

FUTURE SCENARIOS IN UK APPAREL SUPPLY CHAINS: A DISAGGREGATIVE DELPHI STUDY



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Document 5 is submitted in partial fulfilment of the requirements of the Nottingham Trent University for the degree of Doctorate of Business Administration.

Abstract

Purpose

The purpose of the paper is to explore the issues of strategic and supply chain alignment in the apparel supply chain now, and to establish future scenarios for the development of the apparel supply chain in the context of emerging retail strategy and a changing trading environment.

Approach

The approach adopted is a Disaggregative Delphi study based on interviews with experts from across the UK apparel supply chain, a survey ranking variables as important now and in 5 years' time and development of three future scenarios from which emerging supply chain configurations are presented.

Findings

The findings reveal a gap between retail strategy and supply chain practice, with cost and design integrity dominating supply chain decisions. Three future supply chain configurations are developed that illustrate varying tendencies towards enhanced standardisation and cost efficiency; proximity supported flexibility; and responsiveness to niche market demands, respectively.

Research implications and limitations

There is a lingering gap between theory and practice in the apparel supply chain, with a persistent focus on cost, limited adoption of fast fashion and an emerging emphasis on standardisation downstream. The supply chain configurations revealed reflect the difference between upstream and downstream practices which impacts on theory, as most extant research is retail centric. The research is limited to the apparel industry, but there is opportunity to generalise to other low-cost, fast moving consumer sectors.

Practical implications

The findings illustrate the opportunity for innovation in the apparel supply chain in response to growing multi-channel distribution and delays in product development, to align the supply chain with retail strategy. The lingering focus on cost, slow uptake of new technologies and deterioration in relationships is challenged.

Originality and value

Empirical evidence in the apparel supply chain is dominated by single case approaches and the retail perspective. This paper is unique in that it explores the whole apparel supply chain from multiple expert perspectives, while also developing scenarios to inform future research and practice. It introduces the concept of the Dissaggregative Delphi to supply chain 'futures' studies, reflecting the lack of a one-size-fits-all solution. The research explores the supply chain response to shifting retail strategy and reveals the emerging importance of downstream standardisation in future supply chain configurations – at the expense of responsiveness elsewhere in the supply chain.

Keywords

Supply chain strategy, responsiveness, fast fashion, new product development, sourcing

Acknowledgements

With thanks to my family, Joyce, Brian and Robyn.

Sincerest thanks go to my supervisors, Dr. Roy Stratton, Professor Clare Brindley and Barry Harrison and to mentors Professor Peter Doeringer and Dr. Peter Totterdill for their support and encouragement.

In memory of Helen, Nicola, Carol, Aija and Roz.

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1 Introduction

UK manufacturing has become a hot topic, thanks to exposure by Mary Portas with her knickers and The Cushion Factory (Grant, 2012) ... **but** is there real evidence of a significant redesign of the apparel supply chain? The initial strategic question posed for a longitudinal series of research studies undertaken within the DBA process (Oxborrow, 2007) asked: **“How can buyers and suppliers in the volatile UK apparel market address the challenge of supply chain responsiveness?”**¹ Debate within the industry suggests that opinions are still divided as to whether a sea change in garment sourcing and supply management could be the answer.

One view, from sourcing experts, espouses continued sourcing from emerging low cost countries, such as Nicaragua (Flanagan, 2012a), keeping high street fashion prices low. Furthermore, there are signs of continued sourcing from established suppliers in China where, although costs may be rising, productivity and innovation are also improving. An alternative view, proposed by some academics, points to the advantages of supply management practices that support flexibility and responsiveness (Holweg, 2005), better relationships with suppliers (Cox, 2004a), and agglomeration advantages (Carbonara et al., 2002; Holweg et al., 2011). These mechanisms are seen to support responsiveness to changing consumer behaviour and expectations, enhancing competitiveness in markets dominated by both fast fashion and product quality or differentiation. These views are exemplified – perhaps at the extreme - by companies as diverse as River Island and HJ Hall hosiery (ASBCI, 2012a), both increasingly utilising UK manufacturing, a shift that echoes recent investment in other industries. The research seeks to establish the reasons behind such strategic shifts, the extent to which these businesses are representative and whether practice and theory are aligned in the apparel supply chain.

1.1 The Research Aims and Domain

The primary aim of the research is to advance an objective view of present and future developments in the apparel industry supply chain, detached from the media reportage that has become common currency. In addition, the study aims to explore both downstream and upstream aspects of the supply chain, and to understand developments from a broader perspective than most extant literature. Initially, a background and context to the formal research is set out below, based on earlier research during the DBA process. The scope of the study encompasses all organisations within the apparel or clothing industry supply chain, but is primarily concentrated on the product development, production and distribution stages (encompassing textiles/ knit sourcing, garment design, construction and finishing, shipping, distribution and retail) that are carried out or managed from the UK. The apparel supply chain has undergone significant restructuring in the years leading up to this study, with increased outsourcing and globalisation evident from the 1980s onwards (Scheffer, 2012), culminating in the phase out of the Multi-Fibre Agreement between 1999 and 2005 in favour of more relaxed quotas and reduced trade tariffs (ibid). These developments are believed to have been instrumental in reshaping the global apparel supply chain, but there has been no major academic study of the apparel supply chain since they took effect, none that explores these changes

¹ Originally stated as: “How can buyers and suppliers in volatile retail markets deal with the challenge of providing responsiveness?”

in the light of developments in retail strategy, and few that explore the impact of these developments upstream in the supply chain.

What follows is a Delphi style research project designed to explore the current and future changes that are taking place within the apparel supply chain, in the context of strategic drivers in retail and supply. The research, undertaken between summer 2012 and 2013, involves a sequence of exploratory interviews with experts from manufacturing, sourcing and retail organisations within the industry, a survey to confirm the results and identify emerging trends, and the formulation and confirmation of scenarios that set out the most likely future developments in the configuration of the apparel supply chain - taking into account relevant external and internal influences.

1.2 Background: Previous Research

The Document presented here forms the 5th of a series of discreet research projects undertaken by the author. In Document 1, the overarching research strategy was introduced, posing the question: "How can buyers and suppliers in volatile retail markets deal with the challenge of providing responsiveness?" (Oxborrow, 2007). The conclusion of this overarching research plan was that the study needed to address issues of buyer-supplier relationships as well as operational and strategic challenges. The research bounded the study in volatile apparel retail markets in which the need to respond to regular and hard-to-predict changes in demand provides a driver sufficiently compelling to influence the structure and organisation of the supply chain (Fisher, 1997). Building on initial exposure to the industry, small firms (SMEs) within the supply chain were seen as a source of responsiveness, even though their relationships with retail buyers were seen as intermittent, lacking trust, and often adversarial (Hines and McGowan, 2005) – a theme pursued in Document 3.

1.2a Defining the supply chain

Document 2 (Oxborrow, 2008) explored, in much greater detail, the issues affecting the apparel supply chain from a mainly theoretical stance. Initially defining the supply chain as:

"that network of organisations that are involved, through upstream and downstream linkages, in the different processes and activities that produce value in the form of products and services in the hands of the ultimate customer or consumer" (Rogers and Tibben-Lembke, cited in Lysons and Farrington 2006:91)...

In this context, upstream and downstream represents the predominant flow of materials or services, while information flows in the opposite direction (Slack and Lewis, 2002). Thus, supply chain management is defined as:

"the management of upstream and downstream relationships with suppliers and customers to deliver superior customer value at less cost to the supply chain as a whole" (Christopher, 2005:5)

One unresolved issue in extant research is to understand how the benefits of responsive supply can satisfy the needs of all network members, taking into consideration value appropriation, power and relationship aspects, for which it is necessary to research upstream and downstream activity.

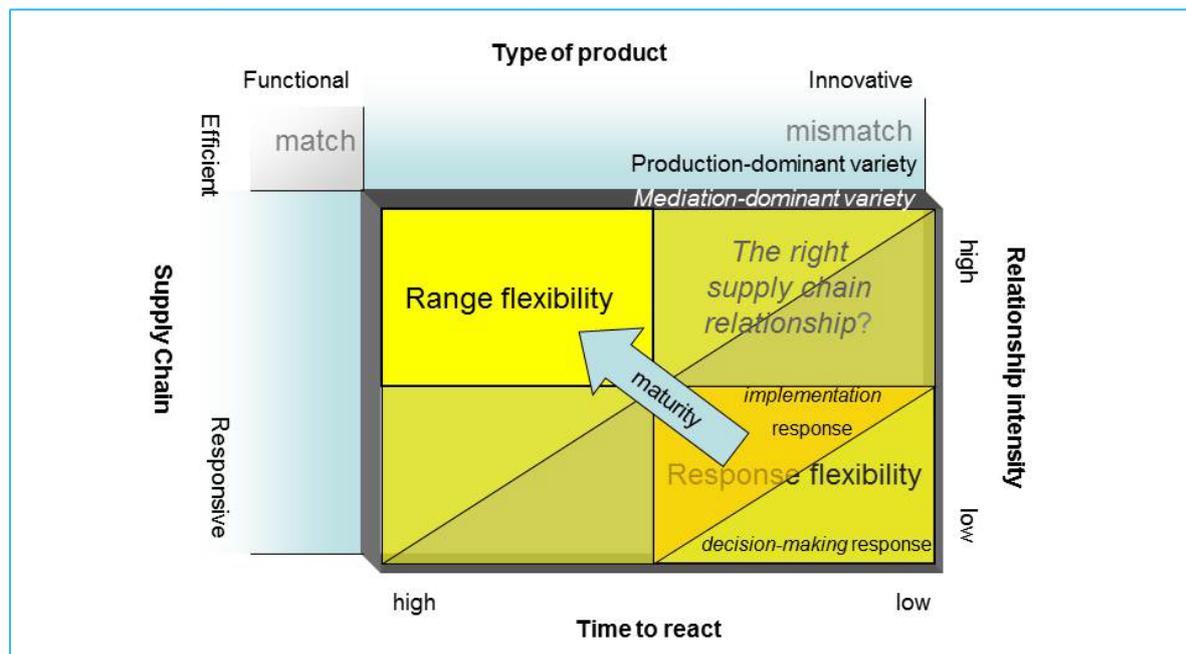
1.2b Supply chains and supplier networks

The review of extant literature in Document 2 (Oxborrow, 2008) combines the ‘prescriptive’ supply chain management school encompassing strategic, operations and logistics management, in which competing sets of supply chains or networks, collectively harness and manage resources (Lamming et al., 2000) with the network and relationship approach of the Industrial Marketing and Purchasing (IMP) group (Johnsen et al., 2006). Oxborrow (2008) draws from Hines and McGowan (2005) to conclude that the relationship and operations themes have difficulty finding mutual ground and are the source of a range of trade-off conflicts and a neglected area of research (Staughton and Johnston, 2005). This is exemplified from discussion of different types of flexibility, and the Document distinguishes between range and response flexibility, associating these respectively with long-term collaborative and short-term transactional relationships (Cheng et al, 1997; de Toni and Tonchia, 2005; Tachizawa and Thomsen, 2007). Maturity and closeness in buyer-supplier relationships supports flexibility through information sharing and common systems, but Oxborrow (2008) concludes that, in theory, closer relationships can lead to a loss of responsiveness, nimbleness and variety (Hines and McGowan, 2005; Schmenner and Tatikonda, 2005). This applies where responsiveness delivers flexibility in reaction to, rather than anticipation of, unpredictable external factors, in particular market changes, as defined by Holweg (2005):

“Responsiveness is the ability of the manufacturing system or organisation to respond to customer requests in the marketplace. To achieve responsiveness, certain types of flexibility are required of the manufacturing system supply and logistics subsystems. The types of flexibility required are contingent upon the system’s structure and environment” Holweg (2005:607-8)

From an operational perspective, responsiveness is seen as a particular strategic capability encompassing the stages of reaction time, (Slack 1987), “decision making response” and implementation response (Cheng et al. 1997:153). The relationship between these concepts was captured in a Conceptual model, as shown in Figure I.1, which expanded the responsive supply/innovative product quadrant of Fisher’s (1997) model.

Figure 1.1 Conceptual Model, Document 2 (Oxborrow, 2008)



From this theoretical stance a number of outstanding issues arise with regard to the apparel supply chain. With increased global supply, it seems pertinent to explore how physical as well as relational proximity affects flexibility and responsiveness in the global apparel supply chain, the extent to which location and physical proximity are inter-connected, and their influence on reaction, decision and implementation time. Other areas for exploration include the importance placed on such proximity factors and Holweg’s (2005) structure and environment factors on supply chain design, and the extent to which theory and practice converge – now and in the future.

In subsequent research (Oxborrow, 2011a), relationship factors were explored in greater detail. The research, undertaken with small UK apparel suppliers, uncovered predictably intermittent and fractious relationships (Cox, 2004a) delivered through a surprisingly complex pattern of triadic interactions between small manufacturers, employed or freelance designers and retail customers. It was also found that SME suppliers have taken on the role of providing a bank of pick and mix designs, to compensate for unresponsive downstream style/design decision making processes (Pan and Holland, 2006), and failed attempts to standardise and decouple upstream processes (Sharifi et al., 2006; Holweg, 2005). Kinship and upstream relationships enabled SMEs to deploy reactive capacity (Raman, 1998) to provide responsiveness and collectively these practices have supported acuity and re-engineering of some processes to help circumvent the slow design and decision making associated with mainstream supply. However, Oxborrow and Brindley (2012) also found that SME responsiveness is constrained by the constant threat of failure and de-selection. The Document also prompted the investigation undertaken in Document 4 – to establish whether local clustering of supply chain activity had helped to reinforce these practices and increase competitiveness.

Document 4 (Oxborrow, 2011b) sought to establish whether there is tangible evidence of the benefits that proximity and close relationships can contribute to apparel supply chain responsiveness. Using Cluster Analysis techniques in conjunction with a supply chain management approach (Carbonara et al., 2002) the research compared the sustainability over time of domestic clusters of apparel supply. While the results were statistically inconclusive, evidence suggested that

localised 'upstream' appropriation of materials, quality assurance and relationships have contributed to the longevity of some apparel clusters, including the womens' fashion cluster in Leicester, UK. The cluster also demonstrates less tangible socio-cultural benefits, such as tacit and codified knowledge sharing (Rosenfeld 1996), which supports 'strategic flexibility', fast *ex-ante* or *ex-post* reactions to market changes (de Toni and Tonchia 2005; Saxenian and Hsu 2001) and 'fashion' innovation (Aage and Belussi, 2008). The research queries the extent to which district advantage and agglomeration economies are achievable in the apparel supply chain on a wider scale or a global context when fragmentation of the cluster, shrinkage in the upstream textile element and anti-clustering outsourcing behaviour (Carbonara et al., 2002) is associated with global supply (Holweg et al., 2011). Remaining firms work to secure loyalty rather than financial benefit and time rather than cost saving (Doeringer and Crean, 2005; Matapoulos et al., 2007) with little evidence that this measurably improves cluster competitiveness (Doeringer and Terkla, 1995). There appears, therefore, to be a mismatch between the provision and uptake of responsiveness in the apparel supply chain, and Document 5 seeks to explore how, or indeed whether, buyers and suppliers in the UK apparel industry can improve responsiveness within the global context.

Overall, the prior research undertaken during the DBA process has followed a consistent theme, in terms of establishing the linkages between supply chain responsiveness and the nature and execution of relationships between buyers and suppliers. However, since 2008, the industry context has shown signs of changing with discussion of re-shoring (McKeigue, 2012; Couto et al., 2008) changing the focus of the research towards understanding how both physical proximity and proximity in relationships fit into the broader and changing supply chain context, a renewed interest on the supply chain environment and whether the supply chain can be re-designed for better alignment to strategic objectives. The research aims have broadened away from the study of SMEs to encompass a wider range of UK suppliers because the findings of Document 3 (Oxborrow, 2011a) revealed common issues and problems being addressed by retailers with their UK suppliers, regardless of size. The current research will therefore pick up and explore further the issues of UK apparel supply chain responsiveness within the context of global competitiveness, but rather than being rooted in the past, Document 5 seeks to explore current and potential supply chain configuration, management and constraints. The research will follow a systematic Delphi-type research process based on exploring views and experiences from across the whole supply chain, thereby filling a gap in extant knowledge (Christopher et al., 2011; Storey et al., 2006), and comparing theory to practice in the apparel industry.

1.3 Research Questions

As initially stated, the overall aim of the DBA series has been to answer the strategic question posed in Document 1 (Oxborrow, 2007) and subsequently modified: "***How can buyers and suppliers in the volatile UK apparel market address the challenge of supply chain responsiveness?***" The review of extant knowledge, set out in Chapter 2, has informed the research questions of this study, and as a consequence, the research questions below have been established for Document 5 to explore the drivers for change in the UK apparel supply chain, understand the nature of that change and build a picture of what might happen in the future.

1. How have strategic priorities changed in the UK apparel retail supply chain over the last 5-10 years?

2. How have these changes impacted upon the design of [and design for] responsive apparel supply chains for UK apparel retailers?
3. How will buyers and suppliers in the UK apparel retail supply chain address the challenge of responsiveness in the supply chain of the future?

1.4 Document Map

Having set out the context, justifying the research and identifying the key research questions, the document goes on to explore key themes in extant literature regarding supply chain strategy and management, both generically and in the apparel industry, as well as a review of current industry news articles. Chapter 3 explores the methodological issues of the Delphi study method, including a detailed exploration of the research and analytical implications of each stage of the Delphi process. In Chapter 4 findings are presented with an in-depth analysis, stage by stage of the systematic Delphi process, leading to the presentation of future scenarios and the associated emerging supply chain configurations for the apparel industry. The findings and analysis are discussed in the context of existing knowledge and the research questions in Chapter 5. The Conclusion furthers the discussion to include a summary of what the research has achieved, implications for further research and for business practice, and a discussion of the limitations of the research approach, with recommendations for improvement. Appendices provide background data on industry context, methodological approach, analysis and reference material for the readers' benefit and further interest.

2 Literature Review

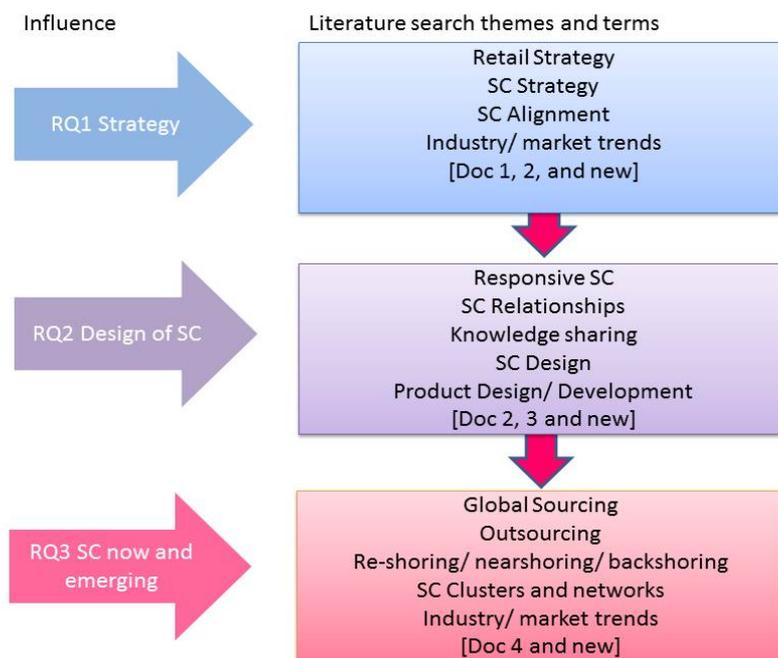
2.1 Introduction

The literature review sets out contemporary knowledge of the subject area to avoid replication, understand theoretical and methodological perspectives and compare the experience and findings of other researchers (Bryman and Bell, 2003). The review attempts to justify the choice of literature, provide an overview and critically discuss chosen concepts, theories and arguments with a view to summarising these into a framework linking the key elements together (Hart, 1998). It follows a five step process as set out in Wong et al. (2012) including: question formulation, locating studies, selecting and evaluating studies, analysis and synthesis of their contents and reporting of the results. The critical review thus serves the purpose of evaluating the material to ensure that it provides a robust starting point for further research (Fisher, 2004).

The literature review uses the extant knowledge discussed in Documents 2, 3 and 4 (Oxborrow, 2008, 2011a and 2011b) but, because of the time-lapse since these initial documents and the development of the research topic, has been substantially updated based on keyword searches, using NTU's 'Library Onesearch' facility which provides access to the Business Source Premier, Ingenta, Science Direct and Emerald databases. Serendipitous sourcing of relevant materials has also been undertaken, focusing on searches for work by specific authors whose early work was influential, well cited or of particular interest. These included Cachon and Swinney, Christopher, Khan, Lowson, Godsell and others. From understanding of the changing context and referral to Documents 1 and 2, search topics included retail strategy, supply chain strategy and alignment, and these will contribute to the answer of RQ1. To update knowledge of the attendant issues of supply chain alignment and configuration from Documents 2 and 3, search topics included supply chain design, responsive supply chain, product development/design and supply chain, supply chain relationships, all of which will contribute to answering RQ2. The emerging trends highlighted by the early contextual analysis contributed to a need to understand developments in supply chain sourcing, globalisation and location choices, and update knowledge gained in Document 4 on clustering and networks in order to answer RQ3. The rationale behind this process is summarised in Figure 2.1.

The chapter begins with a discussion of relevant aspects of retail strategy, supply chain strategy and, based on Fisher's (1997) concept, alignment between the two. This leads into discussion of aspects of lean retailing and supply chain, responsive supply and the associated apparel related topics of quick response and fast fashion. Sharifi et al.'s (2006) model of "*design of and design for*" the supply chain forms the basis of the discussion that ensues looking at the issues associated with achieving supply chain alignment, and is followed by a section that revisits and updates topics of sourcing strategy, location and risk. A discussion on roles and supply chain relationships concludes the discussion of extant literature. In addition, a contemporary account of practice and thinking in the apparel industry is presented, which serves as a basis for the Delphi study. The final contextual section is drawn from some 60 recent journalistic articles from industry and business sources, principally Just-Style.com, The Retail Bulletin and Drapers, which have been selected for their relevance to the search terms identified in Figure 2.1, mapped and coded against themes arising in the literature review and hence provide a justification for the research approach, a secondary account of the current context and highlight the confusion and disparity of practices within the industry.

Figure 2.1 Literature research rationale



2.2 Changes in Retail strategy

Supply chain strategy should complement retail strategy (Lowson, 2005). It is, hence, important to understand aspects of retail strategy and how these influence the development and operation of the supply chain in the apparel industry. Strategy formation, defined by Mintzberg as “a pattern in a stream of decisions” (1978:934) takes on a number of common organisational configurations (Miles et al., 1978) in response to a combination of entrepreneurial, engineering and administrative challenges. Miles et al. (1978) identify four strategic configurations: defenders, prospectors, analysers, and reactors; and organisations within each configuration share strategic, structural, and process characteristics. Defender organizations have well defined product ranges and markets, centralized control, and processes aimed at achieving efficiency (Ketchen and Giunipero, 2004; Miles et al., 1978) consistent with Marks and Spencer (M&S) in the years prior to 1998. However, as the market became more challenging, M&S began cautiously testing alternative strategies and revised its supply chain structure, to reinvigorate its market position while avoiding risk, adopting an ‘analyser’ configuration. On the contrary Zara is a ‘prospector’, finding new ways to continually enhance flexibility and competitiveness, in spite of the risk to profitability, exposure to market failure and lack of efficiency savings. Meanwhile supermarket chain ASDA, by employing entrepreneur George Davis to pioneer its ‘George’ clothing range without compromising its established core market is consistent with Miles et al.’s (1978) ‘analysers’ who enable the marketing perspective to drive process improvements. There is a lack of recent academic research into high level apparel retail strategy, so a detailed account of major strategic shifts in the UK apparel retail and manufacturing sector has been summarised in Appendix 2.1.

Within the supermarket sector, Gauri et al. (2008) found that the combination of price and store format determined differentiation strategies, and that only intense competition within a specific

pricing policy format led stores to adopt a differentiation strategy. In line with Gauri et al.'s (2008) findings, there has been a decline in the market share of mid-market apparel specialists (multiples and independents) and variety chains, associated with seasonal discounting and price incentives, in favour of everyday-low-price supermarkets and discounters (such as Primark, Matalan, George and Tesco) and, to a lesser extent, high-margin brand retailers (such as Fat Face and Superdry). Department stores and mail order formats have succeeded in re-inventing themselves by differentiation as multi-brand and multi-format outlets, retaining a stable market share (Keynote, 2011). A profile of apparel market share from 1991 to 2010 is shown in Appendix 2.2.

Extant literature includes a limited body of research relating to apparel retailers' lower level strategy such as branding, sourcing and marketing differentiation. The development of retail in-house or own brand (private label), considered "*a strategic tool for fashion retailers in the portrayal and control of the corporate brand within the market*" ... the motives for which are "*control, competitive advantage and ultimately profit*" (McColl and Moore, 2011:100) is an influential strategy for retailers. An example is the successful Designers at Debenhams portfolio which has underpinned the re-invention of department stores. Differentiation with own brand creates diversity through more-or-less exclusive products and can be aligned to Miles et al.'s (1978) prospector strategy by facilitating flexibility, and to the defender strategy by enabling process control over cost price, quality, differentiation, design, merchandising and the flow of goods (McColl and Moore, 2011). An own brand strategy and in-house design also provides the capability to turn around new styles from catwalk to store very quickly, although this does expose retailers to price deflation, the need to control suppliers and replace them quickly if something goes wrong and to co-ordinate upstream supply with marketing and demand.

The development of multi-channel retailing is also influential strategy, with both new and traditional retailers establishing mail order, online, and even mobile distribution channels (Mintel, 2011a; Rowley, 2009), in the UK illustrated by Next. Similarly, internationalisation - creating owned and franchised outlets in different countries - is a strategy to enable growth in otherwise mature markets, a tactic used successfully by Benetton (Carmuffo et al., 2001) and H&M, but which Birnbaum (2010) warns could force Zara to standardise design, distribution and sourcing. An associated strategic shift is the gradual move towards standardisation across different distribution channels, a policy that has become the norm for retailers reinforcing their brands through online and in-store sales (Rowley, 2009), as well as internationally (Carmuffo et al., 2001). These developments are important for the supply chain as Storey et al. (2006) and Godsell et al. (2011) advocate that supply chain strategic responses should be differentiated accordingly.

2.3 Supply Chain Strategy

Lowson (2003a) distinguishes between *market driven* strategies, aimed at cost savings, focus or differentiation, and *resource-based* strategies, that use resources, competencies and capabilities to facilitate difference and support strategic positioning. The latter are referred to by Hill (2005) as among a range of *market driving* strategies that specifically aim to outperform current market norms. Broadly speaking market driven strategies align to Miles et al.'s (1978) concept of strategic defenders and Fisher's (1997) concept of the efficient supply chain, while the market driving and resource-based approach is consistent with prospectors or analysers (Miles et al., 1978) and Fisher's (1997) responsive supply chain. Since Lowson (2005) concluded that the prevailing reason to devise a supply chain operations strategy is to achieve the retailer's desired position in the market, a key

factor in determining supply chain strategy is understanding of the prevailing competitive objectives, sometimes expressed as market qualifiers (minimal entry criteria) and market winners (decisive competitive factors) at supply chain level (Christopher and Towill, 2000). For standardised products the market winner is cost, with qualifiers being quality, service level and lead-time; whereas for differentiated products in responsive markets the market winner is service level, while qualifiers are cost, quality and lead-time (Hill 1993; Mason-Jones et al., 2000). Other competitive objectives include product development capability and speed (Hill, 2005), product life-cycle, delivery window, volume, variety and variability (Christopher and Towill, 2000). These factors determine how supply chains compete for market share and are influenced by demand and reinforced by brands, leading researchers to suggest that strategic priorities reflect demand trends, enable clustering of products into groups that correspond to specific targeted supply chain strategies and market winning priorities, and can be customised for product and retail destination (Christopher and Towill, 2000; Lawson, 2003b; Godsell et al., 2011). Lawson (2003b:72) concludes that low cost and flexibility are considered “*inappropriate bedfellows*”, and Hill (2005:54) reminds organisations that order qualifiers can become “*order-losers*” where they fail to meet market expectations. Hence, Brown et al. (2013) confirm that improvements need to address all areas.

In spite of this, consistent with Miles et al.’s (1978) defenders strategy and the market driven approach (Lawson, 2003a), high street apparel retailers have tended towards efficient processes to consolidate their dominance in core markets. Cost reduction strategies, such as standardisation and global sourcing (Scheffer 1992; Lawson, 2002; Walter, 2002; Stratton and Warburton 2006) have dominated since the 1980s and ‘*lean retailing*’, with its inherent inventory and capacity reduction (Abernathy et al., 1999; Oxborrow, 2000), since the early 1990s. As Miles et al. (1978) conclude, the defender strategy has constrained retailers’ responsiveness to shifts in the market and there are limited signs of Lawson’s (2003b) customisation of strategic approach. After institutionalising an off-shoring strategy, the UK’s dominant apparel retailer, Marks and Spencer, was described by Christopher as “*shooting itself in the foot... it had to move its sourcing [overseas], but then its supply chain became over a year-long*” (cited in Davies, 2004:23). Changes in the retail market have resulted in increasingly volatile demand with short product life-cycles while low-cost, global sourcing has permeated retail supply, creating what appears to be a mismatch (Fisher 1997; Stratton and Warburton, 2006) and generating supply chain risk (Christopher et al., 2011).

The mismatch can be explained by the lack of shared critical thinking between organisational strategy and supply chain management identified by Ketchen and Giunipero (2004) and by the strategy lifecycle identified by Lawson (2005) who observes periods of transition or sub-optimal strategic performance non-linearly interspersed with periods where strategy contributes favourably to competitiveness. There are a number of concepts that can help to explain the bridge between retailers’ overall competitive strategy and their supply chain strategy and practice. At a high level, Porter (1998) explains how firms compete by adding-value throughout the chain, influenced by external factors such as institutional support, labour, infrastructure, networks and competition. Similarly, Lawson (2005) suggests that external factors influence the founding of supply chain strategy in particular, but that external conditions ‘*stick with*’ strategy through its lifecycle. From a more specific perspective, Ketchen and Giunipero (2004) consider five aspects of organisational strategy that directly relate to supply chain management. These include resource management determining how hard to replicate an organisation’s supply chain might be; the exchange of knowledge within the supply chain; the level of agency through which supply chain players become

autonomous, exploitative or opportunistic, and mimetic isomorphism in which supply chains mimic best or institutionalised practice within their industry (DiMaggio and Powell, 1983), illustrated by McKinsey and Co.'s (2012:13) reference to a "*herd-like reflex*" to offshore sourcing.

Where supply chains compete, rather than individual organisations (Christopher, 2005). Ketchen and Giunipero (2004:54) conclude that '*strategic*' supply chains — chains whose members are "*strategically, operationally, and technologically integrated*" should outperform others. Similarly, Wong et al. (2012) hypothesise that supply chain strategy and performance needs to be aligned with both customer and shareholder objectives, which - though in need of empirical testing - should be enabled through internal organisation, management and relationships combined with external customer relationships, information sharing and performance measurement. However, Choi and Valikangas (2001) found only a few strategic innovations that relate directly to the retail supply chain - mass-customisation, de-verticalisation (outsourcing) and dis-intermediation. The last two in particular relate to supply chain organisation and are consistent with Ketchen and Giunipero's (2004) organisational strategy of mimicry and agency respectively.

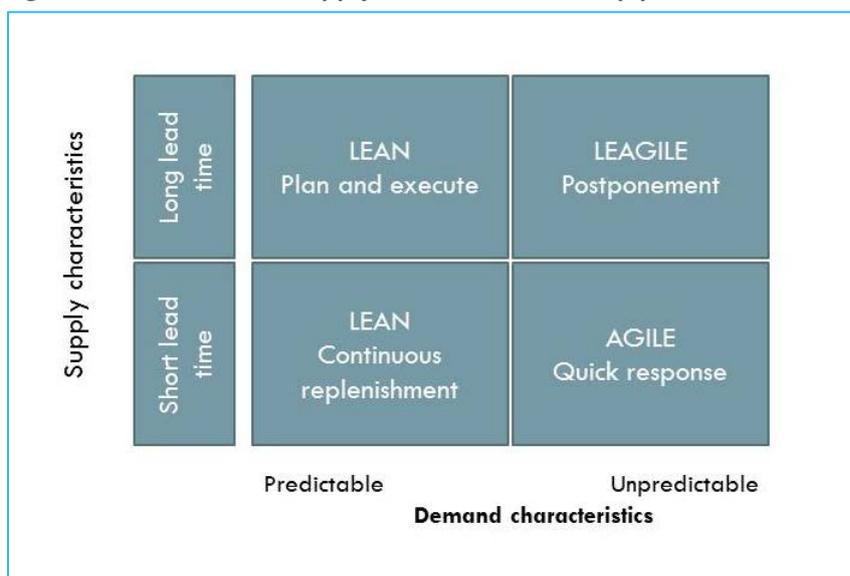
2.4 The Right Supply Chain

The Right Supply Chain (Fisher, 1997) is the result of strategically *aligning* efficiency or responsiveness within the supply chain with the nature of the demand addressed. Fisher (1997) identifies two broad types of demand – functional and innovative. Functional or commodity products with predictable, long life-cycles compete vigorously on price, needing an efficient supply chain (Fisher 1997), effective when customer sensitivity is stabilised and supply chain risk is low (Faisal et al., 2006). Innovative products compete on "*dynamic variety*" or new products prolifically and rapidly introduced (Holweg and Pil, 2005; Reichhart and Holweg, 2007), have short life-cycles with no demand track-record (Fisher, 1997), frequent new iterations and are often high-margin, high priced products. Rapid change amplifies unpredictability and uncertainty (Abernathy et al., 1999; 2000) and, to avoid the cost of markdowns, lost sales and obsolescence (Fisher 1997), a responsive supply chain is required that can easily and quickly be reconfigured to meet the changing market environment when risk and customer sensitivity are high (Faisal et al., 2006). However, this ideal is not always achieved by retailers of innovative products (Fisher, 1997) because of an inappropriate or legacy focus on efficiency savings, akin to a lingering "*defender*" strategy (Miles et al., 1978), retaining characteristics of traditional supply chains that, as concluded by Faisal et al. (2006), have low capacity to deal with risk or market sensitivity. In contrast, Selldin and Ollhager (2007) found higher performance in companies with product and supply chain aligned by cost, speed and dependability objectives. Quality, they found, is attainable in any supply chain – a view challenged by Oxborrow (2011a) who found some compromise on quality to reduce lead-time.

For some, Fisher's (1997) typology of products is too simplistic an influence on supply chain alignment. Brun and Castelli (2008) add unique and hybrid products, characterised by product complexity, stock requirement and number of variants, while "*style goods*", fashion or fad items with short lifecycles, high demand uncertainty and challenging demand forecasting are proposed by Langenberg et al. (2012:501). Combined with changing retail strategy, supply chain configuration and communications and logistics technology, this compounds the complexity of finding the right supply chain. Where low cost sourcing constrains flexibility, and extra flexibility comes at an additional cost, Langenberg et al. (2012:501) ask "*what is the magnitude of potential cost savings that can be attained by realigning product and supply chain portfolio?*" Christopher et al. (2006)

criticise any narrow focus on cost saving, especially for high risk products, emphasising the benefits of aligning supply chains to reduce lead-time. By mapping demand predictability against replenishment lead-time, four potential supply strategies emerge, illustrated in Figure 2.1, that reflect the differing propensity for lead-time related costs to accrue from additional logistics, shipping delays, and the hidden costs of managing an increasingly long supply chain with more diverse participants. To avoid stock-outs, Christopher et al. (2006) suggest that seasonal demand should be addressed using a base/ surge combination of lean and agile supply to reduce inventory and enable replenishment, while for products with an unpredictable life-cycle, lean and agile should be used sequentially during the product lifecycle.

Figure 2.2 Demand and supply characteristics and pipeline selection strategy



Christopher et al., 2006: 283. Reproduced from *The International Journal of Logistics Management*, vol. 17 (2), Christopher, M., Peck, H., and Towill, D., 2006, A taxonomy for selecting global supply chain strategies, 277-287; with permission ©Emerald Group Publishing Limited all rights reserved. DOI <http://dx.doi.org/10.1108/09574090610689998>

Like McColl and Moore (2011), and Gauri et al. (2008), Brun and Castelli (2008) identify brand and retail channel as influences on supply chain strategy and alignment – expanding on Christopher et al.’s (2006) high risk factors. Brand equity for designer or manufacturer ranges creates differentiation and value, raising the risk and cost stakes of out-of-stock situations – especially for products that become “*must-have*” items in advertising campaigns, hastened by social media communications (Mintel 2011b). For brands where reputation makes service level and availability an order winner, Brun and Castelli (2008) suggest make-to-stock or a very reactive distribution process, whereas Fisher’s (1997) concept suggests that for multiple product variants, make-to-stock is inappropriate (Holweg and Pil, 2005; Reichhart and Holweg, 2007). Differing service requirements are appropriate for private label and premium branded products, in turn affecting alignment priorities at different stages in the supply chain, so Brun and Castelli (2008) claim that brand and product are the most important influences of upstream supply chain configuration, and brand and retail channel the most important in downstream alignment. Thus, decisions for managing variation up- and down-stream in the supply chain differ, compounding the complexity of managing multiple supply chain configurations.

2.4a Lean supply and lean retailing

Consistent with Fisher's (1997) model, the concept of lean retailing has developed in many mass markets. Lean retailing is defined as "*adopting a whole interrelated series of channel practices, beginning at the retail level, with the goal of matching supply and demand, and minimising the inherent forecasting errors associated with the management of product mixes*" (Guercini, 2012:236). The cost driven, efficient or lean supply chain is associated with global sourcing to reduce product cost (primarily labour). However, global sourcing lengthens the supply chain (Christopher et al., 2011) and, combined with strategies to reduce the supplier base, exposes the supply chain to hidden costs and risks (Faisal et al. 2006, Hergeth, 2002) that retailers often fail to fully recognise (Christopher 2005; Hines, 2001; Lowson, 2002; Fisher 1997; Peck 2005). In the two-season apparel calendar of the 1990s, retailers' reduced inventory to save cost, while lengthening the supply chain for low cost sourcing. Thus, lean retailing pushed stock upstream out of the retail system, forcing manufacturers to hold more stock to cater for retailer orders during the season – with the risk of being left with redundant stock at the season's end (Abernathy et al., 1999). To reduce their exposure to risk suppliers introduced more flexibility into the production process (Guercini, 2012) hampered by an information gap, described by Guercini (2012) as the weak point in the apparel supply chain, with manufacturers failing to effectively anticipate demand. The onset of lean retailing has apparently resulted in a low cost, rather than lean, supply chain which increased supply chain risk (Christopher et al., 2011).

2.4b Responsive or Agile Supply

A detailed discussion of responsive supply is found in Document 2 (Oxborrow, 2008). In summary, flexibility is variously defined as adaptation of product, mix, variety and delivery (Slack, 1987) and volume, distribution and responsiveness (Reichhart and Holweg, 2007), where *range* refers to the extent of change available within existing capability and *response* to the ease or rate of change between products (Slack, 1987; Cheng et al., 1997). Responsiveness encompasses two critical elements: decision-making and implementing the re-organisation (Cheng et al., 1997) and is associated with flexibility to external influences, predominantly *ex-post* (or in reaction to) changes in external drivers. This offensive and defensive response, according to de Toni and Tonchia (2005) is based on a range of flexibility capabilities: speed, consistency, innovativeness, *acuity* (anticipation of market needs) or *agility* (adapting to these needs). In the context of the supply chain for the dynamic variety of innovative products, Reichhart and Holweg (2007:1148) define responsiveness as "*the ability to push new products more quickly through the whole supply chain while retaining minimal inventory of the old product that must be cleared.*" For van Hoek (2000) responsiveness entails reacting to end customer orders rather than anticipating demand and is effective in tandem with other service performance criteria of improved speed and reliability of delivery (Hill 1993).

