterprise. Continuous learning played a role at each stage of development. Every time the entrepreneurs and his team of executives spotted an opportunity, they did meticulous research, learnt new skills, methods and modified their approach to implement its strategy to utilise it fully. One such instance was described by the company executive in the following words, *"…we have learnt a lot of things along the way. Originally we shipped the UK recipe but then we realised that the French people like different stuff. They do not like sweet stuff and so we had another look at the process and we have in a way reinvented the cake. We are learning and learning."*

The Company G made it good in UK by supplying to superstores. And this is how they learnt to break into them *"…the way to do it with supermarkets is that if you want to break into them. If you get them something even the same product even a better quality even at better price you won't win the business. They will not take*

*anything from you, which they are getting from their existing suppliers. So you have to think of something new."*

## Conclusion

Like most other companies investigated in this research, Company G too, is a learning organisation. Its conduct provides evidence of knowledge formation to drive innovation strategically, fostering creativity, ability to spot opportunities for innovation and continuous learning

### 6.1.3.8 Company H

#### *6.1.3.8.1 Knowledge formation to drive innovation strategically*

Company H is an organic food enterprise, which sells organic ready meals, soups etc. The enterprise was founded by two budding entrepreneurs' conviction in health food. Subsequently, to convert this conviction into a thriving business, the entrepreneurs systematically gained knowledge on organic foods. During the investigation the interviewed entrepreneur appeared to be an expert on organic food. It also became obvious that the enterprise has used this knowledge strategically to drive its innovation. Though, the company employees a nutrition 'expert' to augment its knowledge base, during the investigation, the entrepreneur herself emerged very much an expert on the subject. For example, at one stage she said that many of the health drinks with 'friendly bacteria' were useless because the shelf life was such that most of these would not have survived in the product over the shelf. The knowledge was evident not only on technical aspect of the business but also its economic aspects. For example, during the interview she gave information on how demand was steadily rising and how at particular times of the year, say after Christmas, the demand for their products (and for general diet products) showed a marked increase. Through this significant product-market knowledge, the enterprise has been able to market successfully new products without any market research to identify market needs and has no budget for marketing.

#### *6.1.3.8.2 Fostering creativity*

Both the founding entrepreneurs of Company H are unusually creative. To augment this and to build and sustain a creative organisation they recruit new staff very

carefully. This staff is then provided such a work environment where their creativity blossoms and they like it so much that the entrepreneur said that nobody that ever joined the fledgling enterprise has ever left.

#### *6.1.3.8.3 Continuous learning*

As stated above the enterprise was founded based on the belief of the founding entrepreneurs that health and well being food is the right thing to do. Entrepreneurs along the way have learnt continuously to translate this belief into a successful business and now have become experts on the subject of healthy food.

### Conclusion

Company H's learning processes comprise of knowledge formation to drive innovation strategically, fostering creativity, and continuous learning. Three out of five indicators of learning processes are, thus, visible in its behaviour.

## 6.1.4 Learning processes: Cross case analysis

### 6.1.4.1 Company analysis

Showing proof on all the five indicators of learning processes, Company C is the most learning organisation amongst the case study companies. Companies A, D, F and G emerge as reasonably good learning companies as they show signs of presence of four out of five indicators of learning processes. Companies B and H with a score of three are moderate learning organisations. Company E, however, bucks the trend and must improve its learning processes in order to become more innovative.

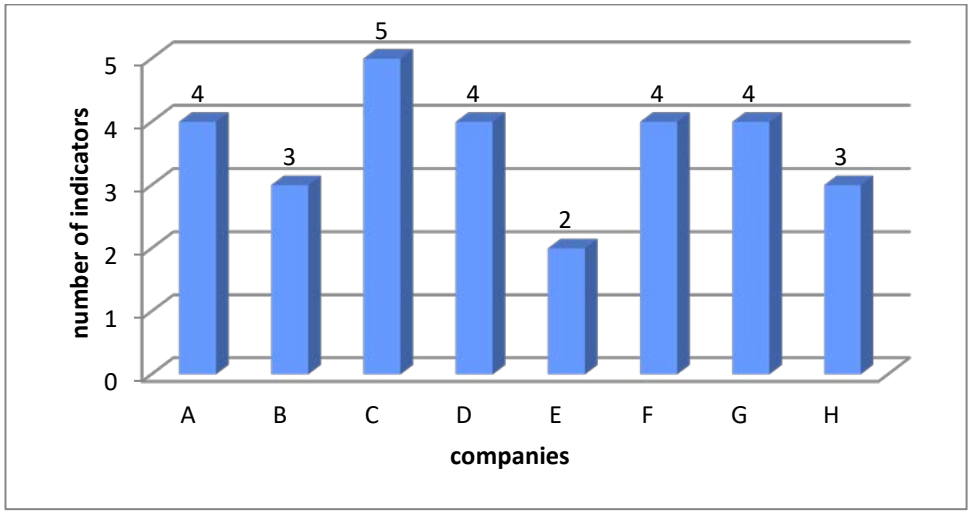



Figure 18: Learning processes in the case study companies

### 6.1.4.2 Indicator analysis

The most found indicators of learning processes in the investigated enterprises are ability to spot opportunities for innovation and continuous learning. These indicators can be seen in seven out of eight case study companies. Also evident are knowledge formation to drive innovation strategically, appreciation of and need for absorbing new ideas and fostering creativity, which are shown by five enterprises.

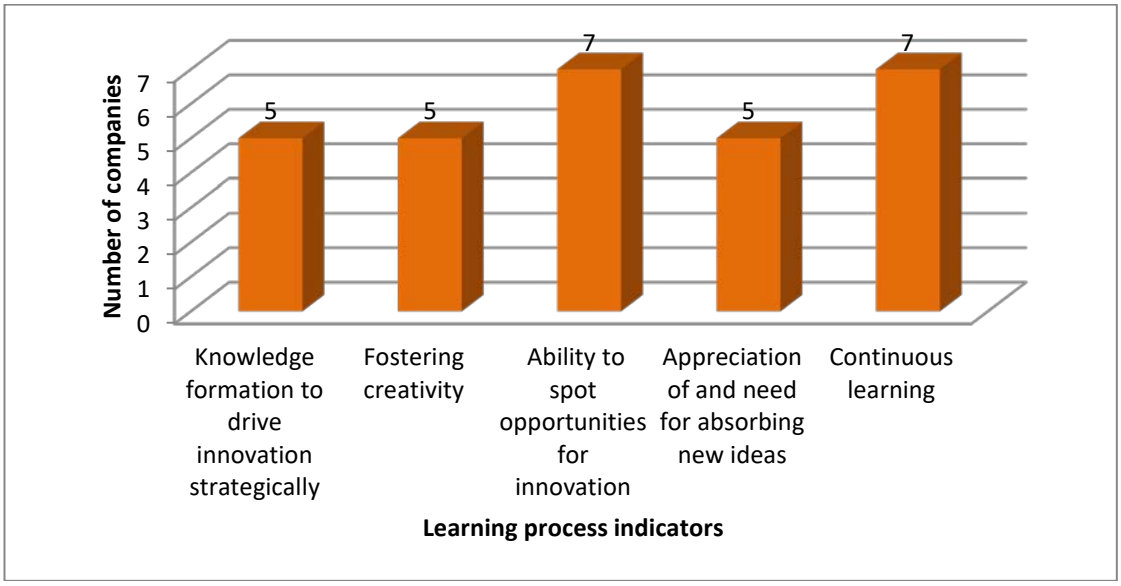



Figure 19: Incidence of indicators of learning processes in the case study companies

As discussed above, in four of the case study companies some very creative individuals are spearheading innovation. However, there is no attempt to foster creativity in other members of staff, which is not a good sign because if these individuals were to leave these companies, the organisational innovative processes may not continue.

## 6.1.5 **Technology policy: Within case analysis**

The previous research in the field identifies the presence of an innovation-determining technology policy pursued by a firm based on certain indicators. Prominent amongst these are development of new ideas, products and processes, strong R&D orientation, active search for new technological knowledge, product uniqueness, products with technological newness, products with large application

scope and active acquisition of new technologies (Cooper, 1984, 1994; Lindman 2002).

### 6.1.5.1 **Company A**

#### *6.1.5.1.1 Development of new ideas, products and processes*

Company A has been constantly trying to development new products, ideas and processes. Though its basic product, pizza allows a limited scope for innovation, it has made it a policy to try to develop its pizza as much as it can. The variations that it has introduced are mostly in terms of creating superior quality than what the market has to offer. It has thus raised the bar for itself and its competitors continuously. The entrepreneur explained, *" …we see what's out there, what's the price and we take the product off the shelf and bring it back here and we try and evaluate and perceive what the value of it. What is the quality of the product, and based on the quality of the product, we always endeavour to make a product that is better than the original product……We just take bits and pieces of ideas from different products stick it together in a totally different way and present it as a totally new concept."*

#### *6.1.5.1.2 Product uniqueness*

Company A has developed many unique products such as Gluten free pizza, corn pizza and microwave pizza. In all the cases, Company A played a pioneering role. The entrepreneur explained, *"… we got involved in producing a gluten-free pizza but it took a lot of time, because the problem with making gluten-free mixes is trying to make comparative products, but we managed to do that because we also have expertise of my father, the senior who also has experience in a wealth of food products , and we developed a high quality gluten-free pizza which was almost as good as a normal food product which was quite revolutionary at the time and the market was very receptive to us because it was packed with quality and so it historically kept us very preoccupied, because the Ian's* (gluten-free pizzas) *are very wet, very dry, very dense, of not very good quality, and so what the market offered was not good enough and what we developed was an excellent product."* Corn pizza of Company A similarly has a unique bread base not found in any other pizza in the market, the entrepreneur informed, *"...we are in terms of the corn star, the corn*

*pizza, is quite the bench mark for the base, and the base is a bread product with brownie sauce and cheese, and…the innovation is that the bread base and the way that we have created the product, the nature of that product…"* Company's star seller at Morrisons is a microwave pizza which the enterprise developed by solving the problem of premature melting of centre of pizza by creating a special sauce that prevented it and allowed the pizza to cook in a microwave uniformly. The entrepreneur informed, *""…our technical people started working on the project. In the beginning, it just sort of melted up in the middle. But they developed it from there and they set us up with the material which was protein based and we took that mixed that with <inaudible> with the kitchen and formulated a sauce which would work well with the pizza and developed the microwave pizza and it is an innovative product at Morrisons at the moment at Morrisons Super market."*

#### *6.1.5.1.3 Products with technological newness*

Microwave pizza described above is an example of a product with technological newness.

#### *6.1.5.1.4 Products with large application scope*

After developing its Gluten free pizza, the company has created its many derivatives. The entrepreneur in this context said, *"…by 2003 our business as an innovator company, had produced a range of food products and also gluten-free products and also developed into major animal products as well…"* Similarly, it has created many derivatives of its corn pizza. The entrepreneur explained, *"…we are in terms of the corn star, the corn pizza, is quite the bench mark for the base, and the base is a bread product with brownie sauce and cheese, and …the innovation is in the bread base and the way that we have created the product , the nature of that product. We can now then move and create derivatives of that product…"*

#### *6.1.5.1.5 Active acquisition of new technologies*

Company A has reached a development threshold where as a result of growing demand of its products it is finding it difficult to continue to use its labour intensive techniques. It is searching for technologies whereby it can mechanise its production without losing advantage of quality of its handmade products. The entrepreneur

informed, *"Our…key challenge, as a handmade product company is to go to the next stage which is how do we utilise mechanization for innovation without losing what we started with and that is a high quality …product and that's the next challenge for us."*

### 6.1.5.2 **Company B**

#### *6.1.5.2.1 Development of new ideas, products and processes*

At Company B, continuous development of ideas products and processes is almost a way of life. As mentioned at many places in this thesis, its executive chef, endowed with exceptional creativity travels extensively in search of new ideas. These ideas are the developed with enthusiasm and commitment. The product development executive of the enterprise informed, *"I think always refreshing the range, and not thinking that a product is going to stay in for more than the duration of an year, and you have to continue to change, and sometimes you think you've lost out on the product, you have to, I mean if you don't go to the customer with new ideas, then somebody else will, and it is that proactivity that has kept us ahead of the competition in innovation."*

#### *6.1.5.2.2 Product uniqueness*

Company B is very much a one-product business. It produces only pate. It, however, has become a market leader in the UK in this segment of food market by creating its own unique range of pates. The enterprise has *"…gone over producing something different from the traditional pate, pate that has a Scottish flavour, Scottish family and Royal Scottish Garrison Brandy and Highland pate soaked in red wine and such things which are quite different from what is available in the UK."*

#### *6.1.5.2.3 Products with technological newness*

As has been highlighted at many places in this thesis, in the Scottish food industry, product innovation and packaging innovation are intertwined. In order to create a packaging of its own type, the company invested a hundred thousand pounds in a new technology to pack its pates in a glass jar, which the product development executive showed with pride. She said, *"Last year we introduced this new packaging* (shows a new type of glass jar) … *it enhances the flavour so that was very different.*

*It is kind of jar that is quite innovative. We put a layer of meat packet in the bottom and a layer of molten cranberries on the top and things like that…people can see the layers on the jars…The investment in this type of glass jars technology is over a £100,000…"*

#### *6.1.5.2.4 Products with large application scope*

Company B has tried steadfast to broaden the appeal of its pates and have used a definite strategy to expand the application scope of its products. The company executive explained, *"…if you produce just purely pate, only for knifing onto a cracker then you limit your market, so we've introduced different pates, kind of, to broaden the appeal, and we've kind of flavoured them so that they appeal to the younger people"*

### 6.1.5.3 **Company C**

#### *6.1.5.3.1 Development of new ideas, products and processes and active acquisition of new technologies*

Acquisition of a Japanese pancake-making machine from a trade fair in Germany and then working tirelessly to make Scottish pancakes on it is an example of both development of new products and active acquisition of new technology by Company C. How the technology was acquired was explained by the entrepreneur in these words, *"I, a guy from sales and the bakery manager Jim went to Germany to what they call e-box, an exhibition for bakery where you get all the new ideas, new equipment and things like that and so we went over for 3 days to have look over for some equipment. First day we arrived in the morning, we went to Eva, which is a big place for equipment, and we walked through this door and we were looking at travelling hot plates and things like that. It was at that point that I saw this machine and thought I like that. It looks nice. I was shown it and shown how it works and what happened was that we had two pancakes filled. And I told Thomas it is not like that in UK. We go for that. That was it."*

It was, however, not easy to make Scottish pancakes on a machine designed to make Japanese pancakes. The company, however, continued to refine and modify its method until it had developed the target product. The entrepreneur described the

events in these words, *"…by the time the machine came, got commissioned, and started manufacturing some pancakes that was about 3 months. We had to finish the building. That was June or July. In October, we were ready to produce. We started producing and I spoke to a company that supplies us with - to manufacture a pancake mix for us. They came along and after all the demonstrations, we picked up one and it was excellent so we got a ton of the stuff made and all that was done at that stage was to make a sample. We tried different packets of stuff to make the pancake and it did not work and another problem that we faced was that we had an ammonia smell from it and we thought something is wrong here and so we had to take it back but it later on transpired that they had changed the recipe without telling us and so they are out now and so we lost another 9 months to a year because we had to develop it again and so now we have a local company doing it and the pancake is excellent."*

#### *6.1.5.3.2 Active search for new technological knowledge*

Company C takes technical advice actively from its suppliers to know what new products can be developed using the ingredients that they supply. There is always an attempt to try and gain technical knowledge, which can be productively used given the company's resources, and prior knowledge. The entrepreneur informed, *"…our guys are really busy in bakery, lots of time with our own products* (and so) *sometimes we try to get somebody who is really good from outside to show us how can it be done in process and we try to find recipes and different ideas and we use some suppliers to do that. They normally send their technical guy in and they can start with our bakery manager or our technical manager and the conversation is what we can do what we can't do."*

### 6.1.5.4 **Company D**

#### *6.1.5.4.1 Development of new ideas, products and processes*

Company D has transformed itself from a subsistence farm into a showcase of sustainable innovation and growth through a tireless development of new ideas and products. Around the broad themes of ice-cream and an adventure centre, it has developed and implemented many ideas such as Banoffee and Heather-Cream ice-creams and organic and fair trade ice-cream ranges.

#### *6.1.5.4.2 Product uniqueness*

Company D does not make run of the mill ice creams and has always tried to make its own unique flavours. One such flavour is its hugely popular Banoffee ice cream, which combines the flavours of banana and toffee. The entrepreneur explained, *"… we had one flavour which everybody who had tested it loved it and that was banana and toffee. And that was number one. And name like that and packaging like that. And for a long time Banoffee ice cream has sold a lot."* As stated previously in order to carry its messages of sustainability, environment protection and healthy eating it has also created its two unique ranges of organic ice creams and fair-trade ice creams.

#### *6.1.5.4.3 Active search for new technological knowledge*

Company D contentiously tries to improve its technology base. Entrepreneurs travel regularly to distant destination in search of new technology. One such case is when they went to Ireland with one of their competitors. The entrepreneur said, *"We were looking for new freezers and we went to Ireland. There was the equipment manufacturing living there. We went there together."* Once they sought and obtained help from Scottish Enterprise to attend a trade show. The entrepreneur said, *"…about 12 years ago when John was trying to go to an exhibition, they helped him go"*.

### 6.1.5.5 **Company E**

#### *6.1.5.5.1 Development of new ideas, products and processes*

Company E today has positioned itself as an exporter of characteristic Scottish foods to North America and a seller of the same to the Scottish gift trade. It, however, has come a long way to reach this point. On the way, it has experimented and developed a very diverse mix of food and drinks products. Not all of them have been successful and the enterprise took some time to realise its final destination. The entrepreneur explained, *"We started with haggis and we also did some verity of puddings and right now we have 5 different types of haggis. And we have gone through the route of doing jams and marmalade and mayonnaise and soups and syrups. Yes, we still do jams and marmalade but the volume have never been big. A typical jam company will do 30 or 40 types of jams but we do only four types of jams like strawberry and*

*raspberry, which have volumes. On the confectionery side, what we did actually was sponge and a bag of sweets and that was successful until somebody copied that. We also did an innovative product (beer) but the volume and cost did not justify that."*

#### *6.1.5.5.2 Products with technological newness*

As stated earlier within the food sector there is limited scope to develop products with technological newness. The case study companies, however, have tried to create technological newness within this limited space. Company E has created fresh product designs. They even copyrighted one of their designs. When it was imitated they, however, decided not take action against the perpetrators due to low probability of success. The entrepreneur informed, *"We start with the design company. There are three design companies actually. One is existing and two are new. We combine the 3 to develop the design and then we do market research and then we have this guy who develops packaging for US...What we did was when we created a new sweetie we registered the design but made no difference. When we realised it was being copied we were told that if we go after them there is 50-50 chance that we can stop them. So we leave it at that."*

### 6.1.5.6 **Company F**

#### *6.1.5.6.1 Development of new ideas, products and processes*

Company F too, like rest of the case study companies, has a systematic approach to develop new ideas and products. Once the product development executive gets an idea he tries to produce a sample himself and then makes a presentation to production, technical, marketing and finance people. Company F is a part of a larger group, which has incorporated innovation into its main policy and has a team of five powerful individuals at the group headquarters who ensure that all companies in the group continue to remain innovative and develop new products on regular basis.

#### *6.1.5.6.2 Active acquisition of new technologies*

Company F moved to new premises in May 2007. The company claims that its *"…new 6000m² premises are one of the most modern seafood production facilities anywhere in Europe..."*

### 6.1.5.7 **Company G**

#### *6.1.5.7.1 Development of new ideas, products and processes*

Company G has grown very rapidly recently and its fast growth can be attributed to its ability to develop new ideas and products en-mass. One of the product development executives informed, *"We may launch 150 cakes a year."* When asked how many ideas it takes to get 150 product launches, the response was *"one in 10"* which means that the company tries to develop around 1500 ideas every year, which by any reckoning is a very busy idea development programme.

#### *6.1.5.7.2 Product uniqueness*

Amongst the unique products of Company G, one can list products such as kid Champaign and a photo cake where the customers' photograph appears on their cakes. In general because of its licensing arrangement with Disney, the enterprise produces a range of celebration cakes with image of Disney characters on top. Cakes in this range cannot by copied by its rivals and make company's cakes distinct.

#### *6.1.5.7.3 Active acquisition of new technologies*

Company G has regularly invested in new technology. In 90s the company *"…invested in this factory here. We have a space of over 25000 square feet. We called …ASDA and Safeway…and they sent up a technical team and they assisted with the planning of the original factory and mainly we were up to the standard they require. We learnt a lot from them as you can imagine that we were starting from scratch…"* More recently it set up a state-of-the-arts manufacturing facility in a place called Loni near Prague to cater to its growing market in Europe.

### 6.1.5.8 **Company H**

#### *6.1.5.8.1 Development of new ideas, products and processes*

Investigation of Company H gives an unmistakable sense of a need to be constantly always looking for new ideas and being entrepreneurial. The notion that you put a product on the market and do not always want to improve it or think of new products

just is not at all applicable to it. The interviewed entrepreneur said the company often has as many as six new products being developed at the same time.

There seems to be a two-stage, product development process where the very basic idea is put up through some fairly informal tasting. If a product gets through this informal stage then there is a second stage of product development where all aspects of the new product are put together and evaluated.

#### *6.1.5.8.2 Active search for new technological knowledge*

Entrepreneurs who have established Company H actively search for new technological knowledge. For the purpose, they not only read extensively they also travel far a field in search of new knowledge in their field. At the time of interview, one of the founders of the organisation was going over to Finland for the same purpose.

#### *6.1.5.8.3 Product uniqueness*

Company H's most products are unique, essentially because there are not many companies making organic ready meals and soups. And so the very nature of the market niche that this company was set up to exploit makes its products unique. During the interview, the entrepreneur gave some examples of products for which there were in fact no other competitors because there were no other similar products. One such product is a health drink that does not contain lactose.

### 6.1.6 **Technology Policy: Cross case analysis**

#### 6.1.6.1 Company analysis

These enterprises have not done as well in terms of demonstrating evidence of innovation influencing technology policy as they have in terms of other determinants. The reason for this is not difficult to surmise. These are not high-technology enterprises but small low-tech food companies. Technology policy is not a major driver of innovation here.

Figure 20 show that company A, has a reasonable record of innovation influencing technology policy with five (out of seven) indicators. Companies B with four

indicators and Companies C, D, G and H with three each and company F and E with only two have relatively poor technology policy evidence.

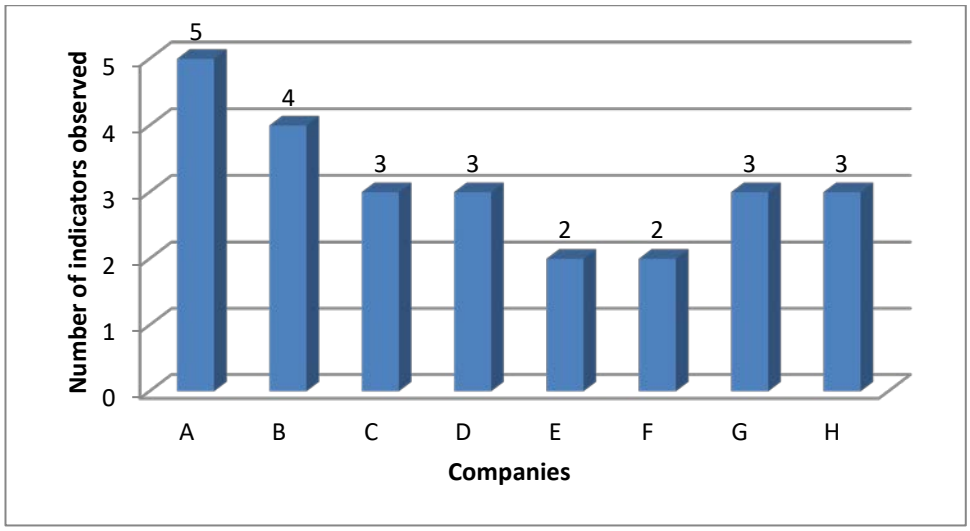



Figure 20: Technology policy indicators in the case study companies

### 6.1.6.2 Indicator analysis

All investigated enterprises exhibit evidence on development of new ideas, products and processes and it is only to be expected. The subject of this investigation is innovation and new product development. These organisations were picked up because of their known contribution in development of new products. Expectedly, the results show all of these companies developing new products and processes.

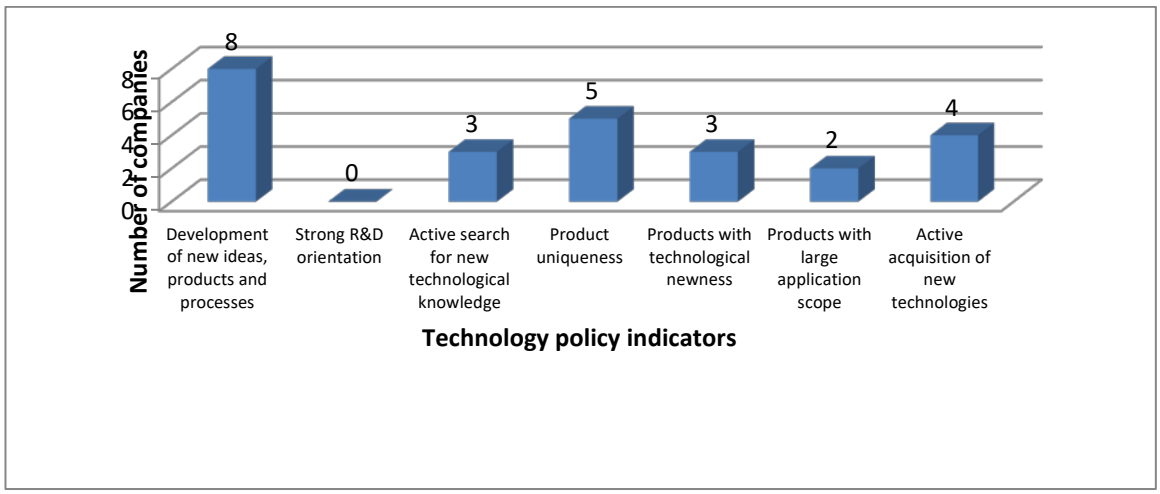



Figure 21: Incidence of technology policy indicators in the case study companies

The noteworthy fact is that 5 investigated enterprises have developed unique products, which confirm them as innovative companies. On the remaining indicators,

however, these organisations have not done so well in terms of innovation influencing technology policy. For example, active acquisition of new technologies is evident only in four enterprises and active search for new technological knowledge and products with technological newness are exhibited by only three emphasising their status as low-tech enterprises.

Products with large application scope are developed by only two companies. This implies that most of these enterprises are active in strong niche markets and have not attempted to go beyond these niches. Most significantly, this investigation reveals that not one of the eight investigated enterprises have strong R&D orientation. This corroborates the major conclusion of this research that innovation in Scottish food industry is low-tech and challenges the relevance of R&D-centric innovation policy of the Scottish Government.

### 6.1.7 **Cooperation and Networking: Within case analysis**

#### 6.1.7.1 **Company A**

Company A collaborates with other Scottish food companies. The collaboration, however, is not in new product development. It is in marketing their products. As stated earlier, Company A has a very successful product development regime and no need is felt at the enterprise to try to network with other companies for innovation. For small enterprises marketing, however, is always a challenge. In case of Company A, which supplies to superstores only to a limited extent therefore there is always a need to expand its market. The company has thus joined a network of Scottish food companies to cooperate for marketing their produce. The entrepreneur explained the concept in the following words, *"…the collaboration is purely to take our products, the product range that we all have to the consumers market and there's a lot of benefits in doing that, both in the business and in the product that you do, especially we've got two other companies, two huge companies that can combine their own product to get another product and at the moment this collaboration is internally between the two company. so there's potential innovation for new product ideas and we get that feedback from the guy that represents us in the market, he is a market guy, a marketing expert and he reports to member companies within the group and he effectively represents us in the market place. So what the manager does*

*is like getting the production manager, getting the marketing manager and the chef's time to talk to various food categories in the menu and push the pizza up to …and we would like to, and we are hoping that we extend that to other members and other food manufacturing businesses and Scottish enterprise are watching that with a lot of interest and in fact we've had a wee bit of help from them in terms of setting that up from them. And we see that as a certain plus for our sales and market."* At the time of investigation, this, however, was a new initiative and its success potential yet to be known. The entrepreneur informed, *"…it is early days and the effects are from now, and it's taken us five months to set up, purely getting the systems up, and finding people so equipped is not so easy especially when you are busy."* An interesting aspect of this joint marketing initiative is that it is a Scottish Enterprise idea as explained by the entrepreneur, *"…it was an idea of the Scottish enterprise* (that)… *were keen to attracting more manufacturers in the food service and …we grasped that from there and we took it forward we got the brochure, the whole lot of literature and were taken to market by a representative. And it is good because what is produced in Scotland is seen as quality in England whether it is fish or whatever and what is produced in England is seen as quality up here."*

#### 6.1.7.2 **Company B**

Company B has been an active participant in a long tradition of collaboration within the Scottish food and drinks industry. The product development manager of the enterprise said, *"I think we are one of the first companies in Scotland to invent clusters."* She went on to inform that "*The MD and the co-founder of* (this) *business was a great networker, and we were a part of it in the very early days of Scottish development agencies and stuff, and we were one of the first industry partner companies,* (we) *were* (one of) *about five or six originally…"* she also confirmed the beneficial consequences of collaboration and said that *"I think we've utilized the benefits of clusters in a very nice way."*

Collaboration of the above kind with other companies, however, is need based and an on-off affair. More regular collaboration in this Company is between the enterprise and its major customer Waitrose and collaboration with other food companies and suppliers it is less frequent.

Networking in case of company B is shaped, thus, more by complementariness rather than the need for the competitors to work together for the mutual benefit. The product development manager of Company B narrated many instances of collaboration with suppliers based on complementariness. *"…the fisherman's society came down to this town and they had an abundance of crab meat they couldn't sell it and we had a need for proteins which nobody else was using and the two companies joined forces, and one of our best selling products is crab pate."* And *"The highland smokeries had this wonderful slightly cooked meat that they couldn't do anything with and we used all of it and made grand smoked meat pate."*

Company B has had support from Scottish Enterprise as well. Company's The product development manager mentioned at various stages of interview *"They have assisted with small bits of capital for machines… for training and development and marketing as well… They helped us design the package… They've helped in the cash flow on occasions." "We've got a good client management relationship … They're very supporting in that way."* And … *"I think that there is a value in what they do and what they offer".*

### 6.1.7.3 **Company C**

In Company C, there is cooperation with other companies and it is very much on product development. The entrepreneur at one stage of the interview pointed out to one of his products and said, *"The technical guy from another company has actually made that cake. We let them in our bakery…they come round* (and make it)*."* Company C, however, uses a clever method to ensure that when they eventually develop a product based on such collaboration, the people who come from other enterprises to help them are not able to copy the product. The entrepreneur explained the approach in the following word, *"When people make cake, it is to take a mix, put in a bowl, add egg and water and spin around and bake. When we do a cake, what we do is we take a base... That is why when we take technical guys from other companies we make sure they cannot see our process and make out how it should be done basically against the practice done. Then we take the recipe and we change that to our way. What they do is to tell some recipe but what we do is that we change it through our process"*

Company C enterprise, however, does not cooperate on a general level with other players in the bakery industry. The entrepreneur informed, *"We do have bakers' federation within that I think. If I have got a problem or anything, we will leave it to them to handle it but that is as far as it goes. We don't get involved in it."* In the same vain when asked if his company has any alliances with any other businesses in the region, the answer was, *"Not much, just on the need to know basis. Ours is a secretive organisation. What we are all trying to do is keep one step ahead of others. We don't tell even our suppliers. If we tell them something, it may go out to others. We thus just keep to ourselves. There was a guy who worked here always. Then he went away. Then somebody told me that such and such guy is working with our competitor"*

#### 6.1.7.4 **Company D**

Company D is a part of a cluster of Scottish ice-cream makers. The entrepreneur, however, did not seem very enthusiast about group participation. There is no evidence of collaboration in product development. When asked if there was an ice-cream industry group and if Company D participated in its activities the answer was, *"There is an ice-cream industry group and we are members and there is a magazine and we get free technical help. We have regional meetings but I have never been to them."* When asked why she has you never been to these meetings, the entrepreneur replied after some thought, *"There is also an annual get-together and exhibition of things like freezes I usually go there. There are folks selling equipment, folks selling new ideas about ingredients. Interesting folks. Now why I don't go to regional meetings? I am probably being totally unfair here because I am just making my judgement. It is very Italian. There are different routes to making ice-cream and different recipes and we are going down the American route of making ice-cream and not an Italian route. And I don't do anything very far beyond exchanging pleasantries.*" When asked about the attitude of other entrepreneurs if they are helpful and welcoming or try to make a contact, the response was *"Nobody has ever phoned. There have been different presidents of the association over the years and there have been a few Scottish presidents…No problem at all. Two or three have been here. We have been to McKinnon's a couple of times. They have been down here once.*" Though there is no networking on product, development there is evidence of some cooperation in other fields such as acquisition of equipment. The

entrepreneur informed, *"We were looking for new freezers and we went to Ireland. There was the equipment manufacturing living there. We went there together. So we do that. The other thing that I do is not as much as that. We have a regional food group. And I am currently its chair and I organise meetings and select topics and we have discussion on legal issues."*

Company D receives regular support from Scottish Enterprise as well. The company entrepreneur said *"…about 12 years ago when John was trying to go to an exhibition, they helped him go"*. And *...Scottish Enterprise is proposing to help us with. And we are going to sit down for a day."*

### 6.1.7.5 **Company E**

Company E is not involved any cooperation or networking with other food companies. When asked if the company belongs to any association or network in terms of sharing information, the entrepreneur informed in negative. He also told that if there is task which he feels cannot be handled by people within the organisation he hires consultants rather than seek advice to support from other food entrepreneurs. He said, *"My relationship with people in business is more of friends than professionals. We go to dinners and social things but I do not like to talk business."*

Company E has been receiving support from Scottish Enterprise for new product development though the entrepreneur believes that the support used to be much better in previous years but the quality has now declined. *"Down the years they were absolutely brilliant. You know the scientist, a guy named Richard Johnson. He worked with Scottish Enterprise. He was brilliant and the products that he developed were first class. When he died it all came down. There is new guy now. He has been ok."* At the time interview too the entrepreneur was seeking Scottish Enterprise help. He said, *"We want to do a feasibility study. Hopefully we can get some help from them. I can say that they do try to help"*

### 6.1.7.6 **Company F**

Company F is a part of a group of food companies, which has operations in Scotland and England. The company naturally cooperates and networks with other food

companies in the same group. There is no evidence of collaboration in new product development as each one of these company has its unique food range. The company, however, has regular contact and collaboration with its customers particularly Waitrose and Marks & Spencer whose representatives participate in validation of products being developed by the company.

#### 6.1.7.7 **Company G**

Company G does not network with other food companies. It, however, has a close contact with Scottish Food and Drinks federation on research. The company executive informed, *"…Food and Drinks Federation helps in research. We work quiet closely with them. We have a good relationship with them."*

Scottish Enterprise has helped the company with its growth strategy and with other general advice. The Company G executive reported, "*There has been an understanding of how the Scottish Enterprise can help the top line growth of business post advising how to do business"*. And *"There was much more involvement of Scottish Enterprise in advisory capacity on how to go about all this in the early stages. Now our relationship has changed as we have now become much bigger business in terms of skills and expertise."*

#### 6.1.7.8 **Company H**

There is no evidence of Company H's participation in any cooperative or networking initiative with other food companies, its customers or suppliers. The Company H entrepreneur however, did say that she thought Scottish Enterprise were very helpful and had been 'good' to the company.

### 6.1.8 **Cooperation and Networking: Cross case analysis**

Table 6 shows the collective evidence on cooperation and networking by the case study companies.

All eight investigated enterprises render proof of some kind of cooperation and networking with external bodies. Only four enterprises, however, use cooperation

and networking for new product development with only two companies cooperating for new product development with other food companies.

Table 6: Cooperation and networking by the case study companies

| Company | Cooperation | With | For |
|---|---|---|---|
| A | Yes | Other food companies, Scottish Enterprise | Marketing |
| B | Yes | Other food companies, suppliers, customers | New product development |
| | | Scottish Enterprise | Training, design development, marketing, cash flow |
| C | Yes | Other food companies | New product development |
| D | Yes | Other food companies | Acquisition of equipment |
| | | Scottish Enterprise | Feasibility studies |
| E | Yes | Scottish Enterprise | New product development |
| F | Yes | Other companies in the same group | General cooperation |
| | | Customers | New product development |
| G | Yes | Scottish Food and Drinks federation | Research |
| | | Scottish Enterprise | Growth strategy, general advice |
| H | Yes | Scottish Enterprise | General help |

### 6.1.9 Financial resources, human resources and managerial efficiency: Within-case analysis

Research analysing the inability of small firms to be consistently innovative indicates inadequate marketing and management skills as the main reason (Moore, 1995). This in turn is caused by problems in obtaining and grooming requisite managerial talent since these firms cannot afford the pay and prerequisites that the large firms usually provide (Grieve-Smith and Fleck, 1987; Beaver and Prince, 2002). The managerial inefficacy thus springs from financial inadequacy as typical small firms lack financial resources resulting in inadequate level of human resources. This in turn causes low managerial efficiency, which makes it difficult for it to innovate successfully. Innovative aspirations of SMEs thus are circumscribed by a vicious cycle, which has financial, managerial, and human resources aspects. This also means the three independently identified determinants of innovation, viz. human resources, managerial efficiency and financial resources are intertwined in the case of small firms. Three of them are therefore analysed together here.