Responsiveness in global supply chains can involve buffering with either spare capacity or inventory (Fisher, 1997; Raman 1998; Stratton et al., 2008), depending on the context. Since capacity is considered wasteful, inventory is often the preferred choice, but this strategy increases the risk of obsolescence and potentially passes inventory cost and risk up the supply chain (Abernathy, 1999; Ismail and Sharifi, 2006). So while capacity offers greater flexibility to demand changes (Abernathy et al., 2000; Raman, 2000), Stratton et al. (2008) alternatively suggest buffering with time, such as integrating time saving processes or enabling decisions to be made later and Schmenner and Tatikonda (2005:1185) propose buffering against market changes with subcontracting or

outsourcing, facilitating “nimbleness”. At the extreme, the alternative of inventory based responsiveness is described by Christopher and Towill (2000), whose definition of agile supply chains includes being market sensitive to real demand; virtual (replacing inventory with shared information and real demand data); and having aligned and interconnected processes between the teams responsible for product development and transparency of information. These innovations, according to Guercini (2012) are elusive in the apparel supply chain – van Hoek (2000) suggests that retail suppliers can at best replenish inventory based on real time retail demand not actual consumer demand. However, Reichhart and Holweg (2007) go on to suggest that customers’ main priority is that their suppliers can be responsive rather than how they go about achieving responsiveness and alignment.

2.4c Quick Response strategy

Quick Response (QR) is a tool to enable the supply chain to become a ‘pull’ based system, reactive to actual demand and less forecast driven. Defined by Birtwistle et al. (2003: 118) as “*a consumer driven business strategy of cooperative planning by supply chain partners... using IT and flexible manufacturing to eliminate inefficiencies from the entire supply chain*”, QR integrates multiple aspects. These include just-in-time; reduced manufacturing and logistics lead-time (Jin et al., 2012); spare capacity and inventory (Stratton et al., 2008); use of postponement (Stratton and Warburton, 2006; Van den Heydon, 2001); a standardised, modular product base, (Sharifi et al., 2006); and parallel sourcing, for example of fashion from UK, Africa or Europe and basics from the Far East (Birtwistle et al., 2003); all supported by information technology. In the fashion supply chain QR can substantially reduce lead-time for new products and replenishment (Abernathy et al., 2000).

From a KSA study, Birtwistle et al. (2003) found few true innovators, seeking ways to advance their QR strategies with joint planning, forecasting, product development and performance measures across the supply chain. Most retailers were defined as pro-active (25% in UK in 2003) or active with lack of investment limiting the extent of their QR benefits – often the result of not changing supplier relationships or redesigning work programmes. Own brand retailers, with high levels of supply chain control were the main proponents of QR (Birtwistle et al., 2003; McColl and Moore, 2011) while, Zara is the archetypal example of a retailer that has refined its ability to sense and respond to changes in demand, quickly and with ease, predictability and quality, (Hofman and Cecere, 2005; Mihm, 2010). Birtwistle et al. (2003), consistent with Miles et al. (1978), conclude that for re-actives that have not yet understood the value and adopted QR strategies, distrust in buyer-supplier relationships create an obstacle to the exchange of information that supports QR, with retailers unwilling to share data, and suppliers reluctant to invest in information systems.

2.4d Adopting Fast Fashion

Referred to as “*fashion McDonaldization*” (Jin et al., 2012: 196), fast fashion retailers introduce new styles quickly to overcome the unreliability of forecasts in unpredictable markets (Stratton and Warburton, 2006; Fisher 1997, Khan et al., 2012), while responding quickly to fashion trends and celebrity influence, maintaining modest prices and building in limited durability. This encourages consumers to buy at full price, rewarding those who buy early with greater fashion utility from their purchases while reducing the impact of strategic consumer behaviour (Jin et al., 2012). Caro and Gallien (2007) identify two sorts of fast fashion, with basics customised during the season using postponement to meet market fads and other rapidly changing fashion items requiring fast made-to-

order capacity. Once the preserve of a few niche market fashion retailers (Doeringer et al., 1998) and later popularised by Zara (Dutta, 2002; Mihm, 2010) fast fashion has been adopted as a mainstream strategy and contributor to performance for UK fashion retailers (Barnes and Lea-Greenwood, 2010), consistent with Ketchen and Giunipero's (2004) concept of mimicry, and Jin et al. (2012) claim that fast fashion retailers outperform others, such as The Gap, in both profit and growth, with markdowns as low as 15%, compared to 40-60% in other retail (Hausman, in Deschamps, 2012a) and with other benefits including differentiation, marketing and socio-political reasons for supporting local manufacture (Cachon and Swinney, 2011).

Fast fashion enables retailers to use a combination of operations, supply chain and marketing practices to introduce more product variety more quickly, reacting to consumer demand, rather than pre-season forecasts (Jin et al., 2012). According to Cachon and Swinney (2011) fast fashion comprises two complementary elements: Quick Response (QR) and Enhanced Design (ED) which can work in isolation, but without the full effect of fast fashion. QR enables retailers in mature markets to offer greater complexity in the number of short product lifecycle stock keeping units (style, size and colour variants or SKUs) on offer in an attempt to increase customer satisfaction and stimulate demand. However, the growth in complexity makes management of design and production more complex and prediction of demand more precarious, creating the need to better manage uncertainty in the retail offer by enhancing design (Cachon and Swinney, 2011). Furthermore, strategic consumer behaviour - waiting for end-of-season markdowns before buying – is a growing challenge (Drapers 2012; Jin et al., 2012) which reduces full price sales, undermines profit margins and cash flow, while cannibalising future sales (Jin et al., 2012). Management of consumer demand is an important component of fast fashion and Zara use the threat of stock-outs as a marketing tactic, encouraging consumers to regard clothes as “*a perishable commodity to be consumed quickly*” (Dutta, 2002:3), stretching the boundaries of balancing supply and demand (Fisher, 1997). In contrast, Barnes and Lea-Greenwood (2010) label fast fashion items as ‘*hero pieces*’ with the under-exploited potential to stimulate demand for other basic items.

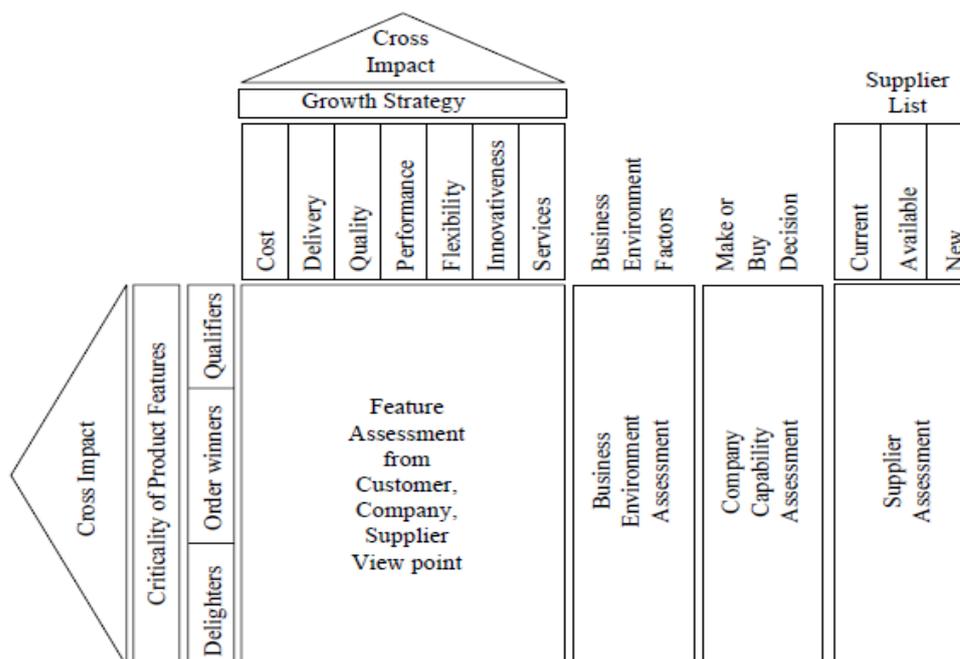
There is poor coverage and definition of the concept of Enhanced Design in extant literature. Jin et al. (2012) identify four practices adopted by Zara: rapid interpretation of fashion trends; manufacturing small batches to create scarcity and re-educate customers; designing products to keep prices low and avoid deterring consumers from making full price purchases; and rapidly designing new ranges to maximise the customer's sense of fashion utility from buying early. These ED practices add value to the product, encouraging consumers to buy early and pay more, but do increase the value of inventory and markdown risk. Management of complexity is supported by both volume and range flexibility, ability to vary output and produce a wide range of products without negative impact (Slack, 1987). Detractors of the ED concept might argue that the growth of short lifecycle products for tightly differentiated markets is considered by senior managers to undermine operational efficiencies and eat into profits (Jacobs and Swink, 2011). Whether product complexity is a boon or a drain on resources is decided by the way that complexity is managed, according to Jacobs and Swink (2011:679) determined by a “*multiplicity of diverse, interrelated elements*” where cumulative organisational learning helps to mitigate rising costs over time. While efficiencies can be gained by leveraging spare capacity and spreading potential economies of scale across different fragmented markets, capacity costs, queues, lack of efficiency and complexity in the retail environment constrain the longer term benefits of fast fashion (Jacobs and Swink, 2011; Barnes and Lea-Greenwood, 2010). Hence, Cachon and Swinney (2011) conclude that the benefits of fast fashion

are enhanced most where the cost of ED is low, consumers are highly strategic and both ED and QR are employed. In the Leicester Fast Fashion cluster there is evidence of the ED function being outsourced, which helps to reduce fixed costs (Oxborrow, 2011a). Indeed, successful fast fashion supply chains usually evolve from vertically integrated to a ‘house branded’ model of centrally controlled subcontracting. However, as they grow globally the challenge of meeting different market needs becomes a challenge of “*bad complexity*” (Bharwaj in Deschamps, 2012c; Deschamps, 2012b) that tests the scalability of fast fashion (Adendorf, 2012), especially where ED and QR are not combined.

2.5 “Design of and design for” the supply chain

Sharifi, et al.’s (2006) concept of “*design for*” the supply chain involves prioritising features the supply chain can develop and deliver rapidly – identifying “*what can be achieved immediately if time is critical and what is it possible to achieve if cost is not a constraint*” (Sharifi et al., 2006:1095). For example, to increase the sustainability of Zara’s inventory-less system during global expansion, Caro and Gallien (2007) propose incorporating past sales data with personal knowledge of store managers into the retail allocation process, effectively enhancing design within the existing supply chain. “*Design of*” the supply chain, Sharifi et al. (2006:1095) argue, should be planned, not spontaneous, and concurrent with product design to better account for the full capacity required for responsiveness to operational variation and uncertainty (Klibi et al., 2009). Responsiveness capabilities, such as capacity buffering, production shifting, flexible overtime and subcontracting, inventory pooling and placement, product replacement and shipment routes need to be ‘*designed in*’. The model takes into account strategic factors and aspects internal to the product, company, supply chain, market as well as external/ environmental influences, mapped against strategic priorities, as shown in Figure 2.3.

Figure 2.3 Integrated Design of and Design for the supply chain



Sharifi et al., 2006: 1094. Reprinted from *Journal of Manufacturing Technology Management* vol. 17, (8), Sharifi, H., Ismail, H., and Reid, I., 2006, Achieving agility in the supply chain through simultaneous ‘design of’ and ‘design for’ supply chain, 1078-1098; with permission; ©Emerald Group Publishing Limited all rights reserved. DOI: <http://dx.doi.org/10.1108/17410380610707393>

Building on Fisher (1997) and Sharifi et al. (2006), a number of subsequent models address aspects of aligning supply chain to market, demand and product strategies, by adapting supply chain architecture (summarised in Round 3 2.3). Langenberg et al. (2012) suggest that innovative products themselves may require varying types of responsiveness because of differing priorities for stock holding costs and availability. Innovative products should therefore be grouped into different portfolios, each matched to appropriate supply chain options with varying supply footprint, production facilities or logistics. In contrast to Lowson (2003b), who differentiated by retail as well as product variety, Langenberg et al. (2012) conclude that homogenous product portfolios require few supply chain options, standardised to one efficient supply chain model to maximise cost savings. Heterogeneous product portfolios and innovative products should be aligned to a range of different supply chain options. Starting from a similar perspective, Selldin and Ollhager (2007: 48) develop the concept of a “*supply chain frontier*” mapping a company’s supply chain by physical efficiency against market responsiveness. The curve (frontier) at which firm performance is optimised reflects the best combination of efficiency and responsiveness for a specific firm within a supply chain, in contrast to Langenberg et al. (2012). Selldin and Ollhager (2007) conclude that production and communication technology advances enable companies to operate beyond the frontier in both efficiency and responsiveness, but without benefit to their overall performance. While Selldin and Ollhager (ibid) are critical of Fisher’s simplistic approach, their model stops short of the variation in the supply chain portfolio identified by Langenberg et al. (2012), which may include segmentation into a number of supply chain formats by product and Godsell et al. (2011) who propose segmenting supply chains according to buyer behaviour, enabling orders to be fulfilled in a way that responds to the reasons *why* customers buy particular products. Customer-responsive supply chain strategy, is defined by Godsell et al. (2006) as:

“the identification and delivery of an appropriate supply chain strategy to meet the needs of the market that it serves. This is driven not by products, channels or markets, but by behavioural market segments and is achieved by matching the desired strategy with the capabilities of the supply chain to deliver”
(Godsell et al, 2006:48).

However, the researchers find little evidence of this practice within the business community, but find businesses responding to the differing needs of customer accounts, which adds management costs for the supplier and potential loss of profitability. While Godsell et al.’s argument is compelling; segmenting customers on behavioural grounds may result in a trade-off decision regarding the level of responsiveness towards specific groups. While Godsell et al. (2006) found more signs of alignment in the make-to-order environment, compared to supply chains making and fulfilling from stock, they recognise that developing customer-responsive supply chain management is compromised by functional boundaries and departmental objectives within organisations, which limit boundary crossing alignment. Other critical alignments that should be encouraged in customer-responsive supply, but rarely happen, are between demand fulfilment and demand creation, and new product introduction and demand fulfilment.

This lack of alignment is partially explained by Seifert and Langenberg (2011), who propose that:

“While a low cost leader might rather aim to push down supply chain adaptation costs and therefore be obliged to align product decisions with its existing supply system, an

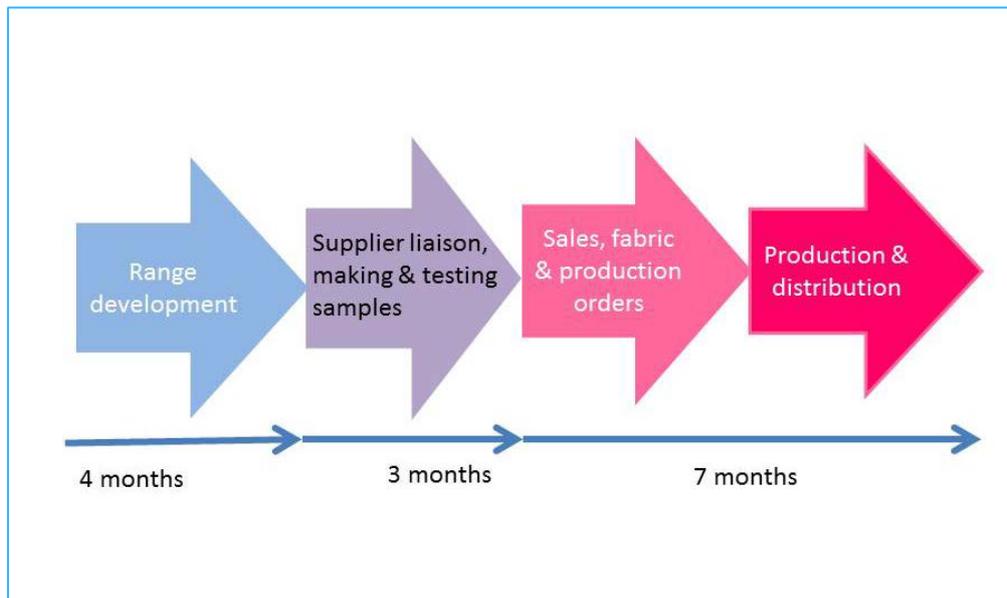
innovation leader might be ready to invest into supply chain adaptation to best support its market-driven product strategy” (Seifert and Langenberg, 2011:561)

This echoes Sharifi et al.’s (2006:1095) “*design for*” the supply chain in the first instance, and “*design of*” the supply chain for more complex product/ brand architectures with greater adaptation. Whatever the strategy, Seifert and Langenberg (2011:562) warn that firms that “*put off ... realignment investments imperil their competitive positions*”. Melnyk et al. (2009) found that strategic visibility and alignment, leadership and managing talent, supply chain modeling, process orientation, developing relationships and trust, and supply chain configuration limit the adoption of strategic supply chain management, and require significant investment at network level to overcome these. Current metrics, they conclude, tend to do little more than eliminate costs in the short term and favour dominant partners at the expense of other supply chain members – an issue which resonates with the fashion supply chain (Oxborrow, 2011a). However, Storey et al. (2006) reluctantly conclude that, although the growth of globalisation necessitates greater attention to logistics and supply chain management, these functions lack political standing to allow significant influence over strategic decisions.

2.5a Design for the supply chain

The conventional design process in apparel belies the life-cycle of the actual product. The VF Corporation begin conceptual design for their lifestyle brands 14 months prior to the selling season as illustrated in Figure 2.4 (Pisano and Adams, 2009). In Document 3, Oxborrow (2011a) found that the time spent confirming designs for range and production is inefficient, with delays due to slow decision making and product testing and both retail buyers and manufacturers anxious to retain brand values (Brun and Castelli, 2008), are reluctant to compromise in order to shorten the design or manufacturing process. At VF “*designers typically did not like to make changes in the design for the sake of manufacturing*” (Pisano and Adams, 2009:8), while Oxborrow (2011a) found that retail buyers were reluctant to speed the design process by limiting options to pre-tested fabrics and designs. In this case practice sidesteps the proposition of Khan et al. (2012) that alignment between the design process and supply chain management helps to improve supply chain performance, for example ensuring that products can be manufactured on time and to cost. The legacy of the traditional product design practice is that, rather than Sharifi et al.’s (2006:1095) concept of “*design for*” the supply chain, some aspects of the supply chain are dictated by the product design process, creating the time-pressure discussed by Thomas (2011).

Figure 2.4 Design Process of VF Corporation



Adapted from Pisano and Adams (2009)

There are exceptions: Azuma (2002:138) found Japanese fashion “*too fast and unpredictable to be dealt with through a normal offshore supply chain*”; the Zara model (Ferdows et al., 2004; Dutta, 2002; van der Heyden, 2001) eliminates creative design, as illustrated in Figure 2.5; and Khan et al. (2012) found that an integrated design process with early involvement in co-design and modularity can resolve problems early and produce better, more responsive designs that are faster to manufacture, but with less risk.

In Cachon and Swinney’s (2011) concept of enhanced design, the key components of a fast fashion system include rapid new product introduction and cost effective manufacture that cannot easily be inserted into existing supply chain architecture. In fast fashion, supply chains increase design speed through an inventory of order-ready designs (Doeringer et al., 1998; Van der Heyden, 2001; Oxborrow, 2011a), which are supported in manufacture by fast, flexible and integrated or local fabric processing. The design selection process is shortened, with less emphasis on materials testing, since failure to align the design process causes a trade-off between product quality or supplier compliance and speed (Oxborrow, 2011a; Marion, 2013). Such adaptations demonstrate how fast fashion retailers have adapted design for the supply chain and integrated design of products with that of the supply chain, consistent with Sharifi et al.’s model (2006). This is particularly evident in Khan et al.’s (2012) Fashion Co. where the company has speeded up design, simplified sourcing decisions and utilised technology to shorten design time, compensating for global sourcing lead-time and reducing inventory and markdown risk by delaying decisions closer to market. This opportunity to reduce lead-time is a gap in both literature and practice.

Figure 2.5 Zara design and business concept

Integrated fashion: Fashion at low cost

- **Integrated fashion: Fashion at low cost**
 - Low cost variables:
 - Get it approximately right
 - Eliminate creative design
 - Define a fast response process that includes design
 - Finalise design with material design constraint
 - Optimise the process
 - Manage follow-up and customer flow
- **Fashion variable:**
 - Store experience
 - Copy fashion
 - Involve the customer and their cohort
 - Create a network/ brand

Adapted from Van der Heyden (2001)

2.5b Design of the supply chain

Of the two types of fast fashion: mass customised adaptations and newly designed fashions (Cachon and Swinney, 2011; Caro and Gallion, 2007) the former are facilitated by postponement to support frequent, minor product adaptations during season. While buyers are resistant to adaptations that limit product choice, such as reducing fabric or trim options (Oxborrow, 2011a), some retailers such as Zara and the Gap are known to use “fabric platforming” (Ferdows et al., 2004; Barrie, 2013d). Where postponement is employed, Pan and Holland (2007:357) explore the impact of changes to the “*integrated decision point*” (IDP) where customer preference is incorporated - further upstream providing more product flexibility, but further downstream enabling greater responsiveness to demand, cost efficiency and faster time to market. In apparel, the IDP can potentially range from final dyeing and finishing (Stratton and Warburton, 2006; Carmuffo et al., 2001) to the upstream buffer of designs-in-waiting and fabric processing. This buffering strategy is more relevant to newly designed fast fashion and enables fast fashion buyers to circumvent traditional decision making and quality assurance processes in the interests of speed (Oxborrow, 2011a). In Leicester, local SMEs provide a collective service similar in process to that of Zara (Ferdows et al., 2004) but lacking the large firm ownership, technology-leading co-ordination and integrated relationships. The practice offers a lower risk alternative to buffering with work in progress or finished goods (Warburton and Stratton, 2002) and is supported by reactive capacity (Raman, 1998) enabled by upstream materials suppliers who provide favourable financial arrangements to secure orders (Oxborrow, 2011a).

Hameri and Hintsa (2009) conclude that trade-offs in product complexity and short life cycle will involve greater use of modularity and postponement, with attendant standardisation of materials, concurrent design and central planning (Khan et al., 2012) which reduces costly air-freight for time sensitive items and reduces risk. However, Abecassis-Moedas (2006) finds that options to delay design decisions or speed up the design process are incompatible with traditional design because speed impedes the design process, while the delay of waiting for information inhibits creativity. Nevertheless, Khan et al. (2012) argue that supply chain responsiveness contributes to supply chain

resilience, because product development closer to market improves chances of market success; supply chain alignment to the product design process increases responsiveness to supply or demand volatility, and both reduce inefficiencies such as excess inventory. Khan et al. (2012) conclude that managers need to reduce non added-value activities and increase speed to market through refined product design processes and working more closely with partners as time is critical in global supply.

2.6 Sourcing and Outsourcing

During the 1990s slow sales and intense competition on the high street caused fashion retailers to look increasingly at standardisation, lower costs of supply and particularly global sourcing, which rapidly become a feature of the apparel industry (Lowson, 2002; Walter, 2002; Scheffer, 2012) together with inventory and capacity reduction or '*lean retailing*' (Abernathy et al., 1999). Although global sourcing looks set to increase in volume and geographical spread (Hameri and Hintsa, 2009), Harland et al. (2005) conclude that outsourcing decisions are primarily short-term, which contradicts the long term nature of their outcomes. This is unsurprising, since Meixell and Gargeya (2005) conclude that only since 2000 have global sourcing strategy models progressed from a narrow focus on location, logistics and cost to link sourcing and marketing strategy, though they fail to recognise supply chain objectives and the pragmatic realities of supply chain decisions. Market fluctuations, seasonality and demand volatility mean that supply flexibility is important to firms managing upstream capacity and JIT or addressing forecast accuracy and Tachizawa and Thomsen (2007:1126) found that firms can implement two supply flexibility strategies: "*improved supplier responsiveness*" where switching costs are high and "*flexible sourcing*" where volume or mix flexibility are needed and switching costs are low. However, Harland et al. (2005) suggest that managers lack information and support, while organisations often lack the capability to develop the strategic outsourcee relationships required to benefit fully. In spite of this, McKinsey and Co. (2012) accuse suppliers of following the herd to off-shore supply, while even SMEs have adopted what Gereffi and Memedovic (2003:8) describe as an "*if you can't beat them, join them*" attitude – becoming importers to compete against low-cost overseas competition.

2.6a Sourcing risk

The cost focus emphasised by Meixell and Gargeya (2005) increases the potential for supply chain risk. Focusing on global sourcing, Christopher et al. (2011), identify five types of supply chain risk, classified as internal process and control risks; supply chain demand and supply risks; and external environmental/ sustainability risks, affecting economic, social and environmental performance. Christopher et al. (2011) go on to suggest that other benefits of global sourcing - access to markets, technologies or flexibility – are not always attained because lengthening the supply chain increases risk, and Wu and Zhang (2011) conclude that onshore suppliers reduce risk in recession.

Faisal et al. (2006) propose that risk can be reduced through strategies that involve information sharing, collaboration and trust, equitable reward and knowledge of the potential risks, whereas Christopher et al. (2011) conclude that such mitigating actions, for example considering total cost of ownership, are rarely practiced because of their demands on data, collaboration and time. In apparel cases, Christopher et al. (2011) find that excessive dependence on Far East sourcing negatively impacts on all aspects of supply chain risk, but especially supply risk, where single sourcing increases switching costs, places dependence on suppliers for design, in spite of poor buyer-supplier communications, and risks exposure to design copying. More generally, Christopher

et al. (2011) found that practitioners had a narrow view of supply chain risk and considered cost and consolidation of the supply chain to be among their outsourcing priorities, regardless of the need to cater for emerging markets, new products or shorter lead-times, resolve trade-offs between quality and on time reliability and seeking competitive advantage. Likening the problem to an iceberg, Hines suggests that there are hidden costs to sourcing, such as management time, procurement costs, reworking costs and ownership costs – which are at best attributed as general overheads. Lost sales costs are rarely monitored and could be higher for overseas sourced merchandise (Hines 2002). Although they increase organisational risk, overlooking these costs enables buyers to reduce personal risk, because their performance is frequently measured against target margins which enable lower cost products to be resold at specific price-points. From the research with seven retailers and contract manufacturers Hines deduces that:

“managers often articulate other requirements in terms of flexibility and responsiveness, but buyers in the final analysis will base their decision on price alone to protect their own interest” (Hines, 2002:7)

On this basis, an overseas supplier with a lower visible section of the cost iceberg provides a more attractive supply proposition.

Risk mitigation strategies focused on progressive re-design of supply networks and creating an undefined risk management culture. Again in this context, the value of practices such as postponement and quick response to real demand information in mitigating demand risk are under-used and traditional supply chains have limited capacity to deal with demand risk (Faisal et al., 2006). Collaboration between global sourcing parties is the most underused strategy (Christopher et al., 2011) highlighting the limited understanding of global sourcing risk throughout the supply chain and in specific industries.

2.6b Location choices and Co-location

Like others, MacCarthy and Atthirawong (2003) identify cost as the most important influencing factor for firms when locating manufacturing, with labour costs identified as a specific sub-factor affecting low-cost products such as clothing and textiles. Infrastructure and worker and management capabilities are also important considerations, particularly affecting delivery performance, availability and time absorbed by transportation of goods to market. Other important location influences include political and economic factors.

In Document 4 (Oxborrow, 2011b) found that co-location of firms in geographically proximate clusters favours rapid response, upstream materials availability and innovation (Doeringer and Terkla 1995), while the need for fast response provides a rationale for clustering behaviour (Doeringer et al., 2009) and the nature of the response differentiates geographical clusters (Rigby and Essletzbichler (1997). For example, in Leicester, the fast fashion cluster remains broadly labour intensive with small scale manufacture and design, while the Nottinghamshire cluster has a higher propensity for off-shoring (Oxborrow, 2011b). Cluster internalities such as market knowledge, enhanced R&D innovation, materials supply and *co-opetition* should enhance firm performance, but this may encourage off-shoring to specialised overseas clusters (The Economist, 2012) as well as local sourcing. Although globalisation encourages anti-clustering behaviour (Holweg et al., 2011), mature clusters can pro-actively engage with global sourcing (Carbonara et al., 2002; Bozarth et al., 1998). Apparel cluster firms, it is found, use *“internal-to-the-district and external-to-the-district”*

designers to create a “*district laboratory*” (Aage and Belussi, 2008:487) or open-source model of market knowledge and design that enables firms to acquire knowledge for trend prediction, conceptual design, selection and sampling of new styles, thus reducing the risk of not knowing the winning fashion trends.

2.6c Roles in the responsive supply chain

There is some blurring of roles within the outsourced supply chain, as Abecassis-Moedas (2006:419) refers to unsustainable “*manufacturers without plant*”, believing that retailers should assume the design role and direct responsibility for outsourcing of production to exploit their market knowledge; but also to retain information transparency, enforce upstream ethics and environmental management, respond to new innovations, economic or market shifts and control costs (Choi and Linton, 2011). Meanwhile, manufacturers should vertically integrate into retailing to get closer to the market (Abecassis-Moedas, 2006). Although Richie and Brindley (2007) predict a flattening out of supply chain hierarchies through disintermediation, Popp (2000) concluded that intermediaries perform a valuable role in filtering and disseminating information. Oxborrow and Brindley (2012) find a compromise, consistent with Gereffi and Memedovic (2003), where apparel SMEs have often ceased to fabricate their own products, but retained the downstream roles of design and managing of production, in most cases overseas. Mihm (2010) compares Zara’s vertically integrated sourcing strategy with that of US discounter, Kohl, which outsources through intermediary, Li and Fung. Mihm (ibid) concludes that Kohl’s discount and sourcing strategies diminish value-adding design and lack flexibility and control. Meanwhile, even fast fashion SME suppliers are involved in off-shoring, by managing a network of upstream overseas suppliers.

2.7 Supply Chain Relationships

Supply chain relationships are discussed in detail in Document 3 (Oxborrow, 2011a), the central premise of which is that although alignment of supply chain strategy and buyer-supplier relationships is important to supply chain competitiveness (Vachon et al., 2009), relationships are managed operationally, rather than strategically (Ford, 1980), and inconsistently between and within organisations (Hunt and Morgan, 1994). The premise of Document 2 (Oxborrow, 2008) is that maturity of relationships leads to a loss of responsiveness, specifically reducing decision making and implementation responses (Cheng et al., 1997). Vachon et al. (2009) found that arm’s length relationships support delivery performance and promote responsiveness, because suppliers improve delivery speed and frequency to avoid disincentives, such as penalties and supplier switching. Cooperative relationships support both efficient and responsive supply chains because of enhanced information sharing (Gunasekarana et al., 2008; Vachon et al., 2009). However, in apparel supply chains, Birtwistle et al. (2003) identify two types of relationship: adversarial where suppliers compete against each other on price; and semi-adversarial where powerful buyers dictate the terms of the relationship. Both inhibit quick response and block information sharing.

Large firms have most difficulty aligning supply chains to responsiveness because of complexity and Storey et al. (2005: 256) found that suppliers are regularly “*reconvincing*” buyers of the value of their relationship because of turnover of staff in buying departments. Downstream relationships between SMEs and large retailers are often owned by a freelance or employed designer (Oxborrow, 2011a). There is little indication that retailers fully value the upstream efforts of their suppliers, especially SMEs, which limits investment, communications and information sharing, and in turn flexibility and

responsiveness in volatile markets (Handfield and Bechtel, 2002), while suppliers are rewarded by commitment and the duration of the relationship, rather than the value (Cox et al., 2007; Ulaga and Eggert, 2006). There is, however, evidence that gaining some value is better than none, and that even such asymmetric relationships are sought after by suppliers (Cox, 2004b; Matapoulos et al., 2007; Edwards et al., 2006). Oxborrow (2011a) found that contractual arrangements favour efficient supply chains, limit the number of suppliers, require suppliers to contribute towards markdowns and invest in call-off inventory, while punishing poor performance. However, operationally, relationships in responsive supply chains are often arms-length but long term, or intermittent. Buyer behaviour can, therefore, restrict innovation, prompt institutionalised and undynamic behaviours, limit SME development (Hong and Jeong, 2006) and compromise use of technology, information sharing and resources to support responsiveness and urgency (Gunasekarana et al., 2008).

Abernathy et al. (2000) conclude that upstream relationships and their influence on finished product responsiveness are a neglected area within supply chain research, a view echoed by Hines and McGowan (2005:525) who conclude that this hampers innovation. Specifically, Oxborrow (2011a) found that although trust upstream can eliminate costly design and technical controls, suppliers feel undervalued and there is a lack of trust and commitment on both sides, manifest in cancelled orders and designs being awarded to other suppliers, regardless of ownership. Suppliers describe the need to be “*trustworthy*” (Oxborrow, 2011a:63) and the threat of failure, penalty and de-selection causes the constraints on innovation identified above. In addition, Johnson and Templar (2011) found that improvements in supply chain management could increase return on capital utilisation and cash flow. In spite of this, there appears to be very little new literature linking buyer-supplier relationships to supply chain performance. One exception is Thomas et al.’s (2011) model to determine the potential costs of leveraging inter-firm relationships to achieve supply chain responsiveness, understanding how suppliers react to time pressures passed upstream. Suppliers respond to the magnitude, frequency and who is responsible for the time-pressure by proactively seeking opportunity and collaboratively solving problems or evaluating cost/ benefits and withdrawing from relationships (Thomas et al., 2011). This research could apply to the apparel product development process, lead-time and call-off practices employed (Christopher et al., 2006; Pisano and Adams, 2009; Khan et al., 2012).

2.8 The UK Apparel Industry Context

A number of challenges have emerged for clothing retailers in the UK and other developed markets, since the Millennium. Perhaps the most consistent are the march towards an increasing array of distribution channels with the growth of online and multi-channel retailing (Mintel 2011a, Rowley, 2009) and the more wide-scale adoption of ‘fast fashion’ (Mintel 2011b), speeded further by social media marketing. Meanwhile consumers expect more size and style choice accompanied by value for money (Mintel 2011a). In turn economic ups and downs have constrained market growth, which was negative in 2009 and modest in 2010 and 2011 (5% and 3% respectively) resulting in apparel market value of £43billion in 2011 (Mintel 2011a; Key Note, 2012). The recessionary pressure has affected consumer groups differentially, with 15-24 year old fashion consumers particularly hard-hit (Mintel 2011a) affecting high-end young brands that have been erstwhile resilient to recession (Mintel, 2011b). Other consumer trends include value-seeking behaviour from affluent older consumers; young professionals purchasing fewer, higher value investment pieces (Key Note 2012; Mintel, 2011b); and others simply purchasing less. Retailers are also affected by higher materials,

transport and VAT costs (Key Note 2012). Retail strategies to overcome stagnant sales include vigorous markdowns resulting in a call to end unsustainable *“discount addiction”* (Drapers, 2012). Other potential solutions include size, style and range proliferation (Mintel 2011b); media informed forecasting; swapping old for new clothes and promoting *‘made in UK’* niche collections (Mintel 2011a; Key Note, 2012). In spite of this, Key Note (2012), perhaps optimistically, forecast an increase of 15.4% (to £52 billion) in the value of UK clothing sales between 2012 and 2016, fuelled particularly by growth in the women’s wear market and online distribution (Rowley, 2009).

2.8a The UK Context: Is manufacturing coming home?

Industry media have embraced the idea of responsiveness as a means of overcoming recession and competition induced decline, but predominantly by examining manufacturing location as a potential solution. Indeed some plausible arguments emerge that support the view that, in the early 2010s, the time is right for a resurgence of domestic manufacturing in some sectors as McKeigue (2012) speculated: *“China’s had its day and manufacturing is coming home”* to the US and UK. Evidence from various UK industries and networks, including aerospace, automotive, and SME manufacturers, reinforce such claims (MAA, 2012; BBC, 2012a; BBC, 2012b; MAS, 2012) and provide evidence of growth (Telegraph, 2011). According to industry commentators, the reason for such growth include lower wage costs, labour availability and currency fluctuations in developed economies, making costs more favourable for UK manufacturers when compared to China and other sources, where costs of labour, land and energy and risk to intellectual property have increased (McKeigue, 2012). Meanwhile, economic uncertainty has forced retailers to hold less inventory and replenish more frequently aided by local reactive suppliers. However, McKinsey and Co. (2012:13) suggest that businesses have, in the past, been guilty of a *“herd-like reflex to chase low-cost labor”* in spite of claims that *“executives in different lines of business [confess] their company decided to outsource/offshore despite the fact that the business case was not compelling”* (McKeigue, 2012).

The result: a new phenomenon in sourcing strategy known as *“reshoring”* (McKeigue, 2012) or *“backshoring”* (Couto et al., 2008) - relocating operations back to the home country of an organisation leading to re-balancing of location decisions. However, McKeigue (2012) concludes that relocating in the West is *“too distant from Asia labour intensive goods produced in high volumes, such as clothes and electronic goods, will still be made in low-cost centres overseas.”*

2.8b Apparel supply – exception or rule?

Similarly, McKinsey and Co (2012) classified textiles and apparel as *‘labour intensive tradables’*, the sector with the lowest levels of R&D, the highest levels of decline in developed countries and the lowest ratio of service related jobs to manufacturing jobs – in other words the least propensity to innovate. The apparel trade press have taken exception to this view, highlighting signs of a limited return to UK supply by fashion retailers such as River Island, John Lewis and Tesco, made newsworthy because of diverse publicity ranging from high profile TV programmes to a UK government statement promoting domestic manufacture (BIS, 2012). Marian (2012c) suggests that fashion supply chains are *“under siege”* through a combination of rising prices and falling sales. UK fashion retail profits fell by 0.8% to 9% between 2012 and 2011 (Barrie, 2012), and sales were affected by overly cautious buying which, for example, limited sales at Marks and Spencer (Marian, 2012f). Growth is coming from retail and supply chain consolidation in the discount sector; growth of online sales, such as at Next and Asos (The Retail Bulletin, 2012b and 2012c); and

internationalisation, illustrated by Marks and Spencer, Supergroup and ASOS (The Retail Bulletin, 2012a and 2012b). These strategies mean new challenges for suppliers, and performance improvements are foreseen to come from the right supplier relationships, robust replenishment policy for fast selling styles, improved full price sales with higher margins and lower terminal stocks (ASBCI, 2012a; Adendorff, 2012) particularly in fast fashion markets.

While there is evidence of strategic drivers for change in the retail sector, these coincide with changing circumstances upstream in the supply chain – still emerging since the liberation of global trade in 2005. Sourcing expert, Flanagan (2012a; 2012c) claims that while US buyers have been increasing their sourcing from China at reduced prices, their EU counterparts have decreased sourcing and prices have increased. However, while EU buyers have more Asian alternatives than their US counterparts because of geographical proximity and lower import duties, they also have less buying power in competitive markets (Held, 2012) since order size is smaller and the Euro has devalued. For their part, Chinese suppliers are increasingly targeting their growing home market and workers are migrating to higher paid industries (Vulser, 2012), which has constrained available capacity, reduced reliability and increased cost. The consequence has been switching of suppliers to countries such as Sri Lanka (at least until duty free status is revoked) and Pakistan (Flanagan, 2012c; Barrie, 2013a). There are few reliable new sources emerging and although the order is shifting the top 20 apparel producing countries account for a steady 92% of all purchases (Flanagan, 2012c).

In spite of the disadvantages, some supply chains remain China-centric. Sourcing company, Li and Fung, are drawn to Chinese supply by over 100 industry clusters, including one comprised of over 3000 SMEs making socks, and related yarns and packaging (The Economist, 2012) and US jeans are predominantly sourced from China and Mexico not lower cost Bangladesh (Birnbaum, 2012) because of superior delivery performance, access to materials and energy supplies, productivity improvements and customs transparency (ASBCI, 2012a; Flanagan, 2012a). Flanagan (2012b) argues for an emerging sourcing concept, labelled “*Off-shoring 3.0*” that addresses the maturity of western markets, rising prices in low cost countries and the negative effects of off-shoring – exploitation of low-waged workers, environmental impacts and lost jobs in developed economies. The unknown, he deliberates, is who pays for the additional costs of improving standards, accreditation and compliance.

Flanagan (2012c) cites evidence of EU buyers who “bought a slightly larger proportion of their garments from their immediate neighbours in [early] 2012 than a year earlier, or even three years earlier” a trend attributed to easier negotiation within duty free trade agreements; more favourable currency exchange closer to home; supply based on fewer, closer relationships; drivers other than cost increasing in importance (Barrie, 2013b and 2013c); and poor experience of sourcing from China. Zara, for example, added 22 suppliers from European (non EU) sources to its 1400 strong supply base, while Asian suppliers fell by 1% to 625 (Marian 2012e). However, US imports from nearby NAFTA countries² and the Asia Pacific Region³ are falling (Flanagan, 2012c; Textile World,

² North American Free Trade Agreement (NAFTA) covers countries of USA, Central America, Mexico, Haiti and the Dominican Republic

2011), demonstrating that trade, duty and currency fluctuations apply differentially to sourcing decisions according to the product being sourced, the ratio of materials to labour costs, the source of upstream materials, currency, and the buyers' country of operation (Flanagan, 2012c).