### 6.1.9.1 **Company A**

Company A has been able to successfully create new products and take them to the market without the use of massive financial or managerial resources. The entrepreneur explained, *"…you don't need masses of data and research and hire these research companies to go in and get the product to the market."* The reason for this is that the company has strong internal capability in understanding a route to successful innovation and reaching its innovation goals. The entrepreneur informed, *"…we know the quality in terms of what we need and what we lack in comparison …and we go far and ahead of the game in the far side of the quality of the products, and the consumer sees the quality side of the products…"*

The company is dependent on idea generation and implementation on a small well-knit team made up of, *"...The production manager, myself, the chairman, my father who is the creative part of business as an idea generator…the other ideas coming from the technical manager* (who) *always most certainly finds something."*

The reason for innovation not being too expensive in this organisation is that the enterprise does not need to invest additional resources in hiring specialist experts as the entrepreneur and his teamwork on innovation concurrently with other tasks in the organisation. When asked if it is very expensive for them to be innovating on a continuous basis, the response was **"***No, no, no, most of these people do, but we don't have that kind of money that big boys invest, their NPD people have only NPD job. Here it is part of our job…we're all near the heart of NPD, it's a part of all the other works that we do."*

The marketing inability mentioned in the literature is also not affecting Company A as it collaborates with other Scottish food companies to collectively market its products with the help from Scottish Enterprise. The entrepreneur explained, **"…***the collaboration is purely to take our products, the product range that we all have to the consumers market and there's a lot of benefits in doing that, both in the business and in the product that you do, especially we've got two other companies, two huge companies that can combine their own product to get another product and at the moment this collaboration is internally between the two company. so there's*

*potential innovation for new product ideas and we get that feedback from the guy that represents us in the market, he is a market guy a marketing expert and he reports to member companies within the group and he effectively represents us in the market place. So what the manager does is like getting the production manager, getting the marketing manager and the chef's time to talk to various food categories in the menu and push the pizza up to the <some word> and fry products and we would like to, and we are hoping that we extend that to other members and other food manufacturing businesses and Scottish enterprise are watching that with a lot of interest and in fact we've had a wee bit of help from them in terms of setting that up from them. And we see that as a certain plus for our sales and market."*

The entrepreneur though did mention that it was not easy to get good chefs. He said at one stage, *"…good chefs are harder and harder to find and they cost a lot…"*

Company A, thus, has been able to innovate successfully and has not faced any problems in terms of managerial inadequacy as the father and son team of company owners possess all the expertises needed to carry out company's low-tech innovation. The company does not face any financial resources crunch because the money needed for innovation in this enterprise is not huge and is always within company's means. It has no issues of human resources shortages bogging down the innovation process too as it runs its innovation concurrent with its manufacturing and depending on the needs of new product development key people share roles and responsibilities.

#### 6.1.9.2 **Company B**

Company B is a part of a larger group of companies. As a result, it does not lack any financial resources. Though this group of companies is owned by a family, which spends most of the profit generated by the companies under its ownership for charity, it always makes available any money needed for reinvestment first before allocating the rest to the charity. It is understood that the family's ability to continue to serve the charities close to its heart depends of the size of profits earned by the companies under its ownership, which in turn depends on exploitation of all profitable investment opportunities. In fact, when the group owners bought Company B they invested so generously in it that Company B's 5-year investment plan was completed in one year. The executive from the company informed, *"Well, I think the business*

*just got too big and needed much more investment than the two guys who started it could cope with, and roundabout '96, '97 we had a five year plan to get the factories operational that could take on Tesco national and it was in phase of five years that we had to stagger the investment and----- were looking to get itself into the food chain in the UK and it was decided that it was the time to sell the business and that five year plan basically we managed to do that in one year."* She also said at one stage, *"There's a lot of re-investment…"*

As a result of its financial well being, unlike other small companies, Company B has a product development team of four full time employees. The company executive informed, *"We have two in development, and we have a technical manager and a quality manager who do all the paper work side of the development."*

Company B is located in the Scottish Borders in a small town. When asked if this location makes it difficult for company to attract or retain employees, the executive answered, *"No. Actually, we've found it quite beneficial. You know the market is Scottish and the customers they all come here, and we give them a lot of time in our business, and it is a very lovely area."* When asked specifically if the company faced difficulties in getting people with innovation expertise to work for it, "*No we haven't, we've been very lucky, engineering wise and technically wise and production wise, and we've always managed to attract people. I wouldn't say for a long time, but if you can get for 2 or 3 years senior managers who have got vast experience and if they can pass that on here in years then, you've actually done quite a good job, I think."*

Company B, thus, faces no problems in raising enough money to finance its innovation activities nor does it faces any problems attracting and retaining managerial workforce to carry out innovation and other activities. One of the reasons for its financial adequacy is that it is a part of group of companies owned by a family, which is well endowed with resources and has a policy of making funds available for all potentially profitable investment opportunities in the companies under its belt. As Company B has been a successful innovator in its line of products, the finance that needs to carry out its innovation activities is always made available to it.

### 6.1.9.3 **Company C**

Company C does not seem to lack any managerial talent. The reason being that the four individuals that collectively own the company have previously occupied high managerial positions in the British Bakery and each one of them has formidable managerial experience. One of the interviewed entrepreneur informed, *"I have been in the bakery industry for over 5 years. Thomas has been for years and years so has been Colin. Phil has been there for a long time.*

These top managers carry out new product development, without a major involvement of other staff. When asked if the other staff is involved with new product development, the answer was, *"I don't think bakery staff gets involved. They don't have time to, the confectioners get involved a bit but other staff? No. I think the biggest problem that the whole industry has with bakers these days is that they are very few now. Though our bakery manager is a qualified baker. He has worked with Crawford. He has lot of experience. But knowledgeable bakers disappeared years ago. Bringing them back is a difficult thing."* Therefore, there seems to be no issue with not having people to carry out innovation. However, not getting people to carry out other tasks is obviously there.

Company C seems to have enough financial resources to carry out its innovation agenda. As new product ideas occur and are validated, financial plans are made for each. These plans are then stored away. When the company is negotiating new products to supply to its major customers, it apprises them of all of its product plans. If a customer shows willingness to put on shelf any one of the company's new products, it takes out the plan from the storage and uses it to develop the product. The entrepreneur explained the process, *"All the products that are new to the company are standard things and are budgeted for and there are sales plans and when it comes it innovation and new machinery we tend to put down as out of the way. They remain in a separate folder if you like and it comes out of the cupboard when we need that. And if we like the products and if we think it is going to work, we start to talk to the customer to get an idea as to what their reaction is. They look like a guy who is barking his own tree. It is very orthodox. We keep them on back burner. So you have got something to bring forward if you like."*

Company C does not lack any managerial talent, as it is collectively owned by five individuals who have a long and distinguished track record of working in high-ranking management positions. It tackles the problem of financial resources by not trying to develop products without assuring that its major customers, the superstores are willing to place orders for them.

#### 6.1.9.4 **Company D**

Company D is run by a team of husband and wife who have complementary skills in innovation. Husband is very creative and is able to come out great new ideas. Wife, in contrast, is pragmatic and decides which of the ideas of her husband is feasible. She is also an enabler in the sense that she is able to execute the chosen ideas successfully. She explained, *"…it was that combination and it is still that combination because he is an innovator. He is constantly coming out with new ideas and I am a practical person who chooses that out of these 3 ideas that he is having right now which is the one that we should be doing…"*

The company has been able to raise resources for market research initially but subsequently has been developing and marketing its products without any market research due the entrepreneurs' evolved understanding of their market and their products. The entrepreneur informed, *"Yes we did that and in fact we brought in a market research company in the very-very beginning…As it turned out, as we ourselves become more sophisticated and we would go to other market reports. 70% is vanilla, 10% is chocolate and in remaining every other flavour in the world. So if you think of something like coffee or mango or whatever all those together are final 10% and that was what we were targeting. It wasn't a sensible strategy…That was once. When we did it first. But subsequently we launched new products…without market research"*

The Company realises that to achieve marketing success with new products deep pockets are needed. The entrepreneur explained this, *"…Ben & Jerry? … American company now owned by Unilever. They go for whacky ice-creams. They launched an ice-cream in UK 5 years ago called Phish Food. I thought nobody is going to buy that and they paid to supermarkets for shelf space to let it be there for 3 years. And in the meantime, what they were doing. They were going to every fresher's week and*

*stand at the bottom of escalators in the underground and giving away 300 ml for people to discover what Phish Food was because in States Phish is p-h-i-s-h and in States Phish Food is chocolate with fish. Young people buy it and so in States people know that Phish Food is the ice-cream that Ben & Jerry are offering. Nobody in UK knew Ben & Jerry or Phish Food so they had to spend a lot of money. A. to persuade supermarkets not to delist them and B. to create the awareness of general public and mainly teenagers of what Phish Food ice-cream was. And so you need deep pockets."* When asked if it is very expensive to promote new products, the response was, *"Yes it is huge. Promoting a new flavour is expensive. You stand in stores and allow people to taste it free and stores charge you 120£ day to do that."*

Despite this, the company has been able to raise resources for its investment needs for innovation because the entrepreneurs have been reinvesting all their earnings in the enterprise. The entrepreneur said, *"It* (the company) *is growing fast but we are continually reinvesting."* The owners very remarkably do not take much money from the enterprise for their personal use. The entrepreneur informed, *"John and I are people who do not work for money. We don't want money at all. John doesn't want an iota of it. I would like a reasonable amount of money for living very-very basically."*

The Company, however, has done well financially and its revenue has grown at 20% per annum against 5% growth in sale. The entrepreneur informed, "(our sale is growing at) *about 5% per year and our revenue is growing at about 20% per year so we are managing to extract more money when they came."*

Company D, thus, does not need extra managerial resources as the husband and wife team of entrepreneurs running this company have all necessary skills to carry out innovation. The company has been able to raise resources for new product development by denying themselves any luxuries and living very basically. The approach has paid off and company has achieved fast growth in revenue.

#### 6.1.9.5 **Company E**

Company E does not appear to have any financial problems in developing or marketing its products. For a company employing only three people yet having an

annual turnover of 3.4 million, the business is well endowed with financial resources. The entrepreneur informed, "*We start* (new product development) *with the design company. There are 3 design companies actually. One is existing and 2 are new. We combine the 3 to develop the design and then we do market research and then we have this guy who develops packaging for US."* The company similarly has no problems in distributing its products. The entrepreneur said further, "*In Scotland it is mainly agency. We have one distributor in Glasgow and one up north but mainly… Outside we have one distributor in London area who looks after it. Basically sales is done by agents, distribution is done by ourselves."*

Company E has been able to carry out its modest incremental innovation easily without facing any managerial or financial problems. Given the low-key low-tech nature of its new product development, it does not need resources beyond it grasp. As it does not supply to superstores but exports its goods, its margins are decent and it has been able to fund its projects. None-too-ambitious nature of its product development also means that entrepreneur does not need to employ experts to guide its product development process. As the company has a policy of outsourcing all its activities, it is able to hire requisite services when need be.

#### 6.1.9.6 **Company F**

Company F too does not face any managerial or financial constraints to its new product development efforts. There are two main reasons for this. The company is a part of a thriving group of enterprises who support each other financially and the company on its own is also quite profitable and growing. At the time of investigation, its annual turnover was £ 16 million. It subsequently invested in a state-of-the-arts manufacturing facility which again shows that there are no financial constraints affecting its activities. The fact that company has a full time product development executive and a product development department also shows that innovation at company F is not hampered by paucity of functional experts. As stated earlier Company F is a part of a larger group, which has incorporated innovation into its main policy and all companies in the group, continue to remain innovative and develop new products on regular basis.

### 6.1.9.7 **Company G**

Company G is financially very well endowed. During the year of this investigation, its annual turnover was nearly £48 million. Naturally, the company faces no shortage of funds for market research, product development, building new capacity or employing functional experts. The company also has a well-staffed product development department headed by the MD of the company. The company demonstrates high managerial efficiency. The interviewed executive informed, *"There are 2 different operational efficiencies, I believe and if they pull them together in the wider context and I am not sure if we can do that. I think at the supervisor level we have very strong quality ethos."*

The company has such an evolved product development process that it even tells what new products their customers, the superstores should sell. One of the executive informed, "*We have constantly got to do gap analysis, market research and we have been showing them* (the superstores) *what we think they are missing… If we get a Halloween brief and they ask for three ideas we will send nine… So it has not to do with doing more than what they ask for*."

### 6.1.9.8 **Company H**

Company H, founded and run by two budding entrepreneurs is committed to popularise organic food. The company's new product development is run by these two founding entrepreneurs. The company also employs a nutrition expert but the entrepreneurs themselves are very knowledgeable about organic food and health foods. The company thus has been able to develop successfully its new products without feeling any constraints in terms of lack of personnel. As explained at many places in this thesis, food sector innovation being low-tech, does not need massive financial resources and the company is able to raise necessary resources for developing its products without any problems. Often at Company H, as many as six new products are developed at the same time. The company at the time of investigation had a staff of 40 carefully chosen people. The entrepreneur said that able to fit into the team was a critical element in bring new staff on board – though this was a rare event – so people must be reasonably happy working there.

#### 6.1.9.9 Financial resources, human resources and managerial efficiency: Cross-case analysis

As has been repeatedly stated in this thesis, the organisations investigated in this research are carrying out low-tech innovation. Unlike their high-tech counterparts in new technology spheres, innovation by these enterprises does not need huge resources. These companies are therefore able to engage in innovation and new product development without any significant financial restraint. There is no signs of shortage of competent managerial workforce. All these enterprises have been able to attract and retain requisite managerial talent. Another significant fact is that in most of these companies the entrepreneurs themselves are fairly skilled, capable of performing on the innovation front and do not require much outside recruitment for the purpose. These organisations have also succeeded in developing their markets well without any major advertising or marketing effort.

## *6.2 Internal non-strategic determinants of innovation*

### 6.2.1 Analysis of age

The work on influence of age of the enterprise on innovation was initiated by Schumpeter (1934). From his examination of the late nineteenth century industrial structure in Europe, he observed that small firms using new technology are able to enter a competitive industry easily. He therefore theorise that the small new firms are major drivers of innovation and argued that successful new firms usher in new ideas, products and processes. Their appearance, thus, disrupts existing arrays of organisation, production and distribution and eliminates the quasi-rents, resulting from previous innovations. He refers to this dynamics, ‘creative destruction’. In later literature, this has been labelled as *Schumpeter Mark I* pattern of innovation (Avermaete *et al*., 2003).

This research, however, does not corroborate the Schumpeter theorem. The case study companies are not young nascent enterprises trying to enter an industry dominated by large companies and they do not use innovation as an instrument to facilitate this.

There is also no evidence of these enterprises causing any creative destruction by eradicating the large food companies in Scotland. The case study companies are not ‘young’. The youngest of them was in business for nine years in year 2006. The mean age of these enterprises is over 20 years. The belief that innovative companies are very young is, thus, not reflected in the age profile of these companies. It is also not so that the age of these companies are skewed on the side of low age companies. They are in fact equally distributed on both sides of the mean age with half of the companies older than mean age and other half, younger than mean age. There is thus no evidence to show that being young is an influence on these organisations' innovativeness.

The reason for this research not supporting the Schumpeterian hypothesis is, however, not difficult to understand. Schumpeter’s conclusions are based on his observation of new technology start-ups active in high-technology industries. The companies investigated in this research, in contrast are from low-tech food sector where the age is obviously no influence on the ability of enterprise to innovate successfully.

### 6.2.2 **Analysis of size**

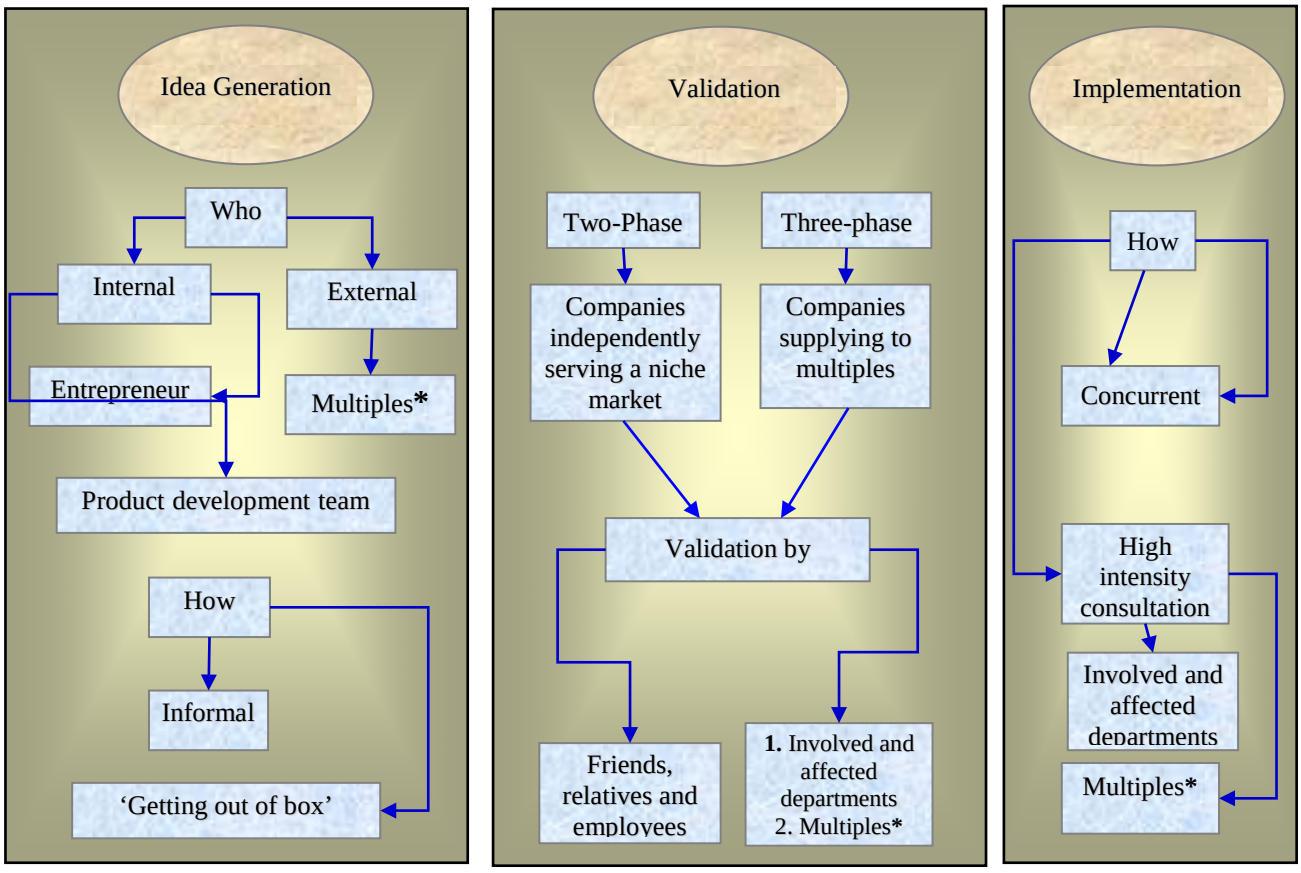
As all companies investigated in this research, were SMEs at the time of investigation, differences in the role of determinants of innovation between small and large companies are not discussed here.

## *6.3 The innovation process in the Scottish food SMEs: A summary*

From vague ideas to fully formed new products, the process of innovation in the case study companies passes through three distinct phases, idea generation, idea validation, and idea implementation. Figure 22 depicts the common threads of process of innovation that emerges from this investigation of eight innovative Scottish food companies.

The seeds of innovation, in the form of fuzzy product ideas, sprout in an enterprise from a variety of sources, from within and without. The principal entrepreneur is most often the most prolific generator of ideas. In many enterprises, however, other

individuals, very often, members of the product development teams, demonstrate creativity in equal measures. At the other end, customers, if they are grocery multiples, prompted by their own market research that keeps a tab on consumers and competitors, present these companies with new ideas to pursue. There is no evidence of any formal processes here but there is ample indication of 'reaching out' to pluck ideas from outside rather than 'churning' them internally as will be clear from the subsequent details. Most remarkable is an absence of 'not invented here' attitude. These businesses are willing to try ideas without being fussy about their source. This does sometimes add a certain element of imitation to their product development efforts. Exceptionally creative, however, as the individuals at the helm of product development process in these enterprises are, they are always able to put their own stamp on the ideas so borrowed or 'lifted'.




*ASDA, Tesco, Sainsbury, Morrisons, Marks & Spencer, Waitrose etc.

Figure 22: The Innovation process in the case study companies

Once a product idea has been identified as worth pursuing, it goes for validation. There are two stages of validation. Validation of market potential comes first. The

product is made in very small quantities, in an experimental way, akin to production of prototypes in scientific research. Then, the way a prototype is tested in a lab to establish a scientific principle, here it is tested 'literally' by a group of individuals to give their verdict on how they find it as a food to eat. The principle behind such 'test marketing' is that a group that includes 'you, your friends, your employees and your relatives' is a representative sample of the real market and if this group likes a new product in significant numbers, the product has potential. The second phase is that of validation of production feasibility. Here the product development people along with the manufacturing, finance, design, packaging and marketing personal, assess the capacity of enterprise to produce it in the quantities in which it is likely to sell.

In the three-stage validation, the first stage occurs more or less on the above lines and then the product is further validated by one or more major customers, usually the grocery multiples. The three-stage validation has the benefit of receiving a further and crucial stamp of approval, which, in essence, reinforces first-stage validation of market potential of product.

Three things seem to separate the two-phase validation companies from those that do it in three-phases, the size of enterprise, the target market and the technology used. Companies using a two-stage validation are smaller companies serving a niche market and usually do not need significant changes in existing manufacturing to produce the new product. Those using three-stage validation are slightly larger, principally supply to the grocery multiples and often need significant changes in manufacturing to create new goods. It is interesting to understand why the enterprises serving niche markets do not need many changes in manufacturing to create new products whereas those serving the multiples need them more often. Niche markets, by their very nature, absorb very narrowly defined products. The new products in a niche market are usually not dramatically different from the existing ones because such a difference may not allow them to serve the same niche. Grocery multiples, on the other hand, sell a wide variety of foods and so new products destined towards multiples can be very different from the existing ones and therefore may sometimes need significant changes in production processes to manufacture them.

Idea validation, though largely informal, works well because a large number of people, representing a variety of internal functions (as well as the grocery multiples' representatives, in the three-stage version) interact continuously, closely scrutinising the potential products from a host of points of view. The process is akin to the cubist perspective in painting explained by Hughes (1980) in the following way "*Picasso and Braque wanted to represent the fact that our knowledge of an object is made up of all possible views of it top, sides, front, back. They wanted to compress this inspection, which takes time, into one moment, one synthesised view*".

In the implementation stage of new product development, the new product is produced in market-scale quantities. Implementation is concurrent in the sense that though the product has been launched, it is still being developed. The product development team is actively absorbing the early market response and effecting changes both in the content of the product and the way it is produced. It is also cross functional in the sense that production people too are involved in full strength as the product, though still experimental in a way, is being produced for the real market. Implementation involves intensive and continuous consultation amongst all stakeholders, as new challenges surface and are addressed. The success rate of new products in the case study companies is very high and they are able to put products in the market in a relatively short period. One of the reasons for such success despite little or no market research is that many of these companies do not have to get it right the first time. As the product is a food item, bought in small quantities on a daily basis, the companies continue to monitor customer reactions after the launch and are able to make changes for sometime even as it is being produced, packed, and put on the shelves. Early customer reactions continue to influence product changes until they get it right. (Such flexibility, however, is circumscribed by stringent standardisation norms manifested in HACCP, and by the fact that some superstores do not allow changes in the product after it has been put on the shelves). Despite this trial and error approach, implementation does not take long in small food companies in Scotland reflecting high agility of these enterprises in reading the signals that they receive from the market and acting upon them. The process from ideas to final products is completed within a year at the most and in many cases in less than six months.

## *6.4 Chief components of the innovation process*

The various components of the innovation process summarised above are now elaborated.

### 6.4.1 The personality factor

Individuals at the core of innovation process in the case study companies exhibit distinct personalities. They are not ordinary entrepreneurs or managers. They possess high innovative proclivity, manifested in their prolific idea generation prowess and confirmed by their testing on Peterson's (2000) innovation potential scale as shown in figure 23.

Peterson (2000) in her pioneering work on innovation proclivity postulates that innovative individuals should possess high motivation to change and a challenging behaviour. Innovation process, by its very nature ushers in changes of varying types and magnitudes. To initiate and sustain innovation, therefore a high motivation to change would be called in. Also needed is an attitude to challenge the existing beliefs, norms and procedures. Innovative people, thus, would also exhibit a challenging behaviour. On the other hand, people who are good at adapting to their circumstances would not try to change them and would consequently show low innovative tendency. Similarly those who have high consistency of work styles would not think out of the box and will be incapable of having breakthrough ideas. Non-innovative people thus would score low on these two counts. She developed and extensively validated a questionnaire to test for presence or otherwise of these four traits in a variety of people and work environments. Those that have higher score on the first two than on the last two, by her analysis, must have high innovation potential. Amongst these four, Motivation to Change has turned out to the best person level indicator of high innovativeness in individuals. The six respondents, who returned an innovation potential indicator questionnaire in the investigation, have higher scores on both 'Motivation to Change' and 'Challenging Behaviour', indicators of innovative behaviour than on 'Adaptation' and 'Consistency of Work Styles', indicators of lack of creativity. The respondents thus show a high innovation potential.

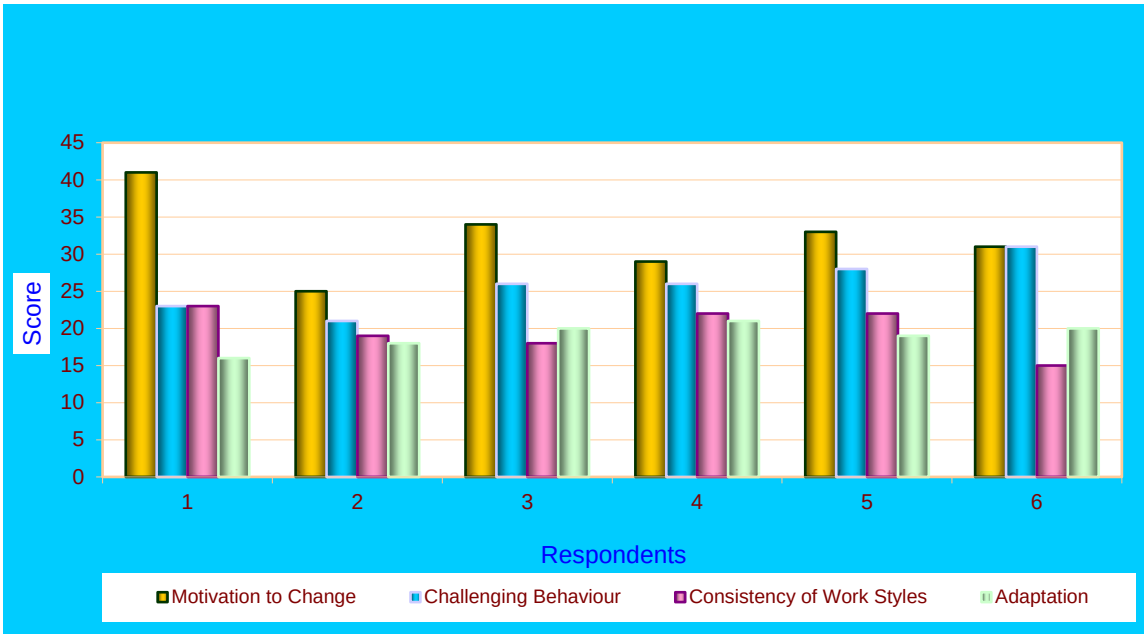



Figure 23: Innovation Potential Indicators

This becomes more obvious when we sum up scores of indicators, 'Motivation to Change' and 'Challenging Behaviour' as 'positive correlators', and those of 'Adaptation' and 'Consistency of Work Styles' as 'negative correlators' depicted in the figure 24.

Apart from scoring high on the above innovation-potential scale, it was also found these people to have a deviant personality, people, who do not follow the beaten path. The Company G entrepreneur described the public impression of her family as, "*The view of the world is that we are a bit different. A family that does not always follow convention*". An executive spoke of her boss *"… he has got an attention span of a fly. When he gets involved in something he also very quickly switches off.*"

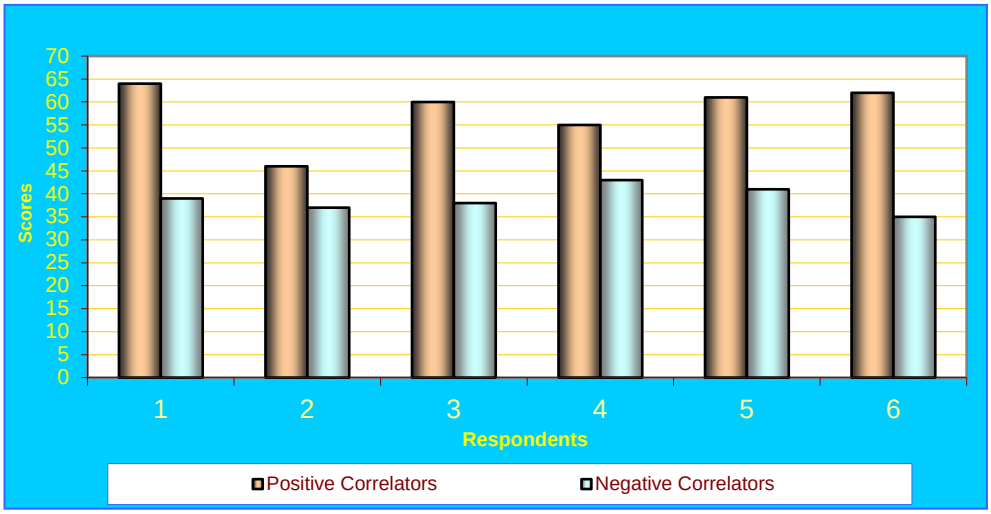


Figure 24: Innovation Proclivity

Though twelve individuals were identified within these enterprises, as stated above, only six of them returned the filled questionnaires. It may thus seem that evidence on high innovativeness of these people is not complete, but as will be shown subsequently there is independent confirmation of innovativeness of many of these individuals, reflected in their capacity to generate new product ideas.

Another important fact is that these people are not motivated by monetary considerations. The Company A entrepreneur described his goal "… *to make sure that we make a product that's a value for our name, our brand and keep coming up with products that people enjoy. I like it, I get a kick when I see their reactions and get their feedback and* (learn) *how the markets have been dragged into the gutter by poor products over the decades and how we can get over that*." Another said, "*John*[#] *and I are people who do not work for money. We don't want money at all. John doesn't want an iota of it.*"

These people are also driven by an irrepressible creative urge. Oblivious to the problems that they face, they remain focussed on innovation. The Company D entrepreneur said "*You may have bank calling its money. You may have problems with a supermarket but you are doing what you are interested in, and that is worth a lot.*"

[#] Individuals identified with high innovativeness who did not fill-in the innovative personality questionnaire

### 6.4.2 Idea generation

As indicated above, idea generation is not a problem for the investigated businesses, driven, as they are, by some exceptionally creative people. None of them said that idea generation was an issue. When asked how often they get new product ideas Company A entrepreneur said "*All the time. Continues to come and go. Sometimes it occurs to me#, sometimes to chef#, sometimes to my father#. There are 4 or 5 people in the company who continuously* (keep on getting new ideas)*."* The manager from Company G, spoke of his chef, himself and his boss "*… If we brainstorm our chef#, he will give you 30 ideas…. I could do the same and Steve# would probably come out with 100.*" Another manager from Company G spoke of his employer as "*he always has about 4, 5 ideas….*" and Company D entrepreneur said of her husband "*He is …constantly coming out with new ideas*". The executive from Company B thought, "*If William# can get out for a couple of months … and just open his mind up; he can come up with a completely new product range*." Company G executive said, "*If we get a Halloween brief and they* (the superstores) *ask for 3 ideas we will send them 9"*.

Idea generation interestingly is not a prerogative of the main entrepreneur, though in most cases he/she is the source of most ideas and the very cause of the enterprise's innovativeness. In most organisations, other individuals often supplement the idea generation task and in one, innovativeness is concentrated in one paid employee, the executive chef. The product development manager of Company B said, "*William is tasked well with being creative as much as possible, he comes up with the ideas of the new flavours and he comes up with packaging ideas as well, so William has been much of the brains behind* (innovation in the company)."

The customer's indirect contribution through adoption of new trends, and in the process, bringing pressure on the businesses to create goods reflecting them is also understood and appreciated by these businesses. "*What drives our innovation is actually what consumers want, at the end of the day it is a consumer who drives any business and the consumer trends are changing very quickly from one product range to another... and so the basic drive behind innovation is the consumer and that drives what the market wants and that comes from what the trends are abroad or what they read in magazines or what they see on the TV*."

The Company C to prevent lack of creativity caused by inbreeding, brings in outsiders to reinvigorate the idea generation process. The company executive said, "*Our guys are really busy in the bakery, lots of time with our own products. So sometimes, we try to get somebody who is really good from outside to show us how it can be done. They normally send their technical guys in and they can start with our bakery manager or our technical manager and the conversation is what we can do, what we can't do*."

Sometimes ideas come from unexpected quarters, the executive from Company G reported. *"Some of the stuff that we have launched has not come from our cake designer. I think it was our graphic designer who came up with the idea."*

There is no evidence of a formal idea generation process. One respondent said "*Is there a formal process for that? I guess not*." And another quipped. "*There is no science to it really*."

Most businesses that are investigated here have a close and constant contact with customers. This results in ideas emerging from both ends. The respondent from Company B said, "…*he* (the chef) *might come up with an idea and bring up to people and say, what you think of that? Or we might get a briefing from a customer who would say that we've got a rough idea of what we want to do and so can you go away and look at it, and so I will say it is roughly 50-50 between the customer led and our own team leading innovation*."

These businesses continually scan the market and speak to their customers in search of new ideas. This constant feedback fuels their creativity. "*You are watching the market all the time. You are talking to the customer all the time but also you are looking at your own sales. What is making money? What is not making money? What can you do to better that*?" The Company F's product development manager says, "*How I get ideas on new products? There are various sources, Trade journals, food and drinks magazines, customers and suppliers*."

'Getting away' is perhaps the best description of the approach used by most investigated businesses for idea generation. The executive from Company B

attributed her chef's amazing creativity to this approach. "*…he has travelled extensively over the years and he's worked in many countries…he's worked in larger organisations as well, so he's got a wealth of experience and … he still travels a lot and eats out and watches all the trends.*" and "*If he can get out for a couple of months, away from the day to day issues and just opens his mind up, he can come up with a completely new product range.*" The product development manager of Company G said, "*We have found that we get the best results if we allow out cake decorators, our designers to go outside for a half day, full day, whatever and look around the shops. Look at things that stimulate them and bring back ideas that they will work on the next morning…* (and it is)*… better than if we try to just brainstorm them when nowhere to go.*"

Very rarely formal market research is undertaken to search for new product ideas. Somehow the informal process of idea generation seems to work better than formal market research. The Company B's product development manager informed. "*The ones that have been great winners for us,* (for them) *there has been no market research…*"

Some of them have used innovative methods to generate ideas for the new products. The ice cream maker reported, "*In one of the events that we do at adventure centre, the public can come along and we give them milk, cream, sugar and an ice-cream freezer and we also give them flavours. Strawberry, ginger, chocolate, toffee. If they want, they can bring their own flavours too and they can make ice-cream and so we get a huge amount of ideas from the general public on what kind of ice-cream they would like and so we quickly see what is popular*."

As mentioned above, some of them rope in outsiders and suppliers. They, however, show ingenuity in not to mindlessly churn out the recipes suggested by others. They cleverly change the proposed recipes and mark them with their own style before they go to shelves as their own product. "*…then we take the recipe and we change that to our way. What they do is to tell us a process but what we do is that we change it.*"

One of them, which has now grown to become comparatively a larger enterprise, does undertake its own informal market research to explain to its customers, usually

supermarkets, and the need for developing new products. Its executive reported "*We have constantly got to do gap analysis, market research and we have been showing them* (the supermarkets), *what we think they are missing.*"

A persistent urge to keep on improving their products results in the entrepreneurs looking for ideas on new products capable of replacing the existing. The Company H has this approach. "*There is a total sense of a need to be constantly always looking for new ideas and being entrepreneurial. The notion that you put a product on the market and don't always want to improve it or think of new products just isn't at all applicable…..*"

The Company A entrepreneur described the process in these words. "*…we see what's out there, what's the price and we take the product off the shelf and bring it back here and we try and evaluate and perceive what* (is) *the value of it. What is the quality of the product, and based on the quality of the product, we always endeavour to make a product that is better than the original product…"*

### 6.4.3 Idea validation

Though it is not too expensive to develop new food products, innovative companies do not go ahead with development before the product idea has gone through a process of validation. In some businesses, idea validation is a two-stage process but in most, the validation passes through three stages. In the three stage model, the idea is first internally validated by a small group of people associated with the product development and / or being impacted by it and then it is validated by one or more major customers usually the grocery multiples.

Companies using a two stage process are smaller companies serving a niche market such as organic food or farm ice cream whereas those using a three stage model have grocery multiples as their biggest and sometimes the only customers. The exceptionally high success rate of new products coming out of these companies is due to the participation of grocery multiples during idea validation process. The collective market share of supermarkets like Tesco or ASDA and grocery chains like Marks & Spencer or Waitrose is massive and their endorsement for a new product is a fair guarantee of its eventual success. The small food companies are also sometimes approached by the grocery multiples with product ideas in the first place

and if what is being suggested by them is within the capability of the small food company, it is easily developed and often works. In two-stage validation, usually the views of friends, relatives and employees are sought.

The people involved in idea validation give very much a cross functional picture of innovation process in the Scottish Food SMEs. As mentioned above, both the people responsible for product development and those affected by it, are involved in the process. The logic of engaging people responsible for new product development is obvious but also keeping on board those impacted by it from the very beginning helps in understanding and sorting out any teething troubles that may come up when the product is formally commissioned. The product development manager of Company B said, *"We've got inputs of marketing and we've got* (it) *from accounts, production, technical, and development sides"*

However, when the company is serving a niche market independently, validation is in two stages and is confined to a small group of close friends, relatives and sometimes employees. The logic is *"I just thought that I knew what people wanted. If I like it, my friends liked it…* (Then everybody else too would like it)*."* In case of Company H there is a process of initial testing of new ideas that the entrepreneur comes up with – in the main either with friends and family or with its own employees and work colleagues – to see if they were worth pursuing further. In Company F once the product development manager gets an idea he produces a sample himself and then makes a presentation to production, technical, marketing and finance people. If this internal presentation of the new product is accepted, he then shows the samples of his product to buyers, which are either from Waitrose or from Marks & Spencer.