Some commentators believe that, within this complex combination of variables, there is an argument to support closer proximity and even domestic sourcing of apparel. Conditions that might support UK apparel sourcing include aspirational brand value and differentiation based on 'made in the UK' appeal (ASBCI, 2012b) exemplified by John Lewis, Debenhams, Burberry and Private White VC (Marian, 2012b; The Retail Bulletin, 2012d; Cadwalladr, 2012; Hawkes, 2012); improved response times, practiced to some extent by George, Arcadia and River Island (Marian, 2012d; Marian, 2012j; The Retail Bulletin, 2012a); and postponed finishing or rescue of imported garments (ASBCI, 2012a; Flanagan, 2012a). Christopher advised industrialists that pipeline inventory can be cut by 40% through onshore sourcing (Marian, 2012i) while River Island CEO claims that quick response *"allowed us to get new fashion to our customers much quicker than we were able to, and as a result some of those products have become absolute bestsellers. We can get more of them and work closely with the factories..... With clever design you can hold the price to something affordable"*. In contrast, Aquascutum collapsed after failing to make its UK factory profitable (Smith, 2012a). Obstacles to any scalable UK sourcing include retail buyer culture; limited supplier showcasing (D'Arcy, 2012); lack of trust in the retailers that favoured off-shoring 20 years ago (Marian, 2012d); deficiency in skills and training (Grant, 2012) and an industry lack of credibility with investors (Flanagan, 2012a). Some small scale initiatives help UK suppliers to access trial contracts for online sales or credit through factoring (ASBCI, 2012a), but the CEO of the industry's Trade Association describes the current state of the industry as *"akin to going home and wanting to put water in the kettle, but you turn on the tap and no water comes out"* (Marian, 2012d) while predictions of *"backshoring"* to UK manufacturing are described as *"flagwash"* by Flanagan (2012a).

2.8c Apparel process changes

In industry generally, technology is seen as an enabler of shorter, more controlled, collaborative and transparent supply chains, able to increase clockspeed, add value, develop local skills, and meet local market needs (Sorbie, 2012; BBC, 2012c) and better informed decision making (Couto et al., 2008) for small and large firms. McKinsey and Co. (2012) concur that supply chain decisions should be determined by the quality of the information available to aid planning and forecasting, not product simplicity. New product and process development technologies and better data will therefore drive innovation and be taken advantage of in different ways by different industries and countries.

In apparel, competitive advantage is perceived to be supported by developing a stronger, more coordinated and responsive supply chain as an alternative to sourcing changes. One strategy is vertical integration, for example, George at ASDA has acquired its sourcing agent in Turkey, while Li and Fung is growing through acquisition (Marian, 2012a). Other process changes include standardising fabric platforms, Vendor Managed Inventory (VMI) for standard items, and small batch production for fashion items, as introduced by The Gap (Barrie, 2013d); consolidating distribution

³ Trans-Pacific partnership Agreement (TPP) covers trade between USA, Australia, Brunei, Chile, Malaysia, New Zealand, Peru, Singapore and Vietnam where garments are made from yarn spun in one of these countries.

centres to reduce delay from receipt of goods to shop floor, as at Marks and Spencer (Marian, 2013b); and reduction in supplier base with closer relationships and knowledge sharing across the supply chain, exemplified by the VF Group (Barrie, 2013a). As a result, buyers are consolidating their supply base, increasingly depending on suppliers for additional services such as design and inventory management, or introducing technology to reduce supply chain costs, cut overall costs (Barrie, 2013b; Marian, 2013b) or shorten product development lead-times and reduce seasonal risk (Held, 2012). However, suppliers predict that retailers will increasingly order later, in smaller batches and with slower payment terms to reduce inventory and risk during recession (Barrie, 2013b; Marian, 2013c), requiring suppliers to be more responsive and accept risk – pressure that sometimes encourages hasty, inexpedient and unethical contracting decisions (Barrie, 2013a) creating a trade-off between quality, cost and speed (Marian, 2013a).

Technology and postponement can help to overcome trade-offs associated with speed, prompting the claim that “*last minute doesn't have to mean hasty or uninformed*” (Adendorf, 2012), but the investment costs of new processes, local capacity, better information sharing and communications, and faster decision making are high and may only be of benefit to complex fast fashion supply chains (Hausman, in Deschamps, 2012c) resulting in sourcing strategies referred to as “China plus one” (Deschamps, 2012c) to minimise cost and risk. For example, M&S has piloted new season trial sourcing from Turkey, increasing sales by 11% (Marian, 2013b), while fast fashion retailers like Zara and H&M show greater profitability over a sustained period than Gap and Benetton (Deschamps, 2012b) with considerably fewer markdowns (Hausman, in Deschamps, 2012a; Marian, 2013b).

In summary, the industry context highlights discussion, rather than evidence, of a return to local sourcing for responsiveness. Closer proximity is significant where cost diminishes as the major decision making driver in the apparel supply chain, favouring other process innovations. The contextual analysis, supported by theory, raises questions about what is really happening, the strategic and operational importance of these developments and their scalability and future sustainability.

2.9 Summary

There is consensus that market or resource based retail strategy should influence supply chain strategy, but evidence that alignment is sub-optimal (Ketchen and Giunipero, 2004) since there is a propensity for old strategy to ‘stick’ and for alignment to be transitory during periods of change (Lowson, 2005). Supply chain strategy helps retailers achieve their desired market position (Lowson, 2005), to which end market qualifiers and winners need to be aligned into a single or portfolio set of supply chain objectives (Langenberg et al., 2012). Fisher’s (1997) model, and subsequent variations of it, emphasise the importance of responsiveness in the supply chain, facilitated by process innovations, buffering options, information sharing and time saving measures to reduce risk of obsolete inventory and lost sales. Supply chain adaptations can be made upstream or downstream, depending on the best match to product (Fisher 1997, Langenberg et al., 2012); brand (Brun and Castelli, 2008), distribution channel (Rowley, 2009) and market (Godsell et al., 2011).

However, Sharifi et al.’s (2006:1095) model suggests that “*design for*” the existing supply chain is more accessible than redesign of the supply chain, because of high investment costs (Langenberg et al., 2012). This argument is pertinent to the discussion of fast fashion implementation – the epitome of responsive apparel supply – which in its comprehensive form encompasses both quick response

processes and enhanced design to maintain flexibility, low cost and customer interest (Cachon and Swinney, 2011). The discussion highlights the challenges that retailers face in adopting the necessary changes to the design and supply aspects of the responsive supply chain (Khan et al., 2012), but goes on to emphasise the importance of global sourcing in the apparel context and the risks that this encompasses (Christopher, 2006). While local, more flexible sourcing can overcome some of these risks and provide other benefits, retail control upstream in the supply chain (Abecassis-Moedas, 2006), asymmetric relationships (Cox, 2004a) and a narrow view of supply chain risk (Christopher et al., 2011) mean that low-cost sourcing prevails. Like theory, industry news favours a return to more flexible sourcing, but the scale of change is hard to determine with conflicting strategies in evidence – relocation of sourcing to lower cost countries, contrasted to an increase in collaboration and proximity.

There are gaps in the literature in areas such as retail strategy generally, but in particular emergent strategy for multi-channel distribution and its impact on supply chain management. The literature review also exposes a gap in knowledge of the upstream impact of strategy on suppliers and their response. Khan et al. (2012) campaigned for the re-evaluation of the role of design in the supply chain, and this can be extended to a lack of understanding of process choices, such as postponement and modularity and their acceptance within the market, and the role of suppliers within the product development process. Collaboration between global sourcing parties is the most under-used strategy (Christopher et al., 2011) for mitigating global sourcing risk, highlighting the opportunity for further study in this area throughout the supply chain and in specific industries. This under-use is exacerbated by a lack of up-to-date research in the area of supply chain relationships generally, as highlighted by Abernathy et al. (2000) and Hines and McGowan (2005).

2.10 Conceptual Framework

Drawing on the above literature and contextual analysis, the conceptual framework has been developed to address the overall strategic question: “How can buyers and suppliers in the volatile UK apparel market address the challenge of supply chain responsiveness?”

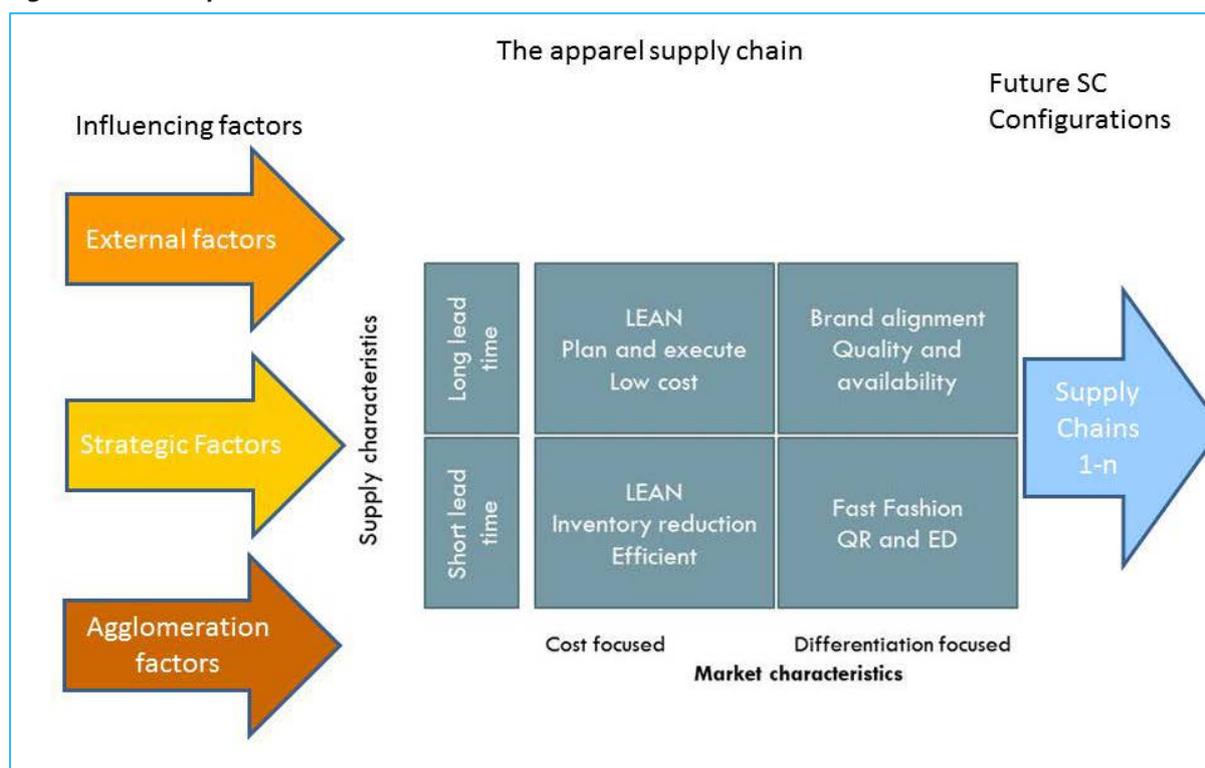
The Conceptual framework (Figure 2.6) builds on the matrix developed by Christopher et al. (2006) and influenced by the broader model of the drivers of supply chain design by Sharifi et al. (2006). The vertical axis is a measure of speed to market, measured in terms of lead-time, which in this context incorporates the whole critical path from conception to delivery, after work by Cheng et al. (1997) in terms of the variable *‘time to react’*, or decision-making response and implementation response, and more recently by Khan et al. (2012). The horizontal axis reflects the strategic choices indicated by Hill (2005) and Lawson (2002 and 2003b) where supply chain strategy is driven by the need to achieve market positioning, predominantly through cost competition or differentiation. In the former case, the low cost option is represented by Christopher et al.’s (2006) concept of *‘plan and execute’* low cost but slow off-shore sourcing and *‘inventory reduction’* rapid call-off systems. The differentiation option is represented in fashion through brand equity, design and quality (Brun and Castelli, 2008), leading to long leadtime provision for *‘brand alignment’* or by frequent style changes represented here by Cachon and Swinney’s (2011) concept of *‘Fast Fashion’*.

The influencing factors are drawn from original research undertaken in Document 4, informed by economics literature (Doeringer and Terkla, 1995) and in supply chain literature by Lawson (2005) and Sharifi et al. (2006) to represent the changing context within which the supply chain operates

and the influence that this has on strategic decisions within the supply chain. External or macro factors include globalisation, economic drivers, trade regulation, environmental and social legislation, etc. (Matapoulos et al., 2007). Strategic factors relate to the prevailing strategy of retailers and distributors, but also include the influence of other competitive elements, such as Foreign Direct Investors, and upstream suppliers (Sharifi et al., 2006); while the agglomeration or micro factors refer to industry structure, knowledge sharing, proximity factors, communications and resources as discussed in Document 4 (Oxborrow, 2011b; Doeringer and Terkla, 1995; Carbonara et al., 2002) and evidenced empirically in Document 3 (Oxborrow, 2011a). Where these factors affect customisation of supply chain strategy, the resulting future supply chain configurations (potentially from one to any number n) can be expected to combine a range of competitive priorities, adapted to demand criteria and targeted towards product and market (Lowson, 2005; Godsell et al., 2011).

Having explored external and micro factors in Document 4 (Oxborrow, 2011b), research question 1 focuses mainly on the strategic influencing factors. Question 2 sets out to uncover what is really happening in apparel supply chains and how this relates to the responsive supply chain concept and question 3 aims to identify the supply chain configurations that might emerge within the apparel supply chain and – overall – how these will relate to the UK apparel supply base. The research questions, identified in section 1.3 (page 11), are discussed below.

Figure 2.6 Conceptual Framework



2.11 Research Questions

As initially stated, the overall aim of the DBA series has been to answer the strategic question posed in Document 1 (Oxborrow, 2007) and subsequently modified: “How can buyers and suppliers in the volatile UK apparel market address the challenge of supply chain responsiveness?” The contextual issues summarised above, topical for the last 18-24 months, underpin the relevance of this question. It seems that, since the outset of the study in 2007, the question has remained substantially the

same, but the answer has become no clearer – either in theory or practice. From the contextual overview, it may seem appropriate to simply ask “what is the opportunity for apparel or fashion manufacturing to return to the UK?” but it becomes apparent, from the previous DBA research and extant literature, that this would be naïve. Sourcing location is just one variable among a number that combine to achieve fashion supply chain competitiveness. As a result the questions below have been established for Document 5 to explore the drivers for change in the apparel supply chain, understand the nature of that change and build a picture of what might happen in the future.

RQ1 How have strategic priorities changed in the UK apparel retail supply chain over the last 5-10 years?

Building on the underlying premise of Fisher (1997) the first question seeks to understand the drivers for responsiveness from a strategic perspective. Various researchers (Storey et al., 2006; Gattorna, 2009; Wong et al., 2012) have expounded the mismatch between business strategy and supply chain operation, and there is expectation in the contextual literature that supply chains will respond according to strategic change. Indeed, while western apparel markets are stagnant, there is dynamism within the market: between players, between different forms of distribution, in the balance between standardisation and responsiveness, and increasing competition to achieve survival and growth in spite of recession. The research aims to identify changing strategic priorities within the apparel retail industry and its supply chain, and understand how these do, and will in the future, impact upon the management of the textiles-apparel-retail supply chain.

RQ2 How have these changes impacted upon the design of [and design for] responsive apparel supply chains for UK apparel retailers?

Based on the suggestion of Christopher et al. (2006) and Gattorna (2009) that supply chains rather than organisations compete, this question sets out to explore how the apparel supply chain is organised to respond to the above strategic priorities and maximise competitiveness. While some researchers claim that companies struggle to align their internal functions, supply chain organisation and relationships (Wong et al., 2012; Storey et al., 2006; Godsell et al. 2006), Sharifi et al. (2006) suggest that aspects of supply chain design should be reconfigured to match product and market strategy. Following the central premise of proximity in relationships and supply networks (Oxborrow, 2011a and 2011b), the research seeks to understand the extent to which supply chain structure, roles, intermediation and integration; relationships and associated issues of commitment, switching, acuity, gain sharing and risk; information and knowledge sharing; collaboration in product development, upstream processes and reactive capacity are organised to achieve competitiveness and alignment, now and in the future.

RQ3 How will buyers and suppliers in the UK apparel retail supply chain address the challenge of responsiveness in the supply chain of the future?

Having discussed how supply chains are developing in the apparel industry, the implications of this are explored in order to extend theory and create opportunities to inform practice. After years of decline (Oxborrow, 2011b), the future extent and significance of localised manufacturing is unclear, but while Hines and McGowan (2005), Birtwistle et al. (2003) and Schmenner and Tatikonda (2005) suggest that current relationships constrain responsiveness, there is a tangential argument (Doeringer and Terkla, 1995; De Toni and Tonchia, 2005) that geographical clustering supports responsiveness and global sourcing increases supply chain risk (Christopher et al., 2011). The

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research aims to develop scenarios that reflect theory, practice and expert views, and which help to understand how supply chains will respond to the “*bad complexity*” (Deschamps, 2012b) that is emerging in the apparel market.

3 Methodology

3.1 Introduction

The research calls for a methodological process able to aid understanding of how apparel retailers' strategic priorities have changed; exploration of the implications of these changes for the supply chain; and provision of an insight into how this will impact on the supply chain of the future - establishing an appropriate methodology capable of rigorously researching a future that has not yet occurred. This challenges the researcher to be "*methodologically self-conscious*" (Clough and Nutbrown, 2007:35) in order to robustly meet the research aims and answer the research questions explained in Chapter 2. The methodology selected is the Delphi Technique, specifically the Policy or Disaggregative Delphi (Tapio et al., 2011), an emergent process for researching future scenarios and based on a mixed method approach to ground the views of experts into a wider context.

The process of identifying an appropriate research paradigm, understanding the relevant ontological and epistemological issues and mapping the research process in order to meet these objectives is discussed below where: "*ontology is the 'reality' that researchers investigate, epistemology is the relationship between that reality and the researcher, and methodology is the technique used by the researcher to investigate that reality*" (Healy and Perry, 2000:118). The chapter will explore the philosophy of the Delphi approach; issues associated with implementing the process with validity and rigour; and evaluate the use of the Delphi technique in Supply Chain research. A plan for the three-round Delphi approach adopted will include proposals for preparation, data collection and analysis and there is a discussion of ethics and recognition of the limitations to the process.

3.2 Understanding the Delphi Process

3.2a A Paradigm for the Future

A paradigm is defined as a cluster of beliefs, an interpretative framework or a "*net that contains researchers' epistemological, ontological and methodological premises*" (Denzin and Lincoln 2000:19), suggesting how and what research should be done, the methods of study, how the results are to be interpreted (Bryman and Bell, 2003), and how consistency can be guaranteed. The Delphi process is methodologically linked to a constructivist paradigm (Healy and Perry, 2000) associated with multiple contextual realities, subjective interpretation of the findings and researcher engagement in the field of research, as evaluated in Appendix 3.1a. An alternative paradigmatic approach places the Delphi process in a distinct 'Foresight' paradigm (Grupp and Linstone, 1999), which balances science and industry, analysis and action. Although it cannot lead to one '*true*' future, Foresight is important as the means of identifying areas of strategic research relating to emerging and generic trends, particularly relevant in new technologies, which include supply chain processes, with the greatest prospects for economic and social benefit. Researching future scenarios is based on little known phenomena, where history is not relevant and the views of experts should therefore be taken into account (Grupp and Linstone, 1999; Tapio et al., 2011). Delphi can capture subjective views about *ad hoc* actions and shifting trends, but in a systematic way in order to anticipate future scenarios (Ono and Wedermeyer, 1994). A scenario is defined as a:

"systematic description of events that would lead to a future outcome. Scenarios are future and action oriented and they often combine qualitative and quantitative

information describing actions over time. Scenario building also combines intuition, logic, reflection and action, rhetoric, and science” (Tapio et al., 2011: 1618).

Tapio et al.’s (2011) comparison of mixed methodology approaches in Foresight research is reproduced in Appendix 3.2. Data gathering (formal to heuristic) is mapped against data analysis methods (qualitative vs quantitative) and the Delphi Technique is located closest to the mid-point giving best representation of both explorative and scientific approach. Similarly, McKinnon and Forster (2000) identify four approaches to forecasting: extrapolation; analysing previous relationships and analogies; modelling future scenarios; or building expert consensus. Extrapolation from factual data or analogies can be ruled out where data is fragmented or does not exist, and Delphi can be applied where it is too costly or too complex to obtain past data or adequate models for prediction are lacking (Ono and Wedermeyer, 1994), leading Rowe et al. (1991) to conclude that Delphi can be used where all else fails! For others, consensus is not always necessary since highlighting differences in opinion can help to develop multiple future scenarios (Okoli and Pawlowski, 2004; Mitroff and Turroff, 2002). Tapio et al. (2011:1618) therefore conclude that the “*Dissaggregative Policy Delphi*”, a method for analysing multiple scenarios (see Appendix 3.1b), represents Delphi “*at its best!*” Consequently, Ono and Wedermeyer (1994:290) regard Delphi as “*the cornerstone of futures research*”; Delphi has become the preferred tool for measuring macro-level Technology Foresight and it may influence future developments (Tapio et al., 2011).

The Foresight Paradigm, represented by the Delphi model, is utilised to explore research questions based on future scenarios, such as ‘what is happening?’; ‘what effect will it have?’ and ‘what needs to be done?’ (Amos and Pearse, 2008). There is therefore a good fit between the Delphi process and the research questions on which this project is based as illustrated:

- | | |
|------------------------------|--|
| 1. What is happening? | How have strategic priorities changed in the UK apparel retail supply chain over the last 5-10 years? - |
| 2. What effect will it have? | How have these changes impacted upon the design of [and design for] responsive apparel supply chains for UK apparel retailers? |
| 3. What should be done? | How will buyers and suppliers in the UK apparel retail supply chain address the challenge of responsiveness in the supply chain of the future? |

3.2b Ontological Approach

Until recently, the ontology - or theory of being of social units (Bryman and Bell, 2003) - relating to the Delphi Technique has attracted relatively little discussion in the literature, but this has been addressed more recently because of a divergence of Delphi approaches. Classic Delphi is an approach most fitting within a constructivist ontology (Amos and Pearse, 2008; Mullen, 2003; Mitroff and Turroff, 2002) based on the argument that humans generate knowledge as a result of their experiences and ideas (Ackermann, 2001) and in Classic Delphi the “*constructivist inquirer*” builds knowledge and experience through successive rounds of enquiry until consensus is achieved (Amos and Pearse, 2008:99). However, the Policy or Disaggregative Delphi is associated with a relativist ontology (Mitroff and Turroff, 2002) which proposes that realities exist in multiple constructions (Guba and Lincoln, 1989) based on the subjective interpretation of individuals according to their social context and experience (Amos and Pearse, 2008) and which aims to arrive at multiple scenarios, rather than consensus. It is the latter approach that is most relevant to this study, which specifically targets the views of a range of industry experts, in contrast to previous case based research.

3.2c Epistemological issues

Similarly, methodologists have struggled to attribute the Delphi Technique to a particular epistemological framework (Amos and Pearse, 2008; Mullen, 2003) because of its hybrid qualitative and quantitative approach. More recently, Amos and Pearse (2008) and Tapio et al. (2011) suggest that the research objective of exploring, identifying and describing multiple realities is essentially a qualitative process which distinguishes the Policy Delphi from the Classic Delphi process of obtaining statistically proven consensus. Grupp and Linstone (1999) add that the iterative processes for exploring chaotic changes in reality should lead to stability of opinion rather than striving for consensus. Essentially, the Dissagregative Delphi consists of a number of steps or rounds:

- i. A first round of qualitative, open questions is put to an expert panel, or sub-panel (Mullen, 2003). This stage is often replaced by a review of literature, although this can constrain the objectivity of the process.
- ii. Subsequent rounds, following an agenda set by the panel, which each include feedback and interactive justifications to inform expert representation of future scenarios and their supply chain consequences.
- iii. Analysis of the Delphi data, which is essentially qualitative, based on categorisation or cluster analysis and interpretation; the quantitative techniques employed are based on heuristically produced estimates for illustrative purposes, rather than objective statistical analysis (Tapio et al., 2011).

The importance of the experts' views leads Scheele (cited in Bryman and Bell, 2003) to attribute the Delphi method to a phenomenological epistemology, since the objectives of a policy Delphi are essentially to use subjective expert judgements and feedback to generate a range of opinions and statements with an idea of how much support exists for each (Amos and Pearse, 2008). The process depends upon accounts from a relatively small group of experts and represents the "*double hermeneutic*" concept (Myers 2009:39) in which the researcher plays a role in interpreting the material being studied and is thus also a subject of the research. The researcher consequently uses their interpretation to understand the mutually dependent meaning and context under investigation (Mullen, 2003). Grupp and Linstone (1999) acknowledge that there is no '*true*' information about the future as it does not yet exist, which also means that the use of Delphi for theory testing is unproven (Tapio, 2002). However, successive rounds of survey inquiry and the iterative process of data collection, analysis and reporting helps to secure validity of the findings, giving the opportunity to test emergent concepts and making for better theory (Silverman, 2005; Amos and Pearse, 2008).

3.2d Evaluation of the Delphi Approach

For Mitroff and Turroff (2002), the classic Delphi approach emerged from a 17th Century Lockian perspective, where data precedes theory and knowledge is derived from experience through observation (external experience) and reflection (internal), leading simple statements to inductively realise generalisations and ultimately consensus. Okoli and Pawlowski (2004) suggest that the diversity of the experts helps with generalisability of the findings and that asking respondents to justify or explain their answers helps to identify causal effects. Much of the criticism of the Delphi process is considered by Mitroff and Turroff (2002) to emanate from later deductive philosophy, with attempts to make the process more '*scientific*' by increasing the panel size and random selection, defining the concept of '*expertness*' or emphasising the theoretical substance (Tapio,

2002). Mitroff and Turoff (2002) argue that satisfying all concerns results in impractical, overly sophisticated models, that the process must fit the theory and that successive inductive-deductive Delphi rounds results in “*deeper insight*” and “*greater confidence*” (Mitroff and Turoff, 2002:26).

Triangulation, through the use of a multi-method approach (Neuman, 2006) adds rigour, breadth and focus or richness (Flick 2002). The useful number of rounds in a Delphi process varies, but generally three to four is considered to provide triangulation (Landeta, 2006). In Classic Delphi processes the third round replicates the second, in an attempt to see whether panel feedback changes expert’s predictions and to achieve panel consensus. In the Disaggregative Delphi, the objective is working towards “*a reliable group opinion*” (Landeta, 2006:468), and Bolger and Wright (2011) suggest that qualitative feedback and more obvious progression between rounds is more effective. Bolger and Wright (2011:1509) stress the importance of avoiding individual responses to minimise “*social influence*” across the panel; while incorporating rich, qualitative feedback, reasons and justifications helps secure validity and promote “*virtuous opinion change*”.

The Delphi technique is a mechanism for capturing group judgements to forecast change where a lack of history precludes extrapolation. The argument for group research claims that groups can resolve conflict and stimulate creativity so that the net “*Process Gain*” from group interaction generates better results than those obtained from the best member (Rowe et al., 1991:235; MacCarthy and Atthirawong, 2003). A counter-argument can also be proposed, suggesting that interacting groups fail to achieve their best potential because of “*Process Loss*” (Rowe et al. 1991:236) caused by the satisficing behaviour of some group members and the dominance of others. Delphi reduces this process loss (Gupta and Clarke, 1996) because the group of experts answer key questions, share feedback and reflection, anonymously and without contact, so that individuals can change, develop or refine their ideas (Ogden et al., 2005) without coercion and embarrassment (Lummus et al., 2005). Furthermore, because the process elicits planned, rather than reactive, responses, individuals are encouraged to give their personal, rather than institutional opinions, stimulating independent thought (Gupta and Clarke, 1996). The procedure is therefore most appropriate for research areas where social and ethical issues are more important than technical or economic factors – the more “*inexact sciences*” (Landeta, 2006:468), a view with synergy to some of the hard to measure aspects of supply chain management, such as strategy development and buyer-supplier relationships.

3.2e Delphi Analysis Tools

Varho and Tapio (2012) acknowledge that much of the literature on the Delphi technique focuses on collecting the data, rather than its analysis. Over a number of studies (Tapio 2003; Vinnari and Tapio, 2009; Tapio et al., 2011; Varho and Tapio, 2012) they develop a more precise methodology, referred to as Q₂, for analysing the multi-method approach to scenario building. The Q₂ methodology adopted by Varho and Tapio (2012) follows a sequence as outlined in Appendix 3.3 based on initial data collection from a questionnaire and data analysis; data collection from interviews and data analysis; data collection from a second questionnaire and parallel analysis of the numerical and qualitative data; compilation of a futures table to compare the results and identify scenario paths and stories and the supply chain configurations that these lead to.

Although Amos and Pearce (2008) classify the Disaggregative Delphi as primarily qualitative, the survey process inevitably generates numerical data. Commonly in Delphi processes, the data

gathered is in a ranking or ordinal scale measurement of individual items (Turroff and Hiltz, 1996) sometimes qualified by nominal data. While various systematic approaches can be applied, such as pre-defining the level of consensus or stating which Likert scores are determined to be unimportant (Williams and Webb, 1994) it is generally not considered possible to subject the findings to statistical testing (McKinnon and Forster, 2000). Instead analysis of mean and standard deviation are favoured, as in, for example, logistics research Delphis (McKinnon and Forster, 2000). There is very little guidance on the analysis of qualitative data in the Delphi process. Varho and Tapio (2012) suggest use of content analysis, but for the rich narrative data generated from face to face interviews a coding or labelling process that identifies themes or issues in the data (King, 2004) is considered more appropriate here. In a two-stage coding analysis, these initial themes are subsequently grouped and re-analysed into fewer, more focused codes (Charmaz, 2006) which can be interrogated in depth across the full set of data.

The ' Q_2 ' scenario technique leads to heuristic projections of future trends in the final stages of the Delphi process by considering the drivers of change beyond those apparent in quantitative techniques alone. Essential to the ' Q_2 ' method is that each data type contributes to the output and the results are analysed simultaneously as described in Appendix 3.4. In spite of Varho and Tapio's (2012:611) claims, which require a leap of faith from conventional analysis methods, in reality the mixed method results are analysed separately, with the findings of each set of data compared in a systematic way to provide validation and explain any sub-groups or exceptions. ' Q_2 ' uses Cluster analysis for quantitative data to classify and group together similar respondents. Cluster Analysis is used for small samples as it does not require a random sample (Varho and Tapio, 2012) and can be applied to analyse subjective judgements (Turroff and Hiltz, 1996) to inform the Delphi respondents how their responses differ from those of the whole group. Qualitative data is analysed using coded themes (Vinnari and Tapio, 2009) or content analysis (Varho and Tapio, 2012) as discussed above.

Cluster Analysis is an exploratory, heuristic technique aimed at identifying clusters or "*group[s] of relatively homogeneous cases or observations*" (Burns and Burns, 2008: 553) that enables the informed researcher to assess when structures represent reality (Aldenderfer and Blashfield, 1984). The tool is popular in dissensus-based Delphi studies, even though it can lack statistical rigour, since its multi-disciplinary methodologies⁴ combine with the multi-method Delphi approach to establish validity (Tapio, 2003), while a random sample is not required (Varho and Tapio, 2012). The Cluster Analysis technique produces 'why' questions such as why are units similar, enabling the researcher to see patterns, testing hypotheses based on case comparisons (Remesberg, 2004). Each method of cluster analysis has limitations, so to establish the best classifications a two-stage process is recommended (Mooi and Sarstedt, 2011; Cornish, 2007; Burns and Burns, 2008). In the first instance a hierarchical Cluster Analysis utilising Furthest Neighbour analysis and standard Euclidean Distance

⁴ Terms for the item being clustered include: case, entity, object, pattern or unit; those for the variables used to create clusters include variables, attributes, characters or features. The relationship between variables follows a 'Q' analysis (Aldenderfer and Blashfield, 1984).

tools (Vinnari and Tapio, 2009)⁵ can identify the optimum number of clusters within the data, while a subsequent non-hierarchical Cluster Analysis method (or K-means) is used to produce a better fit of cases within the prescribed number of clusters (Cornish, 2007) by allocating each case to its nearest group.

3.3 Supply Chain Management research and the Delphi process

According to Handfield and Melnyk (1998), Operations Management is a relatively new field in which theory, as a well-developed set of inter-related propositions for the analysis of empirical evidence (Bryman and Bell, 2003; Fisher, 2004), is underdeveloped and often follows practice. Supply chain management in particular represents an area where theory development is still at the discovery and description stage, and even though progress has undoubtedly been made since 1998 (Lee 2002, Lawson, 2005; Seuring and Muller, 2008; Christopher et al., 2011; Stratton, 2012; Khan et al., 2012) the process of theory development is described as “*work-in-process*” (Handfield and Melnyk 1998:336). There is clearly scope for further research in the field, in accordance with the gaps in the literature identified in Chapter 2, and the primary goal of operations management research is contributing to knowledge – through typology, prediction, explanation, understanding of cause and control mechanisms - ultimately generating acceptance in the real world and testability in real situations. Theory provides the link between data and knowledge and is essential to the process of testability and application. This research, therefore, aims to achieve the initial stages of theory building (after Handfield and Melnyk, 1998) through exploration, description and foresight, moving on to relationship development and theory validation. The iterative Delphi process is considered well suited to exploratory theory building, identifying areas of interest and developing propositions relating to complex and interdisciplinary issues and emergent trends (Akkermans et al., 2003; Okoli and Pawlowski, 2004). In this context proximity to the empirical environment is important and inductive techniques aid with the exploration.

Akkermans et al. (2003) suggest that academic research is relatively thin in the subjects of Logistics and Supply Chain Management, and that the Delphi process provides an opportunity to develop theories by “*listening to experts from business*” (Ibid:289) and enabling them to address complex problems. From its roots in 1950’s military planning (MacCarthy and Atthirawong, 2003), Delphi has been increasingly used to identify future scenarios in business and economics (Landeta 2006), including Supply Chain Management, Logistics, and Sustainability which, consistent with Handfield and Melnyk’s (1998) analysis of operations research, is a relatively new phase of Delphi implementation. The Delphi technique has been used in a number of recent studies into supply chain management where practice is thought to lead theory, in which case capturing the views of experts seems particularly apt (Akkermans et al., 2003). An initial stage in this research project involved identifying the key aspects of eight of these supply chain related Delphi studies and evaluating their approach, scale, focus and analysis to understand the appropriateness of the Delphi process to this study and establish rigour. The findings are summarised in Table 3.1. Worthy of note, McKinnon and Forster (2000) concluded that practising experts have more up-to-date knowledge of

⁵ Vinnari and Tapio (2009) dismissed the more complex Ward method that uses squared Euclidean distance, claiming that it added little benefit although generally considered more reliable.

developments in the field than that represented by academic literature and in the case of supply chain management may provide a source for otherwise hard to find data. Meanwhile Lummus et al. (2005) note that:

“Delphi is used when expert opinion is the best evidence available’ [citing Martino, 1983]. This method is appropriate for helping to understand supply chain dynamics because gathering experimental evidence of supply chain performance is difficult, given the cross-company nature of supply chains” (Lummus et al., 2005:2689)

In short, the Delphi technique has been selected for this study as one of few means to explore future realities, which compensates for lack of historical data, facilitates the process gain of group research, without the process loss, (Rowe et al., 1991) and values the opinion of informed and practicing experts in a field where practice leads theory. Delphi also offers the practical advantage of overcoming the competitiveness issues and seasonal scheduling challenges associated with any group activity in the apparel industry. The Disaggregative Delphi is employed because it respects difference of opinion and results in scenarios rather than enforced consensus, follows an inductive-deductive approach and is most suited to scenario development in the inexact sciences.

Table 3.1. Delphi Technique: A review of Delphi studies in SCM

Authors (date)	Focus	Sample	Process	Ranking objectives	Reflections
McKinnon and Foster, (2000)	Forecast trends in Logistics and Supply Chain 1999-2005	129 executives, academics and logistics consultants across EU.	Initial Questions set by researchers in consultation with EU partner organisations. R1 Increase/ decrease of variable on index 1999; Date of new development; Rate agreement with statement. R2 Agreement with earlier statements (60% response)	5 point Likert scale Results not statistically tested as sample not randomly generated. Use mean and standard deviation. Web address pg4 sets out results.	Page 2 sets out literature on types of Delphi, background and limitations. Includes discussion of forecast changes in manufacturing location attractiveness.
Akkermans, Bogerd, Yücesan, van Wassenhove (2003)	Impact of ERP on future SC trends	23 executives from industries with SC and ERP significance; Undertaken in lab in 'real time'.	Overall project: define terms; identify key issues; group; rank; rate business impact and ERP benefits. Delphi R1: List of key SC trends; R2: Consolidate 22 to 12 key areas/rank; R3: Assess business impact and ERP intervention in top 12 SCM trends	Vote for top 3 SCM criteria for ranking Rank of business impact and ERP support not specified.	Delphi min group size 20
MacCarthy and Atthirawong (2003)	Identify key factors influencing location decisions	20 and 17 respondents from panel of 38. Importance of survey design stressed.	Round 1: from literature Round 2: part open Q's to add to literature, with key points explored using 7 point Likert Round 3: Invite comments on feedback and indication of consensus using Likert scale	Importance placed on descriptive feedback and exceptions. Findings represented by average rating – main factors and most important sub-factors (>3.5 avg).	Analysis using descriptive stats – small purposive sample – statistical tests not relevant. Small sample fine for exploratory study, but generalise with care. Findings help understand survey tool.
Ogden, Pettersen, Carter, Monczka (2005)	Identify Future strategy in SCM	C90 respondents from sponsor companies	R1 Open questions – indicate strategies led to forecast in 19 key areas R2 Validation from 80 predictions – rank confidence and likelihood R3 Reconsider R2 scores and rate impact	Predictions based on likelihood, confidence and impact of each criteria. Combined result used to group responses	Suggests panel of 15 produces replicable results

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Lummus, Vokurka, Duclos (2005)	Identify model of Supply Chain Flexibility	Actual size 13	Round 1: open questions Round 2 & 3: Ranking 59 priority terms	7 point Likert scale	Literature suggests ideal panel size 10;
Zsidisin, Voss, Schlosser (2007)	Supply Chain Relationships with logistics suppliers	Panel = executives from one large firm. Size not specified	Round 1: Review of relationship criteria based on literature R2: ranking criteria R3: rating performance of actual suppliers over 3 year monitored period against ranked criteria	Conceptual importance of relationship criteria – tested against performance of actual suppliers. Based on 5 point Likert scale	Not replicable as based on one company's experience
Seuring and Muller (2008)	Supply chain sustainability	Survey database of 124. Actual response 46, 43, 42	“Brainstorming – consolidation-evaluation”: R1 Open Questions and content analysis R2 & 3 testing priority of 27 items in 4 themes	Based on 5 point Likert scale: R2 assessing individual SC items R3 clarifying contradiction	P458 discussion of validity
Melnyck, Lummus, Vokurka, Burns & Sandor (2009)	Identify future strategies in Supply Chain Management	24 respondents from 2000 conference delegates	Round 1: ranking of list derived from literature Round 2: Ranking priority terms Round 3: focus group confirmation	Importance now: importance 5 years from now. 5 point Likert scale	

3.4 Research Strategy and Implementation

In this study, the strategy is to identify future scenarios affecting the ways in which UK apparel retail supply chains are structured, managed and linked to retailers' overall business strategy. A multi-method Disaggregative (or dissensus) based Delphi technique is employed as part of the overarching DBA process, representing part of the researcher's armoury of research tools employed for theory building (Ogden et al., 2005; Okoli and Pawlowski, 2004; Mitroff and Turroff, 2002). The Delphi process seeks the views of industry experts from a variety of roles within the '*textiles-apparel-manufacturing-retail*' industry complex, henceforward known as the apparel industry. The process therefore involves grouping experts into '*clusters*' dependent upon similarities and differences within their responses; utilising the responses from each cluster to identify '*scenarios*' or sets or patterns of future events and then, from the cluster responses, determining what supply chain configurations might emerge as a result of such scenarios, and how these might be implemented.

Research Questions 1 and 2 are answered by rounds 1 and 2 of the Delphi process, incorporating semi-structured expert interviews, validated by a questionnaire. Question 3, will be answered by analysing the expert forecasts of Round 2, the detailed questionnaire, from which a range of possible future scenarios will be developed and explained in terms of the supply chain configurations that emerge. These will be shared with the experts and validated by their feedback during a third and final Delphi round.