Like most parts of innovation in the Scottish Food SMEs, idea validation too is informal. The product development manager of Company B said, *"I'm afraid; we're not very scientific in that regard. It is gut feel."* The gut feeling, however seems to work well as a large number of people representing a variety of functions are involved in the validation process, and they look at it from a host of perspectives. The same respondent said "*We all have a look at it from different sides, as will that work in the factory or will we be able to sell that, will we be able to take it off the*

*ground and around that table if there's a feeling that this is worth a go then we'll go for it. We won't take it up to the launch stage unless we're convinced that we can do it and we have a market for it."*

The validation process, apart from being informal is also continuous and is woven into the daily company routine. The innovative company personal seem to be constantly talking innovation. The Company C entrepreneur informed, "*We meet at lunch time every day. If I have an idea or if someone else has an idea, we talk if we can do this or we can do that. To be honest with you, it normally comes not fully developed the first time; you have to make it work. And these guys make it work."*

These businesses have a keen sense to know as to who would best judge the market potential of the product. The ice cream entrepreneur informed, *"I would judge it very much on myself and my friends. So my test market is very selective. I will just go and talk to my friends in the central belt. And that has been on the ice-cream side. On the food side too it is similar because at the end of the day* (the question always is) *what food you would like to eat? John on his side would be thinking about the kids. What adventure they would like? So he would always be pushing adventure and danger and something exciting and I would try to pull back a bit by thinking about health and safety and general comforts that parents would like. My friends* (would think) *what they would like for their kids for having fun and the food for eating."*

The second stage of validation follows the first immediately and as soon as the idea has been internally validated, the customer is approached with it. The reason for this haste is the fact that most small food companies in Scotland see their growth potential through the supermarket sales and as they use an idea generation process, which is quite simple and available to all interested, they understand that it is not difficult for their competitors to come out with the similar products. The issue therefore is who approaches the supermarkets with the product idea first. The Company C entrepreneur explained *"… if we like the product and if we think it is going to work, we immediately start to talk to the customer to get an idea as to what their reaction is"*. The Company B's product development manager said, "*… if you don't go to the customer with new ideas, then somebody else will"*.

The bigger companies, however, have more formal processes in place for validation. In Company G, which was approached by ASDA to consider supplying to the supermarkets, the entrepreneur *"researched the market and looked at the supply base for what we call the celebration or birthday cake market* (and found that it) *was very small, it is a niche now, but at that time it was very small. And aside from Marks & Spencer, he felt that the supply base was very small, the quality was not very creative and innovative."* This formal validation process though has fair amount of flexibility and its essence is to establish the profitability of the new product. *"There is a sort of procedure that we follow but it is not rigid because it cannot be. If it is anything completely new and different then there will be a commercial sense check on it first."*

Idea validation sessions involving a wide spectrum of business functions are sometime difficult to negotiate particularly in businesses where the product development manager has the same or lower stature than production people. The product development manager in Company F explained that usually there is fair amount of resistance to introduce any new product as it always means significant changes in the scheduling and sequencing of work at the shop floor. Once production people get used to a pattern of manufacturing, they do not like to alter it frequently as it causes a great deal of additional work. Often genuine objections to the new product ideas come in form of legal restriction on use of certain ingredients or technical difficulties in making it at the company given its processing resources.

### 6.4.4 Idea implementation

Idea implementation stage of new product development in the investigated businesses is very much concurrent and cross functional and there is fair amount of exchange of ideas amongst the people involved. The scenario in Company B is something like this. *"….the chef is up, the product development guys are there and the packaging guys are there and the production guys there, everyone's got their cups and saucers and everybody inputs to this* (new product) *development."* In the pizza -pasta business *…The production manager, the managing director, the chairman, the kitchen chef and the technical manager comprise the team* (that takes product from idea stage to a finished product)*"*. In Company G, "(The) *teams have designers, confectioners and probably food technologists involved with sales and development people working closely"* Company E which has only three employees and which subcontracts all of its activities the product development too is sub-

contracted. The entrepreneur informed, *"We start with the design company. There are three design companies actually. One is existing and two are new. We combine the 3 to develop the design"* The new product development teams in all these companies barring one, have other jobs in the organisation. They work on NPD concurrently with their main job. The entrepreneur from Company A explained, *"We don't have that kind of money that big boys invest, their NPD people have only NPD job. Here it is part of ours, we're all near the heart of NPD, it's a part of all the other works that we do"*

For implementation, extensive and regular consultation occurs before the final shape is given to the product. These businesses understand the costs of product failure and give credence to the views of all the people no matter what place they have in the company hierarchy. In Company B for instance, *"Everybody inputs to this development, and thereafter, we have weekly launch meeting or new product launch meetings and everybody can join in and can come to the meetings and raise issues if they have the problems with them."* Despite such level of consultation the basic process remains informal. Company A entrepreneur explains, *"It is relatively, informal and I say it is relatively informal, but it works, you don't need masses of data and research and hire these research companies to go in and get the product to the market.* (We are able to do it because) *we know the quality in terms of what we need and what we lack in comparison. We go far and ahead of the game in the far side of the quality of the products, and the consumer sees the quality side of the products….."*

The customers, which in most cases are grocery multiples, are involved in the implementation process from the beginning so that the small food companies do not end up wasting resources on unacceptable new products. The product development teams thus remain in constant touch with supermarket representatives throughout the product development process. The Company G executive describes the process, *"We have put two people in place who have direct contact with the supermarkets for development and they both head up a small team of cake decorators. And that is probably the best way to do it because we have a clear communication line with the customer. They see the customer regularly and the customer meets the new product development teams. Sometimes it is as often as once a week that they are down here.*

*Our teams talk to them 3 or 4 times in a day on a phone on a project that they are working on."*

Despite the process being informal and despite people holding other jobs in the company, these companies have evolved a highly efficient yet intuitive method of converting ideas into successful new products. The success rate of new products in the case study companies is very high and they are able to put products in the market in a relatively short period. This lack of formality and lack of standard procedures is something, which an executive calls 'madness' but there obviously is a method in this madness. *"It is not how we start sale. It is about how quickly we do things and so a cake that does not exists as an idea today in 3 weeks' time a consumer can buy it, is fantastic and that is our strength and the trick is that if you can do 80% control, you can do 20% madness but you cannot do 100% madness and if we do 100% control then we lose and lose business… We call it getting cake out of the door."* We find echo of this approach in Cooper's (1990) analysis of innovation in the American corporation 3M *"…creativity and discipline are blended to yield a successful new product program"*.

The reason for a high success rate despite little or no market research is that many of these companies do not have to get it right the first time. Because the product is a food item bought in small quantities on a daily basis, the companies are able to monitor customer reactions to it even after the launch and are able to make changes even as it is being produced, packed and put on the shelves. Yesterday's reactions bring about product changes the next day until they get it right. The Company G executive explained, *"When I worked in beer industry when you launch a brand the amount of research that was going to it was massive in terms of time and cost. Because you had to get it right the first time. Here we have 150 products and you cannot have that amount of research in this. The flip side is that this cake is in market for 13 weeks and we have plenty of chance to get it right."*

Implementation stage does not take a long time in small food companies in Scotland. The reason being that in most cases, innovation is incremental and so the process is completed within a year at the most and in most cases in less than 6 months. In Company B it takes *"…from 3 months to 6 months, although if it is new recipe and*

*new technology, it can even be longer. If it's just a changeover of a recipe, one in, one out, you can do it in about 3 months or so."* In Company E's export business, the entrepreneur explained that, "(it is) a*bout 5, 6 months. As what we are doing most of the times is creating variations, it does not take much time. When we are developing a product for US market from our products here all that we do is change packaging and labels to suit the US market which is fairly straight forward to do so it does not take time."* For the pasta and pizza business it is "*…probably 3 months"*. For the ice cream makers *"10 odd months*" whereas in Company C it is 6 months.

### 6.4.5 Examples of innovation

During the course of this investigation, a wide variety of innovations that these companies successfully introduced was noticed. The examples included principally product innovations but also some process and packaging innovations. In product innovation, the underlying idea has been not merely be to be different but also offer quality that is superior to what is available. The method has been to look at the offerings, contemplate what they lack and then use the expertise they have to try to create a superior version. The Company A entrepreneur explained this process vividly *"… we got involved in producing a gluten-free pizza but it took a lot of time, because the problem with making gluten-free mixes is trying to make comparative products, but we managed to do that because we also have expertise of my father, the senior who also has experience in a wealth of food products , and we developed a high quality gluten-free pizza which was almost as good as a normal food product which was quite revolutionary at the time and the market was very receptive to us because it was packed with quality and so it historically kept us very preoccupied, because the Ian's* (gluten-free pizzas) *are very wet, very dry, very dense, of not very good quality, and so what the market offered was not good enough and what we developed was an excellent product."* The other examples of innovation based on the above approach by the pizza and pasta enterprise are microwave pizza and corn pizza.

There has also been an emphasis on creating versions that suit the Scottish taste. The Company B has *"…gone over producing something different from the traditional pate, pate that has a Scottish flavour, Scottish family and Royal Scottish Garrison Brandy and Highland pate soaked in red wine and such things which are quite different from what is available in the UK."* The Company C entrepreneur who

accidentally came across a Japanese pancake machine in a trade fair in Germany, after a long series of trials and errors, succeeded in making Scottish pancakes on it, and now has a complete factory dedicated to making pancakes, which are very profitable and are also exported to US.

Sometimes innovation results just by observing the mundane phenomenon. The Company C entrepreneur for instance, saw this. *"When you go to the corner shops you buy simple items, something that you want to take home for a reason. So we realised that the big boys* (the superstores) *are selling 4 packs or 6 or 8 but the people buying from the corner shops do not want to buy such large quantities."* Based on this observation he created small quantity packs exclusively for the corner-shops. And so here innovation is not what the product is or how it is produced. It is in how it is packed. And again, it is a packaging innovation not in terms of making it more attractive, but just in creating smaller and more convenient packs than what the supermarkets offer.

In another more elaborate effort, Company B introduced new packaging, developed at a cost of £100,000, a kind of glass jar to pack the pate. The product development manager said, "*We put a layer of meat packed in the bottom and a layer of molten cranberries on the top and things like that where people can see the layers in the jars."* There is a constant realisation in these companies that you have to keep on experimenting to expand your markets and innovation is possible even in products as ordinary as pate. *"…if you produce just purely pate, only for knifing onto a cracker then you limit your market, so we've introduced different pates, kind of, to broaden the appeal, and we've kind of flavoured them so that they appeal to the younger people"*

### 6.4.6 What makes them innovative

The investigated businesses owe their ability to innovate to their small size, their flexibility and to the fact that their products are made using methods that are amenable to quick changes. The large businesses using automated processes cannot show the agility needed to alter their products quickly to suit the changing customer needs.

The product development manager of Company G explained, *"…our production processes are not that unique. There is not so much technology there because there is*

*so much hand labour there"* similarly the product development manager in Company B said, *"Producing almost 100 recipes a week, carrying out a very complex operation with innovation and creativity, we have carved for ourselves a niche and that's what sets us apart from the competition really. We make small batch runs of specialist products whereas, the large factories have automated equipment, and they just can't do it."* The Company H entrepreneur too said it that being small and flexible helped them behave the way they did.

The Company A entrepreneur in a similar vein explained *"…in terms of innovation we have an advantage over the big manufacturers, because our ability to change and to change quickly is far greater than of the larger manufacturers who tend to be heavily geared up and plan equipment for specific products, and to make a change is quite a dramatic problem for them and hence the way we're settled here, more intensive but we're less mechanized, the ability to innovate our technology or products is a far easier for us than for the big manufacturers."* The Company C entrepreneur illustrates this fact with an example. *"We are labour intensive in terms of many things. Most of the things are handmade. It gives us a lot of flexibility. Morrisons said they like lemon drizzle but did not want drizzle at the top. They would just like sugar and lemon pieces. If we did not have that flexibility, we cannot do it that easily. Whereas it is a different ball game, down the road* (for the large manufacturers)*"*.

The flexibility comes not only because of small size and because of being labour intensive it also comes from being not too rigid about rules and procedures. The Company G executive said, *"I have watched a number of very big businesses in the past and what is very refreshing about here is that there are not a lot of constraints and rules"*. Though there is flexibility there is no lawlessness. A combination of control and free rein are at work. Pitfalls of total control and unbridled freedom are understood. The Company G executive said. *"…* (that) *a cake that does not exists as an idea today, in 3 weeks time a consumer can buy it, is fantastic and that is our strength and the trick is that if you do 80% control you can do 20% madness but you cannot do 100% madness and if we do 100% control then we lose and lose business… It is not the culture that we have."*

There is a realisation that if they do not offer a new product someone else would and these companies are determined not to lag behind in the innovation game. The Company B's product development manager said. *"I think always refreshing the range and not thinking that a product is going to stay in for more than the duration of a year, and you have to continue to change… and it's that proactivity that has kept us ahead of the competition in innovation."*

As mentioned earlier, entrepreneurs and product development executives in innovative companies are driven by a creative urge and that also plays a role. The Company C entrepreneur said, *"Honestly innovation comes from making something different. How your packaging is? What you do to your products to make it look different? Because everybody makes the same products, everybody has a bakery and so how different you make your products, that is important, otherwise there is no point."*

Innovative entrepreneurs seem to succeed in rubbing off their passion for innovation on to their teams. This is how innovative individuals have created innovative organisations. The Company G executive said. *"There is great passion here… If we come to work and if we are stopped being paid we may not come next week so I cannot say that it is not about money. Of course it is but if you come only for money my view is that you will run out of steam very quickly. So you need to have a passion…"*

In case of Company F , it is generally understood that new product development is essential for growth and survival as food industry has fair amount of turnover of products due to changing public habits, tastes and preferences and emerging new information on effects of food on health.

Over the years these businesses have developed a knack of creating new versions of products by understanding what to change and what to keep constant and where to look for new ideas without plagiarising. The Company A entrepreneur explained the process of new product development in his organisation in these words. *" …say for instance pizza, look at the components of pizza, we know that the heart of the product is the bread base and the pizza sauce which is specifically made for our recipe and it*

*is stark different from anything else in the market and that is really the heart of our product. So we in development, in terms of product innovation, we have to figure out what goes on the top. It can be a type of vegetable or a mix of meat and vegetables. We tend to try not to copy anybody, in any of our own creations in terms of products. So sometimes it is ham and potato, sometimes peach and sometimes mixed peppers and onions…Whatever we do, we do it in a way that offers quality. So people associate our brand with quality, and the innovation comes from the chef's lair in terms of new ideas presented to the market. That is the key to how we innovate. We have a look at loads of shelves and see what's there, but we don't copy others. We could never do that. We just take bits and pieces of ideas from different products stick them together in a totally different way and present it as a totally new concept."*

A combination of factors, thus, seems to be at work. On the demand side, a relentless pressure from the supermarkets and the department stores, driven by an increasingly variety based competition, to offer new products and new packaging reflecting the changing tastes and preferences of consumer and on the supply side, the creative urge of some exceptionally gifted people, their long experience in the food industry and the flexibility and speed of their organisations to develop and deliver new goods in quick time. The Company C entrepreneur tries to capture the idea in these words *"I have been in the bakery industry for over 5 years. Thomas has been for years and years, so has Colin. Phil has been there for a long time. You tend to find that they* (new products) *come around in circles and the trick is to go and act at the right time in circle. The odd thing comes out... the customer would say... why the range hasn't changed for such a long time. It is really time we did something. The multiples almost pre-empt us. They are always looking for something different. We take to the multiple something that is new… pancake would be great and the reaction of multiples is yes, yes it seems good but we are talking about packaging as well. All these things, everything contributes to innovation. It is very difficult to pin"*

### 6.4.7 How the grocery multiples are driving innovation

A major finding of this study is the role of grocery multiples that include superstores such as Tesco and ASDA and high-end stores like Marks & Spencer and Waitrose in driving innovation in the Scottish Food SMEs. In the backdrop of media reports of supermarket behaviour replete with incidents of stifling competition, causing loss of employment in corner shops and using arm-twisting tactics endangering the small

suppliers, the role of grocery multiples highlighted by this study as drivers and supporters of innovation in small food supplying companies is a revelation and raises the need to revisit their role in regeneration of regional economies.

All investigated businesses, except one, supply mainly to grocery multiples. For instance, Company H 's main market is Tesco and business had grown so much that they have had to get some manufacturing done by a subcontractor in Wales. The Company F sells largely to large buyers like M&S and Waitrose. It also has products being sold to superstores such as Sainsbury and Tesco though sale to superstores is a smaller percentage. The Company C enterprise was previously predominantly a corner-shop supplier; it now supplies to ASDA, Morrisons, Aldi stores, SUWS, Scotmid, Sainsbury and Waitrose. For Company G business, first it was Safeway and ASDA. Now they supply to all the major supermarkets including Tesco and Morrison.

As depicted in figure 25, remarkable complementary roles are played by the innovative small food companies on one side and supermarkets and large department stores on the other in driving the food sector innovation in Scotland.

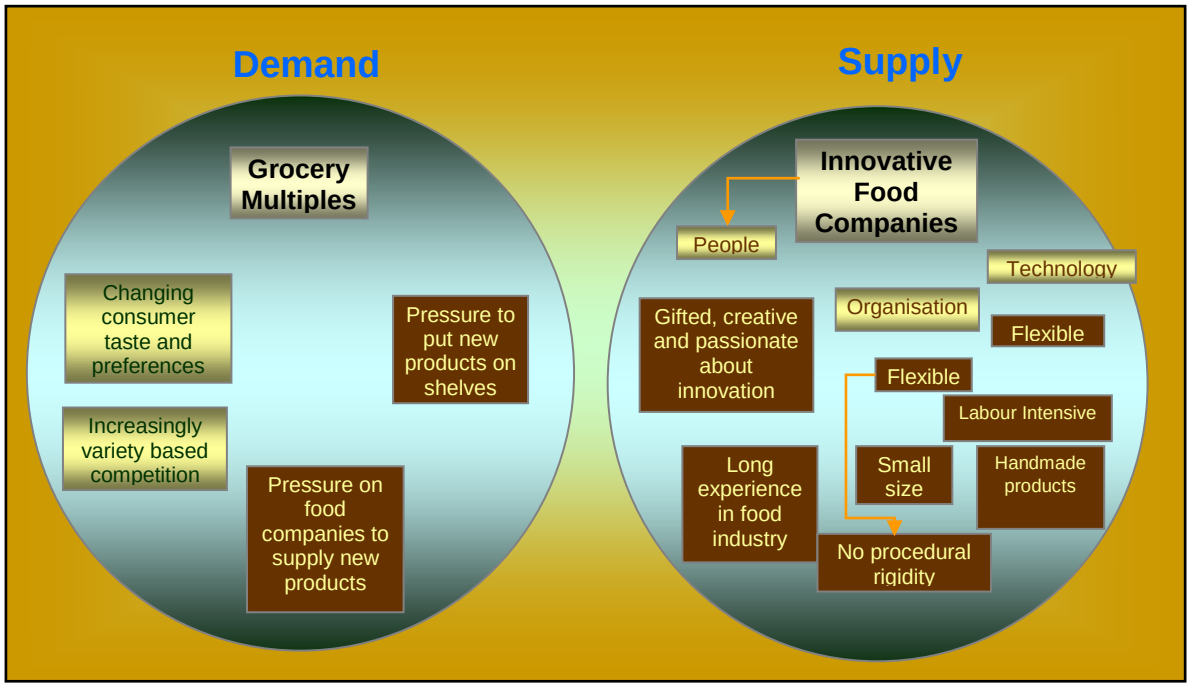



Figure 25: Innovation Process in the Scottish Food Industry: Demand and Supply

This complementariness is based on the mutual need. Supermarkets are reaching the limits of price-based competition. They are also restrained by law in increasing the number and size of their outlets. For them competition is therefore becoming increasingly variety based. They want to show to their customer that they have what their rivals do not have. They are therefore in a perennial search for new products. This impression is evident in the following submission to the competition commission "*Tesco are a very good retailer and their permanent desire for significant growth-rates can only be satisfied by innovation (no way to grow sufficiently on the basis of added square footage alone due to the competitiveness of the grocery retail environment in combination with the planning environment and due to a lack of merger opportunities / competition authorities´ constraints).*" (Groceries Market inquiry: Main party submission, Internet document, accessed on January 2, 2007)

Small companies in the Scottish food industry, on the other hand, realise that the road to fast growth is through the grocery multiples' shelves, which offer enormous market opportunity to any small company due to their huge customer base. It is however, not easy to break into a large chain like Waitrose or M&S as they would not discontinue an incumbent supplier unless it does something terribly wrong and existing suppliers would not do it as would be the virtual end for them. The Company D entrepreneur informed, "*We have been trying for years to get into Waitrose. And they are a great company to supply to but they always say that we think your ice-cream is wonderful but we have got really good relationship with our existing ice-cream supplier and they haven't put a foot wrong.*" Supermarkets also call their suppliers frequently and ask for a price cut or a change in the product or the packaging. Being continuously innovative thus is obligatory for a company, which wants to remain a superstore supplier.

Once, however, you succeed in entering the fold of a multiple such as Waitrose, you get good support. Company B's product development manager said "*What we've got in terms of support from Waitrose* (is so great) *that we've got absolutely no bad word to say about them. I don't think that any company has got a bad word to say about them. They'll try your new product. They'll give you time to make it work. They're loyal.*"

As mentioned earlier, it is difficult to break into supermarkets for a small company but it is impossible if you are not innovative. So it is almost forced upon you to be innovative if you wish to start doing supermarkets. The Company G executive said. *"The way to do it with supermarkets is that if you want to break into them,* (then) *if you get them something, even the same product, even a better quality, even at better price, you won't win the business. They will not take anything from you, which they are getting from their existing suppliers. So you have to think of something new. A lot of our innovative thinking came from that."*

Though, it is enough to be innovative to enter the supermarkets, you have to continue to innovate if you wish to grow. Company B's product development manager said. *"I suppose they are more demanding. If they want something, then they'll say, this is where were going, and if you don't want to come along then we'll go elsewhere. So we've invested heavily in this factory to keep up with Waitrose, but it paid off. And we've got over a million pounds worth of sales to them this year and over £1.8 million worth of sales in Tesco. So any investment that we've made, nearly half of that has worked for what we can say is a very demanding customer."* The Company C entrepreneur made the same point. *"The multiples almost pre-empt us. They are always looking for something different."*

Supermarkets, however, are not passively waiting for innovative companies to approach them. They look proactively for innovators. ASDA, for instance, organises and judges contests and then encourages the winners to supply to it. The Company G executive gave this story. "(Once) *we submitted a celebration cake in a contest, which ASDA judged. They were judging just to understand what was happening in the independent trade. And in one of our meetings, someone told Steve why you not consider supplying to the supermarkets."* Their involvement is not confined to encouragement, they even help organise the manufacturing. The Company G executive told, *"Steve called …ASDA and Safeway…and they sent up a technical team and they assisted with the planning of the original factory*". Supermarkets though differ in their methods, *"Different supermarkets trade in different ways. Tesco is much regimented. They want us to do exactly what they have asked. Others like ASDA are more flexible; they are less structured and allow us to do the way we*

*want to do it. Sometimes it depends on you. How you interpret what you have been asked to do you and you can be innovative here."*

Another important point to note here is that many non-innovative food companies whose products competed directly with supermarkets have been forced to close down due to their inability to match the low prices of the supermarkets. Innovate or perish is, therefore, the message that the increasing stranglehold of supermarkets on the British grocery trade implies for small food companies in Scotland and elsewhere.

### 6.4.8 Types of innovation

The last two Community Innovation Surveys (European Commission, 2004; Scottish Government 2007) show that a very high proportion of Scottish enterprises are novel product innovators. Our investigation of innovation in the Scottish Food SMEs, however, does not show any such pattern. Not many examples of novel innovation in this sector were noticed. This, however, is not a surprising result. In a low-tech sector like food, it is difficult and perhaps unnecessary to create radically different products and processes.

There is some evidence of imitation in this industry. The Company G entrepreneur for instance deliberated trained in outside businesses and on return, applied to his business, what he had learnt outside. The product development manager said frankly *"He plagiarised some of the ideas and took them back to family business"*. The Company C entrepreneur similarly said, *"We may be copying some of the Japanese things down the road"*.

The recurrent theme, however, is that of incremental innovation. The Company C entrepreneur said. *"We make it a little bit different"* and Company E entrepreneur informed. *"If you think in terms of completely new products then I have not done that before. It is always a variation in theme."* Some of the businesses involved, however, do not call this practice incremental innovation and they use the phrase 'range change' for it. The Company B's product development manager explained. *"Simple range change ideas, when, say, a new ingredient has come onto the market, say Australian bush herbs or something like that, that's a range change one. This will happen 3 or 4 times a year."* We may call it supply side incremental change. The demand side incremental change occurs when attempt is made to create varieties to

suit the changing customer. The Company G enterprise' executive revealed. *"Originally we shipped the UK recipe* (to France) *but then we realised that the French people like different stuff. They do not like sweet stuff and so we had another look at the process and we have, in a way, reinvented the cake."*

As stated above some people in the industry use a distinct jargon to describe the prevalent incremental innovation practices. A *range change* (also called line extensions by some) involves changing only some ingredients in a product that is otherwise identical to the previously made product; a *recipe change* involves making an altogether new recipe previously not a part of company's product range. This recipe then may undergo several range changes over its life. Ultimate in the league is the *format change*, which may involve major changes in packaging or processing. The highest level of innovation in the industry is thus, not radical, a product or a process, which is altogether different from the present one. The highest level of innovation here is one that involves a significant alteration in the production or packaging methods. The format change thus is a combination of comparatively more substantial product and process innovation. The innovation continuum in the Scottish Food SMEs, thus, looks something like this:


Figure 26: The Innovation Continuum in the Scottish Food SMEs

### 6.4.9 Healthy foods

Functional[5], healthier and organic foods apparently are the obvious choice for food companies wishing to create innovative new products. The phenomenal growth of Finnish food companies is attributed to their focused search for functional foods. International Food Information Council Foundation in its February 2004 webcast

[5] "Functional Foods' are foods or dietary components that may provide a health benefit beyond basic nutrition. Examples include everything from fruits and vegetables to fortified or enhanced foods. Biologically active components in functional foods impart health benefits or desirable physiological effects. Functional attributes of many traditional foods are being discovered, while new food products are being developed with beneficial components." International Food Information Council (IFIC) Foundation, February 2004, http://www.ific.org/nutrition/functional/upload/FuncFdsBackgrounder.pdf, accessed on 1st August, 2007

ascribes the growing interest in functional foods to consumer realisation of impact of diet on health along with 'rapid advances in science and technology, increasing healthcare costs, changes in food laws, aging population, and rising interest in attaining wellness through diet'.

Amongst the case study companies, however, only one can be considered a health food company, which specialises in organic foods. This company employs a 'nutrition expert' but the entrepreneur too is quite conversant with what is healthy food. (For example, she said that many of the health drinks with 'friendly bacteria' were useless because the shelf life was such that most of these would not have survived in the product over the shelf.) The overall market target for this company is 'healthy food', even to the extent of baby food, and entrepreneur is clearly aware of how demand was steadily rising and also how at particular times of the year, say after Christmas for example, the demand for their products (and also for general diet products) shows a marked increase.

In the rest of the case study companies, however, healthy foods are not at the core of innovation process. The Company A for instance, is developing foods that are healthy on account of the company's product development history and not as a consequence of the healthy eating trends. Its innovative effort happens to be creating healthy products by coincidence rather than by design. The entrepreneur explained *"What we have isn't* (the result of) *a conscious decision taken by us, we naturally come from a restaurant background and so we developed products that are far more wholesome and nutritional and use less additives and artificial ingredients than some of the big manufacturers, so that in itself are healthy in their own right but not by a conscious effort…"*

This company's biggest innovation has been a Gluten free pizza, and so they obviously are influenced by health effect of foods and so have avoided any dubious substances when creating new products. The entrepreneur speaking of such additives said. *"We don't use any of that in our flour base, we use wholesome and* (we try)*…...to have a chemical free product and we have always done it."*

But as the dietary trends influence sale of meals more than the sale of finished food products, the impact on Company A enterprise has been minimal. The entrepreneur explained *"...we do not have big enough market for our meals and our brands that could show the impact of change in dietary requirement. So it is a grey area for us…..No I don't think Atkins has made any impact on us at all."*

The noteworthy fact is that there is an absence largely of any conscious and concerned effort in Scotland to create goods to take advantage of public concern on the health impact of diet. The effort, however, is to take care to create the goods that do not violate such concerns. These concerns, though, are peripheral to new product development process.

Food companies, from a market perspective, divide their products in two broad categories, those that people buy for their nutritional needs and those that they buy as indulgences. The former are bought on a daily basis and the latter only occasionally. There seems to be an overwhelming consensus that there is no need to make the indulgences, healthy, which people buy for taste. It is believed that trying to make them healthy would compromise their taste and would jeopardise the very reason for people to buy them. Innovation in the Scottish food and drinks industry, therefore, is more on indulgences rather than on nutritional foods. The Company B enterprise's product development manager explained, *"Some of them are* (healthy) *and some of them aren't. We do vegetarian products, and we do weight watchers ones and they are healthy, but probably majority of them are more indulgent ones, and it's not something that you have daily. It's more of a special occasion one."*

Some companies in fact did try to take the healthy food route early on but now believe that it was a mistake, particularly as their products are sold mainly in Scotland. The Company D entrepreneur informed. *"We also tried our organic range because we have an organic farm. We launched the organic range in 1999 and we had thought that by this time everything that we will be doing would be organic. The information that we got at that time was that the organics were growing exponentially up. We were the second organic ice-cream company in the whole of UK. So we were the early starters but now we know that Scotland has not got the income where people can afford it. Scotland has not got the pollution where people*

*would feel that they must buy organic and we* (the Scottish people) are *not as trendier or trendsetters and so all the information that we had that organic were going skywards wasn't true for Scotland. Supermarkets said you test market it for Scotland. We tried it and it did not work and now it sells, the vast majority of it, only in London in independent stores"*

The Company C entrepreneur narrated a similar story but highlighted a curious fact. Supermarkets responsible for driving innovation in this sector do not favour healthy foods, which are poor sellers. He informed. *"We manufactured the first pancake with less than 3% fat, high fruit content, good and healthy* …(but) *every one of our multiples said we were wasting our time…dealers want chocolates full of fat, custard full of fat, everything full of fat; even salad, full of fat. Everything has* (to have) *fat in it. That is what they want.* (There are) *two reasons for that, I think, … One is that if someone is going to buy a pack of pancake as an indulgence, they are not going to buy them 3 times a day. They are going to buy twice a week or may be once a week. I think if you are selling something, which is not an everyday food, sandwiches and like* (then there is no problem if it has high fat). *ASDA has a system through which they have found out that people who buy Scottish cake, Irn Bru, Square Sausage, Mars Bars and things like that, they don't buy low fat products and so* (they think) *why to worry and that, to be honest, is multiples' philosophy. They all know that and are very, very shrewd. They do not bother about low fat, low sugar in things, which people buy as indulgence. We have been told by ASDA that your attempt to make low fat, low sugar cakes is commendable but we will not take them because people will not buy them, they taste horrible…Even the weight watchers think that if you are not going to buy it every day why not buy a proper cake and enjoy it."*

### 6.4.10 Packaging

In the food industry, packaging is an integral part of the product. In the food service sector, the quality of a restaurant dish is reflected both in its taste as well as its presentation. Similarly, the quality of food on a supermarket shelf is judged first by its packaging and then by its taste. Nature has taught humans that delicious things to eat come in attractive shapes, colours and fragrances and so the seasoned food developers have learnt to present their creations in attractive designs and shapes. This makes packaging an essential part of the product and innovative food companies spend considerable time in creatively packing their products to increase saleability.

The other issue relevant here is the fact that the customer takes the food home and then eats it and so it must be packed in the manner so that when it is transported and subsequently opened, its contents must come out the same way they have been first assembled. People do not like the idea of a cake with crumbled icing mixed with the main body of the cake. The Company C entrepreneur explained … *We have to deal with a whole lot of cake packaging, which took a lot of time. We had to redesign it. And it is designed so good that even if you turn it upside down it won't move..."*

The investigated businesses spoke of packaging innovation as a part of product innovation. As soon as a new food has been created, work begins to create a packaging that gives maximum leverage to it as a new food and so new food ideas and new packaging ideas emerge quite intertwined. Sometimes packaging innovation stands alone and without making any changes in the product itself just through creative packaging the market is expanded. The Company C entrepreneur explained … *"the big boys are selling four packs or 6 or 8 packs but the people buying from corner shops do not want to buy such large quantities. They want to buy one or two. So what we have done is to create different ranges for different people... We have done creative packaging for corner shops. By creating a lot of two packs of cakes and things like that a person can go and buy instead of four cakes one…we have been successful.*

### 6.4.11 Pricing strategy

Innovative food companies adopt a two-pronged pricing strategy, relatively low prices for supermarkets and high prices for up-market retailers. The strategy obviously is not blanket and simplistic price discrimination of offering the same stuff with cosmetic variations to these two groups of retailers. Involvement of these customers from the beginning of product development process, rules out such a strategy. As one Company G company's executive put it, *"…another basic issue with a Marks and Spencer cake would be that commercially we cannot do it at the price ASDA or Tesco are asking us to do it."*

From the idea generation stage itself the product developers know whether the product is destined for supermarkets or going up-market. Their long experience in food development tells them early on that given the ingredients and the level of processing involved in what range the costs would ultimately balance and what kind

of price is feasible and given the price, who the customer can be. Another significant issue here is that even those products that would end up at price conscious supermarket's shelves are amongst supermarket's more expensive offerings. Two things influence this. Innovation does not come cheap and as mentioned earlier, supermarket encouraging food companies to develop new products are trying to address the issue of variety and not price in terms of competition strategy. The food companies on the other hand know that innovation in high margin varieties is more rewarding and worth the effort. Many of them are following a conscious strategy of creating more luxuriant versions of the existing products and high margins and high prices are consistent with this strategy. As Company B company's product development manager puts it *"… we always thought that we had only to concentrate on natural flavours, on luxurious flavours…* (and so I think) *we could only go up. I did not think we could go down. If we try to go to the low market…* (we will not make money)."

Similarly, Company F Company has a smaller percentage of products being sold to superstores such as Sainsbury and Tesco mainly because its products are high margin expensive variety, which do not fit well with the superstores low price strategies. The product development manager believes that it is not possible to visualise cheap seafood particularly in his line of products, as the basic ingredient itself in many cases is very expensive. He does not seem to bother about low acceptability of his product on the supermarket shelves as he gets enough business from up-market retailers like M&S.

### 6.4.12 Quality

One thing comes out repeatedly in this investigation. The successful innovative food companies in Scotland not merely develop new products; they develop high quality new products. One finding of this research not reported or probably overlooked in other works is the fact that quality is embedded in the process of innovation. The investigated product developers have perfected a process that ensures that the new products that they develop are of high quality consistent with their name and image. As Company G executive explained, *"Steve would often ask, are you proud of that cake? Are you proud to take that cake out?"* Similarly, the pasta and pizza entrepreneur explains, *"Motivation for me is …make sure that we make a product that's a value for our name and our brand and* (we) *keep coming up with products*

*that people enjoy….I like it… I get a kick when I see* (customer's) *reactions and get their feedback and how the markets have been dragged into the gutter by poor products over the decades and how we can get over that"* in the same vain Company G executive said *"our quality has always been good. If you see our awards in front, you would know..."* To get the quality right these companies are willing to go the extra mile. For instance, Company H got some manufacturing done by a subcontractor in Wales. The entrepreneur seemed almost regretful about having to get this done outside Scotland but was very fussy about quality and because only this company in Wales seemed to be able to do it the way they wanted it done, they subcontracted against their patriotic instincts. And Company C entrepreneur said succinctly *"It is that everybody does it but we do it better"*.

And so the validation stage is very important for these food companies. Both the three-stage validation companies as well as two-stage validation companies make sure that at the end of the whole effort a quality emerges that is not just acceptable but irresistible to the customer. One can therefore say that strategically these companies are intentionally searching for more luxuriant and higher quality products capable of being positioned at higher end of the value chain. This allows them to charge a high price making innovation both rewarding and profitable. Charging high price, however, is not possible through spurious quality and so genuine high quality becomes an integral part of the product development strategy. At the same time as the Scottish people in general are not very conscious of health effects of diet, this strategy does not take the direction of organic or functional foods and so most food companies are focussed on indulgences, which is consistent with their high-price, high-margins, low-volume business model.

## 6.5 Key concepts emerging from the case studies

Key concepts that emerge from the above analysis are presented in Table 7.

Table 7: Summary of key emerging concepts

| | |
|---|---|
| From the analysis of *Market Orientation* | Innovative food companies exhibit ability to explore and reach potential markets |
| | Innovative food companies demonstrate a good fit between market needs and firm's resources |
| | Innovative food companies have a good understanding of customer needs and user circumstances. |
| | Innovative companies use production methods that are amenable to quick changes in final products[6]. |

[6] Also from the analysis of process of innovation

(contd.)...

Table 7: (contd.): Summary of key emerging concepts

| | |
|---|---|
| From the analysis of *Learning Processes* | A knack to spot opportunities for innovation and continuous learning is observed in innovative food companies. |
| From the analysis of *Technology Policy* | There is an absence of formal R&D in innovative Scottish food companies. |
| From the analysis of *Cooperation and Networks* | In innovative food companies cooperation and networking exists with customers, suppliers, other food companies and Scottish Enterprise. |
| From the analysis of *Financial and Human resources and Managerial efficiency* | Innovative food companies are able to attract and retain requisite talent for new product development. |
| | Innovative food companies do not face significant financial constraints in new product development. |
| | Innovative food companies demonstrate ability to develop markets without major advertising or marketing effort. |
| | Innovative food companies are able to attract and retain requisite talent for new product development. |
| From the analysis of *Age of Enterprise* | In Scottish food industry, innovation is independent of the age of enterprise. |
| From the analysis of *Innovative People* | Creative People with high innovative proclivity play crucial roles in new product development in the food industry |
| From the analysis of *Process of Innovation* | In the food industry, new product development and new packaging development occur simultaneously. |
| | Food innovators constantly travel and eat new varieties of foods at distant locations to identify new product ideas. |
| | Innovative food companies sell most of their new products to very large retailers such as superstores or grocery chains. |
| | Innovative food companies remain in regular contact with their main customers throughout the product development process |
| | New product development towards more luxuriant and expensive versions suits well the high-variety-low-volume operations of small food companies. |
| | New products that are variants of a company's existing products have better success potential than the products that are significantly different. |
| | In the food industry, the basic innovation process is informal and cross-functional. |
| | In the Scottish food industry, innovation is not focused on development of healthy foods. |

# 7 Validation

To validate the main findings of this research, a panel of six experts from the Scottish food industry was constituted and its members invited to attend a presentation. These experts have significant entrepreneurial experience and first-hand knowledge of the innovation process in this industry.

Brief biographical sketches of the six experts are as follows:

1. Peter Ford joined the family business of Ford's the Bakers in 1976. Ford's the Bakers was sold to Lynedale Foods in 1999. Peter Ford has been, in recent years, an investor in a number of companies in Scotland and has held directorships with Paragon Products (UK) Ltd, East Lothian Economic Developments Ltd, Thomas James Developments Ltd and Zentel Telecom Group plc. More recently, he has been acting as an advisor to a number of businesses in the food sector. He is currently a director of The Premium Roll Company Limited and has recently acquired a bakery specialising in cake production.

2. Mark Laing, a graduate in Economics and Law from Cambridge University is managing director and majority shareholder of Nairn's Oatcakes, the former Simmers of Edinburgh. Mark is involved in several areas of community activity and in 1999 was appointed Vice Chairman of 'Scottish Business in the Community'. Mark is also Chairman of Business Community Connections which is the Business Support Group working in Craigmillar, South Edinburgh.

3. Jo Macsween and her brother James are the third generation directors of the Macsween Haggis business. Jo, who spent time teaching before joining the family business in the early 1990s, is responsible for sales and marketing. Jo and James both see learning as a key part of Macsween's approach to business. They encourage a learning culture at every level in the company and have introduced the practice of 'learning journeys'. This means that a team member visits Macsween's suppliers and other non-competing food

companies to learn new ideas and gain valuable insights away from their routine environment.

4. Tony Stone opened Stoats Porridge bars in May 2005 *"…to modernise porridge, people associated it with their grannies, or prison. We had to get away from that soggy image"*. The business is experiencing strong growth and Stoats' porridge served with a range of toppings like simple brown sugar and single cream; pear, sultanas and crushed roasted almonds; whisky and honey; the seasonal Cranachan is supplemented by a new range of porridge bars and other porridge products sold in Juice Bars and Health shops throughout Scotland.

5. Lesley McVey is the proprietor of the Breadwinner, which opened in 1973 in Bruntsfield Place Edinburgh. Lesley is responsible for operations, sales and marketing of the business and her husband Sean, a craft baker leads the production team. The business focuses on the food service industry supplying a wide range of craft products to hotels, restaurants and conference venues.

6. Robin Pollok is a director of Food Initiative Limited a company, which exists to provide practical help and advice especially to businesses and other organisations within the food sector and related industries. Its team of consultants are former directors and senior managers from the food industry with many years' hands-on experience in a wide variety of food sectors.

The panel attended a 90-minute validation session at the Craiglockhart campus of the Napier University on March 12, 2008. During this session, the panel members were apprised of the main findings of this research and were requested to give their views. The proceeding of the validation session was digitally recorded and later transcribed.

The panel generally validated major findings of this research. The discussion, however, highlighted the fact that some of the personal experiences of the individual members differed from one another and not all members concurred completely with the findings on each count. This is not a surprise, as the innovation process that this research has identified too varies in bits and pieces from company to company and

only the underlying common innovation process that was observed in the most investigated businesses was presented to the panel.

Following is a point-by-point analysis of the major findings of the research and reactions of the validation panel to them.

1. *The Scottish Government's vision of innovation is that it is science led, occurs in high-tech sectors and depends on investments in R&D. The level of investment in R&D by Scottish business is therefore a key improvement target of Scottish Government. The fact discovered by this research, however, is that there is no relationship between investment in R&D in Scotland and innovation performance of its businesses. None of the companies that we investigated undertakes primary R&D to develop new products.*

The panel overwhelmingly supported the finding that R&D in the conventional sense has no role to play in the food industry innovation. Members expressed their dismay at Scottish Government's vision of high-tech start-ups as vehicles of Scottish innovation and were happy to know that I intend to convey the findings on this count to the Scottish Government.

2. *The businesses supply mainly to big chains like Tesco, ASDA, Sainsbury, Marks & Spencer and Waitrose etc.*
3. *The companies remain in constant touch with their main customers throughout the product development process*
4. *An assured sales outlet helps in defining the new product beforehand and reduces the risks of innovation*

It was generally agreed that big grocery chains are the most obvious place to launch new products. As an overwhelming share of the food and drinks trade is now conducted through them, it is not possible to ignore them as the principal sales outlet of food products. It was, however, pointed out that a food company should not depend on supermarkets to tell them what to develop. The panel perceived supermarkets essentially as sales outlets rather than a reliable source of product

ideas. It was pointed out that a company must have a direct contact with the final consumer, as understanding the consumer needs and the market trends are pivotal to idea generation. Grocery-chains should be approached only after the ideas so generated have been internally validated. It was emphasised that ability of a food company to convince a major grocery-chain of potential of a product depends on its ability to explain to them that it understands what the consumer wants and has the capacity to translate that in saleable products. The discussion thus corroborated the findings on the process of idea generation and the nature of relationship between grocery-chains and the small food companies.

Two of the panel members run the companies that do not supply to supermarkets. This is consistent with the findings as one of the case study companies too does not supply to supermarkets and many others have sales outlets over and above the grocery-chains. The basic finding that the company keeps a close contact with its customers during the product development process and goes for final launch only when its customers have validated the product idea is true in these cases as well. The presence of strong market orientation in innovative food companies is, thus, confirmed whether the main customers are grocery-chains or they are independents and delis.

5. *Innovators constantly travel and seek new and different inputs to identify new product ideas.*

Persistently looking out for new product ideas through travel, at food shows and in food magazines as a characteristic of the food industry innovators strongly comes out during this discussion. It is also confirmed that once an interesting product is identified the focus then is always to modify it to suit the Scottish taste. Thoughtful incremental innovation and not mindless imitation, as identified by the research, is, thus, confirmed by the panel. One member of the panel actually goes one step beyond any case study company. He not just travels to foreign locations in search of new product ideas. He actually works in foreign countries occasionally. The goal is not merely to know what the product is but also to master the production process. Here again when it is eventually made in Scotland, distinct Scottish preferences are taken into account to modify the original product.

6. *In the food industry, new product development and new packaging development are intertwined.*

The panel confirmed that creation of more attractive, convenient and suitable packaging is an integral part of the development of new food products.

7. *The basic innovation process is informal, concurrent and cross functional .*

There was agreement that innovation process is concurrent and cross functional. It was, however, pointed out by one of the members that in his company, it is informal in the beginning but for later stages, there exists a formal structure. This is, he explained, the only way creation of high quality products can be ensured. This is an important fact and should be added to the findings. The literature on innovation also confirms that there is significant amount of informality in the initial stage of innovation process, which tends to become more formal, subsequently. This phenomenon is referred to in literature as the 'fuzzy front end' of innovation. On revisiting the findings, it was realised that the innovation process does tend to get more formalised towards the end. Idea generation is very informal, internal validation is slightly more structured. Procedure for validation by the principal customer is well defined and so is the final product launch. That the process gets more formalised towards the end is, thus, true and has been observed during the investigation as well.

8. *People in these enterprises exhibit high creativity.*

There were no comments on this point. May be the panel members did not think it proper to talk about their own creativity in the midst of their peers. When the case study companies were approached, respondents in contrast, were quite eloquent on this. In many cases, however, the interviewed individuals were speaking of the creativity of the owners of their companies and of that of their colleagues and so, they had no reason to shy away from the topic.

9. *High calibre bakers, chefs and production people are pivotal to food company innovation.*

This was generally agreed but it was also pointed out that it would apply to new product development but not to new process development. For new process development only the production people are considered vital. It was also pointed out that whether a company would embark on new process development or not would depend on what discipline the owner came from. When owners have engineering or technical background, they tend to look at the production processes more critically and try to improve them.

10. *New products are mostly 'indulgences' and less often 'health foods'.*

11. *Luxuriant and higher added value new products are ideally suited to the high-variety-low-volume operations typical of small food companies.*

There was general agreement on the second point but some panel members were quite surprised by the first. They believed that there are two key drivers to food industry innovation. One is indulgences or premiumisation and the other is health. They had expected that Scottish food innovation might be occurring in both the areas. Two panel members run companies, which are quite focussed on the health foods. When more detailed evidence was presented on what the investigated businesses had said, particularly on supermarkets' attitude to healthy foods, they agreed that given a marked Scottish preference for indulgences and supermarkets' sales maximising approach, for a majority of small food companies in Scotland indulgences offer better odds on innovation success rather than health foods.

It was, however, felt that health food is a growing niche in Scotland and in years to come, more Scottish companies may explore its potential for innovation. It was also revealed that there is a major distinction in attitude to healthy eating between the two principal Scottish cities. In Edinburgh there is good acceptance of healthy eating but in Glasgow it is very difficult to sell a health food.

12. *Incremental innovations based on existing products and production methods have better potential for success.*

There was a total agreement on it. One member called the process of creating new and better products from the existing ones ‘constant tweaking’. It was also pointed out that investing in new production methods to create new products does not make economic sense for small companies. And that they would not invest in new equipment unless they are convinced that several variants of a product, each with significant market potential, can be produced from it.

13. *Production methods are flexible and are amenable to quick changes.*

It was agreed that in small companies this must be the case and should be the main source of their competitive advantage as innovative outfits. One panel member gave example of Muller Yoghurt, which comes in one fixed size and is very cost effective as it is made using a fully automatic process. Yet the company lost a hugely lucrative NHS food service contract because NHS wanted smaller packs. Hospital patients do not eat so much as comes in a Muller pack. The company, however, could not put smaller pots on their inflexible automatic lines and lost out.

In this context it was added that flexible production methods amenable to quick changes are deployed during the early stages of development of a new product. At a later stage, if the product shows long term potential and if the demand crosses a certain threshold, companies tend to turn towards more automatic production processes to take advantage of the economies of scale.

14. *Cooperation and networking exists with customers, suppliers and Scottish Enterprise – but not with competitors.*

It was agreed that cooperation for innovation with competitors does not make sense in food industry. Cooperation however, with other food companies with which a business may not have any direct competition does occur so does cooperation with suppliers. Significant cooperation with the customer is obviously there as is highlighted previously in this report.

15. *The age of an enterprise is immaterial to its ability to innovate successfully.*

There was agreement on this, as the companies represented on the panel did have significant age differential similar to case study companies. Panel members also confirmed that innovative Scottish food companies that they know of have wide variation in their age.

16. *Other Issues:*

The panel showed keen interest in this research. Members wanted to know if the Scottish Government will be apprised of these findings and were happy to know that this was the intention. They also wanted to know if supermarkets pressurised the small food companies to keep on changing their products, an experience that was narrated by some of the investigated businesses and which could be confirmed to them. They queried on cases of innovation failure that this investigation has come across which was duly described. It was also asked if it is a typical stingy Scottish mentality that makes Scottish food companies to use informal and inexpensive methods to search for product ideas rather than formal market research or it is their inventiveness that allows them to get ideas without a high cost. It was explained that the people at the helm of product development in these companies exhibit an unusually creative trait, maintain a very close contact with the consumer, possess a good intuitive ability to judge the market trends and constantly look around proactively. They, thus, do not need expensive market research to tell them which way their product development should go. Panel members agreed with this assessment.

# 8 Survey

## *8.1 Introduction*

To triangulate the results of the investigation of innovation in the case study companies, a survey of Scottish companies, that have developed new products, was carried out. Before embarking on the survey, the case study results were carefully reconsidered and edited. A list of findings, evident in most of the case study companies was then separated as propositions to be tested and a survey questionnaire to test these propositions was created. For ease of use for respondents and quick and error-free transfer of data to statistical computer programmes, an 'on-line' rather than a 'postal' survey was preferred and Edinburgh Napier University's subscribed survey software, from 'SurveyMonkey.Com' was put to use. The on-line survey questionnaire was pre-tested by a director of Food Initiative Limited and modified further by incorporating his insights. The web-addresses of Scottish companies in the selected sectors were gleaned from the directories of Scottish businesses on the Scottish Enterprise website. The companies that made a claim of development of new products on their websites were contacted via emails sent to the person named 'contact person' on the Scottish Enterprise website. The mails included a cover letter (Appendix 12.4) and a link to the on-line survey.

Of 276 companies that could be contacted, 88 responded to the survey, of which 85 have returned complete and usable responses. Statistical computer programmes, *SPSS.16* and *Minitab.15* are used to carry out the data analysis. Out of 18 propositions indentified from the case studies, 15 are confirmed as valid through analysis of all 85 responses. For statistical control of results, the data is then divided into the following sub groups for segregated testing of survey propositions.

1. High-tech and low-tech companies
2. Food & drinks companies and non-food & drinks companies
3. New companies[7] and old companies[8] and
4. Small companies[9] and large companies[10]

[7] Age 0-10 year
[8] Age > 10 years
[9] Employment < 50
[10] Employment 50 or more

The exercise highlights interesting differences within these groups, which are discussed and summarised at the end of this chapter.

## *8.2 Survey Methodology*

### 8.2.1 The survey questionnaire

The propositions to be tested through the on-line survey questionnaire (Appendix 12.5) are crystallised in four steps. The results of analyses of indicators of three main determinants of innovation, *Market Orientation, Learning Processes* and *Technology Policy* derived from the case studies, is first explored. The indicators observed in seven or more enterprises are considered as having strong enough evidence for inclusion in the survey. However, from amongst these, the ability to explore and reach potential markets, a good fit between market needs and firm's resources, understanding of customer needs and user circumstances, flexible production methods, continuous learning and the absence of formal R&D are included whereas indicators such as knack to spot opportunities for innovation and successful development of new products are excluded despite high incidence, as their presence is expected to be inevitable in the targeted companies. From the analysis of *Cooperation and Networking* four principal networking partners reported by the case study companies, viz. customers, suppliers, competitors and Scottish Enterprise are identified and included in the survey. From the analysis of *Financial Resources, Human Resources* and *Managerial Efficiency* three main conclusions are identified. First, innovative food companies are able to engage in innovation and new product development without any significant financial constraints, second, they do not face a shortage of competent people to develop new products and third, they demonstrate an ability to develop markets without any major advertising or marketing effort. All are included for testing in the survey. Finally, from the analysis of '*Process of Innovation'* the following findings are considered for inclusion in the survey questionnaire.

1. In the food industry, new product development and new packaging development occur simultaneously.

3. Food innovators constantly travel and eat new varieties of foods at distant locations to identify new product ideas.

4. Innovative food companies sell most of their new products to very large retailers such as superstores or grocery chains.

5. Innovative food companies remain in regular contact with their main customers throughout the product development process.

6. New product development towards more luxuriant and expensive versions suits well the high-variety-low-volume operations of small food companies.

7. New products that are variants of a company's existing products have better success potential than the products that are significantly different.

8. In the food industry, the basic innovation process is informal and cross-functional.

9. In the Scottish food industry, innovation is not focused on development of healthy foods.

Following is a list of the findings that came out of the above exercise and the associated questions that are designed to elicit response on each of them.

| |
|---|
| Finding from the case studies:<br>New products that are variants of a company's existing products have better success potential than the products that are significantly different.<br><br>Question<br>*Successful new products developed by us are very different from our existing products.*<br>(Survey question inversely worded, agreement refutes and disagreement confirms the finding) |

| |
|---|
| Finding from the case studies:<br>New product development towards more luxuriant and expensive versions offer better value for money spent on innovation.<br><br>Question<br>*Development of 'premium' products has provided my company better returns on money spent than development of 'low-cost' products.* |

| |
|---|
| Finding from the case studies:<br>New product development towards more luxuriant and expensive versions suits well the high-variety-low-volume operations of small food companies.<br><br>Question<br><br>*I would describe my company as a 'low-volume-high-variety' business rather than a 'high-volume-low-variety' business.*<br>(The first part of this finding is tested by the preceding question) |

Finding from the case studies:

Innovative companies use production methods that are amenable to quick changes in final products.

Question

*Our flexible production methods allow us to alter and modify our products quickly.*

Finding from the case studies:

Absence of formal R&D in innovative Scottish food companies

Question

*There is no formal R&D department in our company.*

Finding from the case studies:

Innovative food companies remain in regular contact with their main customers throughout the product development process.

Question

*We remain in regular contact with our main customers during the development of new products.*

Finding from the case studies:

Innovative food companies sell most of their new products to very large retailers such as superstores or grocery chains.

Question

*We sell most of our new products to large retailers.*

Finding from the case studies:

Creative People with high innovative proclivity play crucial roles in new product development in the food industry.

Question
*The product development team in my company is made up of 'creative' people.*

Finding from the case studies:

Food innovators constantly travel and eat new varieties of foods at distant locations to identify new product ideas.

Question

*Member/s of our NPD teams regularly travel to new locations in search of new product ideas.*

Finding from the case studies:

In the food industry, new product development and new packaging development occur simultaneously.
(No questions are asked on this, as it is considered too specific to food companies.)

Finding from the case studies:

In the food industry, the basic innovation process is informal and cross-functional.

Two questions are used to confirm this.

1. *I would describe the innovation process in my company as informal.*
2. *People in my company working on new product development also perform other roles within the organisation.*

Finding from the case studies:

In the Scottish food industry, innovation is not focused on development of healthy foods

(No question asked to confirm this as it is not applicable to non-food companies.)

Finding from the case studies:

Innovative food companies exhibit ability to explore and reach potential markets.

Question

*Our success in new product development is due to our ability to identify and reach potential customers.*

Finding from the case studies:

Innovative food companies exhibit a good fit between market needs and firm's resources.

Question

*There is a good fit between what the market needs and what we can provide.*

Finding from the case studies:

Continuous learning is observed in innovative food companies.

Question

*We have been learning continuously from our efforts to develop new products.*

Finding from the case studies:

Innovative food companies have a good understanding of customer needs and user circumstances.

Question

*We understand the needs and circumstances of our customers very well.*

Finding from the case studies:

Innovative food companies do not face significant financial constraints in new product development.

Question

*We face financial constraints in our efforts to develop new products.*
(Survey question inversely worded, agreement refutes and disagreement confirms the finding)

Finding from the case studies:

Innovative food companies are able to attract and retain requisite talent for new product development.

Question

*We are able to recruit and retain the competent people needed for new product development.*

Finding from the case studies:

Innovative food companies demonstrate an ability to develop markets without any major advertising or marketing effort

Question

*We are able to market our new products without any major advertising or marketing effort.*

Finding from the case studies:

In innovative food companies cooperation and networking exists with customers, suppliers, competitors and Scottish Enterprise.

Question

*For innovation we depend on close cooperation with ... (Choose all those that apply to you)*
*1.Our customers 2. Our suppliers 3. Our competitors 4. Scottish Enterprise 5. Others (please specify)*

Finding from the case studies:

In Scottish food industry, innovation is independent of the age of enterprise.

(This finding is attempted to be verified by including a question on the age–cohort of the respondent companies.)

### 8.2.2 **The survey process**

As the thrust of this research is new product development, in this survey, Scottish companies that have developed new products are targeted. As mentioned above, to identify such companies, the directories of companies in various industry segments available on the Scottish Enterprise website were explored. Scottish Enterprise website classifies Scottish businesses in the following segments:

1. Energy
2. Textiles
3. Life sciences
4. Digital markets
5. Aerospace, defence & marine
6. Tourism
7. Chemical sciences
8. Construction
9. Food & drink
10. Financial services
11. Enabling technologies and
12. Forest industries

Mullen *et al.* (2009) advise a harmonious sample selection to '*strengthen internal validity for theory testing'*. As the original case studies are focussed on the 'low-tech' food industry, to triangulate the case study findings, it was considered appropriate to look at companies in low-tech sectors of the Scottish economy. For this reason, the directories of *Food & Drinks, Textiles* and *Forest industry* companies were first attempted to be explored. However, due to the absence of a directory of *Forest industry* companies on the Scottish Enterprise website, only *Food & Drinks* and *Textiles* companies were available for consideration. After browsing web pages of listed *Food & Drinks and Textiles* companies that have their own websites, the companies that mentioned development of new products were identified and were emailed the survey questionnaire. It was hoped that about 15% of all contacted companies should respond to the survey. In order to reach a target of 50 plus responses, about 350 companies were therefore, required to be identified. However, exploration of websites of companies listed on Scottish Enterprise website within *Food & Drinks* and *Textiles* sectors led to the identification of less than 350 companies that had developed new products. This made it necessary to look for prospective respondents in other sectors. Of the remaining sectors on the Scottish Enterprise website, *Tourism* and *Financial Services* were not considered as services are not the focus of this work, *Aerospace* and *Energy* were left out as they are dominated by very large companies not comparable to the case study companies and the *Construction industry* was not targeted as preliminary exploration did not show evidence on development of new products by companies in this sector. Of the remaining industries, *Life Sciences* and *Chemical Science* were first explored and companies in these two sectors, which made a claim of development of new products, were identified and emailed the survey questionnaire. When these were added to the already approached companies from *Food & Drinks* and *Textiles* sectors, the number of contacted companies became 348[11].

Unfortunately, due to the listing of emails of 'contact persons' on the Scottish Enterprise website not being up-to-date, a significant number of mails came back as 'undeliverable' and the number of companies which were effectively contacted was

[11] Here it is pertinent to note that companies on the Scottish Enterprise directories are loosely classified and in each segment, that was explored, many companies were discovered that did not exactly belong to that sector. The companies were nonetheless chosen if evidence of development of new products was found. This explains why some of the responding companies are from sectors other than *Food & Drinks, Textiles, Life Sciences* and *Chemicals*.

reduced to 276. The contacted Scottish companies however, responded to the survey in good numbers and the survey received 85 completed and useable responses providing a response rate of 31%. Apart from a good response rate, the survey also has a very high completion rate. Out of possible 1955 answers, only 21 are not provided.

## *8.3 Survey findings*

### 8.3.1 Analysis of general information

#### 8.3.1.1 *Segment–distribution of survey companies*

The survey questionnaire listed the industry segments within which the responding companies were asked to identify themselves. In case they thought that none of these accurately describes their industry sector, they were asked to tick on 'other' and then provide a brief description. The industry segments, selected from the Scottish Business Statistics 2008 and mentioned in the survey questionnaire are as follows:

1. Manufacture of food products and beverages
2. Manufacture of tobacco products
3. Manufacture of textiles
4. Manufacture of wearing apparel; dressing and dyeing of fur
5. Manufacture of leather and leather products
6. Manufacture of wood and wood products
7. Manufacture of pulp, paper and paper products
8. Publishing, printing and reproduction of recorded media company
9. Manufacture of rubber and plastic products
10. Manufacture of other non-metallic mineral products
11. Manufacture of basic metals
12. Manufacture of fabricated metal products, except machinery and equipment
13. Manufacture of electrical machinery and apparatus not elsewhere classified
14. Manufacture of office machinery and computers
15. Manufacture of radio, television and communication equipment and apparatus
16. Manufacture of medical, precision and optical instruments, watches and clocks
17. Manufacture of motor vehicles, trailers and semi-trailers
18. Manufacture of other transport equipment
19. Manufacture of furniture manufacturing not elsewhere classified
20. Recycling company and
21. Other (please specify)

The distribution of respondent companies within different industry segments is shown in figure 27.

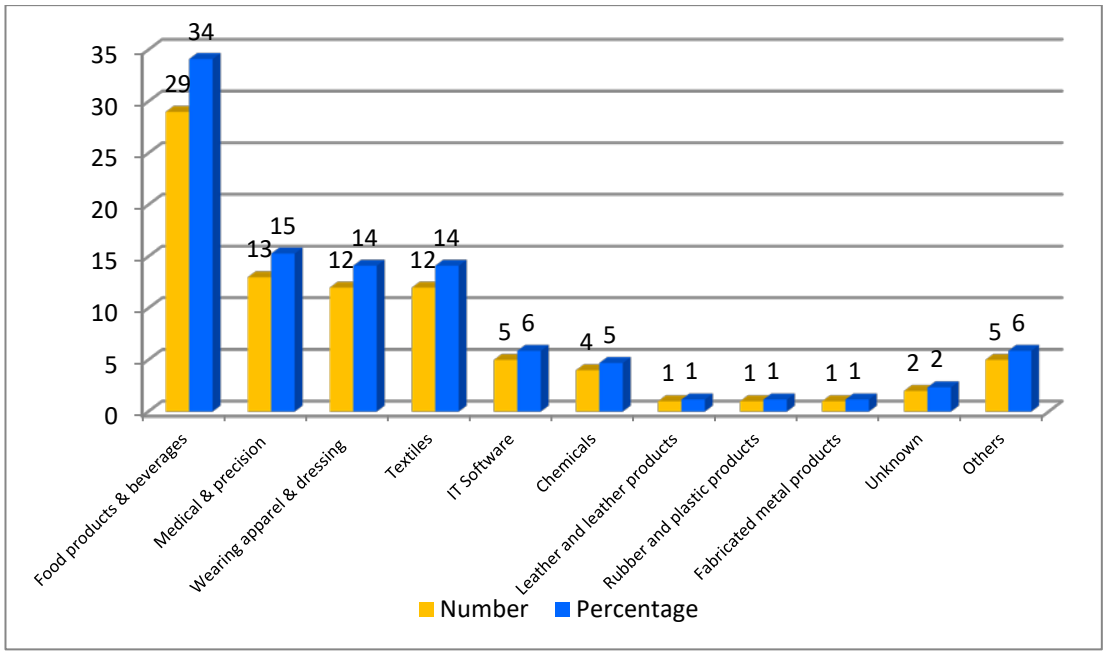



Figure 27*:* Segment–distribution of survey companies

As food and drinks companies constituted the largest number of contacted businesses, the number of respondents from this sector constitutes the largest group. Of the remaining companies, a very large number (27) identified themselves as 'others'. However, a closer examination of how they have described themselves allowed many of them to be placed in one or the other of the listed categories leaving only 5 in the 'others' category. Textile sector companies are divided into two segments *'wearing apparel & dressing'* and '*textile'* depending on how they have placed themselves or in case they have placed themselves in 'others' how they have described themselves. Companies in 'life science' sector are placed in *medical & precision instruments & products* or *IT software* again depending on how they have placed themselves or how they have described themselves. Two of the companies however, have not given any response to the first part of the questionnaire that included questions on industry sector, age and employment. These are shown in the above graph as 'unknown'.

### 8.3.1.2 *Age-distribution of survey companies*

Figure 28 depicts the age-distribution of survey companies and shows that the survey companies are fairly well distributed across various age-cohorts. The largest number of respondents, however, is on the age group of 15+ years. It appears that the

Schumpeterian hypothesis that nascent enterprises lead the thrust for innovation is not observed in Scotland. This issue is further investigated later in this chapter.

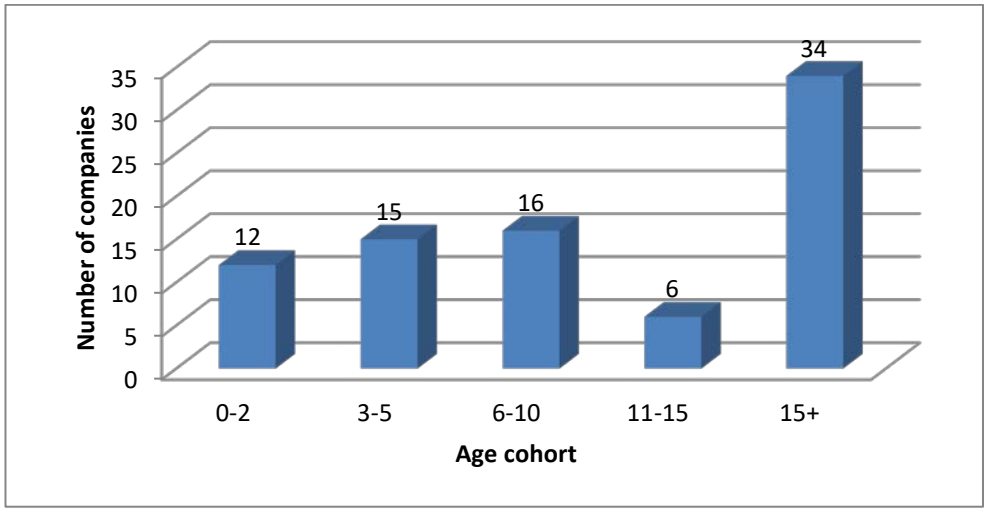



Figure 28: Age-distribution of survey companies

### 8.3.1.3 *Time to innovate*

The survey companies were asked two questions, how long there have been in business and how long they have been developing new products. Most of them (76) have ticked in the same age cohort for both these questions. This means that these companies have been developing new products almost from inception. This is shown in the following graphic.

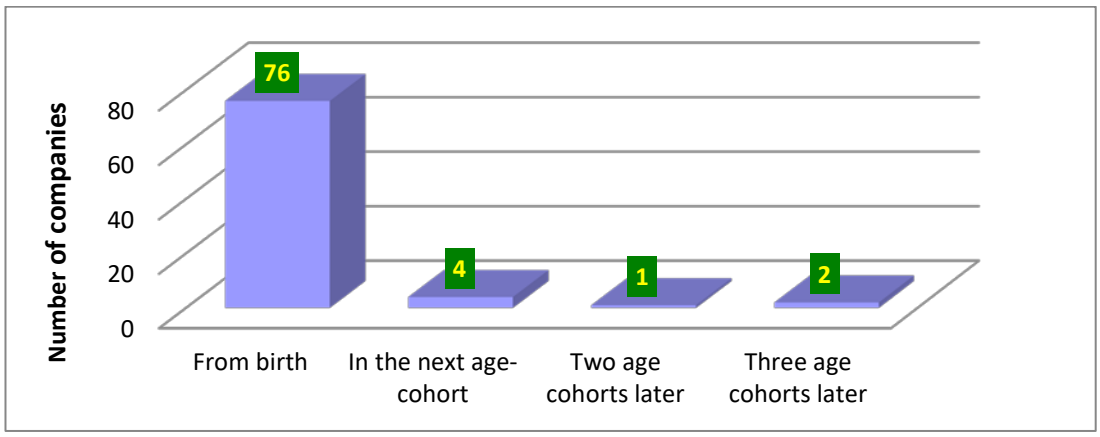



Figure 29: Commencement of new product development

### 8.3.1.4 *Size-distribution of survey companies*

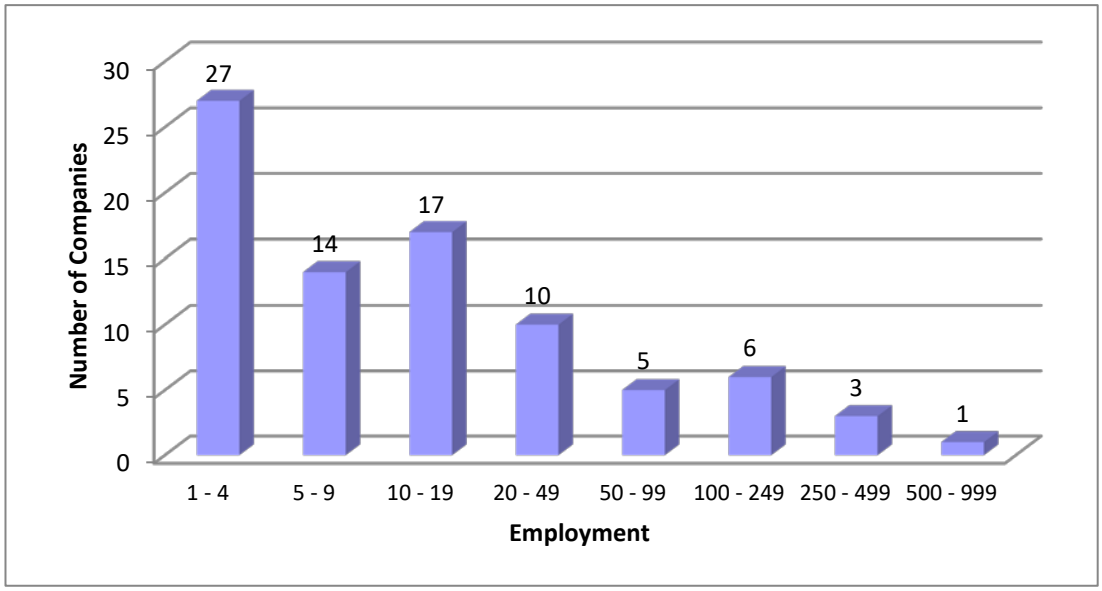



Figure 30: Size-distribution of survey companies

Though the sample companies are not very young, they indeed are predominantly small as is obvious from the above graphic. 85% of respondent companies have fewer than 50 employees. From this, it may appear that smaller companies are over-represented in this sample. This however, is not the case as shown in the subsequent graphic that compares Scottish companies with the survey companies in different size groups.

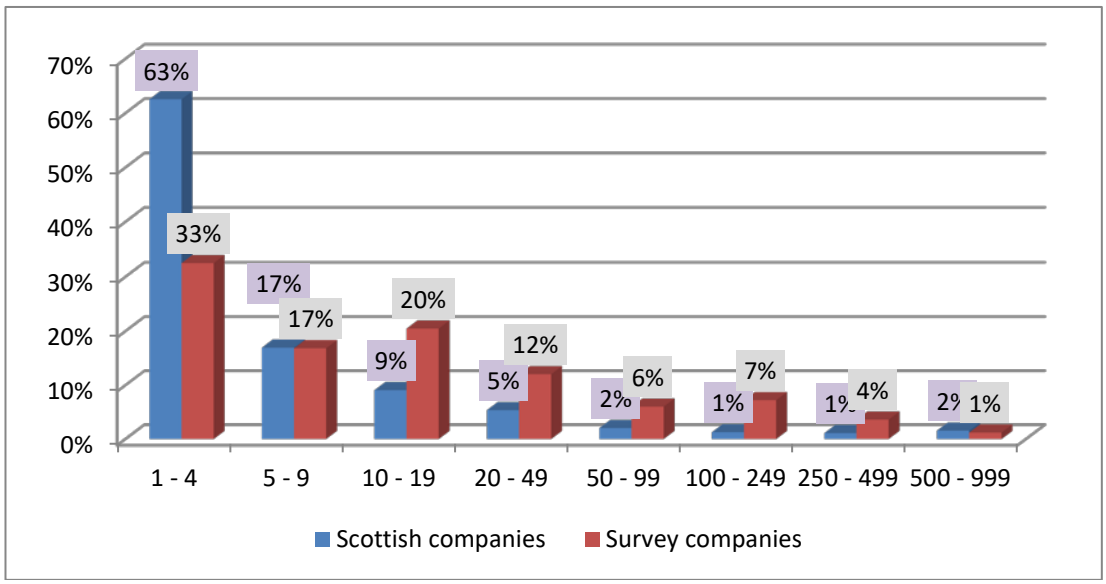



Figure 31: Size-distribution of companies; survey versus Scotland

Source for Scottish Companies : Scottish Government, ONS (IDBR), 2008

63% of Scottish companies are in the lowest employment band of 1 to 4 employees whereas there are only 33% survey companies in this band. As we move towards higher employment bands, we observe proportionately more survey companies in comparison to companies in Scotland in general. This suggests that very small Scottish companies have not been able to create new products successfully, whereas amongst the larger companies, successful product innovators are in greater proportions. This issue is further investigated through a one sample 't' test and its implication discussed later in this chapter.

### 8.3.2 **Analysis of information on innovation**

The survey results for questions on page 2 of survey questionnaire on new product development by the companies are presented in the following way. The first two columns in the first graphic that appear below each survey question in this section, depict total number and percentage of companies that responded either as strongly agree, agree or mildly agree to the question. These columns are named '*Agree'*. The total number and percentage of those that responded either as strongly disagree, disagree or mildly disagree to the question are shown as '*Disagree'* in the next two columns, whereas the total number and percentage of those that responded neither agree nor disagree are shown as '*Neutral'* in the last two columns.

For a more precise presentation of the levels of agreements and disagreements to the survey questions, the responses are given varying weights to capture the strength of agreement versus the strength of disagreement. For this purpose the range of responses are coded in the following manner:

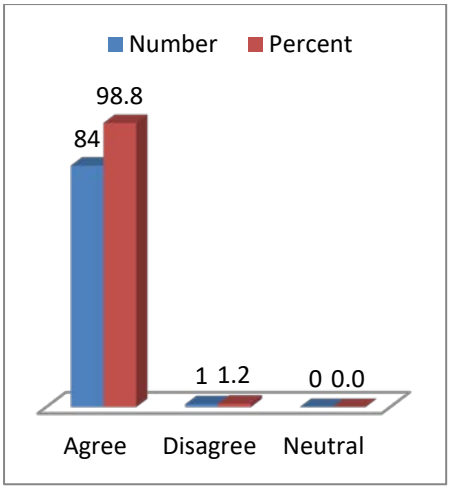
| Strongly agree | Agree | Mildly agree | Neither agree nor disagree | Mildly disagree | Disagree | Strongly disagree |
|---|---|---|---|---|---|---|
| 3 | 2 | 1 | 0 | -1 | -2 | -3 |

In the second graphic, adjacent to the first, the sum of all positive responses is depicted as 'acceptance index' and the sum of all negative responses is shown as 'rejection index'. The zero value responses are ignored and the indices are normalised to account for missing values.