The forecasting period, 5 years, is relatively short for a Delphi foresight process, but deemed to be relevant to current industry developments and industrial policy, mirrors a relatively short history of rapid restructuring and, in an industry renowned for its fast moving, but short-termist outlook, is considered a credible and challenging timescale from the experts' viewpoint. Findings can also be compared to those previously uncovered during the DBA process (Oxborrow, 2011a; 2011b), predating the current research by 5 years.

This following section maps out how the Delphi study was carried out, and discusses the potential variations and justification for the many decisions made during the twelve month process. It concludes with a discussion of the limitations of the research method.

3.4a Research technique – A Delphi Study

The process started with an intensive review of the methodology (summarised in section 3.2) and an evaluation of previous supply chain Delphi research projects was carried out, summarised in section 3.3 and Table 3.1. A database of potential industry contacts was collated. The preparatory phase concluded with a critical review of extant knowledge, and the setting of research questions, as discussed in Chapter 2. Three subsequent Delphi research stages were planned, consisting of:

1. collating data from detailed semi-structured interviews, websites, media reports and prior secondary literature;
2. testing the findings in the context of two successive survey rounds, in which each stage tests the validity of that before it.
3. analysing the data to feedback at each stage and establish a series of future scenarios for validation in a third and final round.

The model adopted, a first round of interviews followed by a questionnaire, is based on that of Tapio (2003) and Vinnari and Tapio (2009). Previous Delphi studies have used a range of combined

methods. In Round 1, open-ended survey questions (Ogden et al., 2005; Lummus et al., 2005), scanning of literature (MacCarthy and Atthirawong, 2003), and interviews have been utilized. The questionnaire serves the dual purpose of identifying the current status of the apparel supply chain, and expert views of how it will change in the future, comparing views of *'what has happened in the last 5 years'*, to *'what is happening now'*, and *'what is foreseen to happen five years from now'*.

The content and process of each round is discussed in section 3.4c-e.

3.4b Selection of the Delphi Panel

Key to the validity of the Delphi process is the selection of experts and composition of the panel (MacCarthy and Atthirawong, 2003; Harland et al., 2005; Landeta, 2006). To ensure the quality of the panel, criteria were set to define the expertness of each individual, consistent with Williams and Webb (1994) and contextual questions were included in the interviews and survey to confirm the respondents' expertise. Experts were defined as being incumbent in, or having recently held, a senior (decision making) role, giving exposure to both strategic issues and aspects of supply chain management within apparel retail, supply, manufacture or associated services - and having done so for five years or more. Considerable effort was invested into ensuring that the respondents covered a representative range of upstream and downstream viewpoints, had experience in different product and market areas (identified as classic, basic fashion, fast fashion and premium), and differing supply chain contexts. Mullen (2003) considers it important for experts to self-rate their expertise, and in three cases, potential targets deselected themselves on the basis of their lack of current experience in the specific field, having recently taken on new roles.

The final panel of 24 respondents were identified from a database of 90 contacts compiled from two industry association databases, targeting key roles in major apparel industry businesses, and an extended network of contacts established by the researcher and colleagues while working with industrialists over a number of years. Delphi panel size can vary significantly and controversially, with panels in the small scale supply chain surveys (Table 3.1) ranging from 13 to 24. The research teams behind Lummus et al. (2005) and Melnyck et al. (2009) studies increased panel size considerably between studies. Indeed, panels of 20 or below are considered to help to reduce attrition (Mullen, 2003) because experts feel more valued in small groups (Hill and Fowles, 1975) but accuracy is also reduced. The target panel size in this study was therefore pre-determined as 15-20, with the built in flexibility to add new members during the process as proposed by Vinnari and Tapio (2009) to compensate for non-participation and attrition where consensus is not sought.

Initially, the sampling method was purposive, to ensure that the research questions could be addressed (Saunders et al., 2009), but, as the research progressed, a snowball approach was employed, consistent with Rowe and Wright (2011) to strengthen composition of the panel. While Williams and Webb (1994) refer to bias in the sample as a result of the researcher's own influence, this extensive database of contacts was collated with objective industry knowledge. Experts were categorised in an expert table, as shown in Table 3.2 (see columns 1-3), to establish breadth and diversity (Vinnari and Tapio, 2009) and overcome any issue of bias. Indeed Varho and Tapio (2012) stress the importance of diverse viewpoints over consistency of the panel, suggesting that new members can be invited during the process, while Vinnari and Tapio (2009) added a new consumer survey to complement a small Round 2 panel. To further this diversity the final panel therefore included a student on placement in a fashion retailer, the chairperson of an industry association and

a US based CEO. While several of the respondents' companies were known to the researcher, the individuals were largely previously unknown. All had experience in the UK apparel industry, and most had extensive experience in global supply.

Table 3.2 Sampling criteria, composition and participation of the panel

Business activity		Data label (Round 1)	Data code (Round 2)	Round		
				1	2	3
Fast fashion	Contract manufacturer	Lingerie (division)	M5	X	X	X
	Brand	US brand	S6	X		
	Retail	Fashion chain	R2		X	
		Men's wear chain	R3		X	
Industry Services	Knitwear	S1		X	X	
Conventional fashion	Contract manufacturer	Clothing	S3	X	X	
		Men's wear (division)	M5	X		
	Brand	Footwear brand	M2		X	
		Retail	Multi-channel retail	R5		X
	Online superstore		R4		X	
Industry Services	Sourcing consultant	O1	X	X	X	
High Performance	Brand	Swimwear	M4		X	X
	Industry Services	Industry association	O2		X	X
Premier brand	Contract manufacturer	Denim	M3		X	
		Sourcing agent	S5	X	X	X
	Brand	Hosiery	S2	X	X	
	Retail	Brand retailer	R8	X		
		Mail order	R1		X	X
Discount/supermarket	Contract manufacturer	Chain supplier	S7	X		
	Retail	Supermarket	R6		X	X
	Industry Services	Dye company	O3	X	X	X
SME	Contract manufacturer	Small factory	M6	X		
	Family manufacturer	Small knit factory	M1		X	
	Brand	Performance wear brand	S4	X	X	X
	Retail	Small retailer	R7	X		

3.4c Round 1 - exploring what is going on.

Based on semi-structured interviews, Round 1 was devised to achieve the initial objective of the Delphi process: identifying key variables currently affecting supply chains within the apparel industry; generating a rich body of data that could be used to really understand the issues affecting the industry and building on Documents 3 and 4; while avoiding the often rather 'dry' findings from a process which is neither fully qualitative or statistically quantitative (Amos and Pearse, 2008; Tapio et al., 2011). Interviewing is a conventional mechanism for collecting meaningful data, since asking probing questions encourages participants to interpret their own experiences (Warren, 2001; Saunders et al., 2003). An interview schedule (see Appendix 3.5) was developed based on a forensic analysis of the literature reviewed in Documents 2, 3 and 4 of the DBA (Oxborrow, 2008, 2011a and 2011b), a review of recent literature as reported in Chapter 2, and analysis of the industry context, also discussed in Chapter 2.

The interview protocol included the following plan:

- From the target of 20 Delphi panel members, 10 interviews with a sub-panel were planned, targeting experts from retail, supplier/manufacturer and associated services.
- Interviews were to be conducted face to face, on a one- to- one basis, at the respondent's own premises (or a neutral venue) and at their convenience, as listed in Table 3.3. Each interview was anticipated to last 45 to 60 minutes, and take place between July and September 2012.
- A preliminary set of open questions was developed based on the literature review and prior research (Oxborrow, 2011a; 2011b). Additional probing questions were to be asked accordingly as the conversation developed (Myers 2009).
- Contextual questions about the interviewees' company, job role and experience served the purpose of recording the interviewee's relationship to the data, confirmed their qualification as 'experts' to support the Delphi process, and willingness to be interviewed, as well as putting them at ease.
- The interview process was piloted with a colleague with prior experience of working in the apparel industry. Minor modifications were made to clarify some questions and shorten the interview.
- An emailed invitation to join the Delphi panel explained the purpose and topic of the interview (as shown in Appendix 3.6) and guaranteed anonymity to both the interviewee and the businesses with which they were associated. Informed consent for undertaking and recording the interviews was to be secured in writing.
- Interviews were to be recorded for accuracy of recall and meaning, and to aid the flow of the conversation. The recordings were later transcribed for analytical purposes. A sample transcription is provided in Appendix 4.1.

Table 3.3

Data code Round2	Experts			Business activity: Data Label Round 1	Interview medium (if in Round 1)
	No.	Role	Years		
R1	1	Product Director	25	Mail order	n/a
R2	1	Technical Manager	24	Fashion chain	n/a
R3	1	Head of Sourcing	20	Men’s wear chain	n/a
R4	1	Technical Manager	15	Online superstore	n/a
R5	1	Sourcing Director	16	Multi-channel retail	n/a
R6	2	Commercial director/ Technical	20	Supermarket	Phone – abridged 20 mins
R7	1	Managing Director	45	Small retail	Phone - abridged 20 mins Replaced R2
R8	1	Non-executive Director	15	Brand retailer	Off-site face-face 60 mins
S1	1	Assistant Buyer	1	Knitwear	n/a
S2	1	Managing Director	30	Hosiery	On-site face-face. 80 mins
S3	1	Commercial Director	28	Clothing	On-site face- face. 110 mins
S4	1	Managing Director	16	Performance wear brand	On-site face-face. 60 mins
S5	1	Sourcing agent	27	Sourcing agent	Off-site face- face 60 mins
S6	1	CEO	40	US brand	On-site face-face 90 mins
S7	1	Production Manager	25	Chain supplier	Off-site face-face. Abridged 30mins
M1	1	Managing Director	33	Small knit factory	n/a
M2	1	Buyer	15	Footwear brand	n/a
M3	1	Design Manager	25	Denim	n/a
M4	1	Head of CSR	11	Swimwear	n/a
M5	2	Divisional Directors	20	Menswear and Lingerie suppliers	On-site face-face. 100 mins
M6	1	Managing Director	29	Small factory	Phone – 60 mins Replaced survey
O1	1	Managing Director	33	Sourcing consultant	Email
O2	1	Chair-person	40	Industry association	n/a
O3	2	Technical/ commercial managers	10	Dye company	Phone 65 mins

In reality, while 19 of the targeted respondents were interested in engaging with the process, the practicalities of organising interviews at their convenience was problematic and some interviews were agreed by telephone or email. A further respondent organised for his colleague to join a face-to-face interview. Although disruptive to the predefined process, these adaptations were welcomed because of the quality of the expertise on offer. For example, the email exchange took place with an internationally renowned sourcing consultant and the one-to-two interview turned out to be with

two Company Directors, each representing their own Division, with very different approaches to the supply chain. Two other shortened interviews were undertaken for the convenience of the interviewee. When approaching participants for Round 2, two further experts offered their reply by way of a short telephone interview, instead of a questionnaire response. Since their expertise was complementary to the panel, interviews were arranged by telephone and an abridged form of the Round 1 interview schedule was prepared to suit each respondent's role and the time available. An adaptor enabled telephone interviews to be recorded.

In Round 1, ten full interviews (each lasting 60 to 110 minutes) and four abridged interviews (of 20 to 60 minutes) were undertaken. Interviews were primarily face-to-face, but included three by telephone and one by email – arrangements made to facilitate distance and fit into the professional schedule of the interviewees. All were recorded and transcribed. An indication of the relevance of the topic was inferred from the willingness of participants to give up their time and share commercially sensitive data, their often passionate response to the questions posed, and their undertaking to participate in subsequent rounds of the study. On the other hand, it is acknowledged that the interview process limits the scale of the overall research (Varho and Tapio, 2012), and in this case some shortened interviews were undertaken in the interests of securing the most diverse participation possible. A list of interviews is summarised in Table 3.3.

3.4d Round 2 Validating the current state and predicting the future – a questionnaire

Following detailed analysis of the interview findings, a questionnaire was developed that identified those aspects of retail and supply chain strategy and practice perceived to have the most significant influence on recent and future developments in the apparel supply chain. A summary of rich qualitative findings from Round 1 was also prepared and incorporated into the questionnaire, consistent with Landeta (2006) and Rowe and Wright (2011). Preparation included identifying additional experts to boost the Delphi panel for Round 2 and compensate for any attrition as proposed by Varho and Tapio (2012). Research was also undertaken to evaluate ways to effectively administer the questionnaire. The arising Protocol for Round 2 included the following actions:

- All 19 of the target Delphi expert panel were invited to complete an online questionnaire – all 10 of the original Round 1 experts had already agreed to participate. Additional panel members would be sought to enhance panel diversity.
- A questionnaire was developed based on findings from Round 1 and reflecting the '*what effect will it have?*' and '*what should be done?*' questions. The format of the questionnaire was based on models identified when compiling Table 3.1 based on a Likert scale with a target of 50 variables. The survey was planned for October to December 2012.
- Qualitative findings from Round 1 were prepared and incorporated into the questionnaire (see Appendix 3.7).
- A pilot questionnaire was circulated to colleagues for comment. As a result 5 questions were removed and others reworded.
- Access to an online survey tool was secured and the revised questionnaire formatted into the survey tool.
- The online tool was piloted again with ten academic colleagues selected because of their prior experience in industry. Three completed the survey and provided feedback, from which some modifications were made to the format, rubric and questions.

- The link to the survey tool was attached to a personalised email inviting experts to participate, which was subsequently sent to the existing panel and targeted additional contacts from the original list.

The questionnaire was designed based on a format used by Melnyck et al. (2009) in which respondents were asked to assess, for each factor, its importance now within the respondent's own supply chain experience, and to predict the importance of the variables 5 years from now. The importance of the factors were measured using a 5-point Likert scale, where 1 = irrelevant, 2 = minimal importance, 3 = some importance, 4 = important, and 5 = critical. The option to select not applicable (0 = N/A) was also provided in line with Vinnari and Tapio (2009) and the "*no judgement*" view of Turroff and Hiltz (1996:5). After each set of questions, respondents were also asked to explain how the issues in question affected their supply chain experiences. The open question was asked in order to capture rich explanatory data capturing exceptions issues related to the differing contexts of supply chains within the apparel industry, in line with the recommendations of Okoli and Pawlowski (2004) and Bolger and Wright (2011).

Before each category of questions, respondents were provided with summarised feedback from the Round 1 research, an important aspect of the Delphi process as experts are asked to reflect on their own experience in the context of the wider panel. A decision to embed qualitative findings within the body of the online research tool was made for convenience of the respondents and to encourage their participation (Bolger and Wright, 2011), but to improve the questionnaire both the findings and the subsequent questions were divided into emerging themes, including Retail Strategy, Strategic Priorities, Product Development and Sourcing Options, as shown in Appendix 3.7. Within each category respondents were asked to assess the importance of 9-11 variables now and in the future.

To pilot the survey a draft of the questionnaire was shared and discussed with three academic colleagues who had experience of working and/or researching within the textiles and clothing industry. Some modifications were made to the wording and structure of the questionnaire before it was circulated in e-survey format to 10 academics based in the School of Art and Design and the Business School, each of whom had some theoretical knowledge of the topic and professional experience in the field. As a result, further modifications were made, which included clarification of rubric and any ambiguous terms, while redefining a number of variables to avoid compounded events (Lummus et al., 2005), which initially increased the number of questions. Wording of the overarching questions was also changed to encourage experts to reflect on their personal experience rather than formal, institutional responses (Gupta and Clarke, 1996). Following discussions with the pilot experts, a decision was taken to ensure that experts were asked to reflect on the importance of variables phrased as a verbal clause, implying an *active* supply chain engagement with each variable, unlike Ogden et al. (2005:2694) who asked experts about a list of 'items', an approach deemed too superficial based on the quality of rich data from Round 1 and the expertise involved. After the two pilot stages the number of questions was reduced from 85 to 72 variables, within 7 categories, in line with surveys of MacCarthy and Atthirawong (2003) with 70 variables in 13 major categories, and Ogden et al. (2005) with 80 predictions in Round 2 narrowed to 59 in Round 3.

An online survey was designed using Survey Monkey. Survey administration was originally by email directly from the Survey Monkey website, but sending a web-link from the researcher's professional

email proved to be a more effective way to contact experts at their business email accounts. Initially the survey was sent to the 10 participants from Round 1, and 9 others who had agreed to join the panel, but not been available for interview because their roles involved travel abroad. Respondents were asked to complete the survey, initially within 2 weeks. This deadline was extended by a further week, with a polite weekly reminder sent by email. After three weeks, only 8 respondents had completed the survey – perhaps reflecting the lack of value perceived to result from their efforts (Hill and Fowles, 1975), the seasonal pressures on individuals within the annual fashion calendar, or the complexity of the survey tool. Further respondents were sought by contacting the remaining 40 apparel industry experts originally identified and eventually a further 20 targets were identified from sources such as Just-style.com articles, conference delegates and contacts recommended by knowledgeable colleagues and expert participants, using a snowball sampling method. This effort proved to be largely fruitless, as three new panel members were identified, but only one additional respondent fully completed the questionnaire and two others provided incomplete responses that were dismissed. Turroff and Hiltz (1996) confirmed that blanket invitations often yield poor results.

Meanwhile, the survey was printed and mailed to the original panel members as a reminder to participate. As a result a further two respondents completed the hard copy and posted it back, two others were prompted to complete the online version, and a further two asked to be interviewed instead. After a short break, a final push was undertaken in Spring 2013 to boost the sample size further in order to make the sample more representative and the analysis more meaningful. Experts who had been unavailable for the original Round 1 and 2 were re-contacted with personalised messages to generate interest, and invitations were extended to 11 new contacts identified through professional networking, whose profile fitted the sampling grid. The final sample consisted of 19 substantially complete responses obtained from a total sample of 90 contacts. There was some attrition from Round 1 (4 experts did not complete) and 12 new experts were drawn into the process, in line with the original plan and the example of Vinari and Tapio (2009).

The panel members who contacted the researcher requesting a telephone discussion were interviewed in spite of scheduling challenges. Their data was added to the Round 1 findings and future scenario analysis, as appropriate, just as Tapio (2002) modified the Delphi process to compensate for a lack of Round 1 respondents by incorporating interviews to add depth and understanding.

3.4e Round 3: Predicting and validating future scenarios.

The third and final round was designed to gain feedback on the three proposed scenarios, consistent with Bolger and Wright (2011) and the process employed by Akkermans et al. (2003). Hence, those variables considered most important in 5 years' time after Round 2 were re-profiled, classified using a Cluster Analysis technique, and summarised into three contextual forecasts or scenarios, and their attendance supply chain configurations, with which experts could agree or disagree. Feedback was based on summarised panel data (Bolger and Wright, 2011), customised with some individual findings. Although Round 2 responses and Round 3, scenarios leading to supply chain configurations, were planned to follow closely behind one another to benefit participants (Landeta, 2006), the process was delayed several times because of the perceived need to bolster the sample size and breadth of Round 2. Overall, ten of the 19 Round 2 respondents also contributed to Round 3.

Panel members were provided with a summary of each scenario, and a list of the variables they themselves had identified as most important, or likely to change most, in 5 years' time. Experts were asked to rank each scenario for appropriateness to their individual experience and to indicate how important they felt that each emerging supply chain configurations would be within their future supply chain portfolio, as well as being given the opportunity to comment on the scenarios and recommendations. The panel were not told which cluster their responses had been allocated to as a test of reliability.

3.4f Analysis: the Q₂ Approach

Initial data from the interviews was analysed using a two stage coding process (King, 2004; Charmaz, 2006). The rich narrative data from each interview was themed according to issues that emerged in the data and from the literature. These sub-themes were then collated and grouped into 11 overriding themes, and the findings from all interviews were grouped together under the heading of these themes, so that the data could be interrogated for comparable and contrasting views and experiences. The main themes were used as a structure for discussion of the collective data.

Data from the Round 2 questionnaire was analysed using mean and standard deviation, rather than a detailed statistical analysis (McKinnon and Forster, 2000). The mean response from the sample was interpreted as an indication of the overall importance of each variable, while standard deviation was taken as a proxy for the level of consensus, with deviation of 0.8 or less deemed to show high consensus and of 1.4 or over [representing the lower and upper quartiles within each variable - now and future] indicating a lack of consensus. Comparing the mean and standard deviation facilitated discussion of the most important variables, with relatively high or low consensus and variation between current and future importance. For clarity, analysis tables show mean and standard deviation rounded to two decimal places, although all rankings have been calculated in Excel and are based on actual figures. The measures were also used as a tool for analysing data within the cluster responses arising from the Cluster Analysis process.

Table 3.4 Cluster Analysis variables.

Cluster variable	Mean - Now & 5 years (n = 38 cases)	StDev - Now & 5 years (n = 38 cases)	StDev - Now (n = 19 cases)
Fashion proxy: 1 (all continuous fashion) - 5 (all fast fashion)	2.79	1.17	
Sourcing from suppliers with production close to market	3.37	1.58	1.5
Pre-booking capacity, with styles confirmed later	3.59	1.52	1.3
Delayed finishing - dye, print, embroider, etc - of greige/part finished goods	3.68	1.32	1.4
Building a portfolio of design developments ready to use	3.47	1.31	1.6
Reducing inventory	3.82	1.09	1.3

For the final stage, quantitative data was analysed using Cluster Analysis, following the Q₂ process (Vinnari and Tapio, 2009; Varho and Tapio, 2012). Practitioners of Cluster Analysis recommend trying

different approaches to get the best fit, and a number of attempts were undertaken before identifying 3 representative clusters. Cluster Analysis was attempted based on grouping of both the 19 cases and also 38 cases (after Varho and Tapio, 2012) incorporating both current and predicted data for each response. Different combinations of variables were tested and in the end, six key variables, were chosen to enhance the study's validity (Cornish, 2007; Mooi and Sarstedt, 2011) and avoid use of meaningless variables that might distort the clusters (Lleti et al., 2004). Mooi and Sarstedt (2011) recommend keeping the number of variables in proportion to the small sample size so only six were chosen as shown in Table 3.4, based on lowest consensus now and greatest variation 5 years from now. Data on fashion seasonality was based on ratio data, so for the sake of consistency, this was converted into a 5 point ordinal scale (Remesberg, 2004).

Based on previous Delphi Cluster Analysis a two-stage process was followed (Mooi, E. and Sarstedt, 2011; Cornish, 2007; Burns and Burns, 2008). An initial hierarchical Cluster Analysis utilising Furthest Neighbour analysis and standard Euclidean Distance tools (Vinnari and Tapio, 2009) for six key variables grouped the cases most readily into 3 clusters, as shown in the Dendrogram in Appendix 3.8a. The subsequent non-hierarchical Cluster Analysis method (or K-means test) was set to allocate the cases to 3 clusters to optimise the fit within each group (Cornish, 2007). The groupings produced by the hierarchical test on 38 cases and the K Means test of 19 cases and 3 clusters both resulted in a good fit. Vinnari and Tapio (2009) recommend Cluster Analysis as a guide that should represent reality rather than artificial data, so minor adjustments were made to arrive at a final definition of the 3 clusters, based on the combined output of each stage and the qualitative responses. Table 4.7 (page 82) lists the cluster participants and Appendix 3.8b shows how these groupings were achieved based on undertaking and sense-checking the successive Cluster Analysis stages.

A '*Futures table*' was used to incorporate qualitative data (Vinnari and Tapio, 2009), as illustrated in Appendix 3.9. A completed version is shown in Appendix 5.2. Reflecting the imbalance between the levels of survey generated qualitative and numerical data, the quantitative data was used to establish clusters and plot the resulting supply chain configurations, while coded qualitative data was utilised to validate the findings, illustrate stories and identify any exceptions within the clusters, consistent with Vinnari and Tapio's (2009) earlier version of the 'Q₂' process. Each scenario was then named and described, incorporating qualitative extracts, to exemplify the scenario '*stories*' and define the next Round 3 output.

3.5 Validity and rigour

Accepted good practice (Stuart et al., 2002; Eisenhardt, 1989) identifies four key aspects of validity and reliability: construct, internal and external validity, and reliability, each of which are addressed.

3.5a Validity

Construct validity relates to the appropriateness of the variables or constructs explored in view of the concepts being studied. Construct validity is supported in Delphi research through asking open-ended questions in the first round, enabling experts to set the agenda (Mullen 2003), as here carried out through expert interviews. The provision of rich qualitative feedback, which has been included at each stage (Landeta 2006; Rowe and Wright, 2011); confirmation of these findings by the panel (Seuring and Muller, 2007) also contribute to validity. Securing consistency in the expert panel throughout the study has been a challenge. Landeta (2006) suggests enhancing panel consistency by stressing the social and motivational benefits of participation, communicating updates and

maintaining a fast turnaround between rounds. In reality, panel members have struggled to maintain adequate interest, and the researcher has struggled to maintain rapid progress between rounds. This is partly explained by the initial efforts, consistent with Seuring and Muller (2007), to building a broader and more independent contact list to target potential experts and secure external validity, which restricted capacity for pursuing individual contacts for their participation to secure stability and may have resulted in attrition between rounds. Although potentially a limitation, this strategy did pay off with greater retailer involvement secured over a period of time.

Internal validity ensures that similar findings are replicated from different aspects of the research (Stuart et al. 2002). Seuring and Muller (2007) stress the need for rigorous Delphi survey techniques to boost internal validity, which can be further enhanced by the research 'team' collectively reviewing findings and analysis. While the team approach has not been possible, Landeta (2006) measures validity and reliability in terms of stability between the responses of each round. External validity enables researchers to generalise findings beyond the study context. Replication helps to support analytical generalisation, as does comparing to like-minded and dissimilar literature (Eisenhardt, 1989). Ono and Wedemeyer (1994) claim that expert opinions can be used for reliable and accurate forecasting, securing external validity where experts are well-chosen, constructs appropriate and the process rigorously carried out. While the findings of a Dissaggregative Delphi should be generalised with care, the approach adopted here of engaging a wide range of supply chain expertise responds to a gap in the literature for research that applies to the whole apparel supply chain, while also enhancing external validity. This is also supported by the breadth and depth of first round interviews; comparing results between rounds; triangulation of different methods and critical evaluation against extant literature.

3.5b Reliability

Research is considered reliable if the exercise could be repeated, leading to the same results (Hill and Fowles, 1975; Stuart et al. 2002). Standardisation is a contributing factor, so the process has been designed based on other supply chain Delphi studies. Documentation of each step is a method for achieving reliability, and this is aided in this case by the use of analytical grids, spreadsheets and an online survey tool, which aids the recording of communications and progress at each stage. Piloting of the research tools at each stage has also been carried out ensuring clarity, for example of the questions and constructs.

3.5c Ethical issues

The research was compliant with the University's Ethical Research Policy, which addresses aspects such as process transparency, participation and anonymity, data security and the right to withdraw. Accordingly precautions have been taken throughout to protect the anonymity of the experts and their companies, and to retain data in anonymised, password protected files. All contributions were made voluntarily and experts were informed through the invitation, confirmation and prior to the interview of their right to withdraw, while permission to record the interviews was also sought. One issue specific to the Delphi process is that of anonymity, with some Disaggregative Delphis revealing the identity of experts after the final round (Tapio, 2003) – a practice avoided for commercial reasons. Another Delphi specific issue is that of sharing data between rounds, and steps have been taken to ensure that no individual or organisational identity is evident through feedback. Care was also taken when identifying experts to ensure that personal contact data was derived from sources

within the public domain, such as the ASBCI industry handbook, or passed on to the researcher with the consent of the targeted expert. While ethical, this two stage process was ineffective and slow. A copy of the ethical approval form is included in Appendix 6.

3.6 Limitations of the Research

Critics of the Disaggregative Delphi process suggest that Delphi lacks advantages over other group research methods – though there is little evidence to suggest that it is any less reliable. Limitations in the process are focused on selection and use of experts, process design and data analysis (Landeta, 2006). The discussion highlights how these limitations relate to the process carried out and what measures were taken to mitigate any limitations.

3.6a Selection of experts

One of the most widely recognised limitations of Delphi operation is the subjective selection of experts (McKinnon and Forster, 2000; Landeta, 2006) because of convenience sampling and lack of clarity of the expert criteria. This research addresses the latter point by targeting specifically acknowledged professional experts and checking their credentials. The issue of representativeness and bias was addressed by using third party databases and a purposive sampling grid to ensure that experts were both neutral and knowledgeable about a range of industry contexts. In practice, however, it is acknowledged that experts with an “*emotional or professional link*” are more committed and prepared to contribute (Landetta, 2006:479). Another criticism is that experts’ knowledge is under-utilised (Rowe, 1991), which was addressed in this case by capturing rich narrative during Round 1 interviews and inviting qualitative comment during Round 2. Rowe also criticises the quality of feedback, which can cause attrition if not engaging. This is acknowledged as a limitation, since there is a lack of guidance on what constitutes good feedback, especially from qualitative data, while industry experience suggests that industry experts would be equally put off by too much detail. A further acknowledged limitation, which again could lead to attrition, is the undesirable delay between Delphi rounds (Landetta, 2006).

3.6b Data Analysis

Gupta and Clarke (1996) suggest that to truly capture statistical probability from the subjective feedback of experts would take many iterations of the process, negating its value and Landeta’s (2006) response is that compromise in the number of rounds is necessary to maintain expert engagement. In this case, the small number of rounds is consistent with Landeta’s (2006) view that triangulation of mixed methods provides validity, and Bolger and Wright’s (2011) suggestion that qualitative feedback is equally valuable when working towards a collective group view. Another issue is that of choosing the number of clusters during Cluster Analysis, and while Vinarri and Tapio (2009) recommended four clusters, the small sample size and best fit in this study was found with three clusters. Since the Cluster Analysis process was designed to replicate that outlined by Cornish (2007) and others, and as a guide only (Vinarri and Tapio, 2009), it is the sample size that is deemed to be more of a limitation here than the process of analysis. Another issue is the challenge of analysing qualitative and quantitative data. A Futures Table (Tapio, 2009; Varho and Tapio, 2012) is recommended to enable assimilation of the results of both sets of data, and Varho and Tapio (2012) suggest that analysis can then be simultaneous. This is a recognised limitation. In practice, analysis must be undertaken separately and the results can then be compared but the study generated too much rich qualitative data at Round 1, and too little rich data during Round 2 to facilitate any direct

assimilation. Instead, the data has been analysed consecutively, but the results of the qualitative analysis used to validate and explain the quantitative data. This does, however, concur with a further drawback - that the process is acknowledged to be time-consuming and troublesome for the experts and researchers alike (Landeta, 2006).

3.6c Poor Practice

Gupta and Clarke (1996) identify a series of limitations in execution, including poor questionnaire design and inconsistency between the results of each round. They do, however, add that most of these limitations are common with other group research techniques. The issue of poor questionnaire design has been addressed by using as a model survey tools from other Supply Chain Delphi research (Melnyck et al., 2009) modified according to a piloting exercise. Lack of consistency between rounds is a recognised limitation, since the mixed method approach means that consistency cannot be tested. However, the results of each round do broadly validate each other.

One other limitation observed is the difficulty of undertaking a Delphi study as an individual. Seuring and Muller (2007) suggest that the research '*team*' secures internal validity, but for the lone researcher it is impossible to collectively review findings or liaise with a diverse group of known experts. In turn this compromises expert engagement, capacity constraints delay the progress from round to round, and the lack of diversity could diminish the value of the findings. Moreover, while email and online tools help refine the process (Amos and Pearse, 2008) the vintage advice of Hill and Fowles (1975) to meet each experts' expectations by communicating by mail, telephone and face-to-face has proven invaluable though time-consuming. All in all, preparation and administration of the research was slow and exhaustive and should not be underestimated in planning for an effective Delphi process, further delayed by the sequential analysis and feedback at each stage.

4 Findings

4.1 Introduction

This chapter summarises the findings from each round of the primary data collection process. One of the criticisms of the Delphi process is that of too much data (Mitroff and Turroff, 2002; Landeta, 2006). To address this, the chapter is separated into sections reporting on the rich qualitative interview data in the first instance, using the primary codes from Table 4.1 for structure. This is followed by the generic findings from Round 2, representing the supply chain as it is currently operating, and incorporating graphs and tables to illustrate these results. The final section represents the three future scenarios that have been identified from the respondents' future predictions and the supply chain configurations that are anticipated to emerge as a result. Each section is preceded by a short discussion of the profiles of the respondent at each stage.

4.2 Findings from first round interviews

The rich data from the initial interviews was coded against a number of key themes drawn from the literature, findings from Document 3 (Oxborrow, 2011a) and common themes that emerged during the interviews themselves. These were collated and grouped into the most important themes, in a two-stage process, as outlined in section 3.4f ([page 52](#)). Table 4.1 details the list of major and sub-themes used to code statements from the interviews. In all, 350 different coded statements were identified.

Table 4.1 List of coding themes and sub-themes.

Primary code	Sub-themes
Company background	including information about individual roles, markets, ownership and organisational structure
Retail strategy	Including polarisation, internationalisation, multi-channel retailing
Alignment of supply chain	order winners: cost, speed, quality, flexibility, and dependability.
The decision making process	including issues relating to product selection, transparency, critical path management and order transactions
The design process	including discussion of product development, testing, modularity, postponement, fabric and components
Fast Fashion	including reference to quick response, product proliferation, demand management and the 'Zara effect'
Flexibility and responsiveness	including issues relating to inventory, lead-time and replenishment
Sourcing and supplier selection decisions	including location, proximity and UK supply; upstream supplier selection
Supply chain relationships	including issues of trust, intermediation and verticalisation, information sharing, communications and ICT
Capabilities	including technology, skills, management capability, organisational roles
An 'other' category	which includes reference to finance and investment, supply chain risks, marketing and growth

4.2a Company background

The interviewed experts were selected using purposive sampling to reflect the diversity of the apparel sector, see 3.6a ([page 55](#)). Their business interests are summarised in Table 4.2 below, together with Round 2 participants.

The qualitative feedback discussed also incorporates data provided by some Round 2 respondents in the open questions, notably a UK and North Africa based supplier of denim items, a UK sportswear brand and mail order company.

Table 4.2 Round 1 and 2 respondent profiles

Data code Round2	Data Label Round 1	Company and business description
R1	Mail order	Mid-sized UK based mail order company designing and selling high quality clothing for the whole family.
R2	Fashion chain	Fashion chain selling own brand fashion for young men, women and girls
R3	Men's wear chain	Fashion chain selling men's wear targeted at young consumers
R4	Online superstore	Online superstore selling own brand and branded clothing for men and women

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R5	Multi-channel retail	Multi-channel retail selling clothes for the whole family through a combination of online, catalogue and TV shopping outlets
R6	Supermarket	Supermarket: A UK chain that sources and retails own brand clothing for the whole family.
R7	Small retail	Small independent retail chain: Designing and retailing its own range of women's wear.
R8	Brand retailer	Brand retailer: a medium sized men's and women's upmarket fashion brand, with retail, in-store departments and wholesale outlets internationally. The respondent is also a director of several emerging brands.
S1	Knitwear	UK based supplier of knitwear to high street chain stores.
S2	Hosiery	Hosiery: branded and contract hosiery, sourcing from factories in the Far East and Europe, and supplying a range of retail stores. owned by Australian investment company.
S3	Clothing	Clothing supplier: A large UK based supplier manufacturing their own brand and contract women's wear and hosiery for several chain stores from owned factories overseas. Owned by Far East based supplier.
S4	Performance wear brand	Performance wear: A small supplier of high performance merino base layer garments for outdoor and professional use in leisure and corporate markets.
S5	Sourcing agent	Sourcing agent: An agent selling women's and men's wear to upmarket retail and mail order for two UK suppliers with production in the Indian subcontinent.
S6	US brand	US brand: a women's wear brand supplying upmarket department stores in the US and manufacturing locally. The expert has experience in UK shirt supply and shares in a UK designer brand
S7	Chain supplier	Chain store supplier: Contract supplier of women's, children's and men's wear, sourcing globally and supplying several retailers. UK division of a Far East supplier
M1	Small knit factory	Family owned factory, manufacturing knitted goods for babywear, school, corporate and leisurewear, with in-house embroidery and print facilities.
M2	Footwear brand	Design led, innovative international footwear brand
M3	Denim	Design and production of denim jeans and associated products with factories in UK and North Africa.
M4	Swimwear	International brand, designing and manufacturing swimwear and swim related products from a global supply base for high street and performance markets.
M5	Menswear and Lingerie suppliers	Lingerie and men's wear supplier: Product divisions of a large contract manufacturer, with owned factories in the Far East, supplying one UK retail customer. Recently acquired by Far East holding company.
M6	Small factory	Small factory: Producing women's wear in the UK for retail and e-tail customers.
O1	Sourcing consultant	Sourcing consultant: linking apparel buyers with suppliers, primarily in Eastern Europe, and providing commercial services.
O2	Industry association	Industry Association: members include technical and commercial representatives from retailers and suppliers to the clothing industry.
O3	Dye company	Dye consultant: providing specialist technical dyeing and finishing services to major international retailers and their suppliers.

4.2b Retail strategy

The initial response from three of the interviewees was that retail strategy had not significantly changed in recent years, but when questioned further all except one of the respondents referred to changes primarily in relation to the growth of multi-channel retailing, and the continued polarisation of the UK market into differentiated, higher value brands and low cost retailing, with the decline of the mid-market chains. With regard to this polarisation, respondents talk about product quality, longevity and design as differentiating factors that are encapsulated in brand values which must be represented in the whole service package. Meanwhile low cost retailers are associated with a fashion offer at low prices, leaving no reason for customers to go to the mid-market chains. This phenomenon is not disconnected from the growth in multi-channel retail. While one small retailer commented that high street running costs are crippling in their traditional business model, a multi-brand retailer was very clear that the start-up costs for new brands to enter the retail market have fallen, resulting in notable growth in concession (shop-in-shop) outlets, temporary or pop-up shops and most importantly, online sales. The brand retailer said:

“...if you take [branded retailer’s] legacy business – it has a large high street presence and a large distributive channel, it’s on its own internet, other peoples’ internet, international and other channels. So you can see it’s a legacy business that’s evolving. Some of the other businesses are... um... much younger and so they don’t have the legacy and can approach a more appropriate strategy. I think that’s again down to polarisation, so legacy businesses are faced with lots of issues whereas new entrants to the market are not faced with those issues, which is why I think we’re seeing lots and lots of smaller niche trading brands.

This is particularly significant when the performance wear brand observation that “*quality brands are recession proof*” is taken into account, suggesting that the mid-high segments of the apparel market are subject to dual advantage in a recessionary climate. Throughout the market, there is agreement that multi-channel retail is essential to competitiveness. However, such change is not without implication. The multi-brand retailer suggested that customers need an experience from higher value brands that make it worth them going to the high street and paying more. The experience needs to include aspects such as availability, transparency of alternative stockists and their prices, combined with quality and design of the product, store environment, and ethical values.

These brand values challenge the supply chain. Respondents suggest that the supply chain is also polarising in two different directions. On the one hand, efficiency, standardisation, economies of scale and rigorous system checks result in a long and unresponsive supply chain. The alternative is a supply chain focused on quality and design, with a more differentiated product. But this supply chain is confused with claims that there is too much focus by retailers on fast fashion for the young market (consultant) and that the spill-over cost/margin imperative hampers innovation and differentiation (denim). Other major suppliers (lingerie, clothing, men’s wear) suggest that their customers are slow to change, but that change is also unnerving for them because of high dependence on a few or even one major retail customer. A small supplier suggests that the growth in different retail channels compounds this challenge. These changes, for some, include the growth in international markets and improved clearance mechanisms through outlet retail. One large supplier, challenged by increased

levels of retail control over the supply chain, suggested that retailers should focus on better retailing and leave the supply chain to suppliers.

For most respondents, fast fashion is not seen as a dominant retail strategy – although it is viewed as a process that affects most of them to some extent, particularly with reference to the supply chain. Surprisingly, however, a number of interviewees still see the 1998 decision by UK retailer Marks and Spencer to change its sourcing and associated marketing strategy, from one based on UK supply to one based on overseas sourcing, as the major shock affecting the contemporary apparel supply chain. In spite of all that has changed since, legacy therefore appears to have a lasting impact on the apparel supply chain.

4.2c Alignment of supply chain

As a result, the dominant supply chain strategy cannot be seen as a direct response to the growth in multi—channel retailing and polarisation between higher value brands and low cost or discount retailing. The strategic needs of the supply chain are complex.... according to the brand retailer:

“People are having to develop operations that will cope with multi-channel, so not only being able to deliver to stores, you have to be able to replenish online sales, you’ve got to satisfy 3rd party channels [wholesale] you’re dealing with and whatever concessions you’re dealing with and having to develop much more flexible ops and also think more flexibly.”

In practice, the growth in off-shore sourcing appears to have continued unabated since well before Marks and Spencer decided to make its strategic shift in the 1990s. However, there are some differences in the ways that retailers and their suppliers manage their mainly overseas supply chain and there is discussion of shifts in sourcing location as discussed below. Suppliers report differential use of direct or indirect sourcing, with the use of intermediaries apparently based on scale, cost or a lack of need for transparency in some markets. In several cases the drive is towards owned facilities or vertical integration across on-shore and off-shore activities, as a means of retaining knowledge, quality and margins. None of the interviewees, however, claimed that vertical integration extended to fabric supply, although this was a potential future development for one supplier. Indeed access to upstream supply is a contentious issue. Volume manufacturers suggested that only a handful of companies are capable of supplying appropriate fabrics, as few as 20 in lingerie, and even fewer for hosiery yarn. This limitation has a number of impacts, including for some influencing garment manufacture location choices, increasing competition between suppliers as their fabric sources (and costs) are the same and promoting Chinese manufacture, since China represents one of the few countries with its own materials – one reason why a major supplier might consider investing upstream as an alternative.

The polarisation of retail strategy, and divergence of supply chain strategy, is not clearly aligned when discussing the supply chain explicitly. In this context, the efficiency strategy - or significant elements of it – dominates, and the responses were coloured with stories relating short-comings where low cost options have failed to satisfy other objectives. There were frequent references to the three-way tussle between cost, which tended to dominate in most cases, lead-time and quality. Evidence of failure in the supply chain was common. One chain supplier reflected that his main customer adopted “*must-have*” strategies that were flavour of the month, such as duty-free supply

or corporate social responsibility (CSR). He concluded that they do things for the wrong reasons, highlighting media coverage as one of these. A retailer suggested that they could offload mistakes through discount or outlet channels, while the performance-wear supplier suggested that his prior experience in a classic brand had led him to produce a ‘*seasonless*’ product, not changing all year round, because in classic fashion “*we had too much of everything*”.

i Cost

Examining the cost objective highlights the tensions evident in the supply chain. The small retailer admitted that his role was a constant “*juggle between lead-time and cost*”, showing that one of the smallest companies agreed strongly with one of the largest, the lingerie supplier, who said “*it should be about quality, but cost is always there.*” The denim manufacturer did suggest that customers are not put off by higher prices for the right, desirable product, though confessing to cutting overheads to reduce unnecessary cost, but broadly in agreement with the US brand, while the hosiery supplier said “*unless it’s got the WOW factor, cost is more important.*”

So, in most instances, the focus on cost prevails, regardless of changes taking place in retail distribution, although curiously for most respondents this was seen as a reason for the things they don’t do or are forced into, rather than for their positive cost reduction strategies. Only the denim manufacturer really spoke of reducing operational costs, apologising that to keep overheads low they retained fewer indirect staff, while the men’s wear supplier suggested that environmental improvements made in a UK factory had the advantage of financial savings too. Sourcing location is the main weapon in reducing cost, with a new group of lower cost sources being reluctantly commissioned to counter increasing costs in China and other developing countries, and the relative advantages and disadvantages are discussed below. While the small retailer explained how cash flow dominates their practices, forcing buyers to place advance orders for low cost items first, holding back from buying shorter lead-time items from local suppliers until such time (and only if) cash flow from sales is adequate, another respondent [lingerie supplier] suggested that costs meant using inferior materials. Several respondents contrasted their supply chain practices to those of discount retailer Primark, although most commonly with regard to the retailer’s practice of booking production quicker and more decisively, rather than any discussion of comparable costs. The US brand suggested that their higher price point gave more latitude to pay higher wages, though he also admitted that his priority is “*on-time at price,*” adding that faster workers, paid by the piece, don’t cost more per item even though they earn more – they are just hard to find among the legal workforce. The small factory, on the other hand, claimed that the difference between their own costs and small volume orders from Turkey and China was diminishing.

ii Responsiveness

Questions about flexibility and responsiveness often led to discussion of fast fashion, although this generated mixed reactions from respondents. For some it is their bread and butter (small factory), but for others it is aimed at producing a “*crowd pleaser – a small buy at a premium*” (lingerie). The overall consensus is that fast fashion is only possible on a small scale – with batches of a few thousand, not hundreds of thousands. However, that doesn’t stop retailers from expecting performance with some fast fashion attributes. One supplier explained that his major customer sourced “*short order*” [short lead-time apparel] from Turkey, but he went on to add that “*It’s small fry – let them do it!*” (men’s wear). While the finishing specialist admitted that quality consistency is less important in fast fashion as styles change every two weeks. However, one major supplier

complained that retailers lack the systems to accurately forecast sales in fast moving items (clothing), and changes in technology make it even harder to predict what will sell and for how long (hosiery).

Others were keener to point out their counter approach to fast fashion. For brands, styles change more slowly, and speed and flexibility (usually considered together) is for replenishment or for a safety buffer. As the brand retailer explained:

“the trade-off depends on the proposition. Engineering cost out of the SC makes it longer and less flexible....” He went on: “Once you move towards more premium, differentiated product you’re looking for more flexibility to be able to order that product late, to be able to trial small quantities and be able to replenish them. It comes back again to polarisation. What is difficult to get to grips with is whether you can do that to any scale.”

In contrast, the men’s wear supplier suggested that having a pipeline of new styles increases retail sales without needing to be fast, while a large chain store supplier admitted that, since long fabric lead-times compromise responsiveness, their strategy has been to move to *“better and best”* products, rather than to compete through speed and flexibility. The men’s wear company had in fact closed its close proximity quick response facility because of lack of demand for products that really needed to be made there and could justify the extra cost. *“We ended up filling it with white shirts,”* he complained.

iii Lead-time

Discussion of lead-time specifically, in apparel the manifestation of the speed objective, was more constructive. The conversation several respondents wanted to generate was about the difference in lead-time between Far East sourcing and sourcing from closer to home – and opinions were divided! The general consensus is that a lead-time of 2-3 months is to be expected for most goods manufactured in low cost countries. The brand retailer described this as the *“same old Far East sourcing model,”* claiming that for wholly ‘own-design’ products there is *“no real alternative”*. The large clothing supplier admitted to underestimating lead-times in order to win business, claiming *“I say it myself if they need it, but I don’t make the time. I’d rather win the business and fail and mitigate than be ‘Honest Jo’. Whoever wins the business will go over time.”* This is in direct contrast to the US brand who, in a different regime, regularly adds days into predicted lead-times to avoid delivering late and appearing unreliable on the expectation that this would cause retailers to cancel orders. Upstream processes, it is claimed, are particularly likely to be late.

But several UK suppliers go further, suggesting that a proportion of their product lead-time is out of their hands, not just because of upstream processes and materials, but mainly due to indecisive retail buying and the design process, as is discussed later. The chain store supplier explains that it is possible to source from offshore in 4-5 weeks. Some respondents have strategies to reduce lead-time, which mostly involves holding inventory of finished goods, while the performance wear supplier and sourcing agent suggested having pre-tested fabrics available and ready to order. The small retailer contrasted committed long lead-time orders with the intention to buy late and local quick response. The latter is only possible if sales and cash-flow are favourable – at present quick response is on hold.

iv Quality

Discussion of quality was largely from a compliance perspective, or to support brand values, rather than operationally efficient, standardised quality – and almost always in the context of cost. The hosiery supplier speculated ironically that although their brand values made them strive for quality, in reality *“the lasting product has missed the point – people want short life products.”* He went on to explain how he had been horrified by low quality standards on a visit to the US, where consistency was not seen to be so important, a factor also acknowledged by the dye company. In contrast, the lingerie company said, of their fabric suppliers *“we need the best, so we’ve got very cheap and cheap!”*

Compliance to quality legislation (use of harmful substances or equipment, and product safety) is seen as being a *“huge issue that fuels the illegal side of the business”* (small factory), while the US brand explained how it is easier and lower cost to pay fines for their contractors’ non-compliance because it saves the cost of litigation. The lingerie supplier admitted that switching production to different suppliers compromises both quality and reliability. She explained that *“you can achieve cost savings, but fail elsewhere – things are bound to go wrong.... and they did!”* Upstream fabric suppliers carry a significant burden for quality assurance, and one retailer claimed that their suppliers would try to substitute fabrics to reduce cost, so they had to inspect fabrics tests and could only trust a few full-service suppliers. Meanwhile, the dye consultant admitted that his company were expanding their business in Asia to undertake fabric and colour tests closer to off-shore garment manufacturing facilities to add this service for their retail customers.

v Reliability

One aspect of general consensus is reliability. Respondents explain how they schedule the supply chain by working backwards from the delivery date, add in extra time to ensure that due dates are met, and aim to shave time out of the supply chain to ensure reliable delivery dates. The most extreme example was provided by the US based brand, who explained how retailers in the US would instantly cancel any orders that were delivered late.

In terms of supply chain control, there is again a sense of polarisation with retailers taking on more control over bulk goods, and establishing centralised distribution facilities, to handing over the management of online distribution direct to suppliers. Upstream in the supply chain, changes of ownership and control are also evident. Investment from upstream in the supply chain, mostly from overseas, is a key factor in maintaining a strong sourcing base.

vi Strategic Priorities

The dominant priority in most supply chains is cost. Other objectives, such as reducing lead-times, delaying ordering, environmental management are seen as subsidiary to the cost objective and are deployed where they have the advantage of reducing costs. In markets where product differentiation is important there are other, sometimes conflicting priorities. These support more technical and design innovations, better product quality and small batch production. However, these objectives are used indecisively where additional costs are involved. One consensus is that growing product proliferation is reducing the need for replenishment, but opinions on product quality are split – with experts predicting that it will become more or less important, depending on market.

4.2d Design, decision making and ordering

i The design process

It may be commonly perceived that retailers have taken more control over the design process, and in most cases, design is retail or brand-led, as reflected by the brand retailer and small contract manufacturer. However, suppliers feel that it is their own design expertise that creates a point of difference and wins them business – the clothing supplier explained how one retailer had contracted supply from a design pack (or specification), but now recognised the suppliers' design integrity saying *"I'm now huge in shapewear for retailer D!"* The design process often takes place in stages with a retail design brief being issued, against which selected suppliers design specific products, often in competition with one another in an attempt to win orders on a product by product basis. It is not uncommon for one supplier to be given samples generated by another to work on. This might be with a request to re-cost competitively, or as a reward for good performance – placing extra business on a preferential basis. The lingerie supplier, having faced problems switching between upstream suppliers, admitted that they were (unusually) on the receiving end – seeing their initial designs allocated to competitors as a penalty for poor performance. The small factory said they had withdrawn from design as it was too costly – relying instead on retail design packs.

Attempts to change the design process are slow, and some, such as use of technology instead of sampling, are greeted with mixed feelings, as one chain supplier said *"communications are all physical, you can't do it without samples"*. Similarly, while it is acknowledged that reducing fabric/component options and ensuring that these are pre-tested can speed up the design process, few respondents thought that retailers would willingly buy into this process. The lingerie buyer laughed that her customer insisted on selecting the most innovative fabrics from trade shows and that her task was to find alternatives that looked and performed as well, but cost less – all taking up time. Only the small retailer referred to streamlining the fabric and finishing process, buying mainly imported fabrics but in greige form that can be dyed locally in Leicester in *"very good printing facilities!"* He added that any fabric knitted in UK uses overseas yarn, *"the industry here has been decimated for price"*.

All-in-all, the performance wear supplier summed up the design process, suggesting that his 11 month product development and testing schedule, incorporating yarn, knit structures and garment development, was long - but he then reflected that compared to his experience in classic branded fashion it wasn't really long at all! Testing takes up time and money, and the small factory claimed that accredited retail standards meant counting pins in their noticeboard and producing fabric test reports for each repeat batch – though one retail customer did thankfully overlook this criterion - a test costs £350 (regardless of batch size) and takes two weeks, holding up production.

Limitations to the design process therefore include lack of confidence in supply chain partners, iterative design decisions, and complex approval practices at each stage. And while there is some potential for adoption of technology, pre-testing of limited fabric options or finishing (such as dyeing, printing and labelling) close to market, these too are limited by a number of factors.

ii Decision making and ordering

Building on the design stage, the iterative process of selecting styles, adapting for manufacture and placing orders is seen as one fraught with difficulty, especially by first tier suppliers. For many, slow decisions and quality tests account for more than half the lead-time for each item, reducing each

supplier's ability to reduce lead-times – regardless of where production is located. However, the sourcing agent admitted that decisions made in haste often go wrong. The most specific process was mapped out by the men's wear supplier who explained that their major customer holds a product review four times each year, and this is the deadline for all product development work, prior to orders being placed. He went on: *"but there is never enough time, and we end up having to rush and courier samples"*. He then explained that for some fabrics the lead-time is too long for on-time delivery of orders placed after the review. Others spoke of having to prompt tricky customers who can't make up their mind, or giving customers milestones for pre-ordering of fabrics, under threat that failure to commit promptly would mean that they can't have their chosen styles.

A contrast emerges between branded and retail own brand suppliers. The branded retailer suggested that for wholesale orders brands lacked confidence and were expecting increasing levels of confirmed wholesale orders before they could book production, rather than using the first customer orders as a barometer of future demand. On the other hand, the men's wear supplier claimed that they could predict sales better than their customers so *"we back with stock at our own risk."* This proved to be a common story when it came to retail orders. Most of the large suppliers were expected to hold stock of finished goods so that some retailers could call-off against a weekly schedule. Retail sales data to back up such call-off plans was described by the clothing supplier as *"crude beyond belief."* As a result, several of these suppliers would create their own estimates of what retailers might order over a season and *"take a punt"* (outwear) that the call-off would exceed the retailers' initial predictions, and there were several stories of where this was indeed the case. However, retail strategies vary, with other significant retailers ordering goods 'Free-on-Board' (FOB) – customer taking ownership of goods on despatch from the supply country. As one major retailer implements an FOB system, suppliers were concerned that this would take away one of their competitive advantages, although from a risk perspective there are some obvious benefits.

The clothing supplier said: "They still want design, still want technology, still want merchandising support, but buy FOB level rather than call-off to stores. The result is our warehouse closed down about a month ago. It was sad to lose what was well run and cheaper than they can ever do. But all that stock that we used to own on their behalf - that we didn't get paid for – that's gone..... Basically it was an open cheque and by doing that they could disguise stock they had in their own company, so it's a big learning curve for them."

A competitor, the men's wear director also said: "On the core stuff we do, we're always ahead of them, so at the moment we've got stuff in the warehouse that's maybe one or two weeks ahead [of predicted call-off demand]. And we can speed up or slow down depending on our own stocks, but that's all going to change next year as our warehouses are going and they're going to take stock direct..... that will be lots of change - a lot of our growth has come from opportunity sales But the bit they can't quite get to grips with is the management of all that and the cost of working capital, they've already realised they are running out of cash and are now changing their terms from 60 to 90 days because they can't afford to pay people."

[lingerie director] "What happens if you say no?"

[men's wear director] "We're not going to are we?"

[lingerie director] "I'm amazed at that - I really am!"⁶

Speaking of another retailer, about to change from FOB to landed supplies (take ownership when goods arrive at their own distribution centre) the hosiery supplier said:

"really they are only looking at it for short termism – it's not a long term plan because when times are hard in retail we don't want to commit to stock for 6 months - we only want to commit for 20 days hence and the only way you can do that is out of the UK or somewhere near. And so it's a very schizophrenic behaviour because there is no real belief in UK manufacturing when you talk to retailers, they are only concerned with their bottom line and their margin."

This alternative is known as 'short-order' or a fast fashion-like QR process. The small factory explained:

"what is normal is that we have an enquiry, like we did last week, that starts 'we need it for next week... what can you do?' If we are busy we have to put them off so we say we can't do it straight away, but we can do it in three weeks. To them three weeks is too late, but we know they can't get it elsewhere..."

In contrast, the performance wear company has adopted the practice of holding inventory to support short orders that circumvent slow procurement from 'made-to-order' corporate customers. While this is not their preferred mode and incurs high costs, it secures supplier loyalty and enhances market exposure of their products, enabling individual users as well as organisational buyers to access online sales from stock.

One practice aimed at reducing risk is to pre-book production capacity and then confirm orders close to the production date. The hosiery supplier had successfully introduced this strategy with Italian suppliers, and employed a merchandiser for each brand to plan the season's orders, while the small factory was in discussions to try to encourage one retail customer to pre-book 500 units (10% of capacity) per week, but admitted *"we are a long way from that!"* Another tactic is to try to remove constant basics from the quarterly or seasonal ordering process to smooth the flow of re-orders (men's wear), but while retailers admitted this was a good idea, they struggled to put it into practice. The benefit was explained by the men's wear supplier who recounted how his major customer runs out of school shirts every August, in spite of years of sales records and just two colours to predict, because they can only buy for the 14 weeks covered by the review period. For basic items the supplier covers with their own inventory, but for fashion lines he adds *"they will only be as good as the placed order - there's no way we'd take a punt on it - no-one would take a punt"*.

In summary, then, a number of ordering practices are in flux, with delivery from stock becoming less important for some retailers, in favour of FOB, although not consistently. Batch sizes have fallen, in line with product proliferation and reduced stock, which has implications in terms of sourcing

⁶ The retailer has subsequently announced increased payment terms from 60 to 75 days for all suppliers of goods delivered FOB (citation withheld to preserve confidentiality)

decisions and cost. Some practices appear to have failed to catch on formerly, such as supplier managed inventory, but are practiced informally at suppliers' risk and call-off from stock is still practiced. Information sharing is limited to selected large suppliers, who question the quality of the information. While retailers' ordering decisions are notoriously slow, it is this, rather than the need for fast reaction speeds, that drives decision making closer to the selling season. The small factory described her customers' decisions as "*last-minute.com*". Like the small retailer and brand retailer, the small factory's major retail customers are "*scared to commit to anything in advance.*"

4.2e Sourcing decisions

Everyone has their favoured off-shore sourcing locations, though there have been some changes recently, reflecting differing experiences of sourcing from China, new lower cost options such as Cambodia gaining potential, and traditional sources such as Sri Lanka losing duty-free status. The sourcing expert suggests that there are some 50 supplying countries to choose from and sourcing is decided on a "*world is your oyster*" basis. Whatever the precise location, opinions are relatively consistent that the benefits of low-cost sourcing outweigh the problems. There are exceptions, and in some markets small volume or trial orders are sourced from closer proximity locations, such as Turkey and within Europe. However, there are often different, but no less significant difficulties, such as lack of efficiency, limited capability and cultural issues associated with this. When higher costs are taken into account these become more challenging.

The large suppliers and small retailer are in agreement that the benefit of specific sourcing locations changes over time. The current trend, expressed by all but the branded retailer, is a move away from China as a source of low cost goods. However, none of the respondents had been completely dependent on China and other trends also emerged. Sri Lanka was held in high regard, but the loss of duty free status with the EU has added up to 12% onto prices, meaning that only the highest quality/ technical goods are now made there (lingerie supplier) using EU supplied fabrics to reduce duty and taking advantage of superior technical skills. Meanwhile, Cambodia is seen as a viable alternative for basics, relatively stable but not easy for all firms to deal with (men's wear, lingerie, clothing, chain supplier). Several suppliers had experienced problems in Bangladesh, but the very low prices remain attractive⁷, even though companies are reputed to be hard to deal with (chain supplier), while others (small retail, hosiery) were increasingly looking to Turkey for flexibility combined with low costs. The US based brand had experienced problems with quality, lead-time dependability, and price when sourcing from China, as a result opting to increase domestic (US) sourcing from 50% to 92%. The experience was in part because of economic development in China, and also because the reduction of Chinese government subsidies has meant consolidation of suppliers, only interested in supplying large customers – pushing out smaller brands such as this. At the extreme, the prices charged by the factory had increased after retail orders were received – leaving the brand having to subsidise the prices quoted to its own customers. In the longer term, the men's wear company reported being pushed towards Turkey for more responsive supply, but not at additional cost to the retailer.

⁷ Interviews were conducted prior to Bangladesh factory collapse and subsequent safety standard concerns.

However, domestic production also has its limitations. The small UK factory is doubling production to a (very small) 9000 units per week, the US brand has to source knitwear outside the USA because of lack of skills and the small UK retailer, who uses local suppliers, acknowledges that it can only source “*very basic items – nothing too complex because the skills don’t exist here anymore and the price would be too high*”. That said he added that volumes of up to 15,000 items per week are achievable for basic fashions from two Leicester factories. “*In short, the short lead-time limits the products available..... Our alternatives have been Romania, which is declining, losing skills to migration, and increasingly Turkey, but they are not cheap*”. The US brand suggests that at the mid-high price level he can see parity between US and China costs, taking into account transport, quality and reliability. However, he admits this would only be possible at mass market price levels/ volumes with “*all other costs taken into account*” including significant differential import duty applied to certain fabrics by the US authorities. This view is reinforced in the UK, with a supermarket expressing interest in UK sourcing for speed and inventory reduction, but “*making it pay is the hardest thing*”, while the denim company had set up a small UK production unit for high-end products, but were testing its financial viability, and the hosiery company lamented the lack of investment available to upgrade a UK factory and potential supplier. These experiences contrast directly with the UK multi-brand retailer who sources mainly from China, with other products from India and Bangladesh, but using a combination of direct sourcing, an overseas buying office and a powerful intermediary.

Interestingly, few of the respondents refer to sourcing decisions in terms of specific supplier selection and most respondents clearly have long term relationships with some or all of their customers and suppliers. For the retailers, the major suppliers are chosen for a number of factors, including reducing prices, reducing inventory or technical capability (chain supplier, lingerie). While the dye company reflected that:

“Retailers soon develop an understanding of which suppliers can’t achieve their standards, not just in colour but also meeting deadlines, restricted substances etc. and these soon get knocked off the list. Retailers are tending to reduce the number of SC partners to work more closely with a few. If you’re selling a high value product it is more important, but if you are selling cheap product then less important. Retailers want fewer suppliers that they are confident in.”

The suppliers also discussed their own selection by retailers, suggesting that it is easy to upset individual buyers, or not understand their expectations because individuals are moved around in their roles and often lack experience. The clothing supplier said:

“I feel sorry for them... buyers deep down prefer to stick with the companies they know but are pushed to move away. The more public owned companies are most focused on returns. With [retailer], for all the talk of direct service there are still 4 companies with over 50% of their supply base – all traditional full service suppliers.”

These views were echoed by the brand retailer, who claimed that there is more “switching of suppliers than there used to be ‘cos of shopping around for price most people have had a relatively stable supply base, whereas now they tend to swap around.” An alternative opinion was expressed by the clothing supplier who suggested that retailers were looking for more independent suppliers because “they [retailers] were becoming bland and bloated” as a result of concentration through their own regional sourcing hubs, while the men’s wear supplier suggested that their flat

management structure made it easy for retailers to deal with them as “when they ask for a decision people tend to just give them an answer” and the small factory were confident that their service of quality and speed was simply not available elsewhere. Meanwhile, the counter side of the argument was put forward by the men’s wear/ lingerie firm who admitted to being nervous about their heavy reliance on one retail customer.

Overall, however, suppliers expressed some regularity among the retailers they deal with, with change reflected more in decisions about which supplier to choose for specific orders – with designs treated as currency to swap between those that created them and those most deserving or cheapest. These decisions were echoed in the upstream supply chain, where several respondents referred to stereotyping suppliers according to their needs: not placing time dependent orders with Indian suppliers, or changing instructions once issued (branded retail, sourcing agent), not expecting postponed finishing in China (hosiery), expecting to check regularly on progress for Turkish fast fashion or Italian knitting (branded retail, hosiery), and issuing only the most basic lines to Bangladesh (lingerie supplier found that two packs of white vests could be done, but changing to single items was too complex!). However, the hosiery supplier also explained how he has to shop around for suppliers of something new and different for the fashion brand, for which the networks of small Italian suppliers offer flexibility.

So, having won orders from their long standing customers, for the large suppliers a significant decision is then how to manage the upstream supply base - whether to outsource, and if so, to which country and then which supplier, or make in-house and in which location. Investment in the latter is a common long-term strategy. In spite of admitting that it is a “*major investment to relocate*” the lingerie supplier recounted how their sourcing decisions for low cost basics had shifted from a joint venture in Bangladesh, to contracting with the same supplier, (having dismantled the JV arrangement following a dispute), to establishing their own factory in India to improve quality, flexibility and control. In the end the respondent’s conclusion was:

“We really need to be in Bangladesh, but we need our own factory there the only way to make money is to own it. You can’t afford to pay a margin and make a margin.”

In contrast, the US brand claimed that the most inefficient facilities were owned factories: “*When I first started the most inefficient operation was the owned one – we overburdened it, worked till midnight, then immigration would shut us down and we’d get up and running again in 3-4 days.*” Internal production has since been closed initially in favour of off-shore sourcing and subsequently replaced by 20 US contractors. A small in-house facility remains for cutting fabrics, to retain control, sampling and making blouses, as these are hard to source locally. The hosiery supplier echoed the limitations of in-house production from previous experience – suggesting that the styles that could be offered were too limited as the company always had to fill its own capacity first. The men’s wear supplier had closed facilities in Lithuania and Morocco that were too hard to maintain at full capacity.

Following the theme, the large clothing supplier explained how decisions are made differentially, so for their own-brand, production is nearly all in-house to protect intellectual property, for a major customer some 85% is made in their own facilities to retain control, but for other customers, for whom price is more important, only 35% is made in-house, while the rest is contracted out, mainly from long standing suppliers. Choosing individual factories is based on a process of monitoring

financial data, production and facilities and also face-to-face meetings. He went on: *“I should write it down, it’s obvious to me, but I have to check my team when they go out there,”* while recounting how one new factory in Cambodia had been chosen following his combination of experience and gut instinct and within months is producing £6million apparel per year. However, the selection process has been modified recently. The clothing supplier added *“when I talk to factories now I ask ‘I want to know how you are going to deal with orders of 3000 pieces?’ I’m not bothered how they do the 30,000 pieces, but they need to be able to plan, buy, and manage small orders. If we don’t someone else will.”* Supplier selection is not unilateral. In spite of sourcing from the Far East, the respondent explained that contracting production for one UK retailer was very difficult – *“if they [the factory] know it’s for them [retailer B] the price instantly goes up”*. The retailer is forced to use an intermediary as suppliers avoid them.

Suppliers aggressively defend their upstream arrangements and knowledge of suppliers. For most retailers, transparency is required, so suppliers are subject to exclusivity agreements to limit retailer or supplier opportunism. The hosiery supplier said: *“and there is in some cases ... you know ... a written agreement that they won’t go direct and in others it’s more moral.”* The lingerie supplier added *“We have to really watch them [retailers]...”*, while the US brand said: *“Contractors have to work for other retailers, but we don’t like it, ‘cos we wonder who else they work for.”* Meanwhile, transparency is not always straight forward. The hosiery supplier explained that management of his Italian hosiery production was through the retailer’s European hub in Turkey, *“so we have to go to Istanbul to talk about a factory in Italy for delivery to an English customer!”* Developing supplier capability is a further constraint. The hosiery company explained that he had identified UK capacity for hosiery, though the factory lacked some essential capabilities and required unobtainable investment to secure the added-value processes required. Meanwhile the small factory was investing in additional capacity. The branded retailer saw advantages in local supply both from a brand equity perspective and also to support the flexibility required in their supply chain, likening clothing to the car industry, but recognising that this would be hard to find.

Ethics are another concern and the small retailer admitted that his factories are not compliant, and don’t always pay the minimum wage. Although, he claims, other retailers use third party agents to source on their behalf, so as not to be seen to be exploitative. In the US, under California law as a contrast, retailers and brands are responsible for the compliance of their subcontractors – and have to make payments to workers if the factories do not. The respondent admitted:

“In LA 17 years ago we used slave labour, but the State got involved and now we’re not bad anymore. It’s drastically different here... Today, my job is to get apparel made – I want my contractors to have a stable workforce ‘cos if they don’t they are late – and we don’t get to be late. The hardest thing in this industry is the cancellation date. I don’t get to say I’m sorry, no - if I don’t make the date, the order is cancelled. We need to make sure everything happens on time.”

Sourcing materials and components upstream is equally complex. The men’s wear supplier said: *“we don’t buy from the cheapest because pretty often you need to buy the best, so we’ve got very, very cheap to cheap suppliers.”* He went on to explain how a local agent helps to find low cost, but good quality fabrics in China. Meanwhile, in the lingerie division, the need for technically superior fabrics, and co-ordination across their ranges, retailers specify certain suppliers and fabrics that they have

pre-selected. Similarly, the hosiery and performance wear suppliers explained that they were tied into one or a few sources of exclusive yarn, including from Italy, New Zealand and Northern Ireland, while the lingerie supplier indicated that the best lingerie fabrics were still sourced from Germany. The sourcing specialist and lingerie supplier agreed that moves towards locating 'needle point' close to fabrics had been short lived as this limited choice of materials on one hand, and restricted options to use the lowest cost production on the other.

Only the small retailer really claimed full control over their fabric supply, using imported fabrics that are dyed locally. However, technological changes in the upstream supply chain that include using standard pre-tested fabrics, delayed processing and limiting component choice, as is discussed in the design section ([page 67](#)), are as yet not widespread in most supply chains. The large suppliers, sourcing specialist, agent and branded retailer all see the benefits forthcoming and are working towards these, but need to persuade retailers of the merits. While the clothing supplier claimed that his own design team were getting smarter at designing with less choice, the lingerie supplier had found a way to reduce lead-times to 8 weeks, as she explained:

"which involves taking greige laces and dyeing them on Sri Lanka, getting elastic and fabric suppliers to run around 2 week dyeing. But it relies on ... the only way we can do it ... is say we want you to make 200 thousand- dozen per week."

In more complex supply chains, transparency is an increasing issue upstream. The dye specialist related stories of harmful chemicals and dye effluent, suggesting that more retailers are following the likes of H&M, M&S and Next to obtain full transparency of where and how each process is carried out. Innovations in the supply chain have been made that enhance transparency, ease communications upstream and also improve the quality of processes carried out - for example dyes that produce less effluent - but these come at a price. He goes on to say that: *"The mantra of the last 2-3 years is know who is in your SC right back to the chemical and yarn supply, because each one can cause you problem and risk"* but for most retailers cost still dominates decisions and they lack the technical knowledge to really appreciate what goes on upstream. The US brand, along with branded retailer and sourcing specialist suggested that it was easier for film crews, activists and bounty hunters to find transgressions upstream in the supply chain, for their own opportunistic reasons. However, where brand equity is highest, such as the performance wear supplier, there is no room for compromise. As the director said:

"we couldn't replicate products with different suppliers – the exclusive yarn is important, but this is based on relationships we had already developed with the New Zealand sourcing company who manage our production in Fiji. We have traceability back to source and antiquity of the product ... as well as good quality, price as contract and consistency."

4.2f Supply chain relationships

From the respondents there is a high level of importance placed on the relationships that are developed with suppliers because of, or to support, the relative levels of stability. The small retailer said "If you have a good relationship an extra 5p or 10p per item is neither here nor there. You want to have the relationships." But he then speculated: "There are times we would look for new suppliers ... If I had a contract with the high street they would ruin us for price and force us to look

elsewhere.” The aspect of relationships that became very clear is the extent to which lead companies in the supply chain try to protect their reliable upstream suppliers. The clothing supplier and small retailer referred to keeping factories busy and feeding them with regular orders, and the small factory indicated the regular payments from retailers after 7 days, while the US brand explained how they help suppliers to maintain cash flow, also stimulating loyalty:

“Labour in California has to be paid within 7 days, so shops [factories] will get you the goods by a certain time and then they get paid on a certain day. So we changed that – we pay twice a week. If they make by Tues, they get paid Friday; make by Friday they get paid Tuesday. The idea is to get goods in early to get money quicker and it works very well. Most people think we’re nuts though to pay twice as quick, but factories love it. Normally all you do is penalise, and it’s not working, we have the same problems as 40 years ago. The problem is getting a constant flow of goods in - if you can’t beat ‘em into submission, love ‘em into submission.”

However, these relationships become more complex at the extremes of the supply chain. Upstream, it is acknowledged that communications become more complicated, especially where culture, language, geographical proximity and transparency become more important, all of which partly explain the use of overseas retail buying offices with ex-patriot managers, and the use of intermediaries such as the UK based supplier respondents here, or large sourcing companies such as Mast Industries and Li and Fung that manage upstream processes on the retailers’ behalf.

In spite of some long and high value relationships between retailers and suppliers, there was also less confidence in supplier-retail relationships, partly because relationships were seen to be between individuals rather than organisations – individuals who regularly change, are subject to conflicting priorities or lack of technical knowledge. Cynically, the sourcing expert claimed:

“Suppliers have resented buyers’ quaint belief that the customer comes first throughout my working life, and have constantly pretended this is a new outrage invented only yesterday. Their inability to understand the need for retailers to make a profit is constant too.”

On the other hand, the lingerie and men’s wear suppliers explained how they had good relationships with buyers in some departments, but still had to protect sensitive data, such as detailed costings and good fabric sources. They told several stories of how their information had been shared with all suppliers when the retailer had decided to put orders for some goods out to tender. The branded retailer confirmed this caution, suggesting that:

“buying departments are under pressure to demonstrate that they are looking at alternative sourcing while suppliers have to be careful about who they do business with. We’re seeing more requests for upfront payments, deposits or letters of credit because they are worried about whether they’ll get paid.”

On the other hand, suppliers, including performance wear, sourcing agent and lingerie spoke of the advantages and resources required to develop ‘trustworthiness’. This was based on proving both reliability and integrity, while developing excellence in a range of other priorities, such as design and

technical expertise (lingerie, clothing supplier and performance wear) and taking the pain out of sourcing (agent, clothing supplier).

4.2g Summary

Retail strategy is changing with an increased emphasis on alignment to multi-channel distribution, but this is not fully reflected in supply chain strategy and there are obstacles to the adoption of new practices that could lead to more efficient and effective use of the apparel supply chain as a means of improving retail competitiveness. In spite of focus on fashion changes, and differentiation of product and brand, the priority in supply chains is cost saving. This has a profound effect in many aspects of the supply chain, especially choice of suppliers, location of supply, speed of response and flexibility. Other priorities are important in different supply chains, with preference for speed which helps to reduce inventory and the associated risk and cost on one hand, or stimulate differentiation and sales on the other.

Design and ordering processes are slow, and although there are various suggestions for speeding up the process, retailers are protective of their control over design selection, materials and product testing. Orders for new products are treated as currency, and awarded to the best performing suppliers, not always those that have undertaken design work. Although retailers are perceived to control the overall supply chain, suppliers are protective of their upstream relationships and knowledge of upstream sources of production and materials. Supplier capability is being enhanced by overseas investment, which also potentially opens new markets overseas.

Generally the perception is that retailers impede rather than support responsiveness, flexibility and reliability in the supply chain through slow, cost-based decision making and lack of accurate information. There are signs of conflict between the strategic direction from controlling partners and the practices considered useful by those involved at an operational level.

4.3 Findings from Round 2

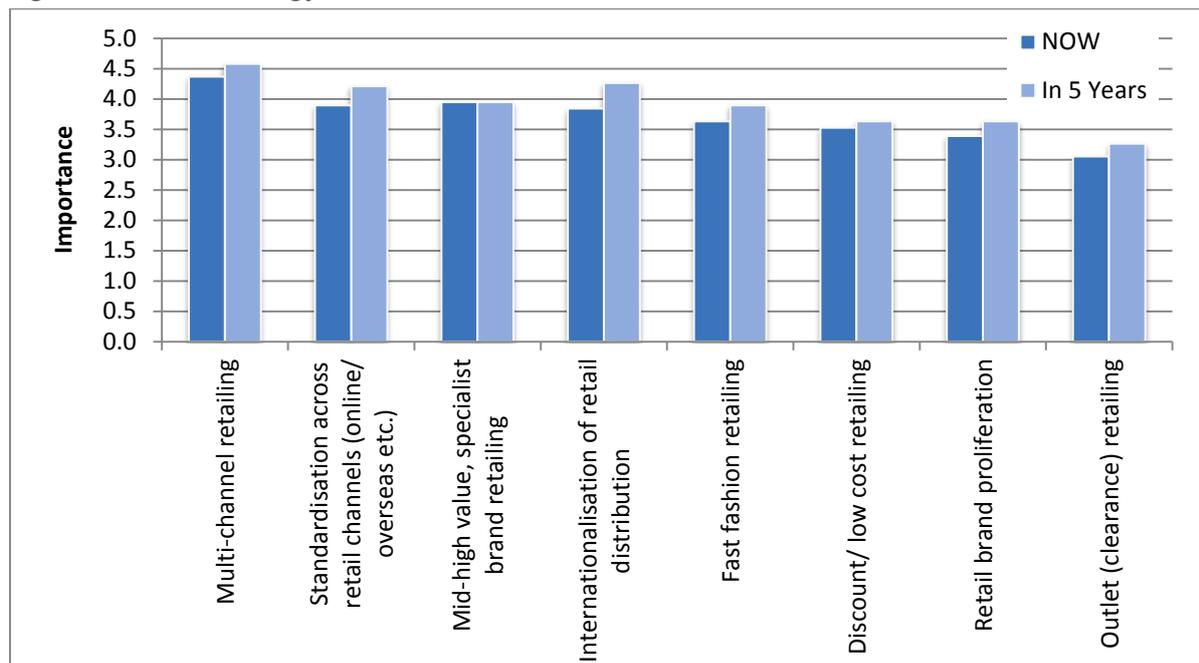
Round 2 findings are based on responses from 19 experts, sampled and profiled in section 3.4d (page 52) with their wide range of experience summarised in Table 3.3 (page 50) and product and market activity in Table 4.2 (page 60). Questions were formulated from the findings of Round 1, and each respondent asked to assess, on a Likert scale, ranging from 1 irrelevant to 5 critical, the importance of each supply chain variable now and how important they expected each would be in 5 years' time. A 'not-applicable' (N/A) option was rarely used. The mean response from the sample is taken as an indication of the overall importance of each variable, now and in 5 years from now, and highest to lowest ranking of the variable means is assumed to be an indication of comparable priority. Standard deviation is taken as a proxy for the level of consensus (McKinnon and Foster, 2000).

Most of the respondents classify their products into more than one category by seasonality, with the modal number of categories being two. The averages illustrated in Table 4.3 represent the mean across the retail/ manufacturer/ supplier sample, including zero responses, but are net of the 'other' category of respondents who are service providers. Fast fashion is highly represented with a mean of 25% across the sample. However, the high standard deviation also represents the range of responses, from just 5% of product range in two cases, to 100% in a further two. Similar averages are found for fashion and continuous products, while basic apparel is less frequently represented. Few make or sell premium products. The seasonality of products is an indicator of the level of product complexity that the supply chain needs to accommodate, and the frequency with which product and batch changes need to be made.