The graphics given below show that out of the 18 propositions[12] that are tested by this survey, prima facie, 14 are supported, two are refuted and two have mixed response. The propositions are listed according to the ranks of their acceptance indices.

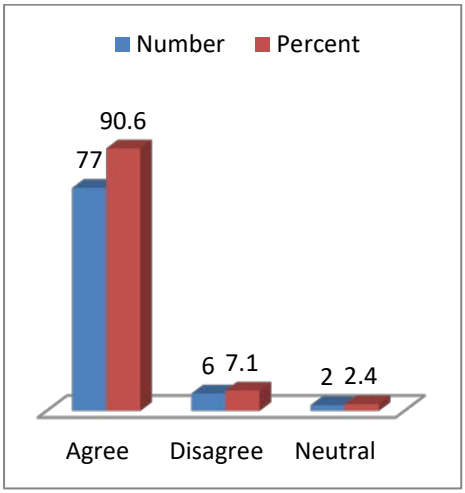
### 8.3.2.1 **Propositions supported by the survey**

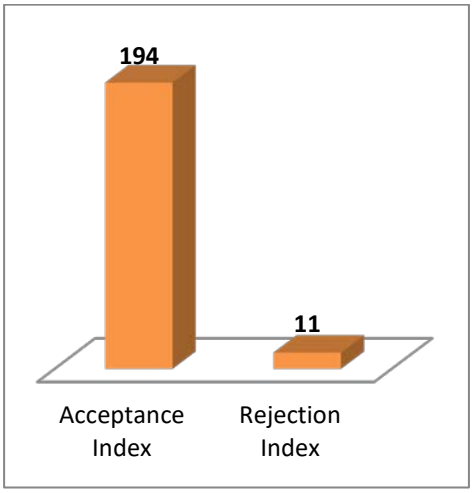
1. We have been learning continuously from our efforts to develop new products





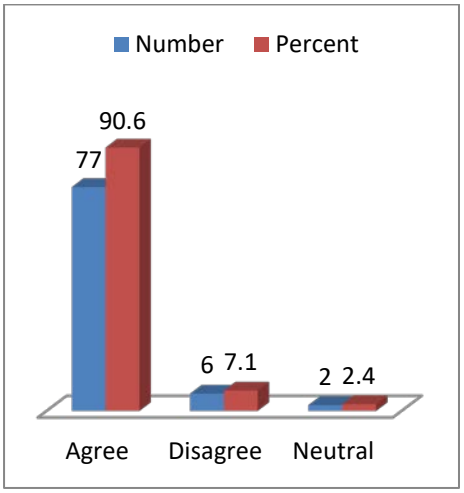
2. People in my company working on new product development also perform other roles within the organisation (Cross-functional innovation).

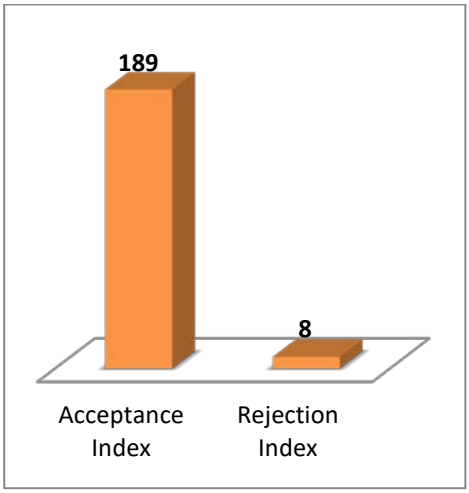


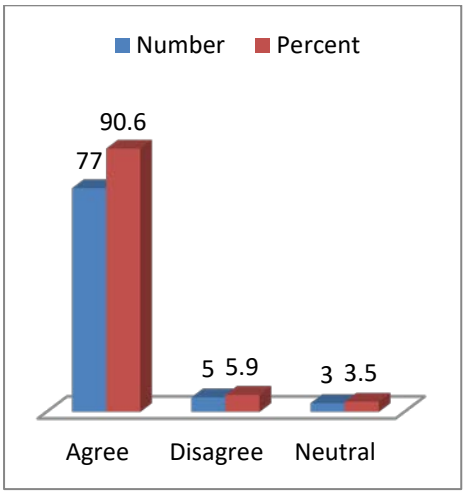

[12] Propositions on age and size are later separately tested.

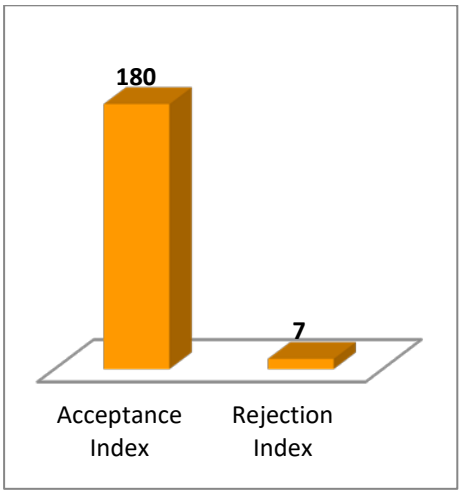
3. The product development team in my company is made up of 'creative' people.



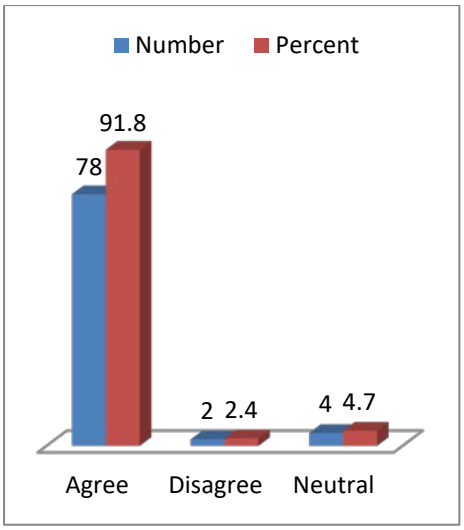



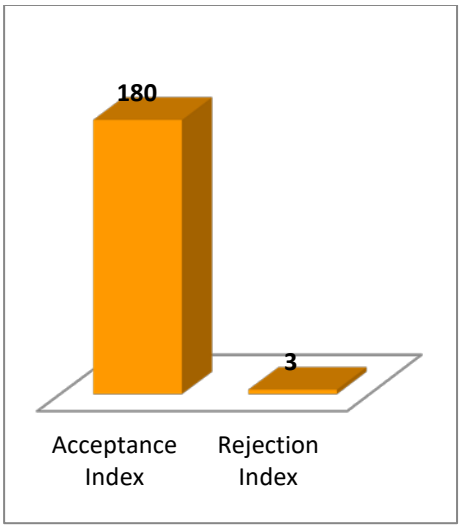

4. Our flexible production methods allow us to alter and modify our products quickly.



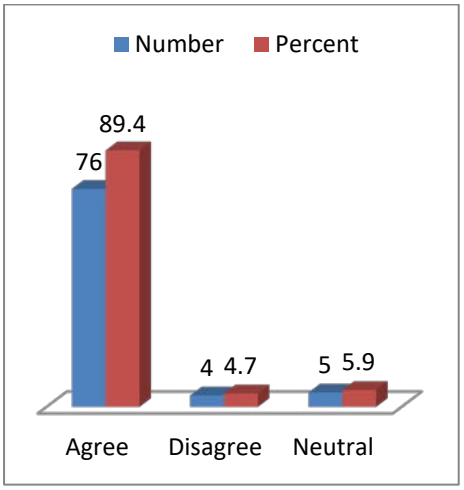



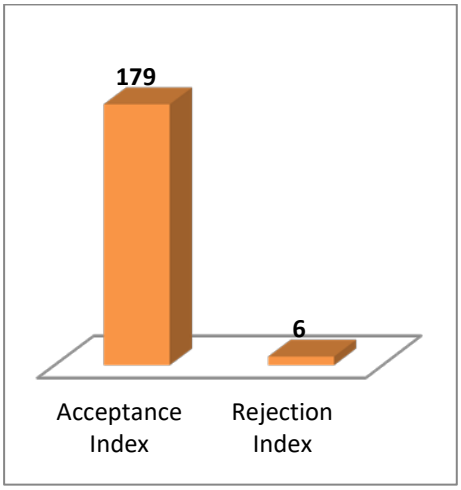

5. We understand the needs and circumstances of our customers very well.



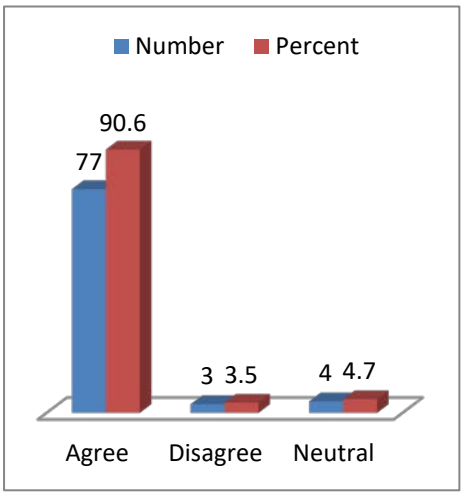



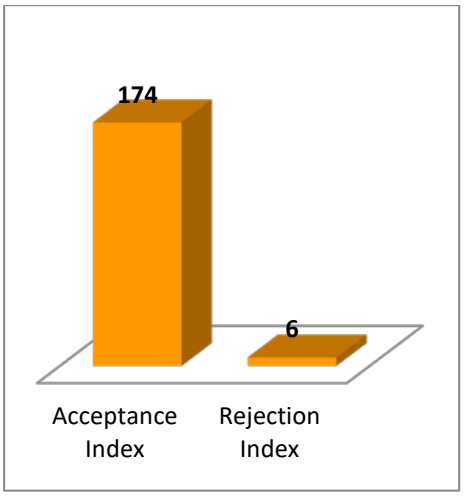
6. We remain in regular contact with our main customers during the development of new products.



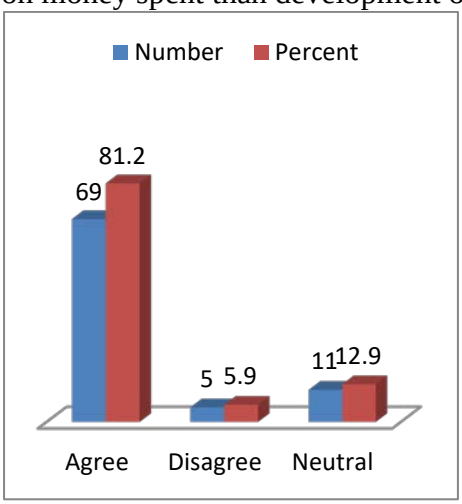



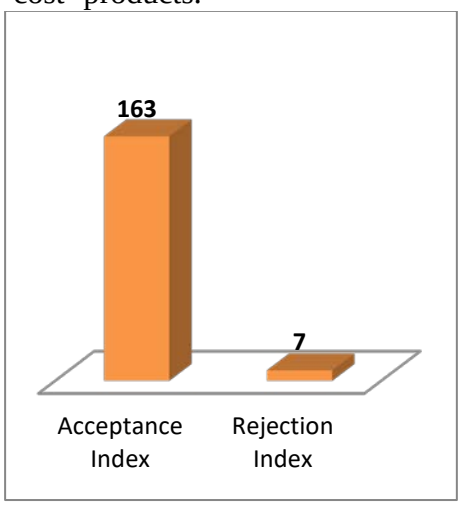

7. There is a good fit between what the market needs and what we can provide.



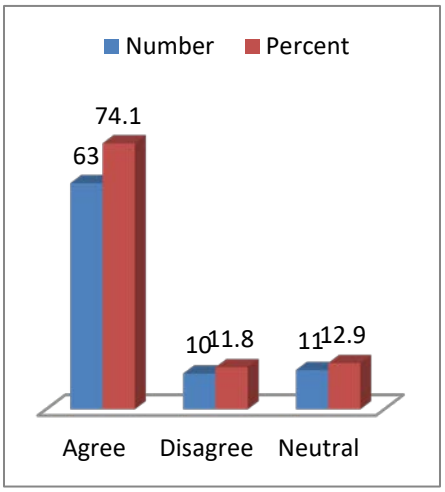



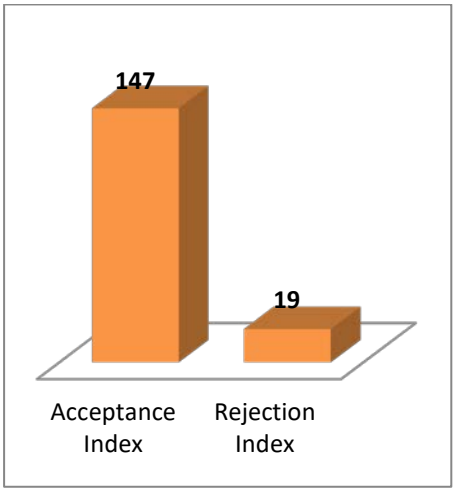

8. Development of 'premium' products has provided my company better returns on money spent than development of ‘low-cost’ products.



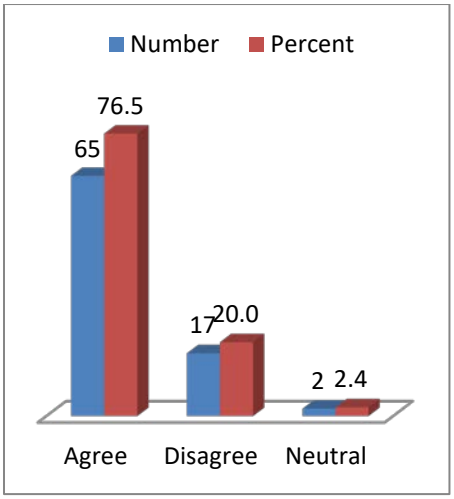



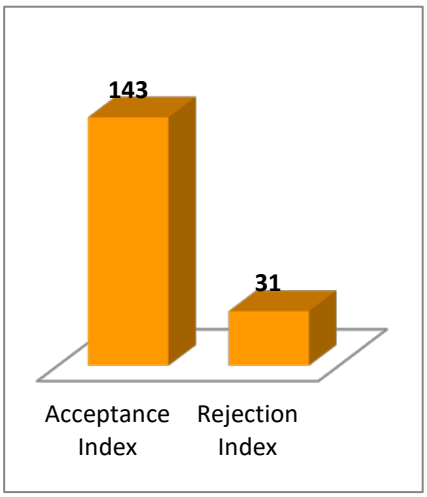
9. I would describe my company as a ‘low-volume-high-variety’ business rather than a ‘high-volume-low-variety’ business.



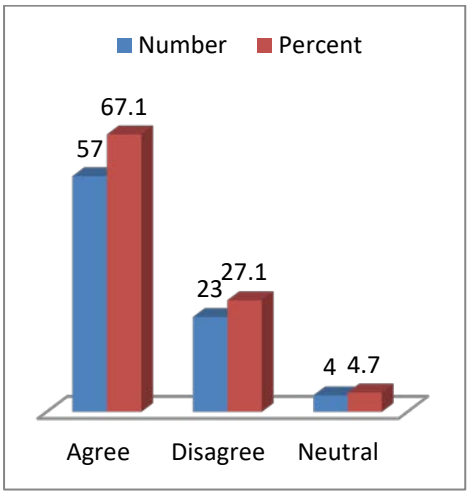



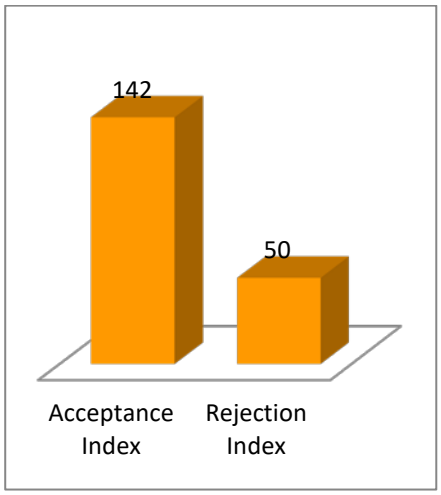

10. I would describe the innovation process in my company as informal.



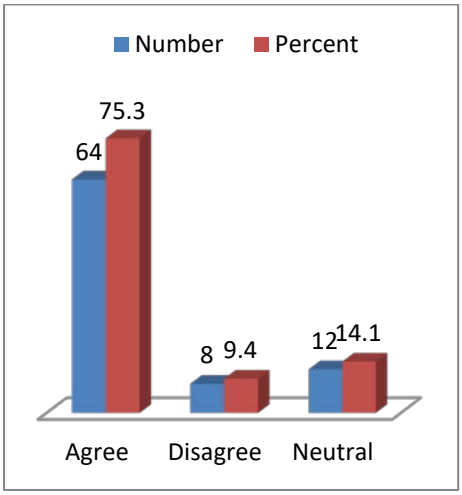




11. There is no formal R&D department in my company.



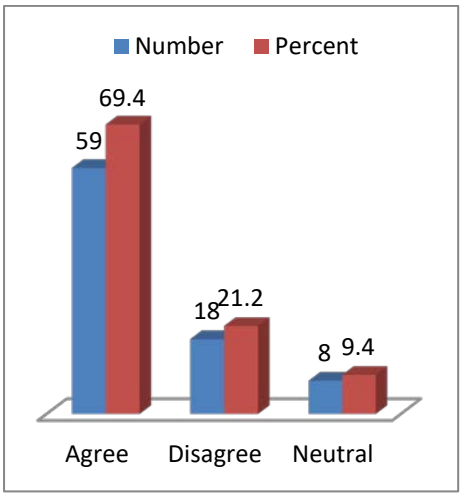



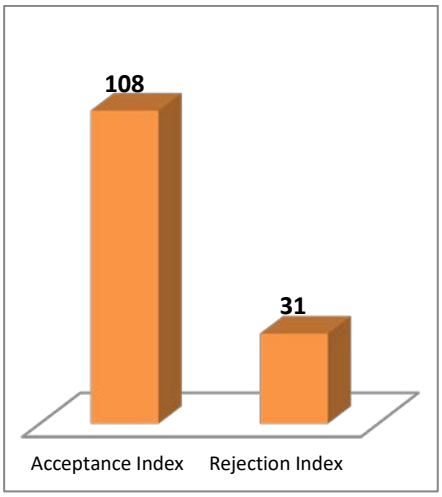
12. Our success in new product development is due to our ability to explore and reach potential markets.



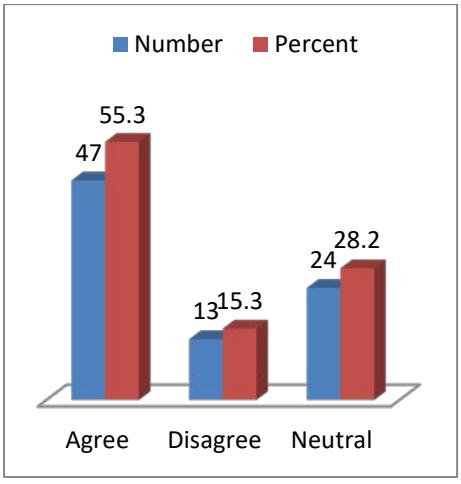


13. We are able to develop markets for our new products without any major advertising or marketing effort



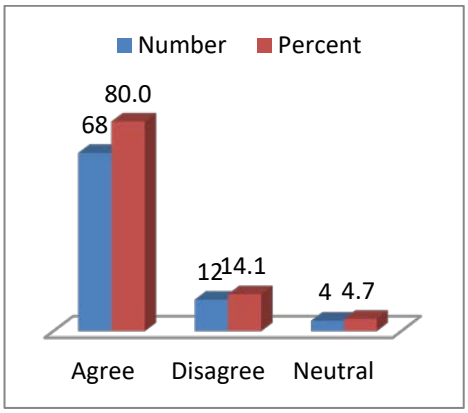



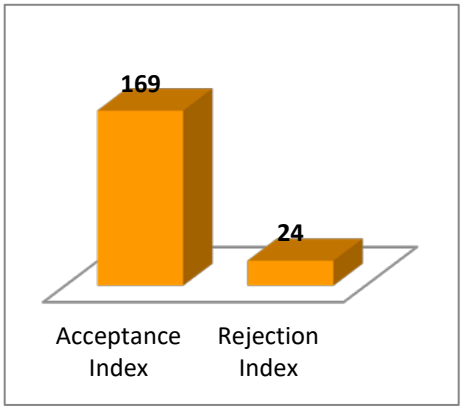

14. We are able to recruit and retain the competent people needed for new product development.



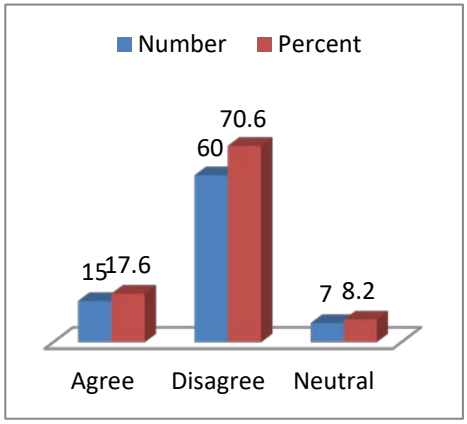

### 8.3.2.2 **The propositions refuted by the survey**

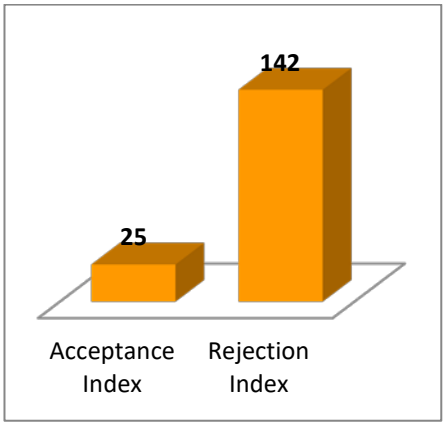
1. We face financial constraints in our efforts to develop new products[13].



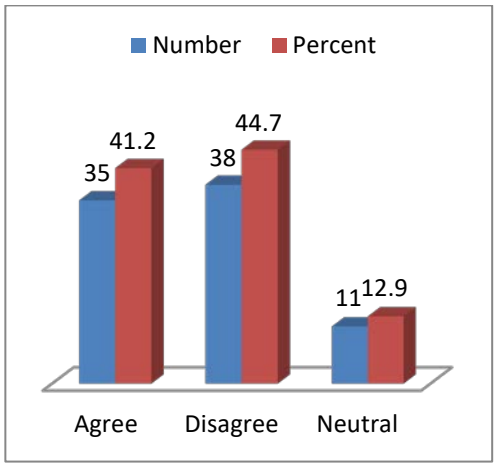

2. We sell most of our new products to large retailers.




### 8.3.2.3 **Propositions with mixed response**

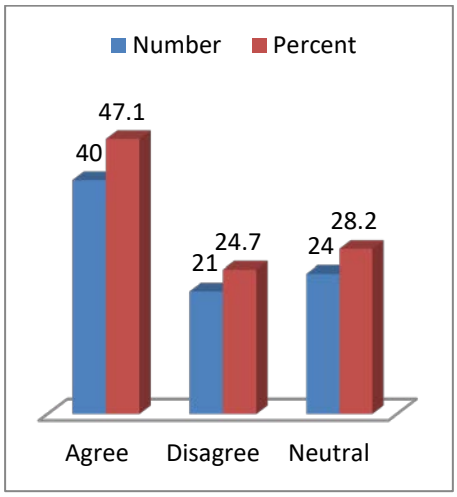
1. Member/s of our NPD teams regularly travel to new locations in search of new product ideas.[14]

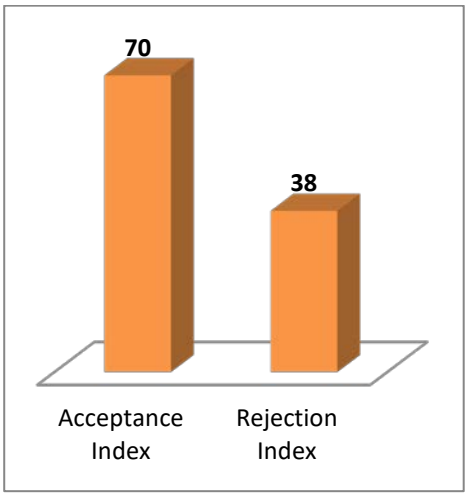




[13] The case study companies *do not* face financial constraints in developing new products. That this survey proposition is supported therefore means that the case study finding is rejected.
[14] This proposition is rejected in a more rigorous statistical testing, shown later in this chapter.

2. Successful new products developed by us are very different from our existing products.[15]




The following graphic lists the survey propositions ranked in order of their normalised acceptance indices.

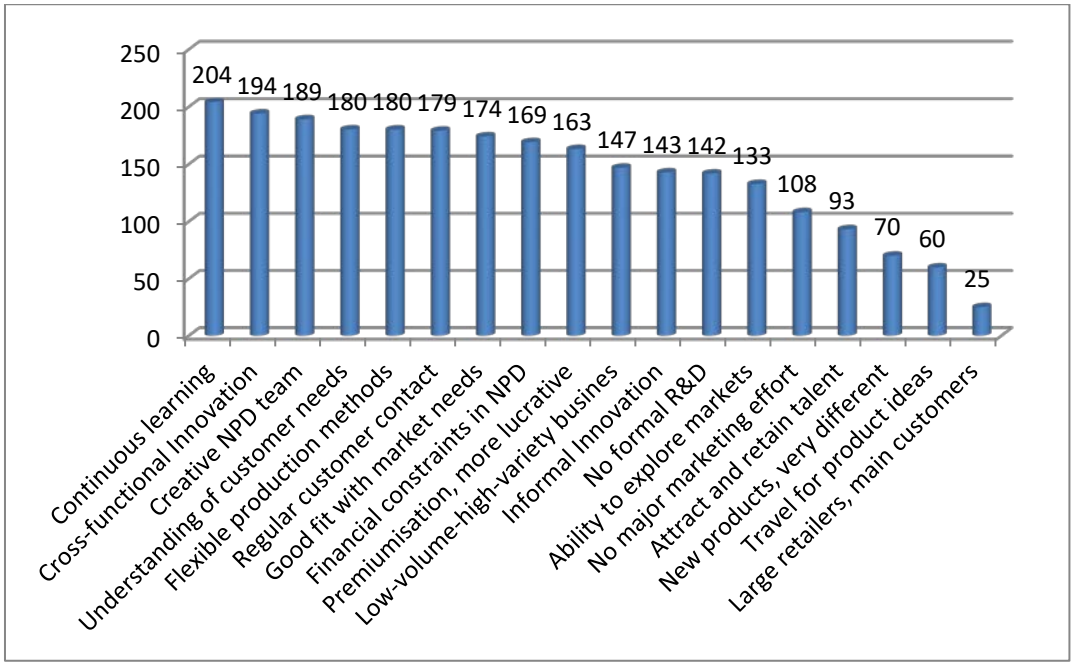



Figure 32: Strength of agreement for survey propositions

[15] This proposition is accepted in a more rigorous statistical testing, shown later in this chapter

### 8.3.3 Networking for innovation

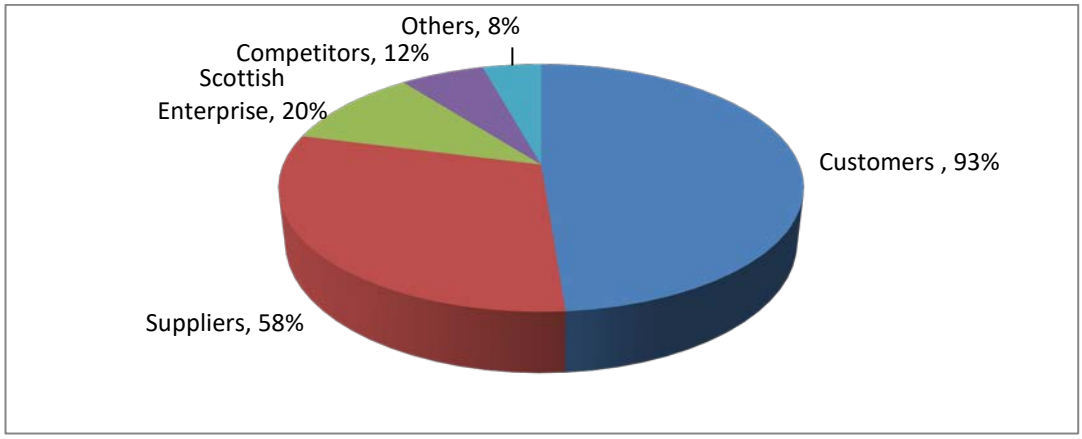



Figure 33: Partners in innovation

The survey reveals that for new product development, the responding companies network principally with their customers and suppliers. Very few (only 20%) network with Scottish Enterprise for the purpose. One interesting finding not obvious in the above graphic is that amongst the 'other' networking partners mentioned by the survey companies, only two companies have specified academic institutions as 'others'. This shows that Scottish universities need to do more to become partners with Scottish companies in new product development.

### 8.3.4 The survey data

#### 8.3.4.1 Response rate

As mentioned earlier the survey has a 31% response rate as detailed below.

| Identified Companies | Contacted Companies | Total Response | Complete and Usable Response | Response Rate |
|---|---|---|---|---|
| 348 | 276 | 88 | 85 | 30.8% |

#### 8.3.4.2 Missing values

The total expected answers on 23 survey questions from 85 respondents were 1955. The actual answer count in the survey is 1943 with 21 skipped questions. The missing value in survey data thus is only 1%.

#### 8.3.4.3 Self-selection bias

A survey of this kind may suffer from a self-selection bias. It is a possibility that the companies that respond to the survey may be different from those that do not and so

the data may have a self-selection bias. If this is so, the generalisation value of results becomes questionable. The standard procedure for checking for self-selection bias is to compare late responses from early responses using late response as a proxy for no response. Mullen *et al.* (2009) suggest, *"Statistically nonsignificant differences on a number of descriptive variables* (between early respondents and late respondents) *indicate a lack of bias resulting from self-selection."* Following this, the variance and the mean of 10 early response companies is compared with 10 late responding companies and the results are displayed below.

Table 8: Independent Samples 't' test between early response and late response

| | Levene's Test for Equality of Variances | | | t-test for Equality of Means | | |
|---|---|---|---|---|---|---|
| | | F | Sig. | t | df | Sig. |
| Creative NPD team | Equal variances assumed | .253 | .621 | .429 | 18 | .673 |
| | Equal variances not assumed | | | 0.43 | 15.21 | 0.67 |
| Premiumisation, more lucrative | Equal variances assumed | 7.32 | 0.01 | 1.93 | 18.00 | 0.07 |
| | Equal variances not assumed | | | 1.93 | 12.52 | 0.08 |
| New products, very different | Equal variances assumed | 0.00 | 1.00 | -0.51 | 18.00 | 0.61 |
| | Equal variances not assumed | | | -0.51 | 17.98 | 0.61 |
| Low-volume-high-variety business | Equal variances assumed | 0.37 | 0.55 | 0.33 | 18.00 | 0.75 |
| | Equal variances not assumed | | | 0.33 | 16.77 | 0.75 |
| Flexible production methods | Equal variances assumed | 0.25 | 0.62 | 0.77 | 18.00 | 0.45 |
| | Equal variances not assumed | | | 0.77 | 12.78 | 0.46 |
| No formal R&D | Equal variances assumed | 0.12 | 0.73 | -0.27 | 18.00 | 0.79 |
| | Equal variances not assumed | | | -0.27 | 17.87 | 0.79 |
| Regular customer contact | Equal variances assumed | 6.56 | 0.02 | 0.87 | 18.00 | 0.40 |
| | Equal variances not assumed | | | 0.87 | 14.54 | 0.40 |
| Large retailers, main customers | Equal variances assumed | 4.75 | 0.04 | 1.32 | 18.00 | 0.20 |
| | Equal variances not assumed | | | 1.32 | 15.22 | 0.21 |
| Travel for product ideas | Equal variances assumed | 2.83 | 0.11 | -1.02 | 18.00 | 0.32 |
| | Equal variances not assumed | | | -1.02 | 17.04 | 0.32 |
| Informal Innovation | Equal variances assumed | 3.44 | 0.08 | 0.80 | 18.00 | 0.44 |
| | Equal variances not assumed | | | 0.80 | 15.00 | 0.44 |
| Cross-functional Innovation | Equal variances assumed | 6.46 | 0.02 | -1.05 | 18.00 | 0.31 |
| | Equal variances not assumed | | | -1.05 | 10.19 | 0.32 |
| Ability to explore markets | Equal variances assumed | 0.15 | 0.70 | 0.00 | 18.00 | 1.00 |
| | Equal variances not assumed | | | 0.00 | 17.94 | 1.00 |
| Good fit with market needs | Equal variances assumed | 0.48 | 0.50 | 0.00 | 18.00 | 1.00 |
| | Equal variances not assumed | | | 0.00 | 15.96 | 1.00 |
| Continuous learning | Equal variances assumed | 2.57 | 0.13 | -1.12 | 18.00 | 0.28 |
| | Equal variances not assumed | | | -1.12 | 16.00 | 0.28 |
| Financial constraints in NPD | Equal variances assumed | 0.02 | 0.90 | -0.15 | 18.00 | 0.88 |
| | Equal variances not assumed | | | -0.15 | 17.98 | 0.88 |
| Understanding of customer needs | Equal variances assumed | 0.33 | 0.57 | -1.21 | 18.00 | 0.24 |
| | Equal variances not assumed | | | -1.21 | 17.83 | 0.24 |
| Attract and retain talent | Equal variances assumed | 1.95 | 0.18 | -0.27 | 18.00 | 0.79 |
| | Equal variances not assumed | | | -0.27 | 16.04 | 0.79 |
| No major marketing effort | Equal variances assumed | 0.56 | 0.46 | 0.82 | 18.00 | 0.42 |
| | Equal variances not assumed | | | 0.82 | 17.96 | 0.42 |

The results show that barring four highlighted cases of variance, the mean as well as the variance for all propositions show no statistically significant difference in

responses at 95% confidence level. This should be interpreted to mean that the data has practically no self-selection bias.

The nonparametric Mann-Whitney test for comparison of median between 10 early response companies and 10 late response companies also show that at 95% confidence level there are no statistically significant differences in the median for any one of the 18 propositions between early and late responses. This further reinforces the inference that the data has no self-selection bias.

**Table 9:** Mann-Whitney test between early response and late response

| | Mann-Whitney U | Wilcoxon W | Z | Asymp. Sig. (2-tailed) | Exact Sig. [2*(1-tailed Sig.)] |
|---|---|---|---|---|---|
| Creative NPD team | 49 | 104 | -.081 | .935 | .971 |
| Premiumisation, more lucrative | 30.5 | 85.5 | -1.569 | .117 | .143 |
| New products, very different | 43 | 98 | -.539 | .590 | .631 |
| Low-volume-high-variety business | 48.5 | 103.5 | -.117 | .907 | .912 |
| Flexible production methods | 45 | 100 | -.418 | .676 | .739 |
| No formal R&D | 45 | 100 | -.398 | .691 | .739 |
| Regular customer contact | 45.5 | 100.5 | -.363 | .717 | .739 |
| Large retailers, main customers | 45 | 100 | -.393 | .694 | .739 |
| Travel for product ideas | 28 | 83 | -1.726 | .084 | .105 |
| Informal Innovation | 45 | 100 | -.390 | .696 | .739 |
| Cross-functional Innovation | 50 | 105 | .000 | 1.000 | 1.000 |
| Ability to explore markets | 49.5 | 104.5 | -.039 | .969 | .971 |
| Good fit with market needs | 46 | 101 | -.340 | .734 | .796 |
| Continuous learning | 38.5 | 93.5 | -1.009 | .313 | .393 |
| Financial constraints in NPD | 46.5 | 101.5 | -.278 | .781 | .796 |
| Understanding of customer needs | 30.5 | 85.5 | -1.603 | .109 | .143 |
| Attract and retain talent | 47.5 | 102.5 | -.198 | .843 | .853 |
| No major marketing effort | 42 | 97 | -.631 | .528 | .579 |

### 8.3.4.4 **Data validity, anomaly and reliability of scales**

The *SPSS.16* test for validity of survey data shows that '*all cases, variables, or data values passed the requested validity checks'*. Similarly, the check for anomaly does not display any Anomaly case Index List, Anomaly case Peer ID, Anomaly case Reason List, Anomaly Index Summary and/or Reasons Summary because '*no anomalies were found*.' The test for reliability for all 18 tested propositions generated

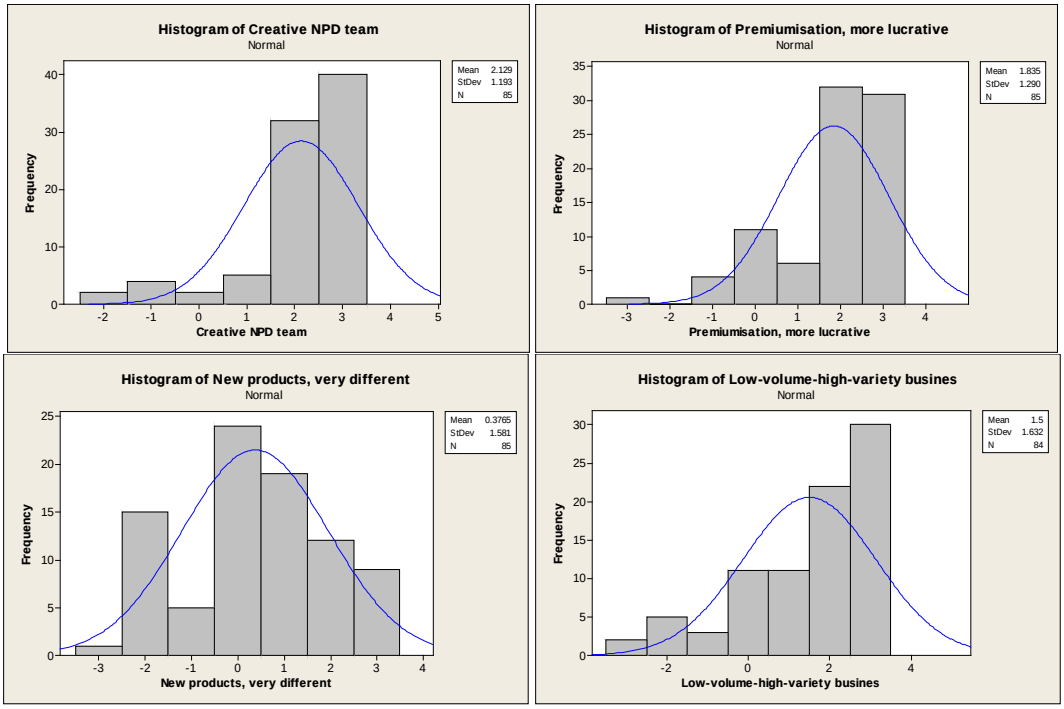
a Cronbach's Alpha value of 0.632, which is quite close to the benchmark reliability value of 0.7 (Mullen *et al.*, 2009).

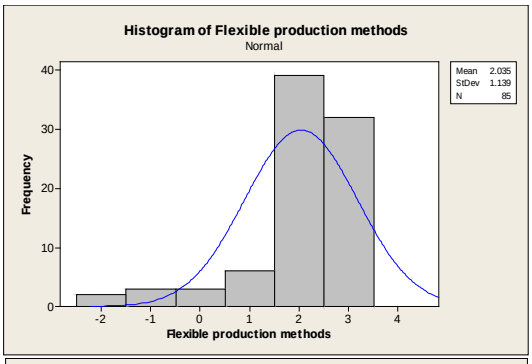
### 8.3.5 **Testing of hypotheses**

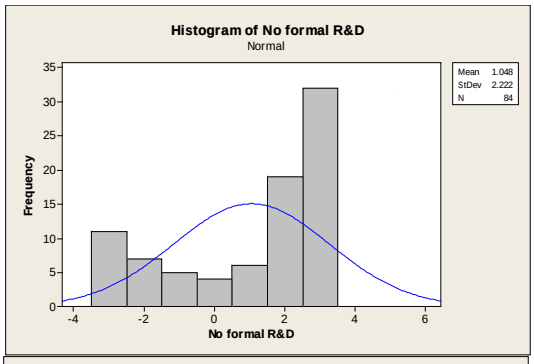
In order to see if the findings of this survey earlier presented graphically, are statistically significant, further tests are conducted using the statistical programmes, *SPSS.16* and *Minitab.15*. For this purpose, each statement listed on page 2 of the questionnaire is taken as a hypothesis and the response data is used to test it. As the responses range from 'strongly agree' to 'strongly disagree' on a 7-point scale, in order to code them for statistical data analysis, they are transformed, as mentioned earlier, in the following manner:

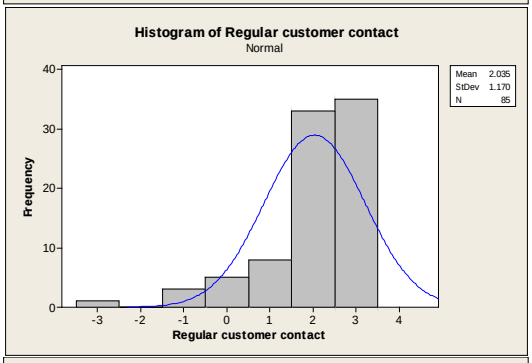
| Strongly agree | Agree | Mildly agree | Neither agree | Mildly disagree | Disagree | Strongly disagree |
|---|---|---|---|---|---|---|
| 3 | 2 | 1 | 0 | -1 | -2 | -3 |

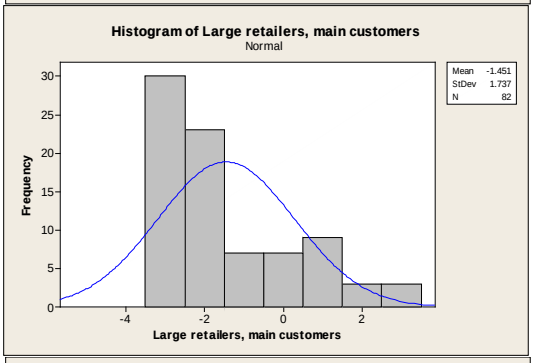
For the hypothesis testing involving a single sample, the most widely used test is *one sample 't' test*. An assumption behind *one sample 't' test* is that the data is normally distributed (Dorofeev and Grant, 2006). Most of the data generated by this survey however, is not normal and is highly skewed as is obvious from the histograms of the 18 data sets.

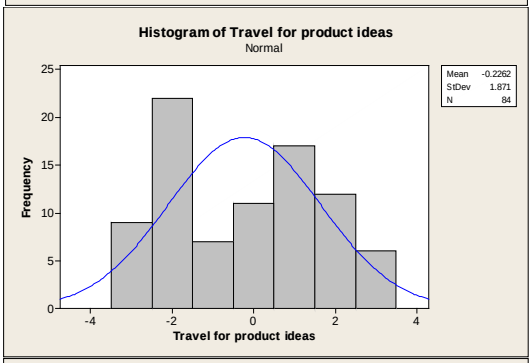


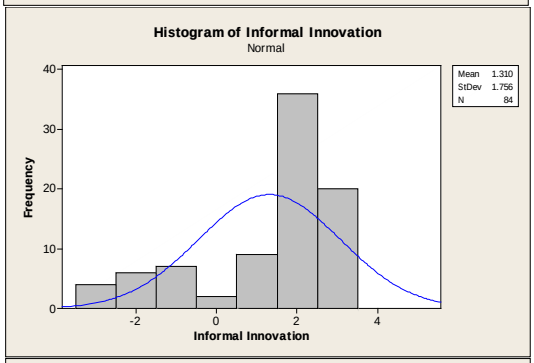

Histogram of Flexible production methods
Normal
Mean 2.035
StDev 1.139
N 85
Frequency
Flexible production methods

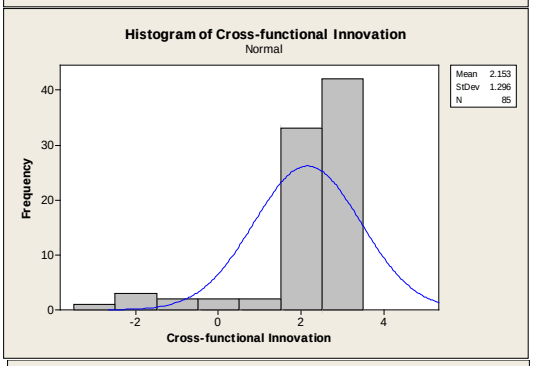

Histogram of No formal R&D
Normal
Mean 1.048
StDev 2.222
N 84
Frequency
No formal R&D

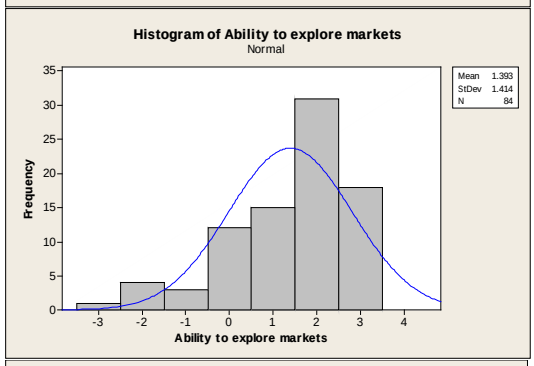

Histogram of Regular customer contact
Normal
Mean 2.035
StDev 1.170
N 85
Frequency
Regular customer contact

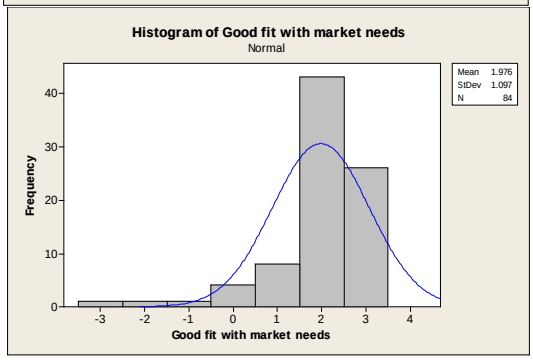

Histogram of Large retailers, main customers
Normal
Mean -1.451
StDev 1.737
N 82
Frequency
Large retailers, main customers

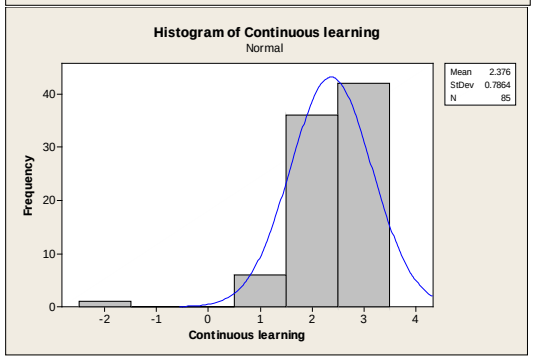

Histogram of Travel for product ideas
Normal
Mean -0.2262
StDev 1.871
N 84
Frequency
Travel for product ideas


Histogram of Informal Innovation
Normal
Mean 1.310
StDev 1.756
N 84
Frequency
Informal Innovation


Histogram of Cross-functional Innovation
Normal
Mean 2.153
StDev 1.296
N 85
Frequency
Cross-functional Innovation


Histogram of Ability to explore markets
Normal
Mean 1.393
StDev 1.414
N 84
Frequency
Ability to explore markets


Histogram of Good fit with market needs
Normal
Mean 1.976
StDev 1.097
N 84
Frequency
Good fit with market needs


Histogram of Continuous learning
Normal
Mean 2.376
StDev 0.7864
N 85
Frequency
Continuous learning

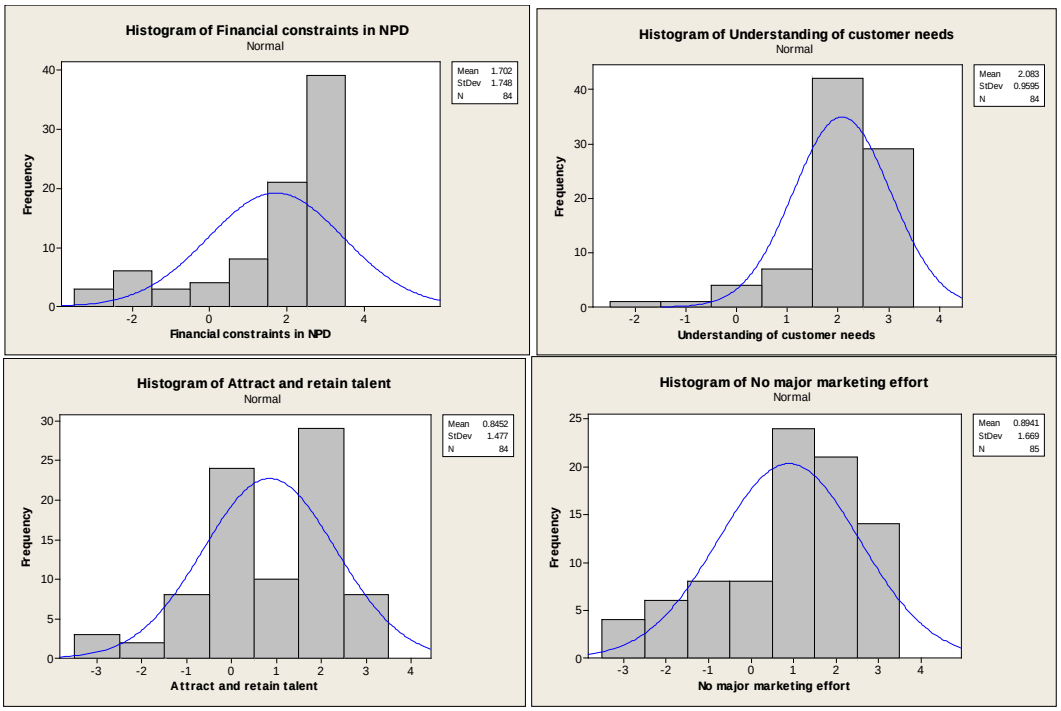



Figure 34: Histograms of data on response to 18 survey propositions

When the data is not normally distributed, nonparametric tests are recommended to test the hypotheses (Moore *et. al*, 2003*;* Gibbons, 1976). Wilcoxon Signed Rank Test, a widely used nonparametric test is, thus conducted on the survey data and the results are displayed below:

$$H_0: \mu = 0; \qquad H_1: \mu > 0$$

Table 10: Wilcoxon Signed Rank Test: All companies, all propositions

| | | N | N* | N for Test | Wilcoxon Statistic | P | Estimated Median |
|---|---|---|---|---|---|---|---|
| 1 | Creative NPD team | 85 | 0 | 83 | 3413.0 | 0.00 | 2.50 |
| 2 | Premiumisation, more lucrative | 85 | 0 | 74 | 2694.5 | 0.00 | 2.00 |
| 3 | New products, very different | 85 | 0 | 61 | 1202.0 | 0.033 | 0.50 |
| 4 | Low-volume-high-variety business | 84 | 1 | 73 | 2423.5 | 0.00 | 1.50 |
| 5 | Flexible production methods | 85 | 0 | 82 | 3328.0 | 0.00 | 2.00 |
| 6 | No formal R&D | 84 | 1 | 80 | 2389.5 | 0.00 | 1.00 |
| 7 | Regular customer contact | 85 | 0 | 80 | 3159.5 | 0.00 | 2.00 |
| 8 | Large retailers, main customers | 82 | 3 | 75 | 342.0 | 1.00 | -1.50 |
| 9 | Travel for product ideas | 84 | 1 | 73 | 1106.5 | 0.911 | -0.50 |
| 10 | Informal Innovation | 84 | 1 | 82 | 2836.5 | 0.00 | 1.50 |
| 11 | Cross functional Innovation | 85 | 0 | 83 | 3351.5 | 0.00 | 2.50 |
| 12 | Ability to explore markets | 84 | 1 | 72 | 2392.5 | 0.00 | 1.50 |
| 13 | Good fit with market needs | 84 | 1 | 80 | 3136.5 | 0.00 | 2.00 |
| 14 | Continuous learning | 85 | 0 | 85 | 3630.0 | 0.00 | 2.50 |
| 15 | Financial constraints in NPD | 84 | 1 | 80 | 2893.5 | 0.00 | 2.00 |
| 16 | Understanding of customer needs | 84 | 1 | 80 | 3205.5 | 0.00 | 2.00 |
| 17 | Attract and retain talent | 84 | 1 | 60 | 1521.0 | 0.00 | 1.00 |
| 18 | No major marketing effort | 85 | 0 | 77 | 2321.0 | 0.00 | 1.00 |

The test results show that for 16 propositions, with p > .05 the null hypotheses (μ = 0) is rejected and consequently the alternate hypothesis (μ > 0) is accepted at a 95% significance level.

Two propositions that are not supported by the test are:

1. Innovators regularly travel to distant locations to identify new product ideas.
2. Innovative companies sell most of their new products to very large retailers.

This means that these two propositions that came from the case studies of eight food companies cannot be generalised in a wider Scottish context. To see if there is support for them within the food and drinks companies in the sample, Wilcoxon Signed Rank Test is rerun for these two propositions exclusively for the 29 food and drinks companies in the sample and the results are shown below.

$$H_0: \mu = 0; \qquad H_1: \mu > 0$$

Table 11: Wilcoxon Signed Rank Test: Food & Drinks companies, rerun for rejected propositions

| | N | N* | N for Test | Wilcoxon Statistic | P | Estimated Median |
|---|---|---|---|---|---|---|
| Large retailers, main customers | 29 | | 26 | 74.5 | 0.995 | -1.0 |
| Travel for product ideas | 29 | | 27 | 59.0 | 0.999 | -1.0 |

The exercise shows that these propositions are rejected by the food and drinks company data as well, at 95% significance level, as the 'p' value in each case is higher than .05. This means that these propositions coming from the case studies of eight Scottish food companies cannot be generalised for the Scottish food and drinks sector.

### 8.3.6 **Segregated data analysis**

In order to understand if there are significant differences in responses from specific groups of respondents, a series of further tests are carried out.

#### 8.3.6.1 **High-tech companies versus Low-tech companies.**

To undertake this exercise, *food products & beverages, wearing apparel & dressing, textiles, leather & leather products, rubber & plastic products* and *fabricated metal products* companies are coded as low-tech enterprises whereas *medical & precision instruments & products, IT software* and *chemicals* companies are coded as high-tech. The exact description provided by respondents in case of five companies listed as 'others' is used to decide on their place in one of these two categories. Two

companies listed as ‘unknown’ and one company that did not reveal its industry segment are excluded from this analysis.

$$H_0: \mu = 0; \qquad H_1: \mu > 0$$

Table 12: Wilcoxon Signed Rank Test: Low-tech companies

| | N | N* | N for Test | Wilcoxon Statistic | P | Estimated Median |
|---|---|---|---|---|---|---|
| Creative NPD team | 59 | 0 | 57 | 1611.0 | 0.000 | 2.500 |
| Premiumisation, more lucrative | 59 | 0 | 54 | 1434.5 | 0.000 | 2.000 |
| New products, very different | 59 | 0 | 45 | 638.0 | 0.088 | 0.500 |
| Low-volume-high-variety business | 58 | 1 | 51 | 1283.0 | 0.000 | 2.000 |
| Flexible production methods | 59 | 0 | 58 | 1693.0 | 0.000 | 2.500 |
| No formal R&D | 58 | 1 | 56 | 1357.0 | 0.000 | 2.000 |
| Regular customer contact | 59 | 0 | 54 | 1435.0 | 0.000 | 2.000 |
| Large retailers, main customers | 57 | 2 | 52 | 165.5 | 1.000 | -1.500 |
| Travel for product ideas | 58 | 1 | 52 | 506.0 | 0.953 | -0.500 |
| Informal Innovation | 58 | 1 | 57 | 1521.0 | 0.000 | 2.000 |
| Cross functional  Innovation | 59 | 0 | 58 | 1635.0 | 0.000 | 2.500 |
| Ability to explore markets | 59 | 0 | 50 | 1140.5 | 0.000 | 1.500 |
| Good fit with market needs | 58 | 1 | 54 | 1410.5 | 0.000 | 2.000 |
| Continuous learning | 59 | 0 | 59 | 1752.0 | 0.000 | 2.500 |
| Financial constraints in NPD | 58 | 1 | 56 | 1353.5 | 0.000 | 2.000 |
| Understanding of customer needs | 58 | 1 | 54 | 1462.0 | 0.000 | 2.000 |
| Attract and retain talent | 58 | 1 | 37 | 540.5 | 0.002 | 0.500 |
| No major marketing effort | 59 | 0 | 53 | 1253.0 | 0.000 | 1.500 |

$$H_0: \mu = 0; \qquad H_1: \mu > 0$$

Table 13: Wilcoxon Signed Rank Test: High-tech companies

| | N | N* | N for Test | Wilcoxon Statistic | P | Estimated Median |
|---|---|---|---|---|---|---|
| Creative NPD team | 23 | 0 | 23 | 272.0 | 0.000 | 2.50 |
| Premiumisation, more lucrative | 23 | 0 | 18 | 167.0 | 0.000 | 1.50 |
| New products, very different | 23 | 0 | 15 | 88.0 | 0.059 | 0.50 |
| Low-volume-high-variety business | 23 | 0 | 19 | 141.0 | 0.034 | 1.00 |
| Flexible production methods | 23 | 0 | 21 | 210.5 | 0.001 | 1.50 |
| No formal R&D | 23 | 0 | 22 | 113.0 | 0.675 | 0.00 |
| Regular customer contact | 23 | 0 | 23 | 274.0 | 0.000 | 2.50 |
| Large retailers, main customers | 22 | 1 | 20 | 33.0 | 0.997 | -1.00 |
| Travel for product ideas | 23 | 0 | 19 | 100.0 | 0.428 | 0.00 |
| Informal Innovation | 23 | 0 | 22 | 174.0 | 0.064 | 0.50 |
| Cross functional  Innovation | 23 | 0 | 22 | 252.0 | 0.000 | 2.50 |
| Ability to explore markets | 22 | 1 | 20 | 198.5 | 0.000 | 1.50 |
| Good fit with market needs | 23 | 0 | 23 | 276.0 | 0.000 | 2.50 |
| Continuous learning | 23 | 0 | 23 | 276.0 | 0.000 | 2.50 |
| Financial constraints in NPD | 23 | 0 | 21 | 231.0 | 0.000 | 3.00 |
| Understanding of customer needs | 23 | 0 | 23 | 276.0 | 0.000 | 2.50 |
| Attract and retain talent | 23 | 0 | 20 | 194.0 | 0.000 | 1.50 |
| No major marketing effort | 23 | 0 | 22 | 146.5 | 0.263 | 0.50 |

The results show that the test, in case of 59 low-tech enterprises rejects three propositions, the same two that are rejected by the test involving all 85 companies and one more namely, *new products, very different from the existing products*, whereas in case of 23 high-tech enterprise, beyond the two rejected by the test involving all 85 companies, the test rejects 4 other propositions, namely *new*

*products, very different from the existing products, no formal R&D, informal innovation* and *no major marketing effort*.

### 8.3.6.2 Food & drinks companies versus non-food & drinks companies

In order to see how food & drinks companies compare with non-food & drinks companies in their response to survey questions, Wilcoxon Signed Rank Test is, run after segregating responses for 29 food & drinks companies and 53 non-food & drinks companies and the results are displayed below.

The results show that the test in case of 29 food & drinks companies does not support the same two propositions rejected by the test involving all 85 companies, however, the test in this case additionally rejects two more propositions relating to new products being very different from the existing products and ability to attract and retain people needed for new product development.

$$H_0: \mu = 0; \qquad H_1: \mu > 0$$

Table 14: Wilcoxon Signed Rank Test: Food & drinks companies

| | N | N for Test | Wilcoxon Statistic | P | Estimated Median |
|---|---|---|---|---|---|
| Creative NPD team | 29 | 28 | 380.0 | 0.000 | 2.000 |
| Premiumisation, more lucrative | 29 | 28 | 377.5 | 0.000 | 2.000 |
| New products, very different | 29 | 23 | 154.0 | 0.319 | 0.000 |
| Low-volume-high-variety business | 29 | 24 | 288.0 | 0.000 | 2.000 |
| Flexible production methods | 29 | 29 | 426.5 | 0.000 | 2.500 |
| No formal R&D | 29 | 28 | 338.5 | 0.001 | 2.000 |
| Regular customer contact | 29 | 26 | 329.5 | 0.000 | 2.000 |
| Large retailers, main customers | 29 | 26 | 74.5 | 0.995 | -1.000 |
| Travel for product ideas | 29 | 27 | 59.0 | 0.999 | -1.000 |
| Informal Innovation | 29 | 29 | 412.5 | 0.000 | 2.000 |
| Cross functional Innovation | 29 | 29 | 421.0 | 0.000 | 2.500 |
| Ability to explore markets | 29 | 26 | 318.0 | 0.000 | 1.500 |
| Good fit with market needs | 29 | 28 | 383.0 | 0.000 | 2.000 |
| Continuous learning | 29 | 29 | 426.0 | 0.000 | 2.500 |
| Financial constraints in NPD | 29 | 27 | 342.5 | 0.000 | 2.000 |
| Understanding of customer needs | 29 | 27 | 367.0 | 0.000 | 2.000 |
| Attract and retain talent | 29 | 17 | 90.0 | 0.269 | 0.000 |
| No major marketing effort | 29 | 28 | 370.0 | 0.000 | 1.500 |

$H_0: \mu = 0; \qquad H_1: \mu > 0$

Table 15: Wilcoxon Signed Rank Test: Non-food & drinks companies

| | N | N* | N for Test | Wilcoxon Statistic | P | Estimated Median |
|---|---|---|---|---|---|---|
| Creative NPD team | 53 | 0 | 52 | 1372.0 | 0.000 | 2.50 |
| Premiumisation, more lucrative | 53 | 0 | 43 | 941.0 | 0.000 | 2.00 |
| New products, very different | 53 | 0 | 35 | 413.0 | 0.055 | 0.50 |
| Low-volume-high-variety business | 52 | 1 | 47 | 992.5 | 0.000 | 2.00 |
| Flexible production methods | 53 | 0 | 50 | 1241.5 | 0.000 | 2.00 |
| No formal R&D | 52 | 1 | 49 | 833.0 | 0.014 | 0.50 |
| Regular customer contact | 53 | 0 | 51 | 1317.0 | 0.000 | 2.50 |
| Large retailers, main customers | 50 | 3 | 46 | 72.5 | 1.000 | -2.00 |
| Travel for product ideas | 52 | 1 | 43 | 494.0 | 0.402 | 0.00 |
| Informal Innovation | 52 | 1 | 50 | 977.0 | 0.001 | 1.50 |
| Cross functional  Innovation | 53 | 0 | 51 | 1268.5 | 0.000 | 2.50 |
| Ability to explore markets | 52 | 1 | 43 | 854.5 | 0.000 | 1.50 |
| Good fit with market needs | 52 | 1 | 49 | 1200.0 | 0.000 | 2.00 |
| Continuous learning | 53 | 0 | 53 | 1431.0 | 0.000 | 2.50 |
| Financial constraints in NPD | 52 | 1 | 50 | 1137.0 | 0.000 | 2.50 |
| Understanding of customer needs | 52 | 1 | 50 | 1271.5 | 0.000 | 2.00 |
| Attract and retain talent | 52 | 1 | 40 | 742.5 | 0.000 | 1.00 |
| No major marketing effort | 53 | 0 | 46 | 758.0 | 0.009 | 1.00 |

On the other hand the test results in case of 53 non-food & drinks companies does not support the same two propositions rejected by the tests involving all 85 companies, however, the test in this case additionally rejects one more proposition relating to new products being very different from the existing products.

### 8.3.6.3 **New companies versus old companies**

To see how more recently established companies compare with companies that are operating for longer period in their response to various survey questions, Wilcoxon Signed Rank Test is, run after segregating responses for 43 companies that are 10 or less years old and that of 40 companies that are more than 10 years old and the results are displayed in Table 16 and Table 17. The results show that there is no difference in response from new companies aged 10 years or less and old companies aged 11 years or more and each segregated sample rejects the same three propositions, two rejected by the test involving all 85 companies and one more, namely, *new products, very different from the existing products.*

$H_0: \mu = 0; \qquad H_1: \mu > 0$

Table 16: Wilcoxon Signed Rank Test: Up to10 year old companies

| | N | N* | N for Test | Wilcoxon Statistic | P | Estimated Median |
|---|---|---|---|---|---|---|
| Creative NPD team | 43 | 0 | 43 | 923.5 | 0.000 | 2.50 |
| Premiumisation, more lucrative | 43 | 0 | 35 | 594.0 | 0.000 | 2.00 |
| New products, very different | 43 | 0 | 28 | 237.5 | 0.219 | 0.00 |
| Low-volume-high-variety business | 43 | 0 | 40 | 728.5 | 0.000 | 2.00 |
| Flexible production methods | 43 | 0 | 41 | 815.5 | 0.000 | 2.00 |
| No formal R&D | 43 | 0 | 41 | 658.5 | 0.002 | 1.00 |
| Regular customer contact | 43 | 0 | 39 | 745.0 | 0.000 | 2.00 |
| Large retailers, main customers | 42 | 1 | 37 | 47.0 | 1.000 | -2.00 |
| Travel for product ideas | 43 | 0 | 36 | 225.5 | 0.955 | -0.50 |
| Informal Innovation | 43 | 0 | 42 | 768.0 | 0.000 | 2.00 |
| Cross functional Innovation | 43 | 0 | 42 | 899.0 | 0.000 | 2.50 |
| Ability to explore markets | 42 | 1 | 36 | 583.5 | 0.000 | 1.50 |
| Good fit with market needs | 43 | 0 | 40 | 787.0 | 0.000 | 2.50 |
| Continuous learning | 43 | 0 | 43 | 936.0 | 0.000 | 2.50 |
| Financial constraints in NPD | 43 | 0 | 40 | 787.0 | 0.000 | 2.50 |
| Understanding of customer needs | 43 | 0 | 41 | 846.0 | 0.000 | 2.00 |
| Attract and retain talent | 43 | 0 | 30 | 363.5 | 0.004 | 1.00 |
| No major marketing effort | 43 | 0 | 41 | 651.0 | 0.002 | 1.00 |

$H_0: \mu = 0; \qquad H_1: \mu > 0$

Table 17 Wilcoxon Signed Rank Test: More than 10 year old companies

| | N | N* | N for Test | Wilcoxon Statistic | P | Estimated Median |
|---|---|---|---|---|---|---|
| Creative NPD team | 40 | 0 | 38 | 724.5 | 0.000 | 2.00 |
| Premiumisation, more lucrative | 40 | 0 | 37 | 703.0 | 0.000 | 2.50 |
| New products, very different | 40 | 0 | 31 | 321.5 | 0.076 | 0.50 |
| Low-volume-high-variety business | 39 | 1 | 32 | 515.5 | 0.000 | 2.00 |
| Flexible production methods | 40 | 0 | 39 | 767.0 | 0.000 | 2.50 |
| No formal R&D | 39 | 1 | 38 | 579.0 | 0.001 | 2.00 |
| Regular customer contact | 40 | 0 | 39 | 773.0 | 0.000 | 2.50 |
| Large retailers, main customers | 38 | 2 | 36 | 149.5 | 0.998 | -1.00 |
| Travel for product ideas | 39 | 1 | 36 | 316.5 | 0.605 | 0.00 |
| Informal Innovation | 39 | 1 | 38 | 677.5 | 0.000 | 2.00 |
| Cross functional Innovation | 40 | 0 | 39 | 728.0 | 0.000 | 2.50 |
| Ability to explore markets | 40 | 0 | 35 | 589.0 | 0.000 | 1.50 |
| Good fit with market needs | 39 | 1 | 38 | 722.0 | 0.000 | 2.00 |
| Continuous learning | 40 | 0 | 40 | 820.0 | 0.000 | 2.00 |
| Financial constraints in NPD | 39 | 1 | 38 | 652.0 | 0.000 | 2.00 |
| Understanding of customer needs | 39 | 1 | 37 | 700.5 | 0.000 | 2.00 |
| Attract and retain talent | 39 | 1 | 27 | 327.0 | 0.000 | 1.00 |
| No major marketing effort | 40 | 0 | 35 | 528.0 | 0.000 | 1.00 |

#### 8.3.6.4 **Small companies versus large companies**

In order to see how small companies, employing less than 50 people compare with larger companies that employ 50 or more people, in their response to various survey questions, Wilcoxon Signed Rank Test is, run after segregating responses for 68 small companies and 15 large companies and the results are displayed in Table 18 and Table 19.

$H_0: \mu = 0; \qquad H_1: \mu > 0$

Table 18 Wilcoxon Signed Rank Test: Companies employing less than 50

| | N | N* | N for Test | Wilcoxon Statistic | P | Estimated Median |
|---|---|---|---|---|---|---|
| Creative NPD team | 68 | 0 | 66 | 2179.5 | 0.000 | 2.500 |
| Premiumisation, more lucrative | 68 | 0 | 58 | 1699.0 | 0.000 | 2.000 |
| New products, very different | 68 | 0 | 48 | 719.5 | 0.090 | 0.500 |
| Low-volume-high-variety business | 67 | 1 | 62 | 1793.5 | 0.000 | 2.000 |
| Flexible production methods | 68 | 0 | 65 | 2088.5 | 0.000 | 2.000 |
| No formal R&D | 67 | 1 | 64 | 1659.0 | 0.000 | 1.500 |
| Regular customer contact | 68 | 0 | 64 | 2069.0 | 0.000 | 2.000 |
| Large retailers, main customers | 65 | 3 | 59 | 87.5 | 1.000 | -2.000 |
| Travel for product ideas | 67 | 1 | 58 | 650.0 | 0.945 | -0.500 |
| Informal Innovation | 67 | 1 | 65 | 1836.5 | 0.000 | 2.000 |
| Cross functional  Innovation | 68 | 0 | 67 | 2227.5 | 0.000 | 2.500 |
| Ability to explore markets | 67 | 1 | 57 | 1497.0 | 0.000 | 1.500 |
| Good fit with market needs | 67 | 1 | 63 | 1988.5 | 0.000 | 2.000 |
| Continuous learning | 68 | 0 | 68 | 2346.0 | 0.000 | 2.500 |
| Financial constraints in NPD | 67 | 1 | 65 | 1963.5 | 0.000 | 2.500 |
| Understanding of customer needs | 67 | 1 | 63 | 2012.5 | 0.000 | 2.000 |
| Attract and retain talent | 67 | 1 | 44 | 779.0 | 0.000 | 1.000 |
| No major marketing effort | 68 | 0 | 63 | 1561.0 | 0.000 | 1.000 |

$H_0: \mu = 0; \qquad H_1: \mu > 0$

Table 19 Wilcoxon Signed Rank Test: Companies employing 50 or more

| | N | N for Test | Wilcoxon Statistic | P | Estimated Median |
|---|---|---|---|---|---|
| Creative NPD team | 15 | 15 | 111.5 | 0.002 | 2.000 |
| Premiumisation, more lucrative | 15 | 15 | 107.5 | 0.004 | 2.000 |
| New products, very different | 15 | 12 | 62.5 | 0.036 | 1.000 |
| Low-volume-high-variety business | 15 | 9 | 40.0 | 0.022 | 1.000 |
| Flexible production methods | 15 | 15 | 120.0 | 0.000 | 2.000 |
| No formal R&D | 15 | 15 | 58.0 | 0.556 | 0.000 |
| Regular customer contact | 15 | 14 | 93.0 | 0.006 | 2.000 |
| Large retailers, main customers | 15 | 14 | 54.5 | 0.462 | 0.000 |
| Travel for product ideas | 15 | 14 | 57.5 | 0.389 | 0.000 |
| Informal Innovation | 15 | 15 | 104.0 | 0.007 | 1.500 |
| Cross functional  Innovation | 15 | 14 | 91.0 | 0.009 | 2.000 |
| Ability to explore markets | 15 | 14 | 97.0 | 0.003 | 1.500 |
| Good fit with market needs | 15 | 15 | 106.5 | 0.004 | 2.000 |
| Continuous learning | 15 | 15 | 114.0 | 0.001 | 2.000 |
| Financial constraints in NPD | 15 | 13 | 78.0 | 0.013 | 1.500 |
| Understanding of customer needs | 15 | 15 | 113.5 | 0.001 | 2.000 |
| Attract and retain talent | 15 | 14 | 100.0 | 0.002 | 1.500 |
| No major marketing effort | 15 | 13 | 75.5 | 0.020 | 1.000 |

The test involving the segregated sample of 68 small companies employing less than 50 people does not support the same two propositions rejected by the tests involving all 85 companies, however, the test in this case additionally rejects one more proposition relating to new products being very different from the existing products. The test in case of 15 companies employing 50 or more people, does not support the same two propositions rejected by the tests involving all 85 companies, however, the test in this case additionally rejects one more proposition relating to no formal R&D.

### 8.3.7 **Influence of size**

The graphical presentation of data shows that the sample companies are dominated by small companies. Those that employ less than 50 people are 85% of the responding companies. From this, it appears that more small companies are innovative in Scotland in comparison to their larger counterparts. Statistical testing however reveals that the situation may be the other way round. Calculations from data on size of employment in Scottish companies that employ 1 person or more show that mean employment in such Scottish companies is 24.87 persons (Scottish Business Statistics, 2008). The mean employment in survey companies, is however 48.79. This means that survey companies are larger than Scottish companies in general.

One sample 't' test for the survey data shows that against a population mean size of 24.87, the mean size of survey companies is higher and *this difference is statistical significant* at 94.7% confidence level. This should be interpreted to mean that ability of a business to innovate is influenced by its size and larger Scottish companies are more likely to be innovative than their smaller counterparts[16].

Table 20 One-Sample 't' test, Employment

| N | Mean | Std. Deviation | Std. Error Mean |
|---|---|---|---|
| 83 | 48.789 | 111.0764 | 12.1922 |

| Test Value = 24.87 | | | | | |
|---|---|---|---|---|---|
| | | | | 95% Confidence Interval of the Difference | |
| t | df | Sig. (2-tailed) | Mean Difference | Lower | Upper |
| 1.962 | 82 | .053 | 23.9192 | -.335 | 48.173 |

### 8.3.8 **Influence of age**

As is seen in the graphical presentation of data, young companies in the sample are few and companies that are older are many, particularly companies that are over 15 years old. From this it appears that fewer younger companies are innovative than their older counterparts. Calculations from data on age distribution of Scottish companies (ONS, 2008) using 20 years as proxy age for the group '10 years or more'

[16] This inference however, is not very robust for two reasons. Exact mean employment in Scottish companies as well as survey companies is not known and the employment data from survey is slightly skewed.

gives the mean age of Scottish companies in year 2008 as 11.42 years. The mean age in survey companies in comparison is 11.54. From this, in terms of age, the survey companies do not look very different from Scottish companies in general. One sample ‘t' test for the survey data also shows that the mean age of Scottish companies and the mean age of survey companies, is *not significantly different* at 95% confidence level. This should be interpreted to mean that ability of a Scottish business to innovate is not influenced by its age[17].

Table 21 One-Sample ‘t’ test, Age

| N | Mean | Std. Deviation | Std. Error Mean |
|---|---|---|---|
| 83 | 11.54 | 7.677 | .843 |

| Test Value = 11.42 | | | | | |
|---|---|---|---|---|---|
| | | | | 95% Confidence Interval of the Difference | |
| t | df | Sig. (2-tailed) | Mean Difference | Lower | Upper |
| .157 | 82 | .876 | .132 | -1.54 | 1.81 |

### 8.3.9 **Survey limitations**

1. The conclusions drawn from this survey cannot be generalised to all sectors of the Scottish economy as the survey companies are drawn from a limited number of sectors.
2. The results for 15 large companies may not be conclusive because of relatively small sample size.