Table 4.3 Classification of supply chain by seasonality of product

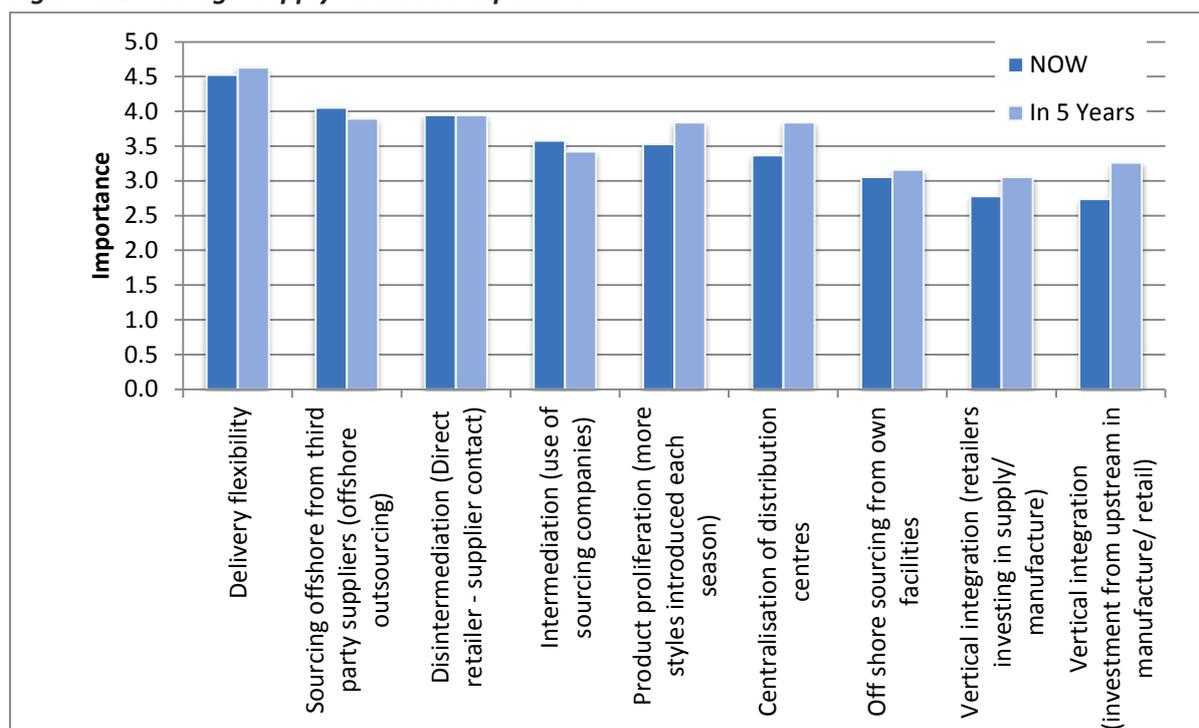
	n	Mean*	St. dev
What percentage of the products of your supply chain would you describe as below?	*Excludes 'other'/ 'none of above' category		
Continuous (unchanging season to season)	11	23.1	22.4
Basic apparel (minor changes season to season)	8	20.0	28.2
Fashion (changes each major season, 2-4 times per year)	11	23.4	22.1
Fast fashion (changes more than 4 times each year)	10	25.0	34.4
Premium classic apparel (few seasonal changes)	5	6.3	11.5
Premium high fashion (major change each season)	2	2.2	7.5
None of the above	3	100	

Figure 4.1 Retail Strategy



Multi-channel retailing is identified as the most important retail strategy affecting the supply chain at present, and respondents agree that this will increase in the next 5 years, as seen in Figure 4.1. Higher value brand retailing, internationalisation and standardisation across these different channels are considered less important now, but with a relatively high degree of consensus that the latter two will increase more rapidly. While fast fashion retailing is of moderate importance, it is subject to the lowest level of consensus now, though respondents are more inclined to agree that it will continue to grow in importance, unlike discount retailing which is predicted to remain more stable.

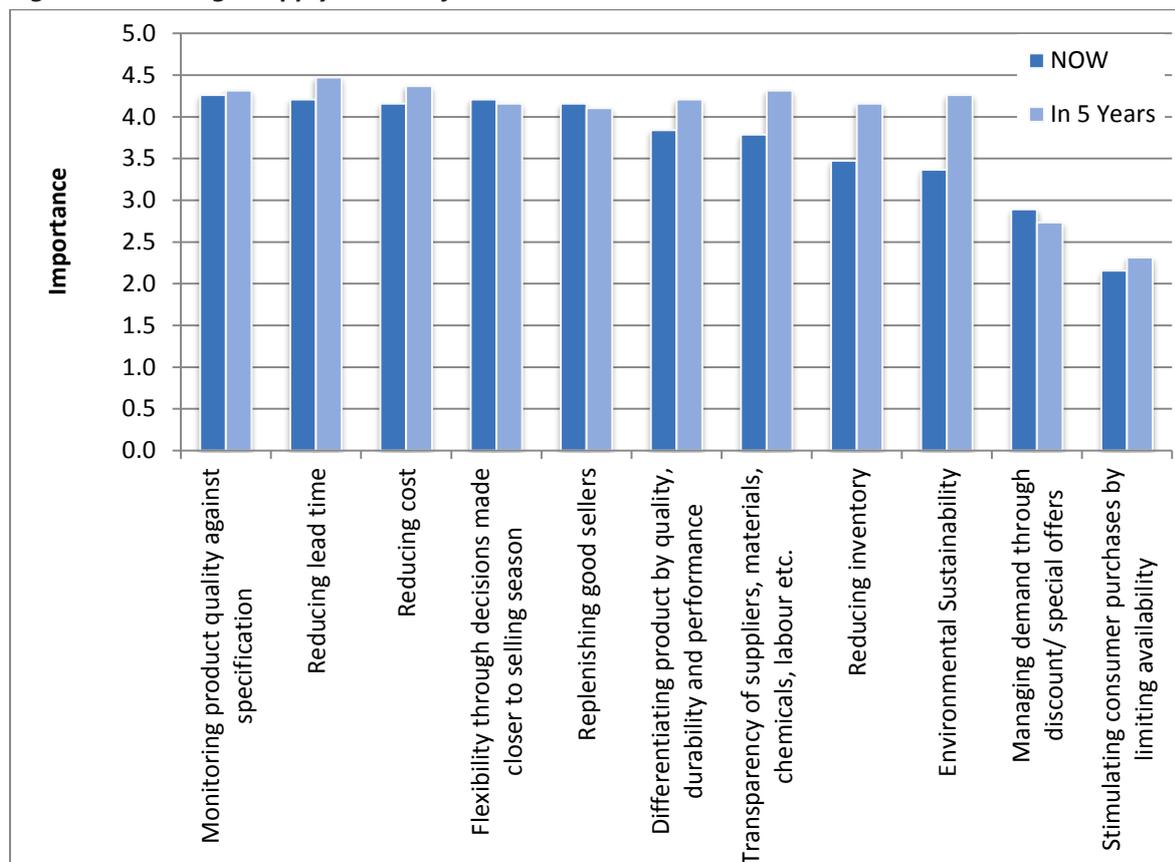
Figure 4.2 Strategic supply chain developments



Delivery flexibility is the most important current supply chain strategic development with a high level of consensus. However, respondents agree that this is not predicted to increase markedly. Sourcing off shore from third parties, and direct retailer-supplier relationships are also important now but predicted to decline or remain stable (respectively) in the coming years. The use of sourcing companies is also predicted to decline with a high level of agreement. Less important now, but predicted to increase significantly, are centralisation of distribution and vertical integration investment downstream in the supply chain. Vertical integration upstream is predicted to become more important, but to a lesser degree and with less consensus. Product proliferation is also expected to continue to increase in importance as shown in Figure 4.2 below.

Figure 4.3 shows that respondents agree that monitoring product quality is the most important manifestation of their strategic supply chain objectives. Reducing lead-time and cost, in season flexibility and replenishment are considered equally important, although flexibility receives greater consensus. However, in 5 years' time, reducing lead-time is forecast to be the most important objective, followed closely by cost reduction, with both predicted to increase. While monitoring for consistent quality is unchanged in 5 years, quality as a differentiator of product is predicted to increase. However, the greatest increases in importance are attributed to reducing environmental sustainability and inventory as well as upstream transparency. All of these increases are predicted with high consensus. In contrast, techniques to manage demand through discounting and limited availability have relatively low importance, but some respondents think the latter will increase.

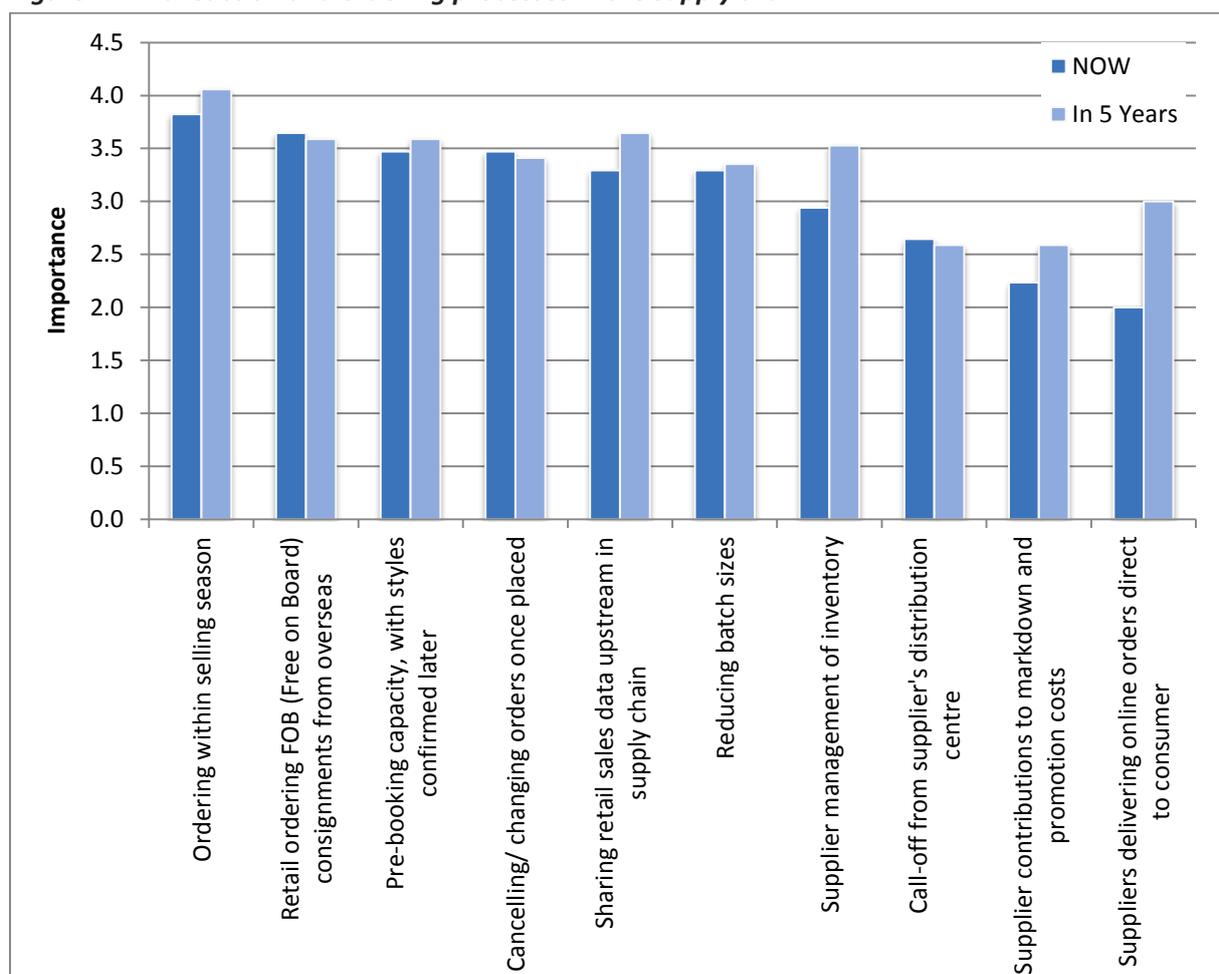
Figure 4.3 Strategic supply chain objectives



The variables represented in Figure 4.4 are generally more fragmented in importance, with lower consensus than those discussed above relating to both current and future importance. Most

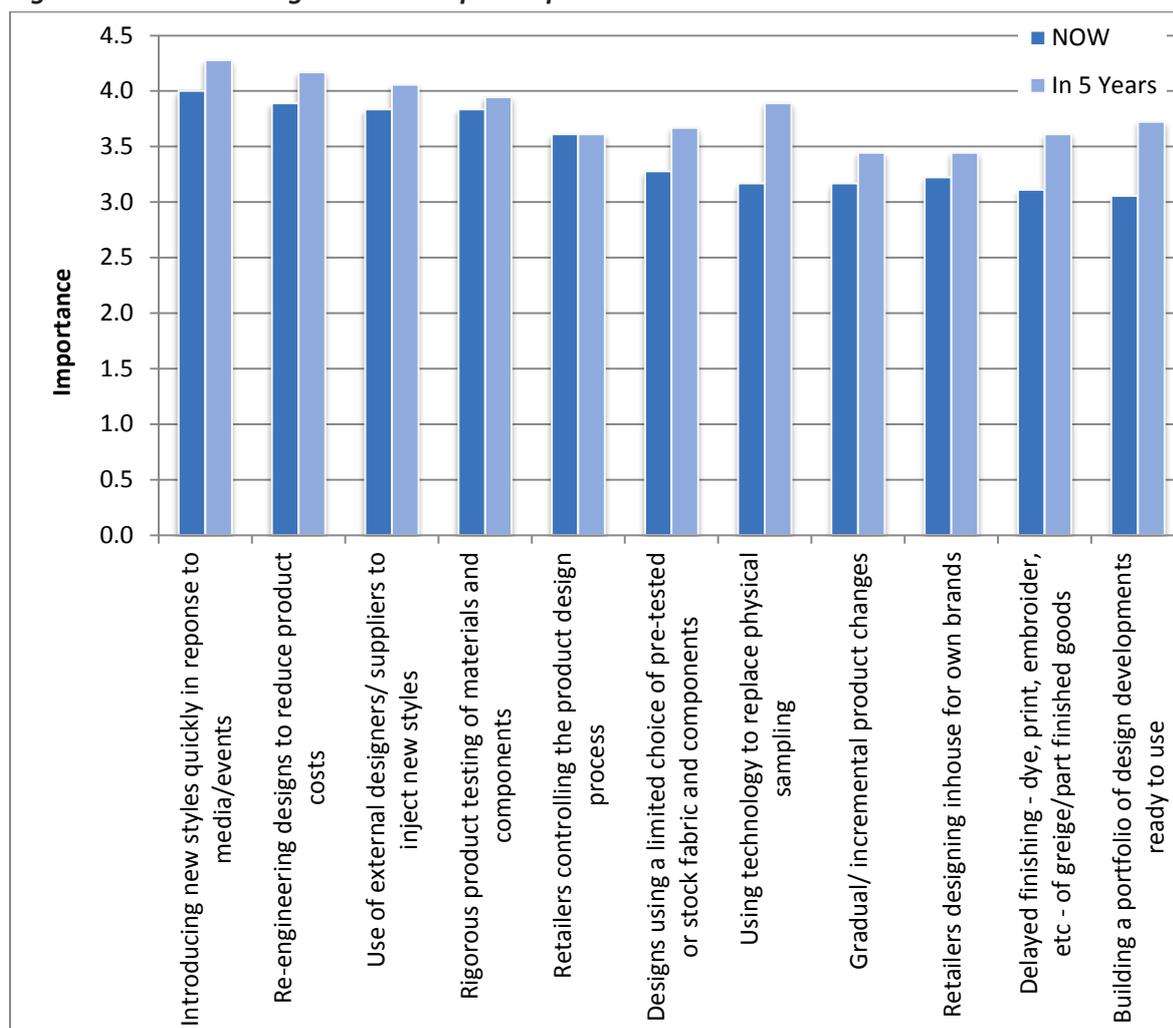
important now is ordering within the selling season, and this is predicted to increase further. Other important aspects now that are predicted to decrease marginally in importance are retailers ordering Free-on-Board (FOB) consignments from their suppliers and cancelling orders. A number of factors of moderate importance and limited future growth include pre-booking of capacity and reducing batch size, while those moderately and less important processes that are predicted to grow in importance include sharing sales data upstream, suppliers contributing to markdown costs and most notably supplier managed inventory. The practice of call-off ordering is not expected to increase further, but direct delivery of online orders by suppliers is currently relatively unimportant but expected to grow markedly.

Figure 4.4 Transaction and ordering processes in the supply chain



In product design and development, the most important variable affecting the supply chain is introducing new products quickly in response to media events – and respondents are in agreement that this is set to increase, as shown in Figure 4.5. Other practices that are considered important with relatively high levels of consensus and continued importance in 5 years' time include re-engineering products to reduce their cost, sourcing designs from external suppliers to capture new ideas and rigorous product testing.

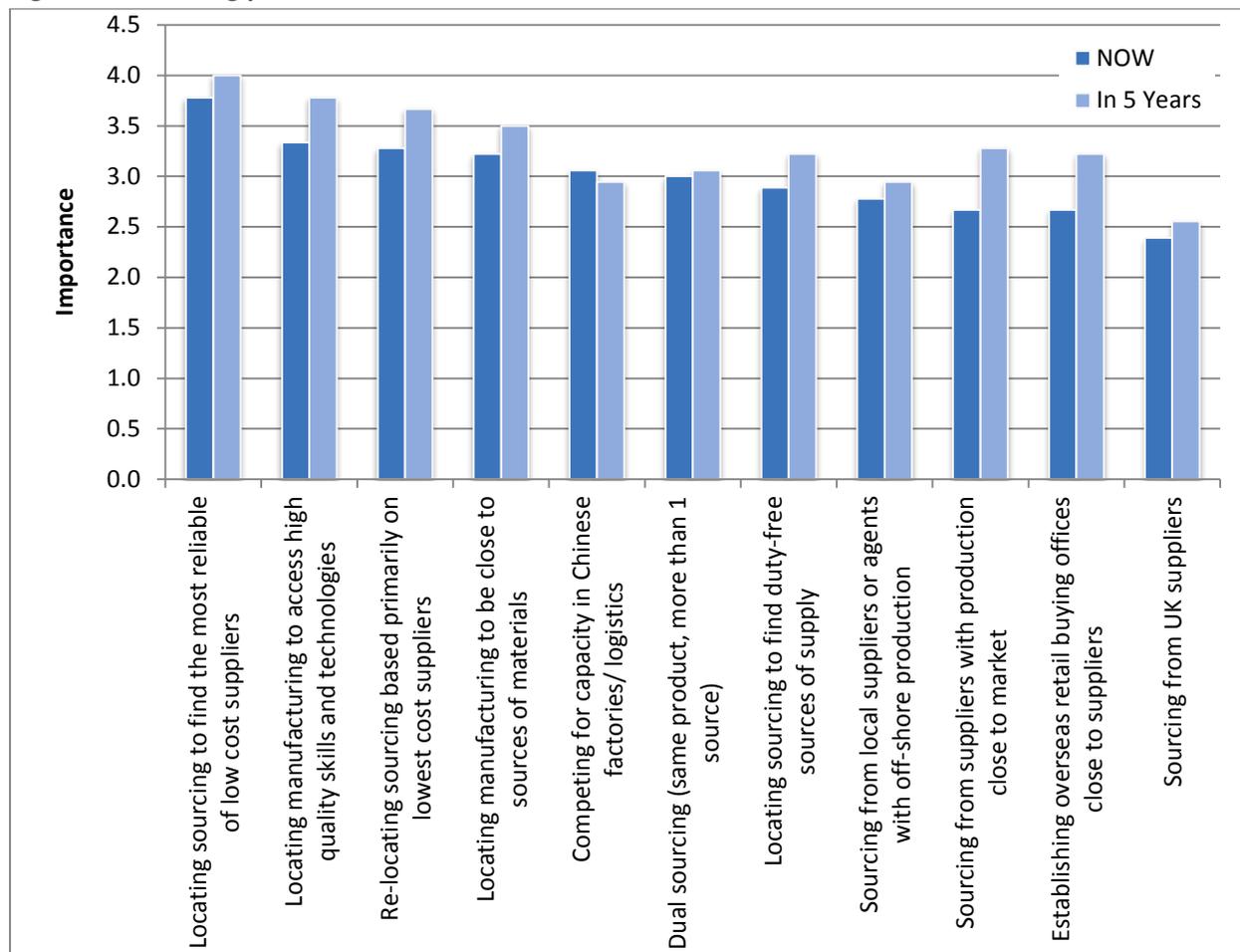
Figure 4.5 Product design and development practices



Of lower importance now, but gaining importance noticeably in the coming years are building of a design portfolio ready to introduce and using incremental product changes, both of which gain relatively high consensus from respondents. Predicted to grow and gain importance but with less agreement are: the increased use of technology in the sampling process, use of limited but pre-tested materials and components, and delayed finishing of greige goods.

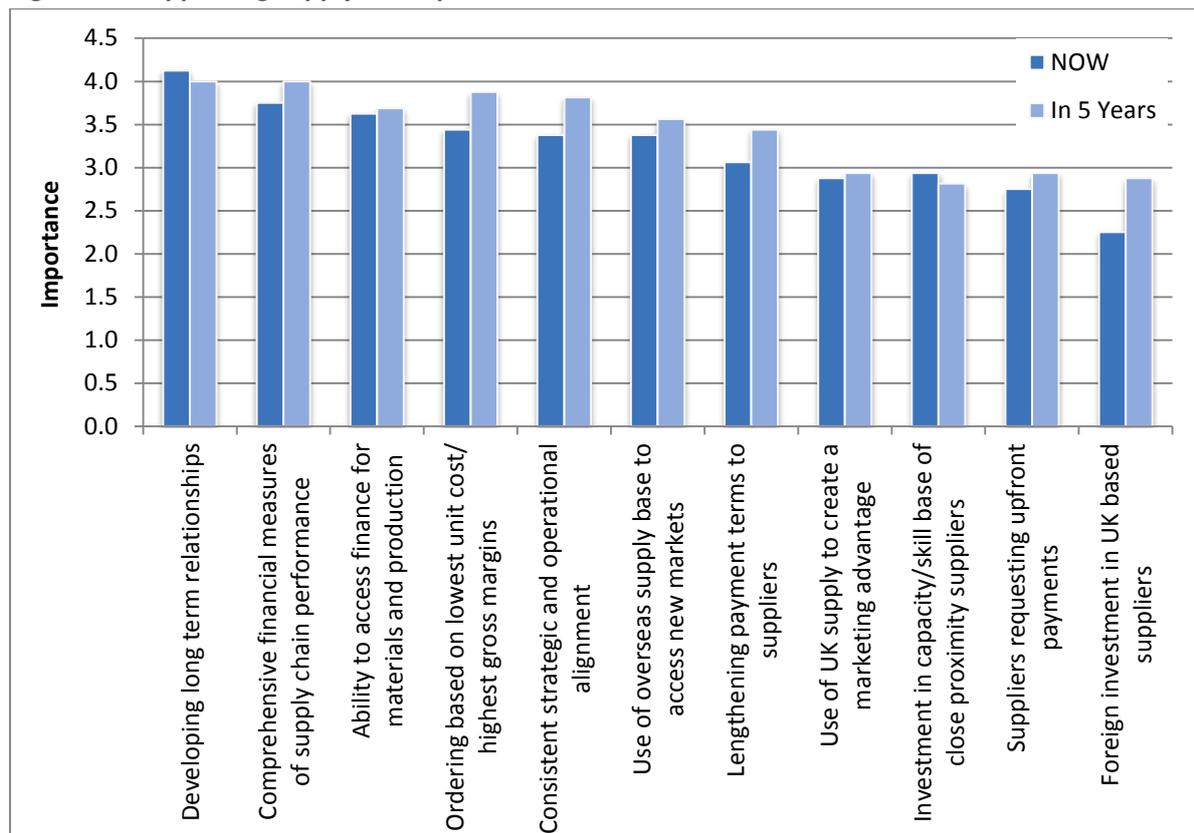
The range of sourcing practices considered important in the supply chain is much more contentious and generally subject to lower consensus now and even more so in 5 years from now as shown in Figure 4.6. Locating sourcing to find the most reliable of low cost suppliers is considered the most important practice now, ahead of sourcing purely for cost or for skills and technologies. However the latter two are predicted to grow in importance – reducing the differential. Sourcing for skills and technology receives the highest level of consensus in this data series. Further down the priority list in terms of current importance, but set to grow, are locating manufacturing close to materials or in duty-free zones while, albeit from a low current base, the greatest predicted gains in importance are attributed to establishing retail buying offices close to supply and locating supply closer to market. All have low levels of consensus, showing that sourcing is a point of supply chain differentiation and closer proximity is not generally deemed to indicate greater importance for UK supply.

Figure 4.6 Sourcing practices



The development of long term supplier relationships is seen as the most important current enabling practice in the supply chain, with a high level of consensus, but not forecast to increase in importance in the next 5 years. Figure 4.7 shows that other currently important issues include financial performance measures and access to finance for production. Those aspects foreseen to grow most noticeably are from further down the current priority list, with ordering based on lowest unit cost/ highest margin predicted to increase in importance, along with lengthening payment terms to suppliers and, interestingly, consistency of strategic and operational alignment. The biggest gain in importance is reserved for the lowest variable on the current priority list – foreign investment in UK suppliers. This contrasts with reduced investment in UK capacity from the respondents, little or no increase in importance in UK supply as a source of marketing advantage and the growth in importance shown in Figure 4.6 above in sourcing closer to market.

Figure 4.7 Supporting supply chain practices



In summary, the findings above suggest that there are high levels of consensus from the diverse group of respondents on a number of issues. Table 4.4 shows the top 10 of supply chain variables from the whole survey. All are considered to be of important or critical to supply chain operation and could be considered to be characteristics of most apparel supply chains now.

Table 4.4 Top 10 variables - Now

Supply chain strategic/ operational variable	Mean NOW	StDev NOW	Rank NOW
Delivery flexibility	4.5	0.6	1
Multi-channel retailing	4.4	0.8	2
Monitoring product quality against specification	4.3	0.7	3
Flexibility through decisions made closer to selling season	4.2	0.7	4
Reducing lead-time	4.2	1.0	5
Replenishing good sellers	4.2	0.9	6
Reducing cost	4.2	1.0	7
Developing long term relationships	4.1	0.8	8
Sourcing offshore from third party suppliers (offshore outsourcing)	4.1	1.0	9
Introducing new styles quickly in response to media/events	4.0	1.0	10

Looking at forecasts of the top 10 most important supply chain strategic and operational variables provides some interesting contrasts. Table 4.5 shows the top 10 forecast attributes with comparable information about their current importance. The importance of delivery flexibility and multi-channel retailing does increase slightly, with high levels of consensus, but their relative position remains unchanged. Reducing lead-time and reducing cost increase slightly in both importance and level of agreement to move up the priority list, to the detriment of monitoring product quality against specification, which loses priority. However, the most significant changes are forecast for upstream transparency and environmental sustainability which increase in anticipated importance and move rapidly up the priority list. Quality as a source of product differentiation and internationalisation of retailing are also predicted to increase in importance, while introducing new styles in response to media events is forecast to become even more important than in the ‘now’ scenario. Appendix 4.2 shows the full range of variables with their perceived importance now and predicted importance in 5 years’ time.

Table 4.5 Top 10 variables – 5 Years’ time

Supply chain strategic/ operational variable	Mean NOW	Rank Now	Mean in 5 Years	StDev in 5 Years	Rank in 5 Years
Delivery flexibility	4.5	1	4.6	0.6	1
Multi-channel retailing	4.4	2	4.6	0.6	2
Reducing lead-time	4.2	5	4.5	0.7	3
Reducing cost	4.2	7	4.4	0.8	4
Monitoring product quality against specification	4.3	3	4.3	0.7	5
Transparency of suppliers, materials, chemicals, labour etc.	3.8	20	4.3	0.9	6
Introducing new styles quickly in response to media/events	4.0	10	4.3	0.8	7
Environmental Sustainability	3.4	38	4.3	0.7	8
Internationalisation of retail distribution	3.8	16	4.3	0.8	9
Differentiating product by quality, durability and performance	3.8	15	4.2	0.8	10

Understanding the highest ranked variables gives an indication of some of the characteristics that might be perceived to be important to all apparel supply chains in the coming 5 years. Meanwhile, identifying those elements that are ranked with high levels of agreement helps to build a further picture of those aspects that might affect all or most apparel supply chains to some extent. For example, the lowest 10 standard deviation scores (as an indication of the highest level of consensus) suggest that specialist brand retailing, using external designers to inject new styles, flexibility gained by making decisions closer to the selling season and reducing inventory are likely to be of some importance to most apparel supply chains. However, in the process of forecasting different apparel supply chain configurations for the various scenarios, those variables where predictions of future importance show poor consensus (higher standard deviation) are potentially more informative. Variables such as supplier managed inventory, sourcing from suppliers with production close to market and dual sourcing, are among those with low consensus, as is consistency of strategic and operational alignment. These aspects will be explored further in the context of subgroups or clusters

of respondents to identify varying future scenarios and the resultant supply chain configurations of UK apparel retailers.

4.4 Future Scenarios: Apparel supply chain configurations now and in 5 years' time

Following the Cluster Analysis process outlined in section 3.4f (page 52) three future scenarios are identified, that lead to specific supply chain configurations, again numbered 1 to 3, based on the consolidated views of respondents within each cluster. The supply chain configurations illustrate how the apparel supply chain might develop in the future. The distinct clusters of respondents are comprised as set out below in Table 4.6 and the scenarios and the resulting supply chain configurations are described in the following sections.

Table 4.6 Cluster case allocation in 3 clusters

Cluster ID	Round2	Respondent Profiles
Cluster 1: Modern Classics Chain	R1	Mail order retailer
	M2	Footwear brand
	S2	Hosiery Brand
	S3	Clothing Supplier
	M4	Swimwear brand
	O1	Sourcing consultant
	S4	Performance wear
	O2	Industry association
	S5	Sourcing agent
Additional members	S7	Chain store supplier (interview)
	R8	Brand retailer (interview)
Cluster 2: Fast Fashion	R2	Fast fashion retail
	R3	Men's fashion retailer
	R4	Global online retailer
	S1	Knitwear supplier
	M5	Lingerie manufacturer
	R6	Supermarket
Additional member	R7	Small UK retailer (interview)
Cluster 3: Updated Retro response	M1	Small knit factory
	M3	Denim
	R5	Online superstore
	O3	Dye company
Additional members	M6	Small factory (interview)
	S6	US brand (interview)

4.4a Clustering for future scenarios

Three clusters were identified, based on statistical grouping of the responses to five variables: sourcing close to market, pre-booking capacity, delayed finishing, design portfolio, and reducing inventory, chosen because of their relevance to findings from earlier research (Oxborrow, 2008; 2011a) and lack of consensus across the sample and between the 'now' and '5 years from now' responses. Since all variables needed to fit a similar nominal scale, a 'Fashion proxy' was allocated to each case ranging from 1 (all continuous fashion) to 5 (all fast fashion) and reflecting the mix of seasonal products indicated in Table 4.7 and Appendix 4.3. The cases represented by each cluster

are listed in Table 4.6. The table also identifies respondents from Round 1 where they have been allocated to the three clusters and the extent of qualitative data available to support the Q₂ method of analysis as outlined in section 3.4f (page 52).

The effectiveness of the cluster groupings can be subsequently tested by comparing their proclivity to the different aspects of fashion apparel. Table 4.7 shows that cluster 1 is dominated by a combination of basic fashion with small changes from season to season, and fashion that changes each of 2-4 seasons per year. Cluster 2 is dominated by fast fashion that changes more than 4 times per year, with a substantial element of fashion in the remaining offer. Meanwhile cluster 3 operates in the extremes, dominated by continuous styles that change little from season to season, with a higher than average contribution to premium apparel and a contrasting proportion of fast fashion too (emphasised further by the non-survey based responses), reflecting the diversity and differentiation of the group.

Table 4.7 Classification of cluster supply chain by seasonality of product

What percentage of the products of your supply chain would you describe as below?	n	Mean*	St. dev	Cluster mean		
				1	2	3
Continuous (unchanging season to season)	11	23.1	22.4	19%	13%	53%
Basic apparel (minor changes season to season)	8	20.0	28.2	32%	13%	7%
Fashion (changes each major season, 2-4 times per year)	11	23.4	22.1	32%	22%	7%
Fast fashion (changes more than 4 times each year)	10	25.0	34.4	7%	52%	12%
Premium classic apparel (few seasonal changes)	5	6.3	11.5	10%	-	20%
Premium high fashion (major change each season)	2	2.2	7.5	No significant response		
None of the above	3	Experts allocated to clusters by qualitative data				

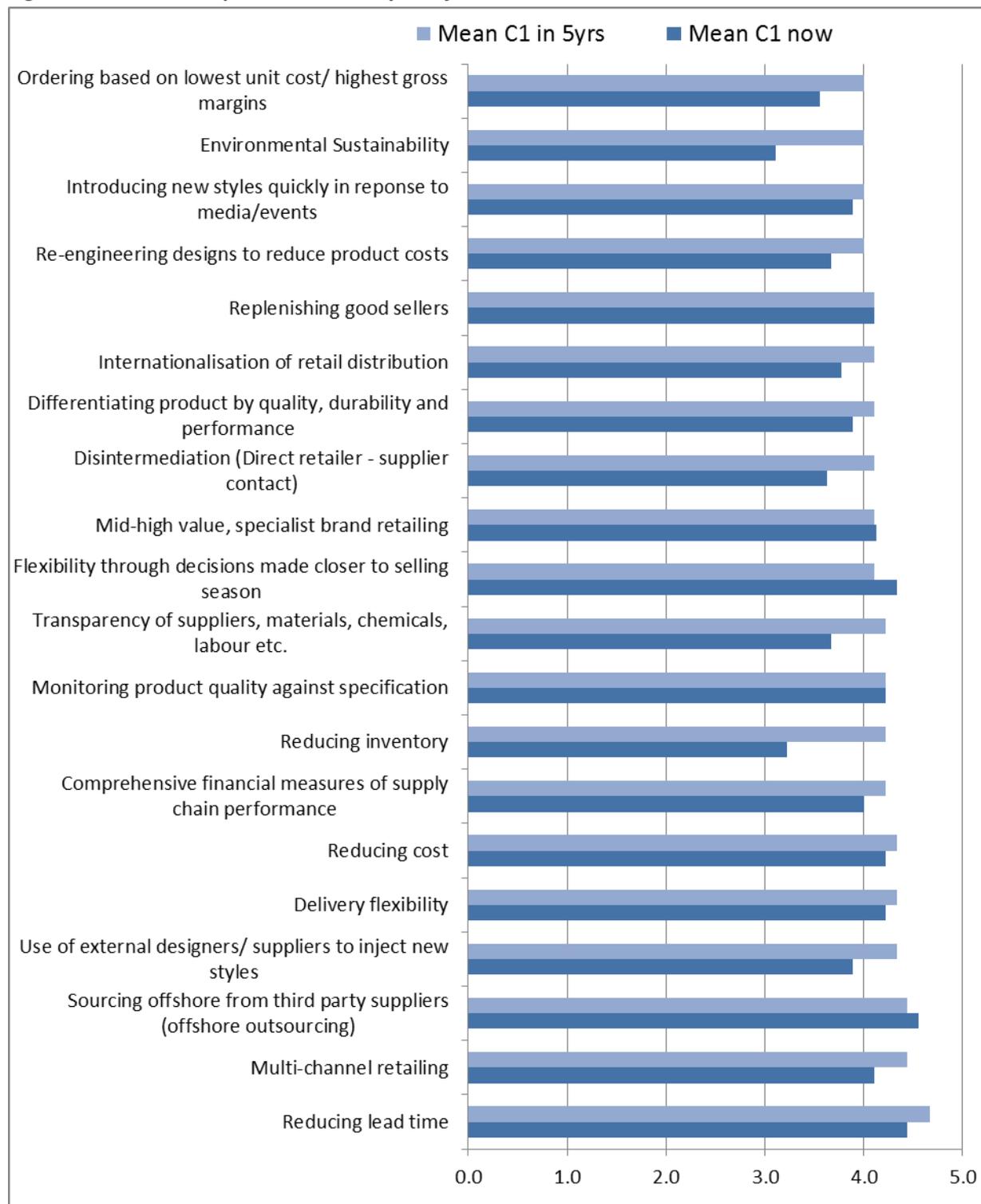
*Excludes 'other' / 'none of above' category.

Supply chain configuration 1: Contemporary Classic Chain

For the respondents in cluster 1, reducing lead-time, cost and maintaining delivery flexibility are already important objectives that continue to drive the supply chain for basic and fashion apparel, which is, in most cases, heavily dependent on offshore outsourcing. However, for this cluster, the strategic market opportunities are growth in multi-channel retailing, specialist brands, and to some extent retail internationalisation and respondents emphasise the importance of managing uncertainty. These combine with increasing pressure to achieve financial benefits through the supply chain, to increase the importance of inventory reduction. In turn, while the importance of monitoring product quality remains stable, its relative priority decreases in favour of overall transparency upstream in the supply chain. Consistent with the financial performance objective, respondents foresee the growing importance of gross margin when placing orders, while trying to balance the increasing challenge of re-engineering designs to reduce the wholesale cost of products with the need to produce apparel that is differentiated by its overall quality and long-term performance.

As shown in Figure 4.8, one variable that reduces in importance is that of flexibility to decisions made closer to the selling season, perhaps an indication of more sophisticated planning or information systems and sharing. Variables forecast to increase most fit two broad categories: responsiveness to fashion changes and corporate social responsibility, as shown on Figure 4.9. In the first category, building a portfolio of designs ready to roll out into production, delayed finishing or postponement and use of external designers to introduce newness are all forecast to increase, but only the latter appears in the top 20 when listed by importance (Figure 4.8). Batch size is added as a hot topic by Q2 respondents, with the two performance suppliers predicting larger and smaller batches respectively. Environmental sustainability and transparency upstream increase notably, and both enter the list of most important variables. Meanwhile reducing inventory, which impacts on both outcomes, is the variable forecast to increase in importance by the highest margin. However, replenishment of good sellers falls to low down the list, and demand management, through discounting and limited availability, are both low in priority, with the former losing importance.

Figure 4.8 Cluster 1 Top 20 variables '5 years from now' and 'now'

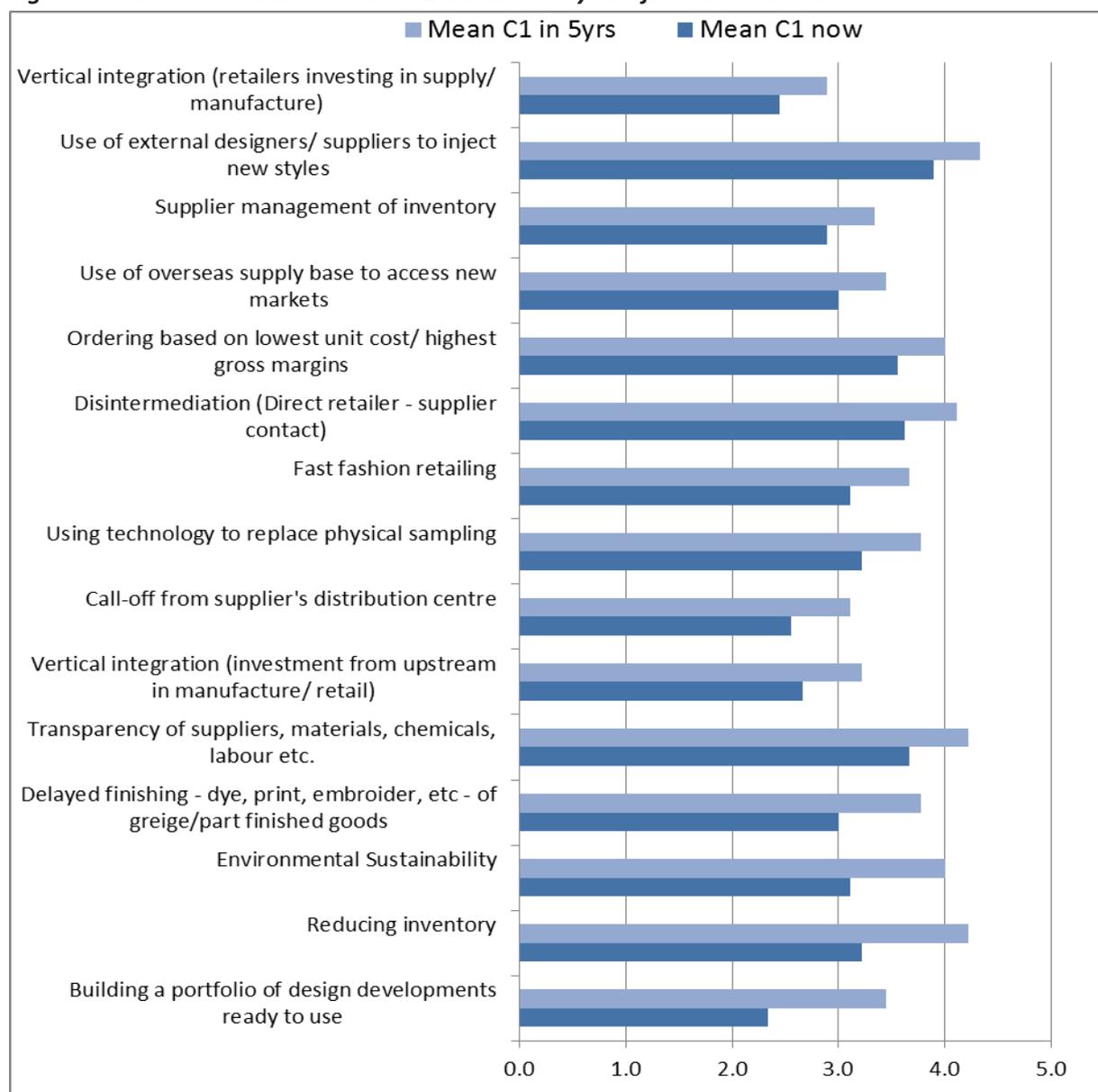


While offshore outsourcing remains dominant, there is a greater importance placed on direct relationships between retailers and suppliers and the use of intermediaries falls in importance, dropping from 22 to 44 in the overall list in order of importance. Access to new markets, through the supply base, increases in importance and moves to 42 in the overall rankings. Call-off from suppliers' distribution centre and supplier managed inventory both increase, but are scored as of some importance only and rank 54 and 49 overall. However, this is one of the most controversial

issues for Q2 respondents, with some facing the switch to FOB delivery for some retailers and managing “JIT issues” with others. Meanwhile, sharing sales data upstream in the supply chain increases slightly in importance but falls from 18 to 21 in the overall list of priorities, while developing long term relationships falls slightly in importance and drops from 11 to 27 in the overall rankings, although Q2 respondents refer to greater collaboration.