## *8.4 Summary of survey results*

The graphical presentation of survey results show that out of 18 propositions examined by this survey, prima facie, 14 are accepted, 2 are rejected and 2 have mixed response. It is further observed that most survey companies network with their customers and suppliers for new product development but few do it with their competitors or Scottish Enterprise and collaboration in new product development with universities is almost nonexistent amongst the survey companies.

In order to investigate the trends that appear from graphical presentation of survey results, further statistical tests are conducted. As the survey data is not normally

[17] This inference is also not too robust for two reasons. Exact mean age of Scottish companies as well as survey companies is not known and the age data from survey is slightly skewed.

distributed, a nonparametric test (Wilcoxon Signed Rank Test) is used for testing of hypothesised propositions.

A summary of results of triangulation survey for all responding companies as well as for each sub-group of responding companies in the segregated data analysis is given below in Table 22.

Table 22: Summary of results of the triangulation survey

| Survey propositions | All | Survey sub-groups | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Low-Tech | High-Tech | Food & Drinks | Non-Food & Drinks | Age 0-10 | Age > 10 | Emp < 50 | Emp 50+ |
| | Number of companies | | | | | | | | |
| | 85 | 59 | 23 | 29 | 53 | 43 | 40 | 68 | 15 |
| Creative NPD team | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| Premiumisation, more lucrative | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| New products, very different | ✔ | ✘ | ✘ | ✘ | ✘ | ✘ | ✘ | ✘ | ✔ |
| Low-volume-high-variety business | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| Flexible production methods | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| No formal R&D | ✔ | ✔ | ✘ | ✔ | ✔ | ✔ | ✔ | ✔ | ✘ |
| Regular customer contact | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| Large retailers, main customers | ✘ | ✘ | ✘ | ✘ | ✘ | ✘ | ✘ | ✘ | ✘ |
| Travel for product ideas | ✘ | ✘ | ✘ | ✘ | ✘ | ✘ | ✘ | ✘ | ✘ |
| Informal innovation | ✔ | ✔ | ✘ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| Cross-functional innovation | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| Ability to explore markets | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| Good fit with market needs | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| Continuous learning | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| Financial constraints in NPD | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| Understanding of customer needs | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| Able to attract and retain talent | ✔ | ✔ | ✔ | ✘ | ✔ | ✔ | ✔ | ✔ | ✔ |
| No major marketing effort | ✔ | ✔ | ✘ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |

✔ Proposition supported
✘ Proposition refuted

The test results show that out of 18 propositions put to test, 16 provide statistically significant results. As one of the propositions, "*Innovative companies face significant financial constraints in new product development*" accepted at 95% significance level, is inversely worded *vis-à-vis* the survey finding, the case study finding *Innovative companies do not face any significant financial constraints in new product development* stands rejected. The data encompassing all 85 survey companies, thus, reveal the following features of product innovation by Scottish business:

1. Creative people with high innovative proclivity play crucial roles in new product development.
2. Successful new products are very different from innovative companies' existing products[18].
3. New product development towards more luxuriant and expensive products offer better value for money spent on innovation.
4. Scottish companies involved in new product development are high-variety-low-volume businesses.
5. Innovative companies use production methods that are amenable to quick changes in final products.
6. Formal R&D is absent in innovative Scottish companies.
7. Innovative companies remain in regular contact with their main customers throughout the product development process.
8. In innovative Scottish companies, the basic innovation process is informal and cross-functional.
9. Innovative companies possess ability to explore and reach potential markets.
10. Continuous learning is observed in the innovative companies.
11. Innovative companies have a good understanding of customer needs and user circumstances.
12. Innovative companies are able to attract and retain requisite talent for new product development.
13. Innovative companies demonstrate an ability to develop markets without any major advertising or marketing effort.
14. Innovative companies exhibit a good fit between market needs and firm's resources.
15. Innovative companies face financial constraints in their efforts to develop new products.

Segregated data analyses of 59 'low-tech' companies, 29 food & drinks companies, 53 non-food & drinks companies, 43 companies that are 10 or less years old, 40 companies that are more than 10 years old and 68 small companies employing less than 50 people replicate all the above conclusions with one exception. The

[18] This proposition, though is supported in testing in data from all 85 responding companies, it is not supported in analysis of data for a large number of sub-groups of companies.

proposition *"successful new products are very different from innovative companies' existing products"* is not confirmed in all these cases at 95% significance level, though it is accepted at a slightly less stringent 90% significance level in most.

The product innovation practices in 23 'high-tech' enterprises however, are significantly different from the general trends. In their case, the propositions related to successful new products being very different from company's existing products, no formal R&D, informal innovation and no need for major marketing effort to sell new products too are not supported. This confirms the presumption on which this research is based that innovation process in often-studied high-tech enterprises is unique and different from innovation in low-tech enterprises, which form the majority of businesses in Scotland.

In the case of 15 large companies that employ more than 50 people, the additional rejected proposition relates to no formal R&D.

Other findings of the survey include, cooperation and networking for innovation largely with customers and suppliers, larger Scottish companies more likely to be innovative than their smaller counterparts and the lack of influence of the age of the enterprise on product innovation.

# 9 Conclusions

## 9.1 Background

This research set out to investigate the process of innovation and new product development in the Scottish food SMEs. As no previous work exists in this area, primary data collection involving case studies of eight small food companies was undertaken. For the purpose, from an analysis of determinants and process of innovation reported in the literature, a framework of analysis was created. Based on this framework, a format for semi-structured interviews was designed. A list of innovative Scottish food companies was first prepared with consultation with the industry experts and contacts within the Scottish Food and Drinks, the relevant Scottish Enterprise cluster. A formal letter was then sent out to the managing directors of twelve such companies. Nine[19] of them agreed for interviews. To have the first-hand account of the NPD process in this industry, all interviews, barring one, were conducted on-site. All recorded interviews, except two, were transcribed. Interview summaries based on detailed notes were prepared for non-transcribed interviews. Raw data thus generated was collated into different segments of inquiry. The semi-structured nature of interviews led to the generation of considerable information not previously reported in literature. These interviews lasted between one and half to two hours and in transcribed and summarised versions, created a document, which through careful analysis revealed the principal drivers of innovation in the Scottish food industry and distilled a distinct underlying process common to these enterprises and many of its little known components. Finally, a larger survey of Scottish companies that have successfully developed new products was carried out to triangulate the case study findings.

## 9.2 Conceptual underpinnings of analysis: Definition of innovation

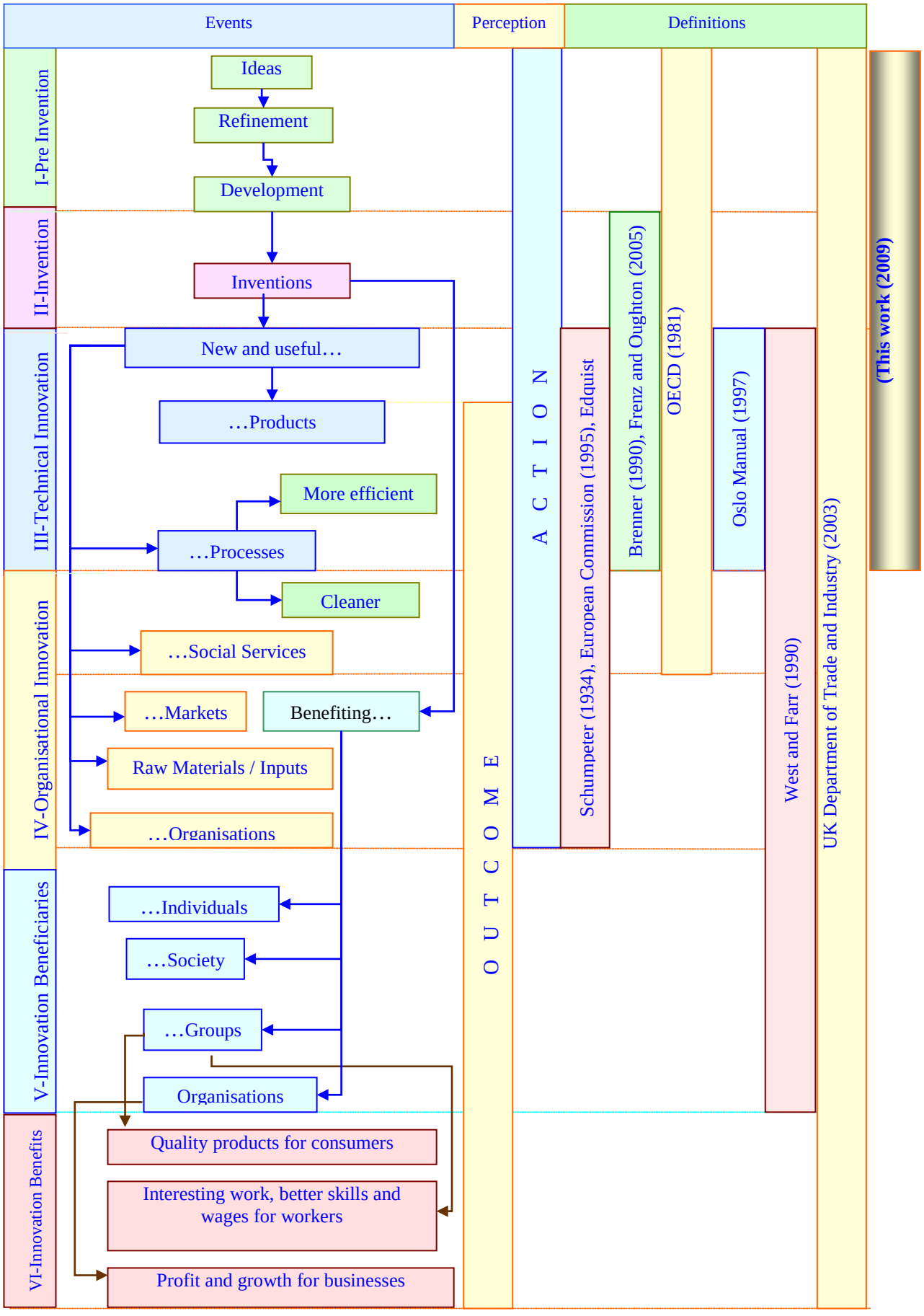
[19] In case of one of the companies, only a telephone interview could be conducted and in an earlier draft of this thesis, details of this company were included. During the writing of the present draft however, I decided to omit this company, as the degree of details required to carry out some of the later analysis is not possible in case of this company.

Studies of innovation often result in very diverse and sometimes conflicting conclusions. This is attributed partly to lack of universally accepted definition of innovation (Le Bars *et al*., 1998 and Grunert *et al.*, 1997) and partly to the fact that a wide heterogeneity of sources and outcomes makes innovation difficult to identify and analyse (Dosi, 1988). In an attempt to understand the reason behind the persistence of such incoherent notions of innovation amongst scholars and to see if many well-known articulations of the innovation process can be logically juxtaposed in the same theoretical space, a set of often quoted definitions of innovation were examined. The exercise led to the realisation that though the definitional writing on innovation includes several aspects of a large span of overlapping actions and outcomes, incorporating six definitive segments[20], a particular definition might include only a certain few. Definitions with uncommon segments thus appear to describe innovation differently. If we chart all elements of these six segments successively, we could visualise the full extent of an 'innovation-span' within which all notions and definitions of innovation can be accommodated. The charting of an 'innovation-span' in this manner, provides a new insight in how the conflict in understanding and therefore analysis of innovation can be resolved. The proposed innovation-span affords a way out of an avoidable academic debate and advances our understanding of innovation. It also helps put any work on innovation in a proper context by positioning it within the span.

The usefulness of the notion of 'innovation-span' becomes immediately obvious when we try to position the current research within it, as shown in figure 35. As, this work explores the refinement and development of ideas into new and useful products and processes in the Scottish food SMEs, it relates to segments I, II and III of the innovation-span. It is thus evident that the process of innovation in the Scottish food SMEs investigated here falls within the view of innovation articulated by OECD (1981), though, because of an obvious absence of social services in the Scottish food SMEs innovation, it is marginally different. On the other hand, though, this work analyses innovation on the same lines as suggested in the Oslo Manual (1997) as well by Brenner (1990) and Frenz & Oughton (2005), by analysing the pre-invention segment too, not considered by them, it goes beyond.

[20] Pre-invention, invention, technical innovation, organisational innovation, innovation beneficiaries and innovation benefits

Figure 35: The Innovation Span revisited



Its relative position vis-à-vis, definitions by the Department of Trade and Industry (2003), West and Farr (1990), Schumpeter (1934), European Commission (1995) and Edquist (2001) can be similarly marked.

Here it is imperative to clarify that another strand of writing on innovation, focussed on the national system of innovation, analyses innovation from a different outlook and the idea of 'innovation-span' though still relevant may not be very useful in visualising innovation from a national system's perspective. Another obvious comment at this stage would be that this research is not on the Scottish system of innovation as it touches only one of its elements, the government policy towards innovation manifested in the role played by Scottish Enterprise in supporting innovation in the Scottish food SMEs.

## *9.3 Taxonomy of innovation*

Taxonomical efforts on innovation have resulted in many classifications. The prominent amongst them are technical versus organisational, product versus process, radical versus incremental and new to the firm versus new to the market innovations.

Technical innovations refer to development of new products, services and production processes (Knight, 1967; Daft, 1978 and Damanpour and Evan, 1990). Organisational innovations, on the other hand, refer to innovations that are related to alteration in an organisation's structural and administrative procedures (Knight, 1967; Daft, 1978; Kimberly and Evanisko, 1981 and Damanpour and Evan, 1990).

During the course of this investigation, it was observed that innovation in the case study companies is geared largely towards technical innovation and there is relatively less evidence of organisational innovation. Though organisational innovations, in the form of alterations in an organisation's structural and administrative procedures, are less evident here, there is, however, evidence of a whole gamut of activities that should be considered as organisational innovation exhibited by the case study companies. These include innovations in logistics, supply chain management and subcontracting. One interesting example of this is Company E, which found insurmountable obstacles in exporting haggis and other Scottish food products to the

USA because of the restrictions imposed by the American Food and Drugs Administration. This company circumvented the problem by getting these products manufactured in Canada, as Canadian produce is not subject to such stringent conditions as the European food products are for import into the USA. Similarly, many of these companies had to exhibit great ingenuity and deploy innovative methods to get round the problem of transporting small quantities of food to a very widespread market without compromising on the economies of scale.

In terms of product versus process innovation, the innovation in the case study companies is predominantly product focussed. One reason for this is that some relatively smaller case study companies, using two-stage idea validation serve a niche market and do not need any changes in existing manufacturing to produce new products. These companies thus have carried out product innovation without any preceding or concomitant process innovation. Slightly larger companies, which principally supply to grocery multiples, however, sometimes need to make minor changes in manufacturing to successfully create new products. In these cases, process innovation, if indeed it occurs, is a by-product of product innovation. As the customer-tastes have been changing over time and the buyers are looking for new kinds of food, there is often discussion between food companies and their grocery multiple associates if a new product to cater to this newly emerging need is possible and potentially profitable. If there is consensus between the two on this, then the subsequent search for ways and means to produce it sometimes leads to realisation that current manufacturing methods may have to be altered to produce it. This process change, however, is achieved not by inventing new kind of machines or manufacturing methods but by using some manufacturing equipment not used previously. The resultant process innovation is thus new to the firm but not new to the industry.

In terms of radical versus incremental innovation, the case study companies engage very much in incremental rather than radical change. Some people in the industry use a distinct jargon to express these incremental changes. A *range change* or a line extension involves changing only some ingredients in a product that is otherwise identical to previously made product; a *recipe change* involves making an altogether new recipe previously not a part of the company's product range. This recipe then

may undergo several range changes over its life. Ultimate in the league is the *format change*, which may involve major changes in packaging or processing. The format change thus is not really a radical product innovation. It is a relatively bigger change in the manner in which the product is produced or packaged.

Though, the Scottish food companies engage in some imitation, new products here usually reflect incremental change, which is most often marginal but sometimes, quite substantial. New to the firm innovations thus here are far more numerous than new to the market ones. The format change is a process innovation but not a radical process innovation, described in literature, as a major technological breakthrough. The vocabulary used by the respondents to describe the hierarchy of innovations thus is different from the standard taxonomy of innovation. The hierarchy here is purely in terms of the amount of money needed to carry it out. Range change needs very little monetary expenditure, recipe change needs a bit more and a format change needs the most. The first two are incremental product innovations of varying degrees whereas the third one is an incremental process innovation requiring a far larger investment.

To sum up, the evidence from the case studies suggests that innovation in the case study companies is more technical and less organisational; it is largely in products and less frequently in processes; it is very often incremental and rarely radical; it is mostly new to the firm and less frequently new to the market.

As the survey to triangulate the case study findings is focussed on product innovation, survey results have bearing on only one of the case study finding pertaining to incremental product innovation. Confirmation of survey proposition, '*innovative companies' successful new products are very different from their existing products'* means that case study observation on incremental product innovation is not borne out in the larger Scottish survey involving all 85 companies. Though the fact that this proposition is rejected in the segregated data analysis involving 59 'low-tech' companies, 23 'high-tech' companies, 29 food & drinks companies, 53 non-food & drinks companies, 43 'young' companies, 40 'old' companies and 68 small companies means that the case study finding on incremental innovation is observed in a wide variety of sub-groups of innovative Scottish companies. In fact, it is only

the sub-group of 15 larger companies, which is not engaged in incremental innovation. As the case study companies are all small and the only sub-group of survey companies that does not show evidence on incremental innovation are larger companies, it appears that only larger companies an afford to engage in costly radical innovation. Rest of the Scottish companies like the case study companies focus on incremental innovation.

## *9.4 Determinants of innovation*

Because of the overwhelming evidence of beneficial consequences of innovation on the performance of a business and that of business performance on job creation and income generation in a region, innovation studies have been perused with vigour for a good part of the 20th century and the first decade of the 21st century is no exception. The most obvious focus of such studies has been the determinants of innovation. As a result, a large repertory of economic, social, psychological and physical factors has emerged as innovation determinants. There have also been efforts to bring together several interrelated factors affecting innovation, to provide them with a common nomenclature and present them as a single influencing orientation of a business affecting its innovative performance. Following is a re-examination of some of the prominent determinants of innovation discussed in Chapter 2, in the light of the findings of this research detailed in Chapter 6 and Chapter 8.

### 9.4.1 Internal strategic factors

#### 9.4.1.1 Market orientation

Market orientation is variously described as integration of customers into product innovation processes, ability to explore and reach potential markets, a fit between market needs and firm's resources, product planning from inception, targeting the international market, the span of market experience, and the understanding of customer needs and user circumstances (Heydebreck, 1997 and Lindman, 2002). Heydebreck (1997) shows that the integration of customers into product innovation processes leads to a higher degree of success in achieving product development objectives. The crucial aspects of a heightened market orientation include competition analysis, co-operation, partnerships, speed and flexibility (Soderquist *et al.*, 1997). It is also understood that market research has a role in understanding

customer needs and likes and it provides useful inputs to create new goods to suit a diverse set of end-users (Edgett and Parkinson, 1994). In analysis of new service development too, it is found that successful service companies judge potential of proposed new service through Market tests and deploy user feedback extensively to modify a service innovation (De Brentani, 2001).

The following indicators of market orientation can be derived from the above literature review. Integration of customers into product innovation processes, ability to explore and reach potential markets, fit between market needs and firm's resources, product planning from inception, targeting the international market, the span of market experience, the understanding of customer needs and user circumstances, competition analysis, co-operation, partnerships, speed and flexibility, market research, market tests and deployment of user feedback to modify an innovation

From amongst these indicators, co-operation and partnerships are excluded from further analysis as they are analysed as independent determinants of innovation in this research. Only remaining twelve indicators are, thus, analysed to ascertain the presence or absence of market orientation in the eight case study companies.

A strong market orientation was found to be the most visible common denominator in the conduct of the investigated businesses. All the case study companies show significant market orientation as out of possible twelve indicators they demonstrate evidence on an average of seven indicators. We can thus say that innovative Scottish food companies exhibit a high level of market orientation. Company D and G are the most market-orientated organisations with evidence on nine indicators. Other companies, however, are not far behind as in three other enterprises, B, E, and F presence of eight indicators is visible and two others Companies A and C show it on seven. Only company H shows a lower market orientation than other case study companies. It is the only health food company in the case studies, and so bucks the trend due to its unique situation.

All eight case study companies show evidence of ability to explore and reach potential markets. All of them also have a long span of market experience, minimum

being nine years. Fit between market needs and firm's resources, understanding of customer needs and user circumstances and speed and flexibility in new product development is also highly evident as seven out of eight enterprises demonstrate them. Product planning from inception, competition analysis and market research, however, are less frequent as only half of the case study companies provide evidence on these indicators. Integration of customers into product innovation processes, targeting the international market, use of market tests and deployment of user feedback to modify an innovation are the least visible of indicators of market orientation in the case study companies.

Speed and flexibility, another set of indicators of high market orientation, too are quite evident here. The flexibility comes because of small size, being labour intensive, from being not too rigid about rules and procedures and the fact that their products are hand-finished rather than totally machine-made. The innovative advantage of these companies stems from the fact that the large businesses using automated processes cannot show the agility needed to alter their products quickly to suit the changing customer needs as much as these companies can.

The triangulation survey of 85 innovative Scottish companies, confirms all propositions taken from the analysis of case study results on market orientation, except one. Fit between market needs and firm's resources, understanding of customer needs and user circumstances and flexibility in new product development are all strongly supported by the survey for all 85 companies and for each sub-group of companies involving segregated data analysis.

The long span of market experience however, is not confirmed by the survey as the survey companies are fairly well distributed across age cohorts with 40 companies in the 10-year plus age group and 43 in the less than 10-year age group[21]. The long span of market experience in the case study companies may have been influenced by the way these companies were selected. The search was made for small Scottish food companies known for successful development of new products. The companies that are operating for longer periods are known to more people than start-ups and so when inquiries were made for recommending case study companies, the

[21] Age of two companies is not known

recommended companies turned out to be those that are in the market for longer periods.

#### 9.4.1.2 **Learning processes**

Organisational learning depends on how the knowledge formation process works and drives the innovation strategically in an organisation (Stata, 1989). It fosters creativeness and the ability to spot opportunities for innovation (Angle, 1989). Learning orientation is an indication of an appreciation of and need for absorbing new ideas (Hurley and Hult, 1998) and continuous learning is a way to attain and expand competitive advantage (Morgan *et al.*, 1998).

The case study companies boast of rich learning and knowledge construction processes both in innovation and in routine manufacturing. For long, they have been accumulating and imparting practical trade knowledge to new generation of family members and new employees. An insatiable appetite for new knowledge and willingness to travel an extra mile to gain it are also quite visible. In search of product ideas and to learn about new trends in food consumption and production, these entrepreneurs and executives roam the world. The executive chef in one of the businesses, exceptionally well travelled already, continues to travel a lot, eats out and watches the new food trends. In the ice cream enterprise, public at the enterprise's visitor centre are given milk, cream, sugar, flavours and an ice-cream freezer and are invited to make ice cream of their choice. This is how the business gets ideas from the public on what kind of ice cream they would like and know quickly what is popular.

Company C is the best learning organisation amongst the eight case study companies as it provides evidence of all five indicators of learning processes influencing innovation. Companies A, D, F, and G have fairly well rounded learning processes, as four indicators of learning processes are evident in their conduct. Companies B and H are moderate learning organisations. Company E, however, lags far behind other case study companies and need to improve on this count if it wishes to become more innovative.

Ability to spot opportunities for innovation and continuous learning are the most observed indicators of learning processes in the case study companies. These indicators are visible in 7 out of 8 investigated organisations. Knowledge formation to drive innovation strategically, fostering creativity and appreciation of and need for absorbing new ideas are also prevalent as they are observed in five organisations.

From amongst 'ability to spot opportunities for innovation' and 'continuous learning', two most observed indicators of learning processes, continuous learning was picked up for testing through the triangulation survey. As all survey companies have developed new products, ability to spot opportunity for innovation was considered inevitable in all respondents and it seemed meaningless to ask a question on this. The proposition on continuous learning tested in the triangulation survey was supported both in the aggregate data analysis as well as in each sub-group of companies in segregated data analysis.

#### 9.4.1.3 **Technology policy**

Ettlie and Bridges (1982) explain that an organisation's technology policy involves its attitude and commitment towards innovation. It entails things such as recruitment of technical people, investing funds in the development of new technology and attaining as well as maintaining technological leadership. Soderquist *et al.* (1997) quote several empirical studies to claim that the presence of an explicit policy to deal with the issues of development of new ideas, products and processes points to the firm's technology orientation. Lindman (2002) suggests strong R&D orientation, active search for new technological knowledge, product uniqueness and products with technological newness as well as large application scope as indication of high technology orientation. It is also believed that an organisation's active acquisition of new technologies in itself should be considered innovative, as they can then employ them to develop new products (Cooper, 1984, 1994).

It is observed that only some elements of technology policy are used for innovation by the case study companies. Commitment towards innovation, recruitment of technical people, investing funds in the development of new technology, development of new ideas, products and processes all are evident in the conduct of these businesses. Contrary to a layperson's perception, technology policy has some

role to play in innovation in low-tech sectors. These companies, however, do not carry out R&D separately and their product development process runs concurrent with manufacturing. This confirms that the informal nature of R&D function in these enterprises is similar to what has been previously reported in literature (Kleinknecht, 1987; Santarelli and Sterlacchini, 1990; Kleinknecht and Reijnen, 1991; Sterlacchini, 1990).

The reason for a subdued technology policy in these companies is understandable. These companies are not involved in high-tech innovation but in low-tech largely incremental innovation. For them technology policy is not a major driver of innovation. As shown in figure 20, in Chapter 6 for the seven indicators of innovation influencing technology policy only company A and B have a fair record, as they demonstrate evidence on five and four respectively. Companies C, D, G and H have not done that well with only three indicators. Companies E and F give poor technology policy evidence with only two indicators.

Development of new ideas, products and processes is observed in all the case study companies and it is not surprising. As the theme of this research is innovation and new product development and as these companies are chosen for this investigation for their record in development of new products, the results show evidence from all of them on this count. On the rest of the indicators, however, these companies have not done so well in terms of technology policy indicators. For instance active acquisition of new technologies is shown only by four companies whereas active search for new technological knowledge and products with technological newness are demonstrated by only three, which again reconfirms status of their innovation as low-tech. Only two enterprises have developed products with large application scope, which shows that most of these companies serving small niches have not tried to expand their markets. Most importantly, this investigation shows that none of the eight case study companies have strong R&D orientation which raises questions on validity of an R&D-centric innovation policy of Scottish Government, discussed in Chapter five.

*'Absence of formal R&D'* was chosen from the analysis of technology policy, as an important case study finding to be tested through the triangulation survey. This is

confirmed in the tests involving all 85 companies as well as most sub-groups of companies in segregated data analysis. In case however, of 23 ‘high-tech’ companies and 15 larger companies, this proposition is not supported. The intuitive expectation that ‘high-tech’ and larger companies would carry out formal R&D, is thus confirmed by the survey. This again highlights an important point made earlier. The sub-groups of companies, which are distinctly different from the case study companies, have certain unique aspects of product innovation, not observed in the case study companies.

#### 9.4.1.4 **Cooperation and networks**

It is widely believed that successful SMEs use cooperative networks to compensate for their individual weaknesses. Dickson and Hadjimanolis (1998) argue that as SMEs generally lack resources such as professional skills and research equipment necessary for innovation, they must obtain them from external agencies like other enterprises, research institutes and the universities. Relationship building with external organisations and networking with them is therefore vital for innovation success of SMEs. Quoting Teece, (1986) they further argue that co-operative acts such as common R&D, strategic alliances and joint ventures are specifically vital to small firms as their innovative conduct has implications beyond them and their markets. They, thus, perennially need resources and knowledge not available within the enterprise. Innovative firms that find their internal resources and capabilities inadequate may thus try to forge formal and informal associations and networks with external agencies that possess them.

Out of eight companies, all provide evidence on some kind of cooperation and networking with external entities. This cooperation and networking, however, is utilised for the purpose of new product development by only four companies and only two companies cooperate for new product development with other food companies. The premier role of cooperation and networking amongst same sector SMEs reported in literature, thus, is not observed in significant amount in the case study companies.

In the triangulation survey, the respondents were asked to choose between customers, suppliers, competitors and Scottish Enterprise as their networking partners, with the

option to mark as many as applicable. 93% respondents showed customers and 58%, suppliers as their partners. The survey however, shows that only 20% of innovative companies cooperate with Scottish Enterprise. The more troubling conclusion here however, is that only two of 85 survey companies and none of the case studies companies are networking with universities for product innovation. In this context, it is pertinent to note that Franz *et al.* (2004) attribute Scotland's good performance as novel product and process innovator despite low intramural investment in R&D to *'the Scottish innovators' higher propensity to enter into cooperative arrangements for innovation with the universities and research organisations'*. The survey does not find evidence of such behaviour.

#### 9.4.1.5 **Managerial efficiency and Financial Resources**

Beaver and Jennings (2000) believe that the entrepreneur and the key decision makers in the firm must possess a unique and diverse set of managerial skills and capabilities to carry out successful innovation. In the same context, Grieve-Smith and Fleck (1987) point out that small firms have serious problems in obtaining and grooming requisite managerial talent, since they cannot afford the pay and prerequisites the large firms usually provide. Managerial inadequacies within SMEs such as poor planning and financial judgement too make innovation impossible (Barber *et al.*, 1989). The other indicated managerial deficiencies include insufficient delegation, high turnover of managerial staff (Nooteboom, 1994) and dependence on word-of-mouth sales without any coordinated marketing effort (Oakey, 1991).

None of the above is observed in the case study companies. On the contrary, these organisations exhibit remarkable managerial efficiency. They also demonstrate significant delegation. During the process of new product development, there is involvement of people from a variety of functions and everybody's opinion is seriously considered. It is a firm conviction in these companies that good ideas and valid objections to them can come from anywhere and the question of insufficient delegation does not apply to them. As mentioned previously, these businesses are dependent for both new product development and routine management on ability of a handful of people, which in most cases include the owner entrepreneur. Only a small number of other managers are needed and no indication is given that there is any difficulty in recruiting or retaining them. Bakers and chefs are the technical people

pivotal to food company innovation and the case study companies have been able to get and keep high calibre people in these departments. The reason may be that amongst their kind, these are relatively more successful companies and pay reasonably well. They are also not in direct competition with any big companies for the kind of products that they make and so not susceptible to poaching. Truly creative individuals employed by these enterprises love the charged, challenging and entrepreneurial environment of these enterprises and are not willingly to go away to big bureaucratic businesses for extra money. Marketing inefficiencies similarly are not applicable here as many of these enterprises market their produce through the grocery multiples which are involved from the very beginning of product development process. Most of their products are therefore marketed successfully. One case study company, not supplying to grocery multiples, too has a successful and growing export trade. The role of Scottish Enterprise is also vital here as it supports these enterprises in whatever aspect of managerial capability they may be lacking.

These companies are involved in low-tech innovation. Unlike the high-tech innovation of their counterparts in new technology sectors innovation by low-tech SMEs does not need massive financial resources. They are thus able to carry out innovation and new product development without any major financial constraints. There is also no evidence of paucity of managerial staff. All these companies are able to recruit and retain requisite managerial talent. In many cases the entrepreneurs themselves are adequately skilled and endowed in innovative abilities and do not need much external recruitment. They have also been able to develop their markets well without any major marketing effort or large advertising budgets.

The ability of a small firm to innovate depends very crucially on its ability to manage resources needed for innovation. It is pointed out in the literature that SMEs face serious constraints in recruiting, training and retaining competent and qualified managerial workforce due to the lack of capacity to compete in labour markets, inability to pay high wages, high costs of staff training and continuous poaching by large firms (Westhead and Storey, 1996; Advisory Council on Science and Technology, 1991; Oakey, 1997). As is pointed out above, the case study companies face no such problems.

In the same context, Beaver and Prince (2002) note that the innovative small firms have diverse and distinct financial needs. They require seed finance as well as development finance and they must pursue R&D for a long time before they have any commercially viable products. During this time, investors must wait before they get any returns. Innovation process needs significant up-front expenses, usually not available from within the small firm's own resources. Apart from this, inability of the financers to appreciate clearly the viability and feasibility of innovation projects makes it difficult for the small firm to manage its finances.

There is no evidence of resource inadequacy affecting ability to innovate of the case study companies, as none of the businesses complained that their capacity to innovate, in any way, is hampered by a resource crunch. The reason for this is obvious. These are low-tech food companies. Their new product development process is not very costly. High-tech innovation needs massive investment in R&D, in both infrastructure and work force. This is not the case here. On the other hand, these are reasonably profitable and growing companies and do not seem to lack resources, particularly so as their innovations are mostly high-price, high-margin and they have an enviable success rate in NPD. Equally importantly, entrepreneurs behind these enterprises are so much driven by their creative passion, that they are willing to plough in all resources at their command to continue innovation.

Three main conclusions from the analysis of *managerial efficiency and human and financial resources* are included for testing in the survey.

1. Innovative food companies are able to engage in innovation and new product development without any significant financial constraints.
2. They do not face shortage of competent people to develop new products and
3. Innovative food companies demonstrate an ability to develop markets without any major advertising or marketing effort.

The survey rejects the first conclusion and confirms the remaining two. These results are repeated across most sub-groups of companies in segregated data analysis. Unlike the case study companies, the survey companies including the food and drink companies report that they face significant financial constraints in new product development, which obviously means that the case study companies are

more resource rich than other innovative Scottish companies a fact highlighted later in this chapter. The greater surprise however, is that the conclusion that innovative companies do not face shortage of competent people to develop new products is confirmed by the overall survey results as well as in the segregated testing involving all sub-groups except 29 food & drinks companies. This means that on this count the case study companies are similar to other innovative Scottish companies but dissimilar to other innovative Scottish food and drinks companies.

### 9.4.2 Internal non-strategic determinants

#### 9.4.2.1 Age and size

Schumpeter takes two diametrically opposite positions on the age and size of enterprise as the determinants of innovation. In his early work he observes that small firms using new technology find it easier to enter an industry (Schumpeter, 1934). He therefore visualises the small new firms as drivers of innovation and claims that successful new firms usher in new ideas, products and processes. Their emergence, thus, disrupts existing arrays of organisation, production and distribution and quasi-rents, resulting from earlier innovations, are eliminated. He refers to this dynamics as 'creative destruction' and this thesis is referred in the literature as *Schumpeter Mark I* pattern of innovation (Avermaete *et al*., 2003). In his later work (Schumpeter, 1942), referred as *Schumpeter Mark II* pattern of innovation, he takes a position that large firms using their huge financial resources engage in R&D projects accumulating in the process, technical expertise in their areas of specialisation and thus use innovation as a barrier to entry in the industry (te Velde, 2001).

In the case study companies, age does not emerge as an influence on the innovation process. They show a wide variation in age profile of enterprises (from 9 years to 35 years). As the mean age of business is more than 20 years here, the case studies do not give any indication that innovation in these companies is driven by the young and nascent enterprises. On the other hand, as this study is focussed only on small companies, the influence of size factor is not ascertainable.

Schumpeter's analysis, however, is based on one premise. To him, creation of new technology precedes all kinds of innovation. In 1932, he sees small new firms creating new technology and causing in its wake creative destruction and in 1942, he

observes large and established firms using their massive resources to develop new technologies. Schumpeter's view of innovation thus is essentially technology-driven. It is not applicable to the case study companies and for that matter to innovation in any low-tech sector. The case study companies do not need to develop new technology to create new goods. They are able to do so using the existing technology. The case studies therefore can neither corroborate nor dispel either of the two Schumpeterian hypotheses. It though proposes one of its own. In low-tech industries, innovation is independent of the age of enterprise. It is, however, difficult to prove it firmly from a qualitative research effort involving case studies of only eight companies. This proposition, though, found support during the validation of main findings of this research as well as in the triangulation survey.

In the case studies, a comment on influence of size on innovative ability of an enterprise could not be made, as all the case study companies are small. The survey allowed an opportunity to test both the influence of age as well as that of size on product innovation. Apart from confirming the case study findings that the age of an enterprise is immaterial to its ability to successfully create new products, the survey discovered that the size does matter and a larger company is more likely to be innovative than its smaller counterpart.

#### 9.4.2.2 **Innovative workforce**

Some analysts claim that success in innovation is people dependant rather than resource dependant (Rothwell, 1983, 1992) and it is the nature and quality of its workforce that would determine whether a business is able to innovate or not. It is very true in the Scottish food innovation context where in the case study companies, innovation is clearly people driven and not resource driven. In this low-tech sector, product development process is not too resource consuming, ability to innovate here, therefore, depends almost totally on the creativity and innovativeness of people in the product development teams. It is also pointed out by the analysts that small businesses cannot match the pay, career prospects and job security provided by large firms. They are, thus, unable to compete for skilled labour (Bosworth, 1989), which is a prerequisite for successful innovation, particularly during the initial stage of product development (Adams, 1982). More recently, KPMG's survey *Aiming to Grow in 2005* reports that 33% Scottish SMEs complain that skill shortage have a

detrimental impact on their new product development process (SFDF Manifesto, 2007). However, as pointed out above in the context of managerial efficiency, obtaining and grooming requisite managerial talent, is not an issue with case study companies.

De Jong *et al.* (2003) in review of new service development literature report that enterprises that develop new services use methods and techniques that foster and direct staff creativity, screen promising staff ideas and put in place mechanisms for guiding service development process. Innovative food companies in Scotland do the same. In the same context, Patterson's (2000) model of employee innovation show *Motivation to Change* and *Challenging Behaviour* to be positively related to innovation and *Consistency of Work Styles* and *Adaptation* negatively related to it. As explained in chapter 6, the case study respondents have high scores on Motivation to Change and Challenging Behaviour, indicators of innovative behaviour whereas on Adaptation and Consistency of Work Styles, indicators of lack of creativity, all of them have relatively lower scores. The respondents thus show a high innovation potential that is corroborated by their prolific idea generation prowess as discussed in 7.4.2

The case study finding that creative people play crucial roles in new product development is supported unequivocally by the survey. The proposition that product development teams are made up of creative people is confirmed in the test involving all 85 companies as well as in the tests involving every company sub-group in the segregated data analysis.