Time-saving innovations in the product development process are forecast to gain in importance – a view vigorously supported by four of the eight Q2 respondents. These include delayed finishing or postponement, the use of technologies in place of physical garment samples and using pre-tested fabrics which speed the NPD process, but limit choice. Postponed finishing jumps from 50 to 29 in the overall importance ranking, while rigorous testing of materials upstream remains important, but loses ranking. However, contrasting issues mentioned by Q2 respondents include the challenge of design for production and differentiation, the stickiness of physical samples and the question of not only how to manage NPD, but also where it should be located.

Figure 4.9 Greatest variance – cluster 1 variables ‘5 years from now’ and ‘now’



Few changes are predicted in sourcing arrangements by cluster 1, and most criteria maintain a comparable position in the overall list of importance. However, there is reduced emphasis on sourcing purely for lowest cost, as for combined reliability and cost, and sourcing for manufacturers close to the materials base. Meanwhile dual sourcing falls further in the importance rankings and sourcing from the UK is one of the least important criteria. The exception is sourcing for access to skills and technology which gains importance and ranking and is strongly supported by the Q2 respondents. Issues affecting current global economics are not seen to have a lasting effect with competition for capacity in China and ability to access finance for production falling in importance and dropping down the importance rankings.

This supply chain configuration maintains many of the characteristics of the traditional apparel supply chain, with a focus on downstream aspects of the supply process to control, maximise efficiencies and respond to market demand, while the upstream stages remain cost focused but with greater contribution to added value in some aspects, such as technology and skills and access to new markets. Due to the balance between the traditional supply chain and the adoption of process innovations to respond to demand, service different retail channels and introduce new products more quickly, the supply chain configuration emerging from this scenario is termed the ***Contemporary Classic Chain***.

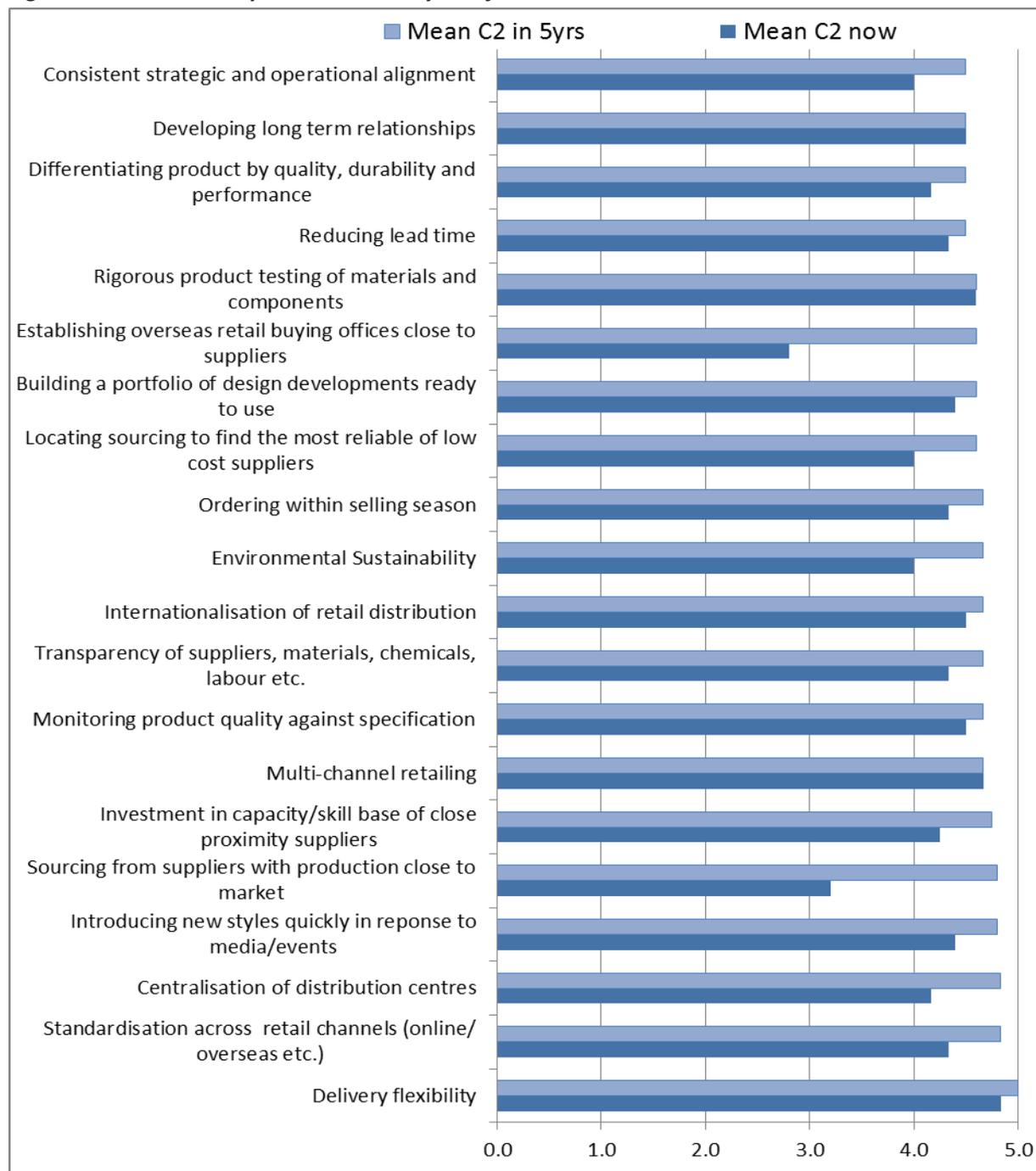
Supply chain configuration 2: Proximity Fast Fashion

While multi-channel retail does not increase in importance for this respondent cluster (though Q2 responses confirm that it remains a priority) and internationalisation of retail increases only marginally, standardisation across diverse retail channels does move up the list of priorities. There is greater focus on strategic and operational alignment, which results in some significant changes in importance between now and the 5 year forecasts – the top 20 most important variables are shown in Figure 4.10 and demonstrate greater anticipated dynamism than was evident in responses from cluster 1. Changing strategic priorities are driven by the need for delivery flexibility, and the need to introduce new styles at short notice which rank number 1 and 4 respectively, with the latter also increasing in importance. One Q2 respondent referred to satisfying the “*I want it now*” culture. Also important, though stable, are ordering within the selling season and lead-time reduction, all variables consistent with the respondent’s fast fashion focus.

Proximity is of increasing importance to Cluster 2 respondents, as shown in Figure 4.11, with the greatest increases in significance attributed to variables relating to sourcing from suppliers with close to market capacity, which leaps from ranking of 59 to 5; locating buying offices close to suppliers, and sourcing from local suppliers with off-shore facilities. There is also forecast growth in upstream investment along the supply chain, and investment in capacity and skills to support close proximity supply (ranked number 6 in 5 years’ time), primarily forecast to come from overseas. Meanwhile there is also forecast growth in retail investment in the supply chain. Consistent with these findings, Q2 respondents variously refer to quickening the critical path and speeding up the design process. However, this pattern contrasts with similar forecast growth and levels of importance in sourcing for low cost suppliers, for reliability at low cost (which ranks in the top 20 forecast variables) and in search of duty free supply – so the apparent dichotomy in priority remains, and is perhaps typified by the drop in relative importance of developing long term relationships - although this does remain in the top 20 most important variables; and off-shore outsourcing which

drops from 44 to 66 in the rankings. This more responsive, close proximity, low cost supply base is facilitated by more centralised retail distribution centres – perhaps an attempt to standardise downstream the greater complexity upstream. In spite of a move to greater proximity, there is an anticipated decline in importance of UK suppliers, and in ranking of dual sourcing.

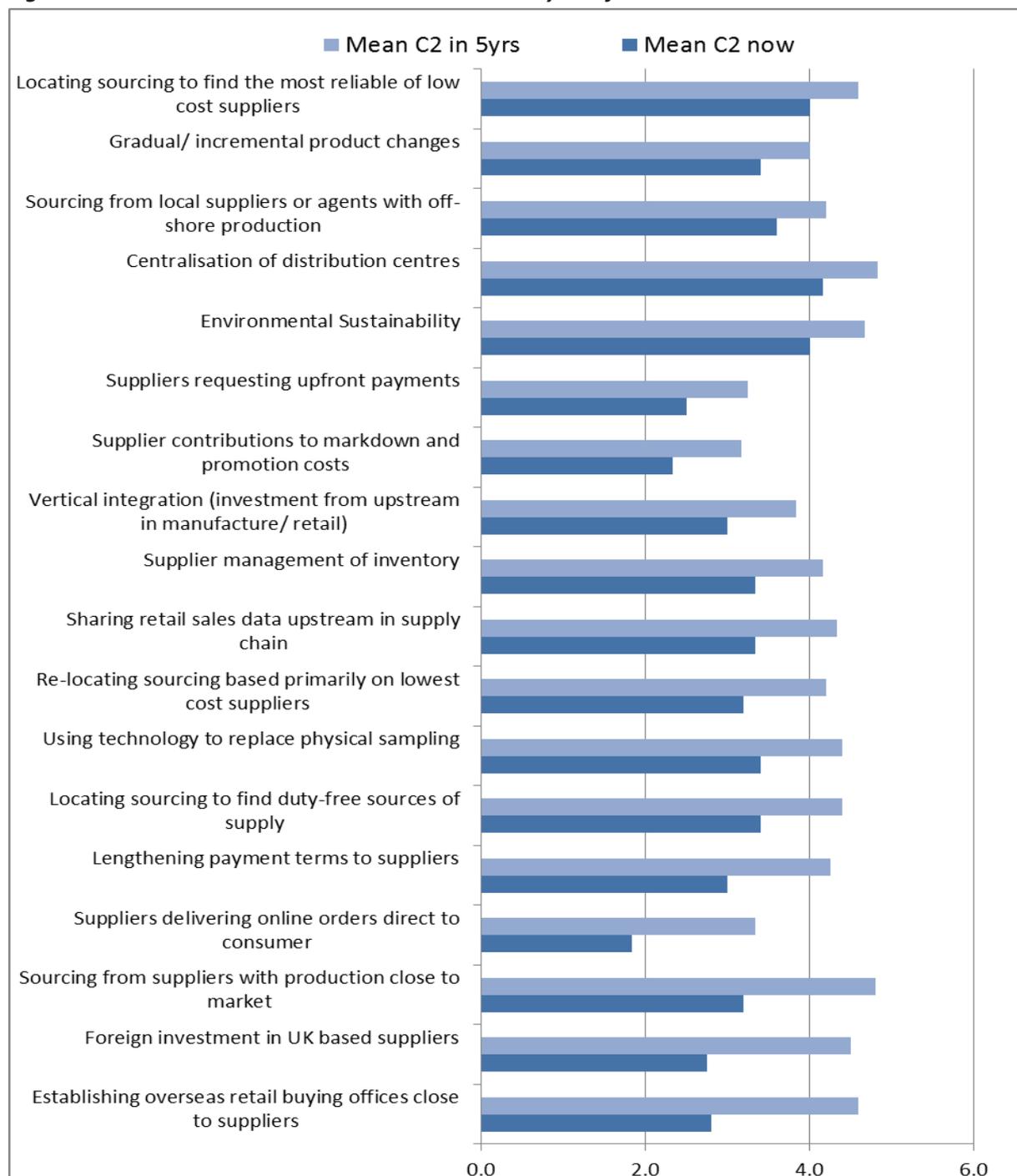
Figure 4.10 Cluster 2 Top 20 variables ‘5 years from now’ and ‘now’



Being a supplier in this supply chain remains challenging! It is forecast that payment terms will increase, suppliers will be more involved in inventory management, while the supply chain strives to reduce inventory - to be substituted for more sharing of sales data, challenges accentuated by one Q2 respondent. For some respondents call-off from supplier distribution centres is less important (forecast to be the least important practice), but more suppliers will be expected to deliver direct to

online consumers and contribute to markdowns and promotional costs. Growth in incremental product changes is forecast to be supported by growing use of technology in the sampling process, although Q2 respondents highlight resistance to this. Replenishment of good selling lines is forecast to fall in both importance and priority and there is expected to be less use of external designers and less relative importance placed on re-engineering designs to reduce cost.

Figure 4.11 Greatest variance – cluster 2 variables ‘5 years from now’ and ‘now’



As with cluster 1, environmental sustainability increases in importance, and there is predicted to be greater emphasis on transparency upstream in the supply chain, monitoring product quality, and

quality as a source of differentiation, although time consuming testing of materials upstream is forecast to drop down the relative importance rankings.

In spite of the focus on speed and proximity, the importance of fast fashion retailing for this group falls slightly relative to other improvements that support the overall strategic goals. Discount and clearance retailing are seen as relatively low in importance. However, because of its overall focus on fast fashion values and proximity, the supply chain configuration emerging from this scenario is labelled ***Proximity Fast Fashion***.

Supply chain configuration 3: Updated-Retro Response

As in scenario 2, this supply chain emerging from this scenario is driven by multi-channel retailing and the flexibility objective. However, the response differs in important, but subtle ways as each group seeks a better alignment between strategic and operational priorities. For the Fast Fashion Proximity cluster, standardisation is important to counter balance the growing supply chain complexity. For this group (cluster 3), differentiation is important to satisfy market niches and find opportunities in the competitive market – standardisation across channels decreases notably in importance ranking, while retail brand proliferation increases.

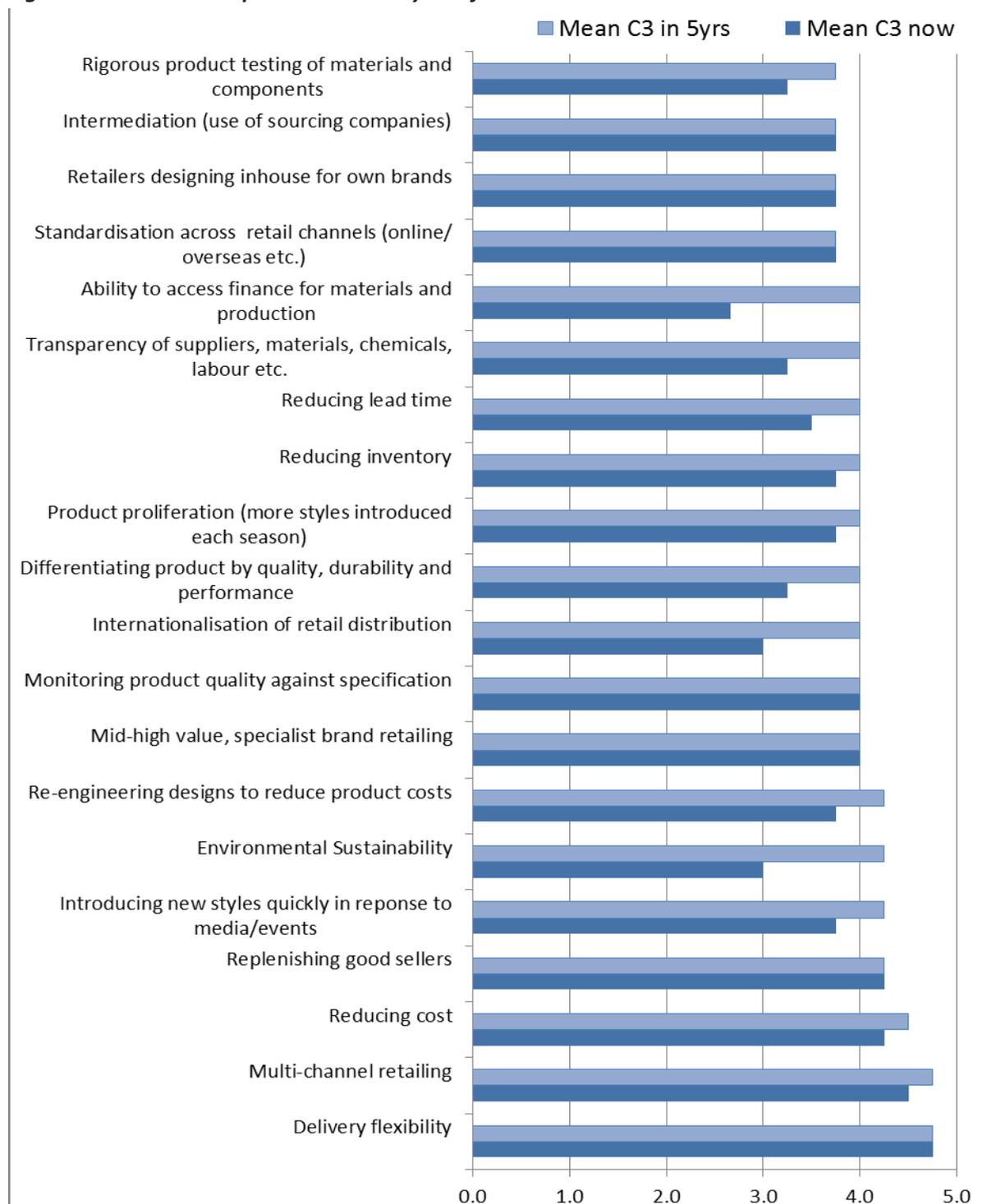
As a result, the top 5 forecast priorities (Figure 4.12) include launching new styles quickly and responsively, which has risen from 17 to 5 in the respondents' rankings, as well as being able to replenish good sellers. While at odds, these variables satisfy the differentiated priorities of the cluster in fast fashion and performance and premium apparel. In this differentiated market, cost control - increasing in importance for product costs, but also evident in process - is an important objective, but association with better end, specialised markets means that quality of product is also anticipated to become more important, though there is marginally less emphasis on quality monitoring at the end of the process, and more on quality of materials. These aspects all support brand equity and the growth in internationalisation of retail in niche markets, reinforced by sourcing for skills and technology, as well as using domestic manufacturing to create a marketing advantage.

Product proliferation and inventory management remain important, but unchanged in relative terms, though support through processes such as pre-booking capacity and sharing information upstream decrease in importance. Lead-time becomes a more important aspect, however, and there is reduced dependence on markdowns to manage demand. The single largest increase in importance (Figure 4.13) relates to suppliers being expected to deliver direct to online consumers – an additional challenge to the speed imperative in any supply chain.

The use of sourcing companies and retail in-house design both fall in relative importance, and the move to more local supply is reinforced by forecast difficulties for this group in accessing capacity through established Chinese sourcing routes. The issue of sourcing attains the lowest levels of consensus among this disparate group. The only real consensus is that sourcing from UK manufacturers remains constant at only 'some importance' and that the use of buying offices close to suppliers should decrease. Sourcing from UK suppliers, or suppliers with close-to-market production, is deemed more important for some, with aspects of sourcing for low cost, sourcing for skills and technology or reliability being considered of greater importance, but with low consensus. Q2 responses explain the divergence, with one referring to suppliers holding British made stock fabrics for speed, in spite of the risk to suppliers, another to "*made in UK*" as a marketing benefit;

with others referring to reduced loyalty experienced because of customers' dual sourcing and the need for greater supplier skills and technology to support innovations.

Figure 4.12 Cluster 3 Top 20 variables '5 years from now' and 'now'

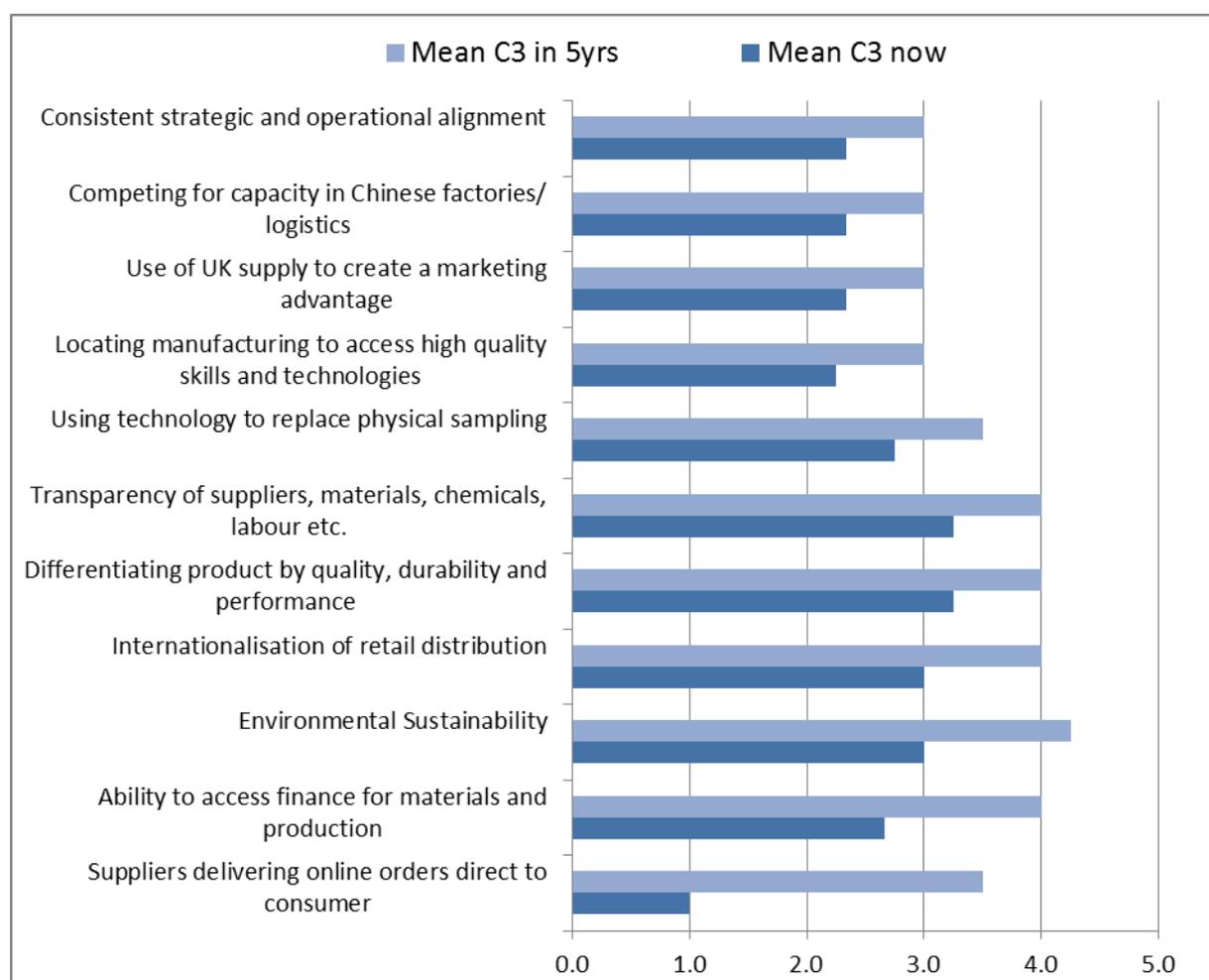


There is less direct retail integration in the supply chain, but in contradiction, disintermediation falls in importance. There is a lack of consensus on aspects of delivery, supply managed inventory and contributions to markdown or promotional costs. Retailers are expected to take less control and have less input in the design process, though the alternative comes from inside the supply chain rather than from external designers. There is some increase in importance of the use of technology

in product design and greater interest in the potential to pre-test a limited range of fabrics, though one Q2 response suggests that cost is a burden on suppliers and another that payment terms will deteriorate. However, the supply chain is anticipated to be increasingly challenged by access to finance for production, and while developing partnerships to support these developments remains relatively important when compared to practice forecast by other clusters, it loses importance from place 6 to 26. As with other scenarios, environmental sustainability and upstream transparency increase in importance (Figure 4.13). Geographical closeness between buyer and supplier supports both objectives, but Q2 responses reinforce the potential obstacles in these areas for niche supply chains.

Because of its return to core values of differentiation, product quality and industrial legacy, updated with technological advancements in product and process, this supply chain configuration is called **Updated-Retro Response**.

Figure 4.13 Greatest variance – cluster 3 variables ‘5 years from now’ and ‘now’



4.4b Round 3 Feedback

Of the 10 respondents who replied, 3 gave their endorsement of the proposed scenarios and supply chain configurations without further comment. However, others were more specific in their feedback, which was generally positive about each of the supply chain configurations, with ratings of 4 (Agree) or 5 (fully agree) for each. The suppliers and retailers who responded were all, with one

exception – a fast fashion supplier, working mainly in supply chain configuration 1, who predicted this to continue. Opinions were divided between those who saw themselves continuing to operate completely in the Contemporary Classic supply chain configuration, and those who predicted a mixture of strategies, dominated by this configuration, with 16-25% of supply utilising the Proximity Fast Fashion supply chain and a small amount using Updated Retro supply. Exceptionally the fast fashion knit supplier predicted operating exclusively a Proximity Fast Fashion chain. Two of the three industry support representatives recognised all three supply chain configurations as within their experience, with the exception of the sourcing agent who claimed *“I don’t recognise supply chain 3”*. Further comments are incorporated into the discussion that follows. Two respondents claim to be utilising the findings in their strategic visioning discussions.

4.4c Summary

In summary, the three scenarios lead to growing differentiation in the apparel supply chain architecture of the future – represented by three supply chain configurations. While they are responding to similar challenges in the face of growing diversity of retail channels, growth in the requirement for sustainability and similar economic pressures, the responses differ according to other factors. The result is differentiation in approaches to standardisation and differentiation; sourcing objectives, proximity and structure; NPD strategies and adoption of new technologies and processes; product quality and integrity; relationships between buyers and suppliers; and, not least, attitudes towards responsiveness. A summary of the top 20 variables for each cluster of respondents is represented in Appendix 4.4.

5 Discussion

5.1 Introduction

The discussion that follows answers the three research questions posed in section 2.11 ([page 34](#)) by critically analysing the findings in the context of existing knowledge explored during the literature review in Chapter 2. The answers to research questions 1 and 2 are drawn from both the qualitative and quantitative findings from the first and second rounds of the Delphi research, which have been compared side by side in a coding table (Appendix 5.1). However, the discussion corresponding to research question 3 is based on the Q2 analysis of the sections of Delphi Round 2 where respondents were asked to predict how important supply chain variables will become in 5 years' time. This latter data was enhanced by the comparative analysis of respondents' explanations of their anticipated supply chain developments (Appendix 5.2).

RQ1 How have strategic priorities changed in the UK apparel retail supply chain over the last 5-10 years?

One initial observation is that the interviewees from the large, multi-product and retail suppliers immediately referred to two strategic shifts: the dramatic growth of overseas supply in the late 1990s [and more specifically Marks and Spencer's rapid move to off-shore sourcing in 1998 triggered by the impending phase out of the Multi-Fibre Arrangement and a major strategic shift by the retailer], and the emergent growth of online retailing since 2010. As the former was well outside the period covered by this research, its inclusion in the responses illustrates the perceived significance of this industry shock, consistent with Doeringer and Terkla (1995). However, the dominant contemporary strategic shift affecting apparel retail, and evident from both R1 and R2 respondents, appears to be the growth of multi-channel retail, and to a lesser extent internationalisation strategies, supported by standardisation across distribution channels on one hand, and differentiation through either product and brand, or low price, on the other. The polarisation of retailing to discount and higher-price brands as a response to competition in the mid-market and consumer discount addiction (Mihm, 2010; Drapers, 2012) is consistent with Gauri et al. (2008), who suggest that competition in different retail price bands leads to the development of new, competitive outlet formats. However, according to Miles et al. (1978), these developments should be market-led strategies, consistent with '*analysers*', who establish processes, including the supply chain, consistent with their strategic proposition, as in the case of Khan et al.'s (2012) Fashion Co.; or '*prospectors*' carving out new ways to compete, as in the Zara case (Ferdows et al., 2004). The respondents disagree, with all but one suggesting that their supply chain strategy is slow to change, with control and efficiency, or at least low cost, remaining the prevailing drivers – consistent with Miles et al.'s (1978) *defenders* strategy, contradicting the level of customisation and evolution predicted by Lawson (2003b; 2005). This can be explained by Scheffer's (2012:22) reference to "*functional*" and "*cognitive lock-in*" – respectively lack of ability to change and lack of awareness of alternative ways to compete and the lack of strategic influence of supply chain functions (Storey et al., 2006). Over time, the R2 responses hint at a relative increase in importance of delivery flexibility and lead-time reduction compared to cost efficiency, signalling that the lock-in may be gradually overcome, although at a slow pace of change.

Ketchen and Giunipero (2004) impose aspects of organisational strategy onto supply chain strategy. Such aspects that determine the value of a supply chain and how hard it may be to replicate are clearly visible from the R1 respondents. Protecting information about upstream sources, design and

sourcing expertise or costs, vertical ownership and exclusivity agreements with upstream suppliers, all ensure that first tier suppliers have developed supply chains that are hard to copy. While, at least in theory, retailers with own brands are considered to control their retail driven supply chains (McColl and Moore, 2011), in the case of the large suppliers and intermediaries who responded, a considerable element of supply chain management, control, knowledge and experience is in the hands of first tier suppliers. Moreover, the evident use of large intermediaries for upstream sourcing by the branded companies suggests that process replication and even standardisation across different retailer or brand supply chains has become part of the service providers' offer, and helps provide access to otherwise hard-to-reach sources, although R2 responses suggest that dependence on sourcing companies may fall. Ketchen and Giunipero's (2004) other strategic matches between organisation and supply chain strategy are harder to observe from the findings. Autonomy of suppliers is controlled through upstream exclusivity contracts, although there is also evidence that most first tier suppliers and some contractors are supplying numerous distribution channels with varying degrees of autonomy, such as the clothing and hosiery companies with their primary retailer, other retailer and branded divisions. Exchange of knowledge throughout the supply chain is a recognised weakness in terms of willingness to share, trust and quality of information, while mimicry is a challenging concept. It might be assumed from media and academic coverage of the Zara phenomenon that more retailers would attempt to copy this system, but, while fast fashion is predicted in R2 to increase, it appears to be too hard to replicate beyond individual elements or small scale supply, and this is consistent with Cachon and Swinney (2011) and Birtwistle et al.'s (2003) conclusion that fast fashion strategies are often only partially adopted, while the benefits are consequently diminished. Other success stories, such as Primark in the UK (and similarly Forever 21 in the US) are treated with some derision and suspicion by competitors for their low margin approach, rather than any desire to copy, which leaves the traditional Marks and Spencer, efficient, tightly controlled supply chain model and McKinsey and Co's (2012:13) "*herd-like reflex to chase low-cost labor*" as the most mimicked, even though mature and even perhaps outdated strategies, and those which are forecast to continue.

It is apparent from the findings that different distribution channels create distribution complexity that, like supply and demand complexity, needs to be managed or reduced for effective SCM. Respondents suggest that, while technology supports new channels to market, monitoring and communications, it can also make it harder to predict what will sell and for how long, enabling fluctuations to take place more quickly and making it harder to physically keep up with the pace of virtual change. Meanwhile, McColl and Moore (2011) suggest that retail or brand control over the supply chain comes with responsibility for the whole supply chain. The supply chain of the future, therefore, needs to be responsive to new products and fluctuations in demand (Fisher, 1997) as well as complexity in distribution channels, sourcing and supply fluctuations, and must, according to R2 findings, be increasingly underpinned by sustainable values and cost efficiency.

However, regardless of developments in retail strategy and routes to market, findings here show that supply chain strategy is predominantly based on efficiency, cost savings and standardisation (Lowson, 2002; 2003a), rather than differentiation (Brun and Castelli, 2008). Even those supply chains where product quality or design provides a point of difference are substantially influenced by cost, which compromises other advantages but appears too pervasive to be attributable to the cyclic divergence of organisational and supply chain strategies in transition (Lowson, 2005). As a result order winners from the interviewees' perspective are dominated by cost or sometimes cost-plus-one

strategies. Although there is greater current importance placed on flexibility and quality in the R2 responses, predictions for the future point to an increasing focus on cost – in line with the qualitative findings. This suggests that, while considered by Christopher et al. (2006) as leading to sub-optimal decisions and efficient, rather than effective supply chains (Fisher, 1997; Stratton and Warburton, 2006; Hines, 2002), cost is a dominant factor in practice that is unlikely to go away. Respondents refer to “*quality at a price*”, “*reliability at a cost*”, “*greater flexibility at zero cost*”... which suggests that order winners should be based on an adapted ‘value proposition’ based on cost and Hill’s (2005) other key competitive objectives. There is, therefore, an emerging gap between theory and practice, as the challenge to meet cost expectations has intensified in the current climate, and there is evidence that cost has become potentially “*order-losing*” as defined by Hill (2005:54), in that respondents feel that they face de-selection while their experience confirms that business has been lost to lower cost overseas suppliers. There is, therefore, potential for a new theoretical approach where cost becomes a ‘given’ and a decisive measure when combined with other priorities, in contrast to extant theory which suggests that cost should at best be a market qualifier in responsive, differentiated supply chains (Christopher and Towill, 2000; Mason Jones et al., 2000). The supply chain, however, also needs better measures and greater transparency of the full cost of ownership, as proposed by Hines (2002) and new ways to manage cost-sensitive decisions (Christopher et al., 2011) and the research provides little evidence of such progress. Indeed, R2 respondents give almost equal priority to comprehensive measures of SC performance as they do to ordering based on highest gross margin, with the latter forecast to increase in importance.

Brown et al., (2013) suggest that supply chains need to balance order winners and qualifiers to meet the needs of different market sectors and be prepared to improve in all areas at once. There is, therefore, pressure to improve on key performance objectives due to their order winning status or changes in customer expectations of what constitutes qualifying standards - but often on the proviso that they are improved at low cost or zero cost. Often it is only perceived to be worth enhancing other criteria if cost also decreases or at least remains stable. For example, reliability is primarily seen by interviewees as a mechanism for avoiding indirect costs in the supply chain, manifest as financial penalties among the UK suppliers, loss of retail buyer loyalty as explained by the lingerie supplier, design orders being awarded to alternative, more worthy suppliers, or suppliers being delisted. However, the penalties reported in the UK are light compared to the US context, where late delivery results in immediate order cancellation and *ex-post* loss of business. Criteria such as reliability therefore have the potential to become order losing sensitive when they fall short of changing customer expectations (Hill, 2005; Brown et al., 2013) and the research shows that this can occur pre- or post-order and at different stages of the supply chain, including between retailers and suppliers or suppliers and manufacturers. The concept of reliability as a source of brand equity (Brun and Castelli, 2008) is less evident, important mainly to the branded and performance wear suppliers, although the significance historically placed on replenishment call-off from supplier-held stock and issues of poor forecasting suggest that this is, or should be, of more general importance, in line with Abernathy et al. (2000) and Guercini (2012). However, for fashion apparel the emphasis has shifted from replenishment and stock availability to continuous availability of new lines, in response to fashion events and long range trend forecasting, both of which are important in R2 findings. The respondents argue that complexity in new product development forces suppliers to take action to

ensure reliability at each subsequent stage in the supply process, as final delivery dates are dictated by seasonal range planning, and delays in design and ordering processes impact downstream.

Speed or lead-time is another multi-faceted aspect of competitiveness. In the fashion supply chain, speed is interpreted as short production lead-time facilitated by proximity, technology or reactive capacity (Raman, 1998; Jin et al., 2012; Stratton et al., 2008; Stratton and Warburton, 2006; Van den Heydon, 2001 and Sharifi et al., 2006). While lead-time is considered important to all respondents, for the full service suppliers the production lead-time is within their control and therefore, long or short, not considered challenging. Speed of the design and decision making process is, however, an aspect of contention in the supply chain, and decision response, as identified by Cheng et al. (1997), is evidently slow with any progress towards lead-time improvement attained by reducing time for implementation response. This represents the opportunity for a market driving approach to competitiveness, pushing competitive norms for market advantage, like Zara, as documented by Ferdows and de Meyer (2002) and after Hill (2005) - so it is curious that such processes have not been more widely adopted and that they meet with resistance in some cases.

Again, there is a cost implication of speed to market, as Christopher et al. (2006) emphasised by focusing on the cost implications of replenishment lead-time delay. For some, whether supplying replenishment or new styles, moving goods quickly through the supply chain creates a rapid cash-flow that compensates for the extra cost of transparent and responsive local supply. For major UK retailers, the facility to call stock quickly from an inventory pool held by suppliers is a significant cost saving, and creates cash-flow liquidity, while short lead-time in mass markets is seen as a way to reduce costly inventory buffering (Stratton et al., 2008), rather than a mechanism for improving responsiveness to changes in fashion or consumer demand *per se*. Of significance here is the quality of information and forecasting within the supply chain. Guercini (2012) identified an information gap with manufacturers failing to anticipate retail demand in order to reduce their exposure to inventory risk, and this is evident for the brand suppliers who err on the side of caution, delaying upstream orders until wholesale demand is confirmed for less predictable items, and making for stock of basic items only. The former scenario forces retail customers to place orders months in advance which in the VF case (Pisano and Adams, 2009) proved to be a cause for customer discontent. In this research, however, there is evidence that retail own brand suppliers are also compensating for inferior retail information in order to take advantage of opportunities to sell more basic, predictable items, claiming that it is retailers who fail to effectively predict demand. However, the established system is in flux, and although R2 identifies sharing of retail sales data upstream and supplier managed inventory as important, R1 respondents describe how two major UK retailers are changing their ordering processes from call-off in favour of direct delivery to their own consolidated distribution centres, while others continue to develop supplier-held inventory. Speed of replenishment will take on new significance as this reconfiguration unfolds and major retailers lose the capability to call imported stock from local supplier warehouses as-and-when needed.

Quality is an exception and a priority where the focus is, in supply chains focused on performance, and differentiated apparel, shifting away from cost as an order winner. There is very little concern from respondents regarding quality standardisation as a means of reducing uncertainty and cost, indicating that this is an order qualifier in some markets, after Hill (2005). The shift in quality focus is perceived to be towards product quality, rather than speed, as a differentiator of fashion items, and R2 forecasts this objective to gain almost equal importance as adherence to specification, especially

in markets where performance needs, lifecycle costs and durability are a reflection of recession-induced value seeking. One outcome is the trade-off already observed between quality, cost and speed (Oxborrow, 2011a; Christopher et al., 2011), which remains unresolved while the upstream complexity of materials selection, testing and product prototyping remain as high priority, since even current standards are described as involving too much testing, lacking in confidence and trust and also an area where suppliers and buyers risk duplication of effort and difficulty sharing risk and reward (Wouters et al., 2009; Faisal et al., 2006). These are additional obstacles where NPD forms part of a responsiveness strategy with smaller, more frequent new product cycles. Quality is not the only trade-off with lead-time and responsiveness, which are seen by Beach et al. (2000) to also compromise reliability, with more complex NPD demands potentially leading to delays and penalties, as evidenced by the lingerie and menswear supplier, which, according to Beach et al. (2000) is a disincentive to implementing responsiveness in the supply chain.

However, in practice the limited adoption of responsive apparel supply is part of a strategic decision to focus on predictable, efficient supply for the majority of lines, and fast fashion *per se* is not seen as the main priority in most markets. As one large scale supplier explained, the process and product adaptations necessary to supply fast fashion are only viable for very large production runs. This defeats the object of the smaller batch sizes that support greater product complexity, except for the very largest retailers. The finding is consistent with Jacobs and Swink (2011) who suggest that fast fashion is not viable when the long term benefits remain unproven, and Langenberg et al., 2012, who question the cost-benefit equation of supply chain realignment. According to most R1 respondents, the cost-benefit of enhanced design (Cachon and Swinney, 2011), more responsive supply configurations (Sharifi et al., 2006) or innovations to improve responsiveness and flexibility (Khan et al., 2012) are not fully recognised, and most retailers manage only a fraction of their supply chain activity in a wholly responsive way. Birtwistle et al. (2003) suggest that such lack of progress in adopting quick response strategies is explained by relationship constraints that have not developed in line with investments. This is not to say that responsiveness and fast response more generally are not valued. These are seen as a means to maintain freshness in core lines, improve cash-flow and, as put very strongly by the sourcing consultant, to reduce inventory costs. It is possible that these advantages are also more easily compatible with the emerging objective of standardisation of the supply chain across distribution channels, and the investment and cost advantages of a relatively narrow supply chain portfolio, as identified by Langenberg et al. (2012) with limited evidence of the customisation and targeting proposed by Lowson (2003b) and Godsell et al. (2011).