## *9.5 Other explanations*

The companies investigated in this research are thriving business enterprises. Company A has recently successfully targeted international market and is now exporting over half a million pizzas to Italy and Germany. Company B is a market leader in the pate category in the whole of UK and Company C one of the largest independent bakers in Scotland. Company D has profitably launched its organic and fair-trade ranges of ice creams and has been receiving huge number of visitors to its adventure centre. Company E has a flourishing export trade and was on the verge of crossing half a million pound trade in US, at the time of investigation. Company F

has recently invested in a 10-million-pound ultra-modern manufacturing facility. Company G and company H have been so successful and their success so noticeable that they were recently bought out by multinational food giants.

As these are all very innovative companies and as discussed in section 2.1, the literature on business performance has consistently linked business success to innovation (Mansfield, 1968, 1971; Freeman, 1974; Temin, 1979; Cavanagh and Clifford, 1983; Dosi, 1988; Pavitt, 1991; Nonaka and Takeuchi, 1995; O'Gorman, 1997; Kotler, 1999; Frenz *et al.*, 2003; European Commission, 2004). Therefore, an obvious conclusion to be drawn here is that these companies are successful because of their innovation.

However, as most businesses do well when the economy is expanding one possible alternate explanation could be that these companies have succeeded due to expansion in the Scottish economy in the period prior to the case studies. To capture the status of growth in Scotland during the 10 years prior to the research let us look at the growth trend in the Scottish economy from 1995 to 2005. This trend is shown in the figure 36.

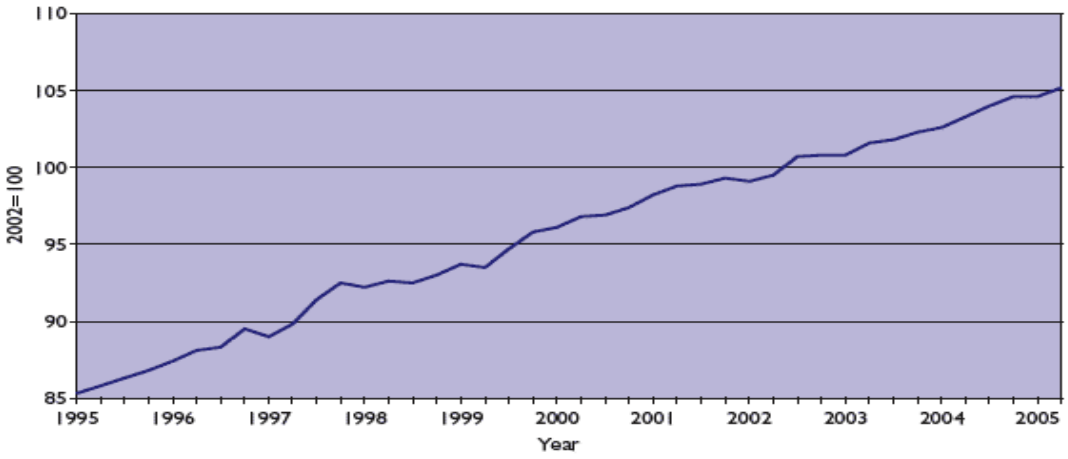



Figure 36: Scottish GDP Index 1995 Q1 - 2005 Q2

Source: Scottish Government

Figure 36 shows that in the decade prior to the case studies, the Scottish economy has been growing continuously. This however, has not been a period of rapid growth. During this period, the Scottish economy grew on an average at 2.1% per annum (Scottish Economic Statistics, 2005). Against this, the case study companies have grown much faster.

Though data on growth rates of these companies is not specifically collected the indirect evidence that is available shows that these are unusually fast growing companies and the country's rate of growth of about 2% is no comparison. For instance, as cited earlier Company C entrepreneur was expecting his turnover to grow from £5.2 million in 2006 to £7 million in 2007. This converts to a 35% growth in one year. As reported by the entrepreneur in Company D's its revenue was growing at 20% per annum in 2006. Company E's website mentions that the company doubled its production capacity between 2002 and 2007. This translates into a 40% per annum growth in capacity and company G was expecting its turnover to rise from £46 million in 2006 to £53 million in 2007, a 15% annual growth. The future growth of Company H similarly was expected to so stupendous that an international food giant bought this small company for a staggering £214 million. These statistics make this obvious that these companies are in a league of their own and their 15% to 40% annual growth cannot be explained by a 2% per annum expansion in the Scottish economy. Their success therefore must have occurred for reasons other than expanding economy and from the findings of this research; innovation appears to be a very strong contender as a contributing factor.

An analysis of some of the companies' however, does show that beyond their ability to innovate successfully some of the case study companies' special circumstances augmented their success. For instance in case of Company D, investment in the parallel business of an adventure centre led to a fast expansion in that arm of the business, which must have helped the food business. In case of company G, its licensing arrangement with Disney played a part in its success. Despite these two cases of non-innovation success factors, the role of high innovativeness of these enterprises in their success cannot be ignored.

A comparison of these companies' performance with what was happening to the rest of the food and drinks industry during 1995-2005 is quite instructive in this context.

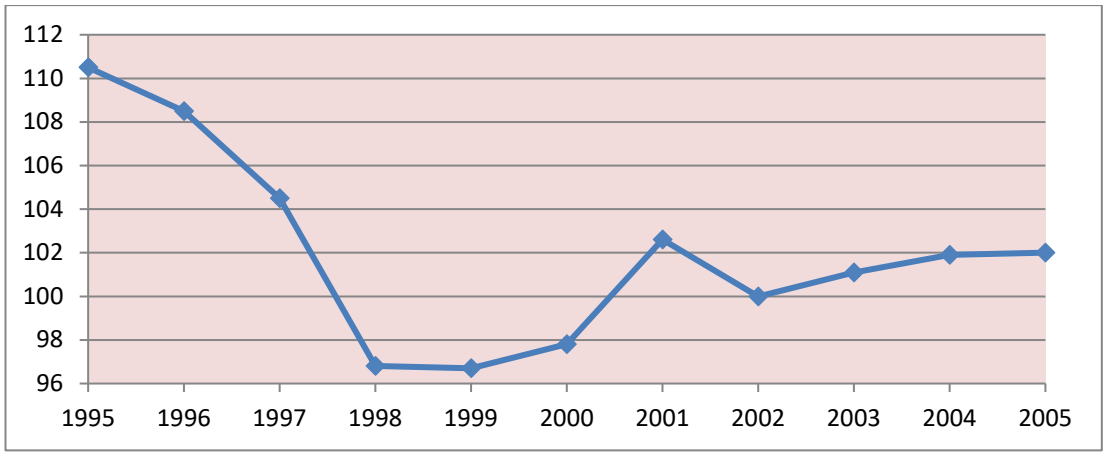



Figure 37: Scottish Food and Drinks GDP Index 1995 Q1 - 2005 Q2

Source: Scottish Government

Figure 37, shows that when the case study companies were registering rapid growth, the rest of the food and drinks industry had actually declined by about 1%. This again shows that the performance of these companies was not caused by general economic conditions. In fact, because of their innovation they are able to outperform both the Scottish economy as well as the food and drinks sector.

## 9.6 *Summing-up: Factors affecting innovation and new product development in Scottish enterprises*

The findings from the case studies after their triangulation through a survey of innovative Scottish companies show that innovation and new product development in the Scottish enterprises can be attributed to:

1. Strong *market orientation* reflected in their ability to explore and reach potential markets, fit between market needs and firm's resources, understanding of customer needs and user circumstances and flexibility of their production methods
2. High calibre *learning processes* reflected in continuous learning.
3. A *technology policy* highlighted by absence of formal R&D
4. *Cooperation and networking* principally with customers and suppliers.
5. *Managerial adequacy* reflected in ability to develop markets without any major advertising or marketing effort and availability of competent people to develop new products but *financial inadequacy* highlighted by financial constraints in new product development.
6. Creativity and innovative proclivity of people involved in the NPD process.

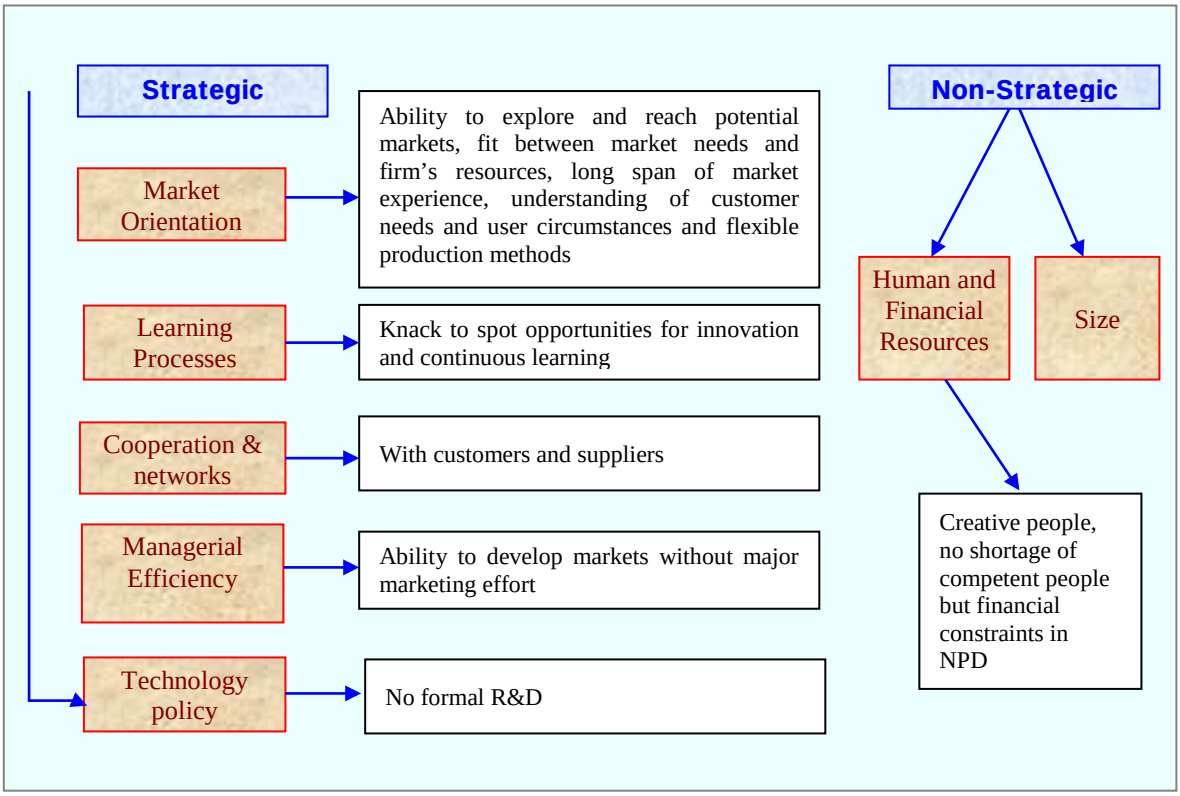



Figure 38: Innovation determinants identified in case studies and confirmed by the survey

## 9.7 *The underlying process of innovation in the case study companies*

The innovation process in the case study companies passes through three distinct stages, idea generation, idea validation and idea implementation.

Idea generation is not a problem for these businesses, driven, as they are, by some very creative people who exhibit distinctive personalities and score high on Peterson's (2000) innovation potential indicator scale. Though the main entrepreneur is the most prolific generator of ideas in these businesses, other individuals, with equally high innovation proclivity, often supplement the idea generation task. Consumers too contribute to idea generation indirectly through adoption of new trends, in the process, bringing pressure on the businesses to create goods reflecting them. There is no evidence of a formal idea generation process and very rarely market research is undertaken to search for new product ideas. Instead, most businesses have a close and regular contact with customers whose constant feedback fuels their creativity. 'Getting away' is the most often used approach by the investigated businesses for idea generation.

In some businesses, idea validation is a two-stage process but in most, the validation passes through three stages. In two-stage validation, usually the views of friends, relatives and employees are sought. In the three stage cases, the idea is first internally validated by a small group of people associated with product development and being impacted by it and then, it is validated by one or more major customers usually supermarkets or the up-market grocery chains. Keeping on board those impacted by it from the very beginning helps in understanding and sorting out any teething troubles that may come up when the product is formally commissioned. Companies using a two-stage process are smaller companies serving a niche market such as organic food or ice cream and need little changes in existing manufacturing to produce the new product. Idea validation, though largely informal, works well as a large number of people, representing a variety of internal functions (as well as the customer representatives, in the three-stage version) interact continuously, closely scrutinising the potential products from a host of perspectives. The validation process appears seamless and woven into the daily company routine.

The idea implementation stage of new product development too is very much concurrent and cross-functional and involves intensive consultation. The customers, which in many cases are grocery multiples, are involved in implementation process from the outset. The success rate of new products in the case study companies is very high and they are able to put products in the market in a relatively short period. One of the reasons for such success rate despite little or no market research is that many of these companies do not have to get it right the first time. As the product is a food item, bought in small quantities on a daily basis, the companies continue to monitor customer reactions after the launch and are able to make changes for some time even as it is being produced, packed and put on the shelves (though some supermarkets do not allow this). Early customer reactions continue to influence product changes until the companies get it right. Despite such trial and error approach, implementation does not take long in case study companies. The process from ideas to final products is completed within a year at the most and in most cases in less than six months.

There is evidence of extensive Scottish Enterprise support to case study companies. The support, however, does not relate to any particular component of the innovation process such as idea generation, validation or implementation but is rather for a

broad spectrum of general business functions many of them unrelated to innovation. The Scottish Enterprise support is targeted towards businesses with growth potential. As the case study companies have obvious growth potential, they have become a natural choice for support, which is comprehensive. It can be said that case study companies are able to focus on innovation, as Scottish Enterprise is extending help to growth (read, innovative) companies for just about every aspect of running the business. These businesses not merely acknowledge this support they also are clearly appreciative of its contribution. Most companies at the time of interview were either being helped by Scottish Enterprise or were contemplating seeking advice. The Scottish Enterprise support, however, does not come free or even cheap and some of the businesses are sceptical of quality of work done against the costs. The Scottish Enterprise seems to reduce support as an enterprise comes in a situation from where it grows on its own. As one of the respondents interpreted this as waning interest, Scottish Enterprise needs to communicate its approach to the supported businesses more clearly. There is also the feeling that Scottish Enterprise is passing through financial difficulties and has become more bureaucratic, compromising its ability to help.

In the NPD process in the case study companies, product, process, logistics, supply chain and packaging innovations are interwoven. In product innovation, the underlying idea is not merely to be different but also to offer quality that is superior to what is currently available. The approach is to look at the existing offerings, contemplate what they lack and then use the expertise they have to try to create a superior version or versions that suit the British and the Scottish taste. There is very little evidence of radical innovation and some signs of imitation. As these are mostly small-volume-large variety businesses, they have plenty of scope for incremental change, the predominant theme, therefore, is that of incremental innovation.

Apart from the innate creativity of people at the helm, the exceptional flexibility of these organisations makes them successful innovators. The flexibility comes because of small size, being labour intensive, from being not too rigid about rules and procedures. Their innovative advantage stems from the fact that the large businesses using automated processes cannot show the agility needed to alter their products quickly to suit the changing customer needs as much as these companies can. A

combination of factors, thus, seems to be at work. On the demand side, a pressure from the grocery multiples to change the product and the packaging driven by changing tastes and preferences of consumer and on supply side the creative urge of some exceptionally gifted people, their long experience in the food industry and the flexibility and speed of their organisations to develop and deliver new goods in quick time.

A major finding of this study is the role of grocery multiples in driving innovation in the case study companies. All investigated businesses, except one, supply mainly to the multiples. Remarkable complementary roles played by small food companies and multiples in steering the food sector innovation in Scotland were observed. The complementariness between the two, works something like this. For a small food company the most obvious path to fast growth and assured survival is to become a supplier to multiples. Multiples, however, are reluctant to change their incumbent suppliers even if offered better quality of the same product at a lower price by a new supplier. On the other hand, as the competition in the grocery trade is becoming increasingly variety based, they are highly receptive to new products and look proactively for innovators. The most obvious choice for a small food company thus, is to create new products, if it can, if it wishes to become a multiple's supplier.

This investigation found significant evidence of networking in the case study companies. There is a long tradition of collaboration in the Scottish food and drinks industry and evidence of its beneficial consequences. Networking, however, is shaped here more by complementariness rather than the need for the competitors to work together for their mutual benefits. These companies network more often with their customers and suppliers and less often with their competitors. There is one distinct type of intra-firm networking in existence. Many of them come together and combine their products to create a larger and more complete menu. They then market this composite menu through one single marketing effort.

In the case study companies, creation of healthy foods is not the most chosen path to innovation. Food companies, from a market perspective, divide their products in two broad categories, those that people buy for their nutritional needs and those that they buy as a treat or indulgence. There is overwhelming consensus within the industry

that it is futile to create healthier versions of indulgences. It is believed that trying to make indulgences healthy, compromises their taste and jeopardises the very reason for people to buy them. In a related occurrence, some companies who tried to get into the organic food bandwagon early on, now have given up the effort and believe that it was a mistake, particularly as bulk of their sale is within Scotland where healthy living, at least now, is not very popular. Multiples, responsible for driving innovation in this sector, too discourage creation of healthier versions of indulgences, as they are poor sellers.

Out of eight case study companies, only four are exporting and only one earning significantly from exports. Some of them do not export because they think they have a market in the UK big enough to cater. For others, willing but unable to export, two factors seem to operate as inhibitors. One, their products are perishable and two; theirs is a low-volume-high-variety operation. Some of these varieties have export potential but they sell in such small quantities in a given country that trying to export them makes no economic sense. Only one case study company, which interestingly is also the only one not selling to multiples, has significant revenue coming from the US exports in which it visualises substantial growth potential. This has one interesting implication. Multiples, which are driving innovation in this sector, are also reducing incentive to innovative companies to export. For small companies exporting and selling through grocery multiples both are plausible routes to rapid growth. Developing export market, however, is not easy. In contrast, for an innovative food company, getting into the multiples' fold is relatively easy due to high receptivity of multiples to new products.

Another distinguishing feature of the innovation process in food companies in Scotland is the quality of their products. The successful innovative food companies in Scotland not merely develop new products; they develop high quality new products. For them quality is a prerequisite for innovation. These companies intentionally search for more luxuriant and higher quality products capable of being positioned at higher end of the value chain. This allows them to charge a premium, making innovation rewarding and profitable. Charging premium, however, is not possible through ordinary products and so genuine high quality becomes an integral part of product development strategy. At the same time as the Scottish people in

general are not known for being very conscious of the health effects of diet, this bias for quality does not take direction of organic or functional foods but turns more often towards indulgences which fits well with the high-price, high-margin, low-volume models of these businesses.

To sum-up, case studies of eight innovative food companies show that they deploy an informal idea generation process made seemingly effortless by creativity of product development teams helped by their practice of regularly getting away from their everyday environment. Very small companies serving a niche market use a two-stage idea validation here whereas slightly bigger companies use three-stage validation also involving multiples' representatives leading to cross functional yet informal implementation with continued involvement of multiples. The process is marked by complementary roles played by small food companies and multiples in steering innovation and extensive Scottish Enterprise support for a broad spectrum of general business functions not necessarily related to innovation. Three strata of incremental innovation are evident here; range change, recipe change and format change, all leading mainly to creation of indulgences rather than healthy foods. A high success rate and flexible production methods leading to fast new product development is another hallmark of the process.

In the survey conducted to triangulate the findings of case studies most components of the above-described innovation process, observed in the case study companies, are reported. Some others however, are specific to the case study companies and are not seen amongst the survey companies. The survey companies, like the case study companies, use informal methods and creative individuals play central roles in their product development process. These people however, do not travel to new locations in search of new product ideas. Use of flexible production methods is another component of the innovation process that is reported by the survey companies. Incremental innovation though is not established by the larger survey, its presence is confirmed in a very large number of sub-groups of innovative Scottish companies. Close cooperation with customers too is observed in the survey companies as well though unlike the case study companies, their main customers are not large retailers. Innovation in survey companies is very much informal and cross-functional as is in the case study companies. The single most important difference between the survey

companies and the case study companies is absence of complementary role played by large retailers in new product development. As survey companies do not sell their new products through large retailers, absence of this practice amongst them, however, is only expected.

## 9.8 *Contributions to knowledge*

The main contributions to knowledge by this research include crystallisation of the new product development practices in Scotland, highlighting difference in product innovation practices between various sub-groups of enterprises, particularly between high-tech and low-tech enterprises, a new conceptual construct within which all notions and definitions of innovation can be accommodated and identification of a basic flaw in the present innovation policy in Scotland.

# 10 Recommendations

## *10.1 For non-innovative food companies*

The innovation process in the investigated companies, as identified in the case studies and confirmed by the survey is influenced significantly by the initiative, commitment and skills of certain creative individuals. The obvious and relevant question therefore is this. Can other non-innovative organisations start and continue new product development process in absence of such individuals? This research suggests that the non-innovative small food companies may be able to embark on innovation by taking the following route.

As detailed earlier, in some of the case studies companies, the hired employees who possess high innovative proclivity and who have long experience in the food industry, play crucial roles. These people are also empowered with sufficient flexibility and discretion in decisions concerning innovation. Non-innovative organisations willing to embark on a path to innovation must first recruit such people and delegate requisite independence and discretion to them. In two of the case study companies, the hired individuals who have significant authority in product development drive innovation almost single-handed. It thus seems plausible that if an organisation is able to recruit and empower people with such attributes they should be able to ignite the innovation process.

The successful new products that have come out of the case study companies are often a variant of their existing products. Though the triangulation survey does not corroborate this, barring the single sub-group of companies employing more than 50 people, the segregated data analysis of all other sub-groups of survey companies support this. The innovation aspirants therefore should proactively search for the answer to the following question. Which way the technology at their command and the products in their hands can be marginally moulded to cater to a long unfulfilled or newly emerging need (Vyas, 2009)? While contemplating new products to create, it would be a good idea to search for gaps in the market and try to conceptualise the products, which are feasible within the company's skills and expertise without a major investment in new technology.

After identifying the product idea, the company should go for its validation through intensive consultation involving all internal and external stakeholders to check for production feasibility as well as market potential. Case studies show that making several variants of a product and offering people you know, is the simplest and most effective method to ascertain market potential of a new food product.

In order to improve the product and achieve a good fit between the product and the customer needs, during the implementation stage when the product has been put in the market, a high sensitivity and responsiveness to customer reactions would be called for.

## *10.2 For the Scottish Government*

As explained in Chapter 5, there is a need on the part of Scottish Government to rethink its innovation strategy. Government's concern and determination to make Scotland a more innovative region are well known. The present strategy to achieve this, however, is flawed. The fault lies in the presumption that innovation is science-lad, occurs in the high-tech sectors and is caused by investments in R&D. It is true that in some businesses, innovation does occur in this manner but such businesses are in a minority in the present Scottish economy. None of the case study companies and barring the obvious exceptions of high-tech and larger Scottish companies, none of the sub-groups of innovative survey companies invest in formal R&D. If Scottish Government corrects its vision of innovation in Scotland and focuses its resources on understanding and supporting innovation in its low-tech traditional industries, it can make Scotland a more innovative and competitive region than what it is today.

## *10.3 For Future research*

This research, based on case studies of small Scottish food companies and a triangulation survey of innovative Scottish companies similar, as far as possible, to the case study companies, highlights many interesting features of product innovation in Scotland. A larger Scotland wide survey, on product as well as process innovation, involving enterprises from all sectors of the Scottish economy, including service organisations, should be more illuminating in explaining the totality of process of business innovation in Scotland.

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# 12 Appendices

## *12.1 Semi-structured questionnaire*

**History**

History and background of the company
Timeline and evolution to current market and products.
Are they naturally entrepreneurial?

**Innovation.**

Describe innovation as any activity to improve competitiveness.

What generally drives innovations in the company? Why do they do it? Do they have a view on anything about their company that makes them innovative – say size or lack of mechanised processes etc?

Ask for some company examples to focus on and ask to take us through these from market to production...

> Where do the (product) ideas come from? If there is a gap in the market how do they know this – is it formal market research or ad hoc? Is there a general trend they follow – such as health food fads / convenience food / use of natural materials etc?

How many ideas would they typically have over a time period and how many of these would get to the market?

How do they evaluate the ideas to tell which are likeliest to work? Do they try to judge the risk of putting new products out or do they just try it in small volumes and see if it works?

How are the innovations developed from infancy to being on the market? Are there any identifiable stages in the development process? Who is involved in this development process – particularly in terms of cross functional involvement?

Are there any other significant issues regarding the development process – lack of sufficient expertise / funding to carry it out / keeping the idea a secret?

**Support and help.**

What help and / or support do they get from agencies like Scottish Enterprise?

Do they have any collaboration or share information with other organisations? If they do, is there a trust issue? If they do what exactly is the added value of the collaboration?

## *12.2 Letter to the managing directors of innovative food companies*

14th November 2005.

**Innovation research – Napier University**

Dear -----,

Hi. My name is Ron Masson from Napier University Business School. I'm writing to you to ask if you might consider helping us with something.

I represent a research group who are trying to identify and explore some of the key issues that lead to companies being successfully innovative – particularly companies in the Scottish Food and Drink sector. Innovations would include any kind of change to products or processes, however trivial that lead to improved commercial success. It's apparent that your company may be one that does seem to be successfully innovative so we're interested in perhaps exploring, from your company's perspective, what are the things that can lead to successful innovations.

The research would in the main simply involve us talking to yourself and perhaps if necessary to some other relevant staff, say for an hour or so in two or three meetings spread over a couple of weeks. Napier University has a strict code of ethical research and data protection which binds us into not divulging any research results

such as these, or even that you are participating in any such research, without your written permission. You may of course wish to jointly publicise any results in such a way as to enhance the profile of your organisation.

If you are at all interested in helping us with this I wonder if you'd mind meeting myself and perhaps another member of our group to discuss this. I'll try to ring you in a few days.

The best wishes.

Yours sincerely,

Ron Masson,
Professor of Operations Management.
0131 45 4306 r.masson@napier.ac.uk

## 12.3 Innovative personality questionnaire

| This questionnaire has 36 statements. Rank each statement in a range from 1 to 5 using the adjacent scale. Remember there are no right or wrong answers. | Strongly disagree | Disagree | Neither agree nor disagree | Agree | Strongly agree |
|---|---|---|---|---|---|
| 1. I would always evaluate an idea before putting it into practice. | ① | ② | ③ | ④ | ⑤ |
| 2. I tend to reset the goals and objectives of the work regularly. | ① | ② | ③ | ④ | ⑤ |
| 3. I look forward to taking part in brainstorming sessions. | ① | ② | ③ | ④ | ⑤ |
| 4. I believe it is better to ask for forgiveness that to ask for permission. | ① | ② | ③ | ④ | ⑤ |
| 5. I would describe myself as a risk taker in the work that I do. | ① | ② | ③ | ④ | ⑤ |
| 6. I find it difficult to cope with shifting work goals. | ① | ② | ③ | ④ | ⑤ |
| 7. I love challenges. | ① | ② | ③ | ④ | ⑤ |
| 8. I find it easy to generate enthusiasm to complete tasks at work. | ① | ② | ③ | ④ | ⑤ |
| 9. I would never try out new ideas without proper authority. | ① | ② | ③ | ④ | ⑤ |
| 10. I only suggest new ways of doing things if they are really necessary to get the job done. | ① | ② | ③ | ④ | ⑤ |
| 11. I follow a strict system in the way I do the work. | ① | ② | ③ | ④ | ⑤ |
| 12. I find it easy to look at a problem from many different perspectives. | ① | ② | ③ | ④ | ⑤ |
| 13. I am aware that I am one of the last persons in the workgroup to accept something new. | ① | ② | ③ | ④ | ⑤ |
| 14. If I had a new idea, I would find it easy to influence others in the department. | ① | ② | ③ | ④ | ⑤ |
| 15. I prefer to use tried and tested methods to get the job done. | ① | ② | ③ | ④ | ⑤ |
| 16. I have ideas that would significantly improve the way the job is done. | ① | ② | ③ | ④ | ⑤ |
| 17. I often contribute to changes in the way the department works. | ① | ② | ③ | ④ | ⑤ |
| 18. I like to tackle one problem at a time. | ① | ② | ③ | ④ | ⑤ |
| 19. I sometimes get criticized for lacking discipline in m work methods. | ① | ② | ③ | ④ | ⑤ |
| 20. I try to avoid getting caught up in problems that have no clear-cut answers. | ① | ② | ③ | ④ | ⑤ |
| 21. I find it difficult to persuade others into the way of thinking. | ① | ② | ③ | ④ | ⑤ |
| 22. I tackle the work methodically. | ① | ② | ③ | ④ | ⑤ |
| 23. I try to adapt older methods of doing things rather than dream up totally new ideas. | ① | ② | ③ | ④ | ⑤ |
| 24. I try to improve the way I do the job rather than try ways that are totally new. | ① | ② | ③ | ④ | ⑤ |
| 25. I feel constrained by the work culture and the “way things are done around here”. | ① | ② | ③ | ④ | ⑤ |
| 26. If I felt strongly about a proposal I would take a stand against others. | ① | ② | ③ | ④ | ⑤ |
| 27. I am consistent in the way that I tackle work. | ① | ② | ③ | ④ | ⑤ |
| 28. I like to have frequent changes in the way I do the work. | ① | ② | ③ | ④ | ⑤ |
| 29. Others would describe me as predictable in the way I do the work. | ① | ② | ③ | ④ | ⑤ |
| 30. The peers describe me as a non-conformist. | ① | ② | ③ | ④ | ⑤ |
| 31. I would always challenge a decision at work if I thought it was necessary. | ① | ② | ③ | ④ | ⑤ |
| 32. It does not bother me if people around me at work disapprove the work methods. | ① | ② | ③ | ④ | ⑤ |
| 33. I require a positive feedback from others to persist with a new idea. | ① | ② | ③ | ④ | ⑤ |
| 34. I try to analyse new ideas carefully before using them for work. | ① | ② | ③ | ④ | ⑤ |
| 35. I find it difficult to gain a fresh perspective on old problems at work. | ① | ② | ③ | ④ | ⑤ |
| 36. I am better at thinking up new ways of doing things than actually carrying them out. | ① | ② | ③ | ④ | ⑤ |

## *12.4 Survey cover letter*

Dear Mr. X,

I am a researcher at Edinburgh Napier University.

Your company's achievements as an innovative business with a distinguished record of successful development of new products, has prompted me to contact you.

I am conducting a survey of innovative Scottish manufacturing companies. I would greatly appreciate if you (or a member of your product development team) could spare a few moments from your busy schedule to participate in the survey. It takes only 2 to 3 minutes to complete.

This is an anonymous survey. It does not include any questions, for which the response would reveal your identity. In any case, under no circumstances, the individual responses be made public. It is an on-line survey and you will be able to open and complete it by clicking on the following link.

http://www.surveymonkey.com/s.aspx?sm=O5a8EJwsXVBQV55PFsFx5w_3d_3d

*Some questions in the survey refer to 'new products'. Here 'new' means either new to your company or new to your market.*

If you have any questions or concerns feel free to drop me an email.

With regards,

Vijay

**Vijay Vyas**
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**Edinburgh Napier University**
**Edinburgh EH 14 1DJ**
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**Phone: +44 131 455 4715**

## 12.5 *Survey questionnaire*

**1. General Information**

**1. Our business is a...**
(Please choose from the following drop-down menu)

If you have chosen 'Other' (please specify here)

**2. My company has been in business for... years.**
(Please click on the appropriate answer)

- 0-2
- 3-5
- 6-10
- 11-15
- 15+

**3. We have been developing new products for... years.**
(Please click on the appropriate answer)

- 0-2
- 3-5
- 6-10
- 11-15
- 15+

**4. The total employment in my company is ... people.**
(Please click on the appropriate answer)

- 0 - 4
- 5 - 9
- 10 - 19
- 20 - 49
- 50 - 99
- 100 - 249
- 250 - 499
- 500 - 999
- 1,000 +

**2. Information on Innovation and New Product Development**

**1. The product development team in my company is made up of 'creative' people.** (Please click on the most appropriate level of your agreement or disagreement to this statement)

- Strongly agree
- Agree
- Mildly agree
- Neither agree nor disagree
- Mildly disagree
- Disagree
- Strongly disagree

**2. Development of 'premium' products has provided my company better returns on money spent than development of 'low-cost' products.** (Please click on the most appropriate level of your agreement or disagreement to this statement)

- Strongly agree
- Agree
- Mildly agree
- Neither agree nor disagree
- Mildly disagree
- Disagree
- Strongly disagree

**3. Successful new products developed by us are very different from our existing products.** (Please click on the most appropriate level of your agreement or disagreement to this statement)

- Strongly agree
- Agree
- Mildly agree
- Neither agree nor disagree
- Mildly disagree
- Disagree
- Strongly disagree

**4. I would describe my company as a 'low-volume-high-variety' business rather than a 'high-volume-low-variety' business.** (Please click on the most appropriate level of your agreement or disagreement to this statement)

- Strongly agree
- Agree
- Mildly agree
- Neither agree nor disagree
- Mildly disagree
- Disagree
- Strongly disagree

**5. Our flexible production methods allow us to alter and modify our products quickly.** (Please click on the most appropriate level of your agreement or disagreement to this statement)

- Strongly agree
- Agree
- Mildly agree
- Neither agree nor disagree
- Mildly disagree
- Disagree
- Strongly disagree

**6. There is no formal R&D department in my company.** (Please click on the most appropriate level of your agreement or disagreement to this statement)

- Strongly agree
- Agree
- Mildly agree
- Neither agree nor disagree

- Mildly disagree
- Disagree
- Strongly disagree

**7. We remain in regular contact with our main customers during the development of new products.** (Please click on the most appropriate level of your agreement or disagreement to this statement)

Strongly agree

Agree

Mildly agree

Neither agree nor disagree

Mildly disagree

Disagree

Strongly disagree

**8. We sell most of our new products to large retailers.** (Please click on the most appropriate level of your agreement or disagreement to this statement)

Strongly agree

Agree

Mildly agree

Neither agree nor disagree

Mildly disagree

Disagree

Strongly disagree

**9. Member/s of our new product development team regularly travel to new locations in search of new product ideas.** (Please click on the most appropriate level of your agreement or disagreement to this statement)

Strongly agree

Agree

Mildly agree

Neither agree nor disagree

Mildly disagree

Disagree

Strongly disagree

**10. I would describe the innovation process in my company as informal.**
(Please click on the most appropriate level of your agreement or disagreement to this statement)

Strongly agree

Agree

Mildly agree

Neither agree nor disagree

Mildly disagree

Disagree

Strongly disagree

**11. People in my company working on new product development also perform other roles within the organisation.** (Please click on the most appropriate level of your agreement or disagreement to this statement)

Strongly agree

Agree

- Mildly agree
- Neither agree nor disagree
- Mildly disagree
- Disagree
- Strongly disagree

**12. Our success in new product development is due to our ability to explore and reach potential markets.** (Please click on the most appropriate level of your agreement or disagreement to this statement)

- Strongly agree
- Agree
- Mildly agree
- Neither agree nor disagree
- Mildly disagree
- Disagree
- Strongly disagree

**13. There is a good fit between what the market needs and what we can provide.** (Please click on the most appropriate level of your agreement or disagreement to this statement)

- Strongly agree
- Agree
- Mildly agree
- Neither agree nor disagree
- Mildly disagree
- Disagree
- Strongly disagree

**14. We have been learning continuously from our efforts to develop new products.** (Please click on the most appropriate level of your agreement or disagreement to this statement)

- Strongly agree
- Agree
- Mildly agree
- Neither agree nor disagree
- Mildly disagree
- Disagree
- Strongly disagree

**15. We face financial constraints in our efforts to develop new products.**
(Please click on the most appropriate level of your agreement or disagreement to this statement)

- Strongly agree
- Agree
- Mildly agree
- Neither agree nor disagree
- Mildly disagree
- Disagree
- Strongly disagree

**16. We understand the needs and circumstances of our customers very well.**
(Please click on the most appropriate level of your agreement or disagreement to this statement)

Strongly agree

Agree

Mildly agree

Neither agree nor disagree

Mildly disagree

Disagree

Strongly disagree

**17. We are able to recruit and retain the competent people needed for new product development.** (Please click on the most appropriate level of your agreement or disagreement to this statement)

Strongly agree

Agree

Mildly agree

Neither agree nor disagree

Mildly disagree

Disagree

Strongly disagree

**18. We are able to develop markets for our new products without any major advertising or marketing effort.** (Please click on the most appropriate level of your agreement or disagreement to this statement)

Strongly agree

Agree

Mildly agree

Neither agree nor disagree

Mildly disagree

Disagree

Strongly disagree

**19. For innovation we depend on close cooperation with ...**
(Please click on as many options as are applicable to your company)

Our customers

Our suppliers

Our competitors

Scottish Enterprise

Other

Other (please specify)

## 12.6 Published work

1. Vyas, Vijay (2009) *"Survival and Growth of High-tech SMEs: Some Uncommon Strategies"*, in Manimala *et al.* (Eds.) Enterprise Support Systems: An International Perspective, Sage Publications

2. Vyas, Vijay, Laing, Susan and Craig, Aidan (2008) *"Relationship between R&D and Innovation: Implications for the Scottish Innovation Strategy"* Proceedings of Applied Business and Entrepreneurship Association International's Fifth Annual Conference, Hawaii, USA

3. Vyas, Vijay, Masson, Ron, Laing, Susan and Craig, Aidan (2007) *"Innovation and New Product Development in SMEs: An Investigation of Scottish Food Industry"* Proceedings of Applied Business and Entrepreneurship Association International's Fourth Annual Conference, Hawaii, USA.

4. Vyas, Vijay (2005) "*Imitation, Incremental Innovation and Climb Down: A Strategy for Survival and Growth of New Ventures"*, Journal of Entrepreneurship, Vol. 14, No. 2