In summary it can be concluded that the strategies of retailers and suppliers in the UK apparel supply chain have gradually changed over the last five to ten years - in ways probably unimaginable by Fisher in 1997. Multi-channel retailing in particular continues to escalate quickly, while differentiation of product and market and standardisation of process are set to challenge future supply chain competitiveness, pointing to an emerging need to align supply chain with distribution channel as well as product. However, the research suggests that supply chain strategy and competitive priorities have not fully developed in line with retail strategy as proposed by Miles et al. (1978) and Ketchen and Giunipero (2004). The focus on cost remains dominant and seems consistent with the emerging challenges of dealing with economic and social pressures, but at odds with distribution and supply complexity, and uncertainty in products and markets. It can be argued that this constitutes no change, as the cost-focus already reflected the market driven move towards global sourcing throughout the 1980s and 1990s, when cost emerged as a potential order loser. The

persistence of this strategic path and reluctance to adapt equally to other priorities, is consistent with the constraints in making changes to supply chain architecture that were identified by Melnyk et al. (2009) and Seifert and Langenberg (2011) and the lock-in suggested by Scheffer (2012). Even though failure to invest now could compromise competitiveness in the future (Seifert and Langenberg, 2011), there is a lack of evident market driving supply chain strategy beyond the influential cases of Primark and Zara, and mimicry is constrained by a number of strategic limitations: retailers are reluctant to recognise the importance of suppliers' contribution and risk and reward are unevenly shared; exchange of knowledge and information is limited, though potentially improved in vertically integrated systems; addressing distribution flexibility is seen as a short-term stop-gap until standardisation across distribution channels can be achieved; and the NPD process and decision making stages inhibit lead-time reduction but improvement requires costly and comprehensive realignment. As a result there are unresolved trade-offs between quality, responsiveness, lead-time and cost, which have a differential affect according to market drivers, and some potential supply chain improvements, such as fast fashion, are therefore only partially adopted. Others, such as faster product turns and inventory reduction are adopted for alternative reasons, including reducing inventory costs and risk. The supply chain implications of the potential strategic mismatch are discussed below.

RQ2 How have these changes impacted upon the design of [and design for] responsive apparel supply chains for UK apparel retailers?

Sharifi et al. (2006) developed a complex model for analysing the drivers and constructs of design of and design for the supply chain in response to external and strategic factors, and to identify what the supply chain could do rapidly and what could be done without cost constraints. The main dimensions of this model have been consolidated into the conceptual framework, shown in Figure 2.6, which has been used as a foundation for this study and which forms the basis for discussion of the impact of strategic developments on the design of and design for the responsive apparel supply chain, taking into account the strategic drivers and associated order qualifiers, winners and losers encompassing Hill's (1993) key performance objectives as well as service level and innovativeness (Hill, 2005). External drivers such as the economic environment, sustainability and transparency and agglomeration factors, such as economies of scale, relationships, capability and knowledge sharing are also considered. However, in this discussion the main focus is on the aspects that affect Christopher et al.'s (2006) concept of lead-time as a decisive factor in supply chain success, mapped against influences of cost and differentiation on supply chain operation, inventory reduction, responsiveness, new product development, fast fashion and their collective relationship to internal capability and outsourcing.

The discussion relating to strategic priorities suggests that a cost-value or cost-plus-one approach to order winners prevails, where cost is a decisive factor in all but the most defensive, brand-orientated strategies in which quality and availability dominate, consistent with Brun and Castelli (2008). The effect of cost as a dominant competitive priority has led to a gradual shift of supply chain configuration towards overseas production, although it is clear from the respondents that in two prominent cases this is internally owned by UK based first tier suppliers, rather than outsourced. On discussion it is evident that global sourcing is most prominent where cost is the main driver and has, through time, led to production being serially relocated, even where factories are wholly or partially owned by UK suppliers, because of emerging opportunities to further reduce labour costs, latterly to

countries with poor infrastructure such as Bangladesh, Cambodia and potentially Myanmar. In line with Fisher (1997) and Faisal et al. (2006) this is characteristic of supply chains where customer sensitivity is stabilised and supply chain risk is low. Relating to Christopher et al.'s (2006) model, Hines' (2002) Iceberg and the conceptual framework, this strategy increases lead-time, necessitating a plan and execute strategy suitable only for predictable demand, but Christopher et al. (2011) suggest that this strategy is in itself still a source of supply chain risk, one inadequately considered by businesses in their search for lower costs. The research suggests that this is the result of a heuristic approach to formulating supply chain strategy widely adopted by retailers. The increase in supply complexity and lead-time, with reduced reliability and capacity to respond to even slight changes in demand (such as changing double packs to single vests) exemplifies this, and discussions with respondents suggest that shifting location indicates cost saving rather than efficiency, is not seen as supply chain reconfiguration, rather just "*what we do*" and is in itself a costly, slow and potentially high risk strategy that inhibits, rather than supports, responsiveness.

This lack of responsiveness is compensated for further downstream in some supply chains where call-off from supplier-held inventory, in line with the Christopher et al.'s (2006) model of continuous replenishment, is utilised to respond to short term demand fluctuations and to minimise retailer inventory risk. In contrast to the models of base-surge or sequential combinations of lean and agile supply proposed by Christopher et al. (2006), this practice shows the use of lean (plan and execute) combined with lean (continuous replenishment) at upstream and distribution stages of the same supply chain respectively, consistent with the upstream-downstream differentiation of approach to brand and own brand supply proposed by Brun and Castelli (2008). Where the dominant supply chain configuration is one aimed at standardised low risk, low variety basics, this might be considered an effective approach, but references by the large suppliers to redundant stock, or by the multi-brand retailer to heightened clearance activity, suggest that this level of volume or response flexibility to fluctuating demand, in contrast to the Christopher et al. (2006) model, masks the level of unpredictability even in these basic items - the impact of which has been pushed upstream. While all of the large suppliers operate a call-off system for some of their customers, the brand retailer and small sourcing company practice batch delivery. Other exceptions include the small factory and small retailer, the former of which provides a responsive, small batch made-to-order service to large retailers (mainly online) who need to satisfy fast fashion demand, and hence representing part of the differentiated fast fashion supply chain of the conceptual framework. However, the small retailer is subject to a dichotomy of having to either order larger-than-needed minimum quantities to secure overseas supply – thus incurring unwanted inventory downstream – or reduce garment complexity to match the limited capability of local factories. The trade-off reflects the lack of power and opportunity for economies of scale among smaller retailers and exemplifies the firm's inability to either differentiate effectively or operate efficiently, and explains its acceptance of non-compliant, low cost supply, consistent with the assertion of Reichhart and Holweg (2007) who suggest that how responsiveness is achieved is less important than the fact that it exists.

Furthermore, retailers' attempts to streamline the supply chain have resulted in individual suppliers gaining more responsibility for a narrower range of product categories. Selection of suppliers by retailers is made on a category basis for specific items, from, in the majority of cases, a relatively small number of favoured suppliers, who in turn allocate production to a few pre-selected outsourced or owned facilities, depending on cost, time and capacity, representing Tachizawa and Thomsen's (2007) concept of improved supplier responsiveness which helps to address delivery and

mix uncertainty. Routine new supplier selection for specific products is confined to niche products or to fabric and material supplies, although in the case of one large supplier, a major exercise to relocate production had resulted in a new supplier taking on sizeable business volume in a short period of time – reflecting the consolidation upstream. This narrow supply base reduces opportunities for response flexibility (switching between products) beyond the broad product categories of each supplier (Cheng et al., 1997). That said, each of the larger suppliers organises supply differently for different divisions of their own business – own brand and different retailers, in line with Godsell et al. (2011), but this is notably practiced where the scale of each is sufficiently large to warrant additional investment and the pressure of brand equity a compelling driver (Brun and Castelli, 2008). Further exceptions to this include the multi-brand retailer and hosiery brand, the former of which uses a major intermediary to access a wide range of suppliers, while the latter uses local networks in Italy to choose from a myriad of small factories, each with product specific production technology. A similar contrast is made by the clothing supplier, who differentiated between his own upstream supply base and that of his retail customer, whose overseas buying office dealt with several times more suppliers than he felt manageable. This strategy provides more flexibility to find suppliers of a wide range of products and batch size options and exemplifies Tachizawa and Thomsen's (2007) concept of supplier switching to resolve volume or mix uncertainty.

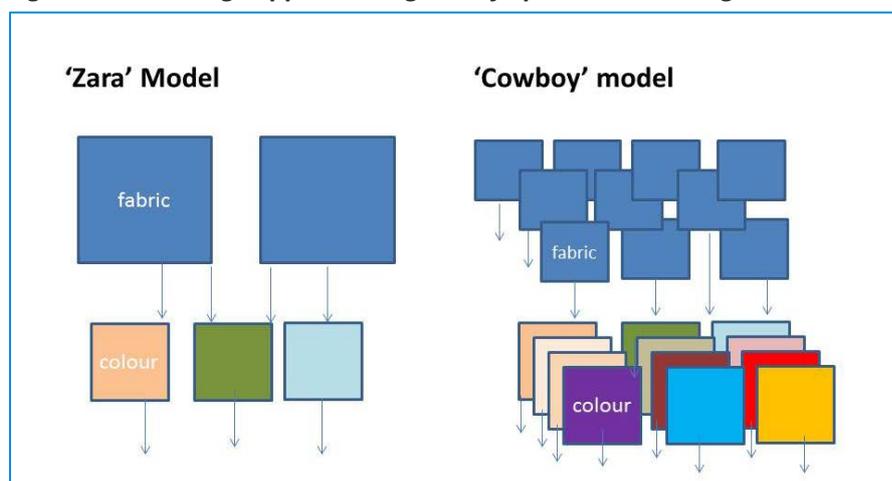
One consequence of delisting suppliers, as penalty for poor performance or because of lack of product range flexibility, is the need to source alternatives and this is identified as a resource and time intensive process. Examples include suppliers seeking fabrics that are more cost effective but equally aesthetic as those specified by buyers, or the company building its own factory in India to replace an existing unreliable supplier in Bangladesh. This is contrasted by the small factory owner who has enough confidence in order winners of speed and flexibility to gamble by turning down unrealistic customer requests, knowing that alternative capacity is hard to find. Generally, however, the responses illustrate a relatively stable supply chain, with limited breadth in the supply base, and penalties imposed at order level, rather than at relationship level, indicating a preference against flexible sourcing to address the volume and mix uncertainty of the fast fashion quadrant.

Other competitive priorities have affected the configuration and design of the supply chain in differing ways. Discussion of innovation and new product development proved to be a hot topic among respondents. The NPD process is seen as a constraint on responsiveness and flexibility, consistent with the lack of alignment observed by Godsell et al. (2006). Responsiveness to changes in demand, across the board or for '*hero pieces*' (Barnes and Lea-Greenwood, 2010: 768) has become an accepted challenge in the apparel supply chain, whether through rapid replenishment from stock or genuine ability to introduce new styles quickly. While the latter aspect is projected to become more important, recognition of the constraints on responsiveness throughout the supply chain, in line with Klibi et al. (2009), from upstream design and fabric selection to downstream marketing, have increased. Although the care and attention paid to range and product development is a major driver of supply chain performance, extending well beyond the process itself and consistent with maintaining brand values (Pisano and Adams, 2009; Brun and Castelli, 2008; Abecassis-Moedas, 2006) the small factory and sourcing agent stopped offering any product design service because of repeated iterations, time and cost, and poor returns. Meanwhile the large suppliers claim that their product knowledge, technical innovation and sourcing capability provide a decisive point of differentiation over competitors. It also, however, proves to be a major point of contention within relationships, as suppliers evidently lack confidence in the ability of their

customers to make quick decisions, which adds time pressure upstream. According to Thomas et al. (2011), individual causes of time pressure would see suppliers reducing or terminating their engagement with retailers, but the research suggests that delays are regarded as an industry norm and suppliers demonstrate a will to work with buyers to plan and solve the problem. Consistent with Thomas et al.'s industry norm (2011), the dominant practice is of frustrated suppliers responding to delays with opportunism, exemplified by the menswear supplier “taking a punt” by oversupplying the call-off system to generate additional sales volume, and the small factory refusing orders with very short turnaround times, in the anticipation that more time will be offered.

For the large contract manufacturers, product innovation is a collaborative practice that sees suppliers designing specific products to a retail range planning brief in a competitive process, while also developing new product concepts under their own direction. Achieving the best design is no indication of success, however, as the R2 findings show that re-engineering designs to meet cost thresholds is common practice, while interviews show that orders of some designs are awarded to competitor suppliers as a reward for reliability. R2 findings also show that there remains a focus on materials and product testing to ensure quality standards are met, but that the cost of this is disproportionate to the falling batch size of orders placed – with a high unit cost resulting from smaller batches in all markets, but especially for the small retailer and factory who’s typical order sizes are very small. This is compounded in markets, for example lingerie or high value items, where materials make a significant contribution to product design and one on which buyers choose not to compromise, as illustrated graphically by the clothing supplier who contrasted his customer-imposed “cowboy” process with that of Zara, as shown in Figure 5.1. The findings are therefore consistent with Jacobs and Swink (2011) who suggest that product complexity eats into efficiency and profits, and Beach et al. (2000) who recognise that the demands of small batches and increased complexity are a disincentive to be flexible. Overall, the complexity of the NPD process confirms Cheng et al.'s (1997) separation of response time into decision making and implementation time which can be likened to Khan et al.'s (2012) separation of product development lead-time and production/ distribution time. Since Christopher et al.'s original (2006) model focused on replenishment time, this distinction is not clear in the lead-time variable, but the research shows that this aspect cannot be overlooked and informs the contrast between plan-and-execute and inventory-reduction strategies to some extent, but most specifically the divergence in lead-time between brand alignment and fast fashion strategies.

Figure 5.1 Clothing supplier’s diagram of upstream sourcing architectures



From reading the literature, one might assume that process innovation is dominated by the adoption of fast fashion, but using Cachon and Swinney's (2011) concept of combined quick response (QR) and enhanced design (ED), this is evidently not the case. It is apparent that the components of quick response: cooperative planning, IT to facilitate pull and efficiency, Just-in-Time (JIT), short logistics and production lead-times, buffering with capacity and inventory, and postponement have been adopted inconsistently. In some cases, in line with Khan et al.'s Fashion Co. (2012), they appear to be used to compensate for one another, so JIT delivery and faster production lead-times are used to make up for the longer logistics pipeline associated with off-shoring to poor infrastructure sources – which does not fit precisely the fast fashion model. While suppliers generally appear to be keen to innovate in order to speed up design, this is observed to be a less popular practice with retailers – indeed the findings of R1 contradict the suggestion of Hameri and Hintsa (2009) and Khan et al. (2012) that modularisation and postponement will prevail, although R2 suggests these are likely to advance in the coming years.

Furthermore, the components of efficient design are poorly applied. While there has been a move towards smaller batches and rapid trend interpretation, the process of designing-out unnecessary costs takes time, and new product development, in some supply chains, remains slow. So, whereas Barnes and Lee-Greenwood (2010) assert that Fast Fashion has been widely adopted, and Birtwistle et al. (2003) suggest that QR is more widely utilised than ED, there are signs in this research that neither strategy is consistently employed. One solution to the long term disincentive to innovate is to reduce the overhead costs of Cachon and Swinney's (2011) concept of enhanced design. However, strategies such as buffering with a portfolio of designs and pre-tested fabrics potentially increase ED overheads, which is one reason why outsourcing aspects of ED to small suppliers (Oxborrow, 2011a) is a potentially winning retail strategy, and according to R2, one set to grow in some markets, though one which pushes cost and risk upstream. More widespread adoption of ED is limited because of the requirement to redesign processes at organisational level, as in the case of Fashion Co. (Khan et al., 2012), and therefore marginally viable for a limited proportion of sales or 'hero pieces' (Barnes and Lee-Greenwood, 2010: 768). Indeed, the observed increase in strategic importance of gaining UK market share through new distribution channels and exploiting new markets internationally may reduce the overall priority of quick response and fast fashion among UK retailers, in favour of standardised supply practices that can be universally applied to grow overall market value.

So, while Langenberg et al. (2012) claim that fashion fad items are hard to forecast, current practice confirms Seifert and Langenberg's (2011) claim that where cost prevails in supply chains, 'design for the supply chain' (Sharifi et al., 2006: 1085) within its existing architecture is the dominant strategy, and innovation leaders alone can invest in redesign of the entire supply chain or develop a multiple supply chain portfolio. R2 respondents favour greater process innovation, but interview data, past experience and current strategy calls this into question unless multiple objectives can be supported at little or no additional cost. Strategic priorities are played out differentially upstream and downstream. Cost is reflected by retailers as low unit price, which in turn provides attractive pricing for consumers but also reduces inventory risk. For suppliers, cost is reflected as efficiency savings that enable maximum benefit from the supply chain in terms of speed and flexibility, availability and buffering constraints, or new technology. It can be argued that retail control constrains suppliers' ability to enhance order winning strategies or employ market driving strategic change.

In spite of claims by Scheffer (2012) and Lawson (2002) that outsourcing is inherent in the apparel industry, vertical integration is evidently practiced upstream in supply chains where speed, service level, compliance to stringent retail standards and transparency are important. A further issue to consider for some suppliers is Intellectual Property protection in their own-brand supply chains, although this is less evident across retail/ wholesale brands. While those suppliers who practice vertical integration also use parallel outsourced supply chains for basic items and lower cost markets, those that have moved away from vertical integration suggest that using owned capacity is too limiting in terms of mix flexibility (hosiery, US brand). In contrast, large scale suppliers claim that owning upstream sewing capacity is the only way to retain profits and R2 respondents suggest that use of own facilities is likely to remain stable, while there is predicted to be increased investment into downstream processes, notably distribution, and some further investment upstream. Suppliers have clearly considered, but lack any consensus on, the potential for investing in fabric supply close to needle point and/or more directly under their own control. Vertical integration upstream has little or no impact on lead-time, although the Zara and Fashion Co. cases (van der Heydon, 2004; Khan et al., 2012) suggest otherwise where there is integration downstream, particularly where decision making response is concerned (Cheng et al., 1997). Vertical integration is evidently used to support the differentiation strategy, supporting reliability and replacing some of the horizontal aspects of agglomeration, such as knowledge sharing and access to market data (Carbonara et al., 2002).

Subcontracting is a process largely overlooked in literature but common practice in the apparel sector as an alternative to outsourcing, especially for retail own brand production, as a means of enabling brands to retain control of materials and design, while accessing flexible production capacity, providing nimbleness to market change (Schmenner and Tatikonda, 2005). Oxborrow (2011a) identified the use of upstream networks to provide nimbleness by financing reactive capacity, while the US supplier spoke of using rapid payment agreements to achieve subcontractor loyalty. While use of reactive capacity supports responsiveness, Abernathy et al. (1999) and Ismail and Sharifi (2006) claim that inventory is favoured over spare capacity, and there is evidence of this in high-cost economies such as the UK, where spare capacity is limited and factories respond by using overtime and in some cases non-compliant working practices. There is certainly little evidence of subcontractors such as the small UK facility delivering the high level of service identified by Doeringer and Crean (2005) to secure market share. Rather this respondent uses capability and capacity as a point of negotiation, in contrast to the experience of the small retailer, whose style options are limited by the low capability of their lower cost UK suppliers.

Supplier assessment is focused on the capability associated with external and agglomeration conditions of different regional concentrations, in line with Rigby and Essletzbichler (1997). This results in first tier suppliers searching for new sources of supply in lower cost locations and relocating rather than redesigning the supply chain to meet increasing cost pressures, in spite of other competitive priorities. According to some respondents (small retailer, hosiery) the concept of "*design for the supply chain*" (Sharifi et al., 2006: 1095) means that the capability of remaining UK production facilities is so constrained by the lack of skills and limited capacity to invest in new technology that the likelihood of their selection is equal to those in emerging economies. UK suppliers offer little added-value other than faster lead-times and smaller batches but with the disadvantage of higher cost, which is only appropriate when associated with differentiation. Future predictions highlight the advantages of greater proximity to market, though this rarely suggests a return to UK supply. Retailers have addressed the issue of proximity by establishing buying offices

close to central sources of supply, and this is set to continue. However, contra to the suggestions of Christopher et al. (2006) it is first tier suppliers rather than retailers who are engaged in supplier selection for upstream processes, while knowledge of the product and market, in the remnants of what Aage and Belussi (2008:487) termed the “*district laboratory*”, are evident in the sustained relationships between some retailers and their UK based first tier suppliers.

Transparency and sustainability are areas forecast to increase rapidly in importance by R2 respondents. Looking at R1 findings, however, there are interesting dichotomies in transparency. For branded, performance wear suppliers of differentiated products and large suppliers of major cost-focused retailers, transparency and compliance are very important and dictate practice such as choice of suppliers and vertical integration. In contrast the small retailer admits that compliance is sacrificed for speed and cost, in direct contrast to the emerging US experience where local regulation is improving compliance in flexible sourcing for the mid-market. Meanwhile the hosiery supplier illustrates how the information supply chain has become longer than the product supply chain, since minor suppliers to UK retailers are forced to deal with regional overseas buying offices – liaising with an ‘European’ buying office in Turkey about supply to UK from Italy. Although established to create closer proximity to clusters of suppliers, concentrating local interests in this way partially undermines the benefit of relocating supply for closer proximity, as emphasised by Christopher et al. (2011), and potentially compromises transparency, thus creating a contrast between the fast fashion and brand alignment categories of the differentiated supply chain within the conceptual framework.

In summary, the strategic focus on cost leads to global sourcing which ultimately has compromised responsiveness in the supply chain, in line with warnings of Christopher et al., 2011. Serial relocation of sourcing is a feature of the supply chain, and the level of uncertainty is greater than Fisher (1997) predicted even for basic apparel. The supply chain response varies upstream and downstream: flexible distribution is based on JIT call-off, but progress is towards centralised distribution; meanwhile unresponsive sourcing in some supply chains is matched by flexible sourcing in small batch production. Sourcing at each stage in the supply chain is from a relatively narrow and stable supply base, although there is some use of intermediaries and networks to provide range flexibility. Local sourcing provides short lead-times but constrains product complexity, and there is some use of overseas sourcing offices to provide proximity. While subcontracting is used for reactive capacity (Oxborrow, 2011a; Raman, 2000), there are issues of compliance and transparency, but the predominant buffering strategy is inventory, for both low cost apparel and to protect brand equity and availability, though this is often pushed upstream (Abernathy et al., 2000).

NPD processes are inherently slow, but retailers are resistant to reducing the NPD lead-time and adopting technologies such as modularisation and postponement, as predicted by Hameri and Hintsa (2009) and Khan et al. (2012). The greatest opportunity for improvement is in large scale production, but the direction of current trend is greater product complexity in smaller, more frequent batches, compromising their viability (Beach et al., 2000). In spite of this, there is limited evidence of growth in fast fashion, encompassing both QR and ED, as described by Cachon and Swinney (2011). For most retailers, fast fashion is a partial supply chain solution, which limits capacity for the comprehensive restructuring necessary to implement comprehensive fast fashion, furthering work by Khan et al. (2012) and Langenberg et al. (2012). Overall, design for the existing supply chain prevails (Sharifi et al., 2006; Seifert and Langenberg, 2011), and there is a lack of supply

chain redesign, market leading innovation and little tangible move towards Langenberg et al.'s (2012) portfolio supply chain approach, except in niche markets.

RQ3 How will buyers and suppliers in the UK apparel retail supply chain address the challenge of responsiveness in the supply chain of the future?

The scenario forecasts identified by respondent clusters for the apparel supply chain of 5 years' from now have contributed to the development of three different supply chain configurations emerging to address the challenge of responsiveness. Indeed, responsiveness, *per se*, is of varying degrees of importance across the three scenarios, a finding which is, though not surprising, influential in determining the design and configuration of future apparel supply chains and the role of buyers and suppliers in shaping the same.

In the Contemporary Classic supply chain configuration, the main priority is a continued drive towards cost efficiency, consistent with McKinsey and Co.'s (2012:13) '*herd-like reflex*' but constrained on the one hand by adaptations to meet the changing needs of the increasingly diverse distribution channel portfolio of many retailers and brands, and on the other hand by the need to differentiate product and service offerings by price, style and quality. However, just as Christopher et al. (2006), warns against any narrow focus on cost saving, the drive towards greater efficiency includes an increasing imperative to reduce inventory and markdown activity. Core to achieving this objective is greater responsiveness to fashion changes, but rather than *ex-post* response to sales, this is manifest as responsiveness to better long range planning and faster implementation of new product development, aided by external designers, adoption of new technologies and the use of pre-tested platform fabrics or modularisation which Hameri and Hintsa (2009) concluded is a means of achieving trade-offs in product complexity and short life cycle. The sportswear respondent in R3 suggested that customer value and service would become more important, but at present the "*feedback loop from consumer back into insight and through development process is not always responsive enough*".

Responsiveness is predicted to be utilised in this future supply chain as a way to reduce the risk of holding less inventory, ensuring that NPD is effective, aligned to market needs and can support product differentiation, and that this aspect of lead-time can be reduced to compensate for global supply. This is consistent with Reichhart and Holweg's (2007) definition of responsiveness based on *pushing* new products through the supply chain while minimising inventory obsolescence of existing lines. Sourcing is not forecast to change markedly to improve this push responsiveness, but rather to access better skills and technology to embrace the changes identified, albeit at neutral cost. In spite of the rhetoric, two R3 respondents predict that this will favour China, because of a lack of productivity, infrastructure and skills elsewhere. Supplier knowledge and expertise in sourcing helps to make the supply chain harder to replicate (Ketchen and Giunipero, 2004).

While meeting the buyers' imperative to reduce inventory and facilitating the efficiency imperative, it is suppliers who often need to implement upstream responsiveness, as proposed by Guercini (2012) in order to avoid inventory being pushed upstream, a major concern of Abernathy et al. (2000). This supply chain configuration does incorporate improved information exchange between buyers and suppliers, overcoming the information gap identified by Guercini (2012). However, some respondents suggest that retailers will expect more use of just-in-time delivery and small batch production, while reducing the role of the intermediary in the supply chain, consistent with Choi and

Valikangas (2001) and Abecassis-Moedas [2006], although surprisingly placing less emphasis on developing long term relationships. These developments imply a greater burden on suppliers as retailers continue to exercise power in buyer -supplier relationships and reflect Handfield and Bechtel's (2002) lack of retail respect for supplier efforts, consequently compromising flexibility and responsiveness. Further upstream, however, the R3 sportswear respondent suggested that relationship specific assets would continue to tie the brand to its long term suppliers. In turn, interviewees suggest that the drive towards new technology and refining the NPD process is from suppliers, and is a major cause of contention in the current supply chain, since buyers appear reluctant to accept limited choice and suppliers face losing some of the opportunism created by delays attributed to retailers, as explained by Thomas et al. (2011).

From the retailer' perspective, one of the most pressing aspects of achieving responsiveness is in distribution, and especially for online retail channels, aided by the use of centralised distribution centres. However, one important aspect of change over time is the retailers' move towards finding ways to standardise across multi-channels of distribution. It should, meanwhile, be noted that online retailing is an important contributor to improved forecasting and monitoring of early demand. Continued internationalisation of retailing is also important and provides an additional challenge to responsiveness. However, in R3 the sourcing consultant stresses that margins are low in most international markets and that multi-channel distribution has yet to demonstrate significant cost savings.

Exceptions within the cluster include the major retailer in the process of streamlining distribution centres which reduces just-in-time delivery from suppliers in such a way that one supplier suggested that a major rival "[retailer Y] *would laugh!*" The move potentially compromises suppliers' ability to exploit their capability to be responsive and confirms the retailer's drive towards efficiency, but contrasts the more widely held view that supplier management of inventory and call-off will increase. This is potentially an extension of the views of Selldin and Ollhager (2007) who concluded that production and communication technology advances can enable companies to operate beyond the frontier in both efficiency and responsiveness, but without benefit to their overall performance. The addition of logistics and distribution advances configured into this supply chain provides potential for future research. Another exception is represented by the two performance brands which are looking for efficiencies in the NPD process, but these are to incorporate design for effective manufacture of high performance products and an objective to increase batch size, accompanied by postponed customisation where feasible.

In the second supply chain configuration , Proximity Fast Fashion, responsiveness to fashion changes is higher in priority, with a focus on delivery flexibility and introducing new styles quickly to satisfy what one respondent described as the "*I want it now*" culture. This is more consistent with Van Hoek's (2000) definition of responsiveness which entails reacting to end customer orders rather than anticipating demand through speed and reliability of delivery. Implementation of these strategies is forecast to include greater use of closer proximity suppliers, though not specifically local supply, unless this provides access to offshore sourcing, and the continued introduction of buying offices closer to supplier locations. In order to facilitate such responsiveness, respondents forecast greater use of new technology to speed up NPD but, unlike the Contemporary Classic supply chain, greater internal control of the NPD function, with retailers internalising this role, according to Abecassis-Moedas (2006) to take advantage of their superior market knowledge, or to Choi and Linton (2011),

to retain information transparency, upstream ethics, environmental management and responsiveness. There will also be reduced re-engineering of products and testing of components, but with increased transparency of the supply chain process. This supply chain configuration comes closest to Ketchen and Giunipero's (2004) concept of '*strategic mimicry*' of the Zara model, described by Dutta (2002) and Ferdows et al. (2004).

From the suppliers' perspective implementing responsiveness is forecast to involve fewer close relationships with more transaction based sourcing and switching on grounds of cost, speed and reliability (Tachizawa and Thomsen, 2007). While supplier switching can be equated to the capacity buffer responsiveness proposed by Stratton et al. (2008), spare capacity is considered wasteful and not cost effective in the apparel sector, so in this scenario, a broader supplier base provides responsiveness. Those suppliers that remain involved in the proximity supply chain can expect to be asked to provide more additional services, as identified by Doeringer and Crean (2005), and to invest in close proximity capacity and skills, but with longer payment terms, greater markdown contributions and reduced loyalty. Any UK investment is foreseen to come from overseas, in a similar manner to that seen in the automotive industry (BBC, 2012b). The overall impression, however, is of continued retail control of the supply chain, in order to speed up the critical path and facilitate short-term sourcing choices, though the sourcing expert in R3 suggested that retailers will have to work around growing political uncertainty. To reduce the impact of complexity upstream, respondents also forecast greater standardisation downstream, with common approaches adopted across distribution channels and centralisation of distribution centres. So, just as Cachon and Swinney (2011) suggest that ED cannot easily be incorporated into existing SC architecture, and Langenberg et al. (2012) question the cost-benefit trade-off of wholesale realignment, businesses in this supply chain typology appear to be making partial decisions about redesign of the supply chain architecture. Meanwhile, the drive towards transparency, increased pressure and limited incentives for suppliers, and the unproven benefits of fast fashion (Jacobs and Swink, 2011), mean that in this scenario the long term sustainability of the supply chain is questionable. The sportswear supplier and R3 respondent suggested that another opportunity for the Proximity Fast Fashion chain is in the growth of more customised small batch supply.

In supply chain configuration 3, the potential return to local manufacture and traditional processes to support responsiveness and service level (Brun and Castelli, 2008) gives the Updated-Retro Responsiveness cluster its identity. The scenario sees brand equity as a major driver, both in terms of providing fast response to fashion events, differentiated product and fulfilling the differing demands of multiple and divergent distribution channels. Unlike in other configurations, there is greater attention to replenishment responsiveness, rather than inventory reduction. In this scenario there is less reference to standardisation across channels, but rather responsiveness to their differing needs, be that through speed, quality, legacy associations of sourcing decisions, such as 'Made in UK', or distribution flexibility, consistent with Godsell et al., 2011. This in turn creates a lack of consensus within the cluster and inconsistency in the emerging supply chain configuration. As a result, while upstream sourcing decisions range from local or close proximity to establishing buying offices close to suppliers, there is a general consensus that suppliers will take on greater responsibility for enhanced product design, upstream testing to guarantee component quality and, most notably, distribution direct to online consumers, whether direct-to-consumer sales or on behalf of customers. This realignment, although apparently modest in scale, sees some aspects of agency among niche suppliers (Ketchen and Giunipero, 2004) and buyers, in turn, are associated

with retail brand proliferation, reflecting the emergence of new brands not wed to past practices as suggested by Scheffer, 2012 and confirmed by the brand retailer. The respective role of buyers and suppliers therefore is in contrast to supply chain configuration 2 in particular and this does appear to contribute to greater responsiveness.

Consistent with the priority of responsiveness there is a strong focus on lead-time reduction, but also a surprising but lingering focus on cost generally, since re-engineering products for price gains in importance more so than in other scenarios, underpinning the suggestion that cost is important in all supply chains. So, while the differentiated niche approach of the Updated Retro supply chain creates domestic and international market opportunities, its small scale also creates a major constraint, consistent with Jacobs and Swink (2011) who suggested that supplying short lifecycle products for differentiated markets eats into profits. In this scenario finance for investment, materials and production remain hard to obtain, access to some sources, notably in China, proves stubbornly difficult and it is hard to achieve any economies of scale while small batches, frequent style changes or design for functionality exacerbate complexity and uncertainty. This is especially evident where the cost of testing for smaller batches, speculative holding of fabrics, product re-engineering and investment in skills and technologies are hard for some to implement when buyer loyalty remains low. Similarly, while the dye expert suggests that supply chain configuration emerging from Scenario 3 is best placed to improve environmental sustainability, other respondents suggest that this is too difficult for small supplier. So while this supply chain configuration most closely represents the classic model of Fisher's (1997) responsive supply chain, its viability and scalability are questionable without a change in economic conditions and/ or a return to some of the horizontal benefits akin to those agglomeration factors experienced by clustered small firms (Doeringer and Terkla, 1995; Aage and Belussi, 2008). This contradicts the 20 year trend towards anti-clustering outsourcing behaviour (Holweg et al., 2011) perpetuated within the apparel industry.

More generally, in the supply chain configurations emerging from Scenarios 2 and 3, there is a requirement to invest in UK or close proximity skills and capacity to support responsiveness, which in the current economic climate respondents have identified as a potential obstacle. While this may change in the coming 5 years, this level of investment counters the long term trend within the apparel supply chain, which has seen repeated moves away from European supply to increasingly remote sources in the Far East. However, if the benefits can be proven, consistent with emerging signs from the US, then there may be a resurgence of sourcing from marginal and low wage economies of Eastern and even Southern Europe, or from exporting European regions such as Italy. This may spin off into the UK, as in Scenario 3, in response to fashion changes and the need for brands to reinforce their reputation with availability and protect costs by reducing inventory. In the current climate, however, capability in the UK is a constraint on product differentiation in some apparel markets and speed constrained by limited capacity.

Investment from upstream in the downstream supply chain (and *vice versa*) is a potentially important trend. As exemplified by the case of fast growing Li and Fung (Marian, 2012a), large overseas investors have interests in retail distribution in emerging economies and potentially can help both suppliers and UK retailers to expand into new markets. While one respondent expressed considerable doubt regarding the desirability of expanding "*tired western retail concepts*" into Far Eastern markets in an attempt to standardise across retail channels, partnership and joint venture could facilitate the internationalisation of both UK product and retail concepts and this emerging

phenomenon is worthy of further research. Its relationship to responsiveness is an interesting one, as global expansion appears to be regarded as an opportunity to manage out some complexity, though there is evidence that distribution complexity may become an increasing challenge.

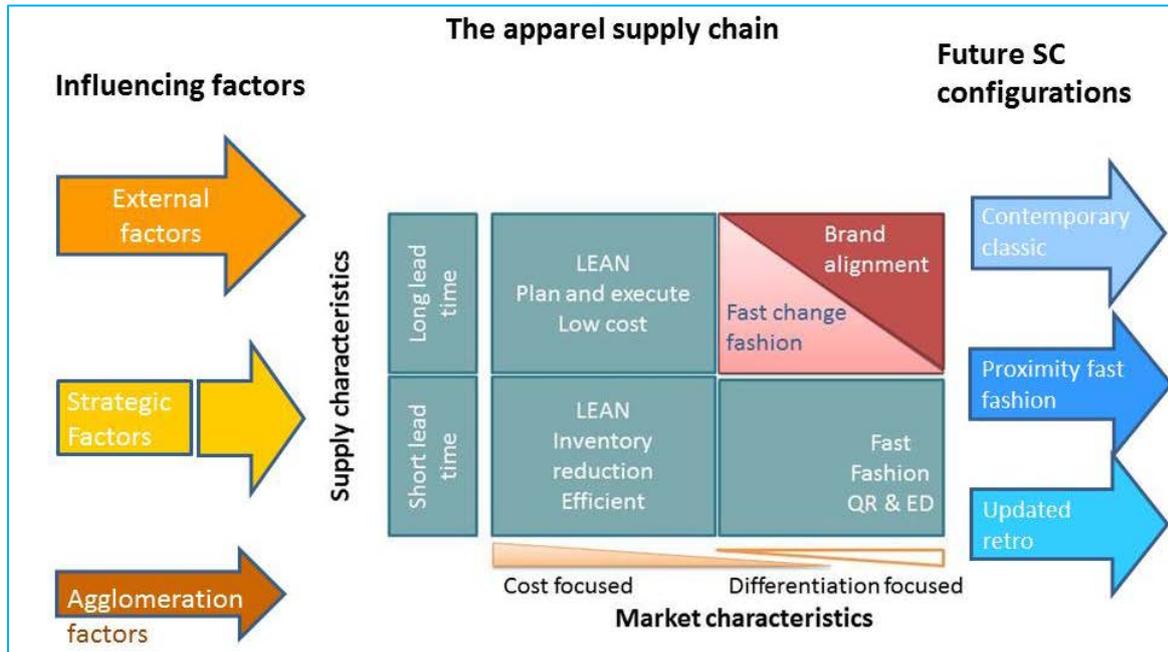
Whatever the strategy, Seifert and Langenberg (2011:562) warn that firms that “*put off ... realignment investments imperil their competitive positions*”, although Melnyk et al. (2009) found that managers considered there to be a number of obstacles to achieving a more strategic approach to supply chain management, such as strategic visibility and alignment, leadership capability, supply chain process, configuration and relationships. None of the projected scenarios and associated supply chain configurations entails a comprehensive supply chain redesign. The focus is on market driven investment and a drive to minimise adaptation costs (Sharifi et al., 2006) since neither savings nor revenue benefits from reconfiguration are guaranteed.

As a strategic imperative, responsiveness in itself declines in relative importance, but remains important in different ways to different supply chains as a means of achieving other objectives - reducing inventory, efficiencies or differentiation and brand equity. What does responsiveness mean? Global sourcing means that flexibility remains important, but not necessarily *ex post* reactive response as in Fisher's (1997) strategy to reduce or eliminate uncertainty by better forecasting and demand management, rather than managing uncertainty with greater responsiveness.

5.2 Revised Conceptual Framework

The discussion of research findings has led to a revised conceptual framework, in which the influencing factors have been amended to reflect the diminished influence of agglomeration factors, the gap between organisational and supply chain strategy and the continued influence of external factors upon the apparel supply chain. The core supply chain aspect of the model is updated to reflect the variables of product proliferation and constant new style ‘*push*’ through the global supply chain without the benefit of full fast fashion and short lead-time, represented by the ‘fast change fashion’ variable. The model also represents the pervasive influence of cost over differentiation in much supply chain activity. Finally, the three predicted supply chain configurations are mapped into the model, shown in Figure 5.2, with links identified between all long lead-time forms of supply and the contemporary classic configuration; fast-change fashion and the proximity fast fashion configuration; and QR and ED based fast fashion with the updated retro configuration.

Figure 5.2 Revised Conceptual framework based on discussion of findings



6 Conclusions

6.1 Response to research and strategic questions

Overall, the research has covered a considerable breadth of material to analyse and evaluate changes in the apparel supply chain, which it is found encompasses differential responses to classic and performance apparel, fashion and fast fashion. In total, some 24 experts from apparel retail, manufacturing and associated services have been consulted, together with an extensive review of literature and the contemporary industry context. Following three rounds of the Delphi process, the strategic and research questions can be answered in this section. A discussion follows that summarises these conclusions, revisits the conceptual framework, and evaluates the potential contribution to academic knowledge, while deriving implications for further research and for business practice, and addressing limitations of the research approach and the project overall.

6.1a How can buyers and suppliers in the volatile UK apparel market address the challenge of supply chain responsiveness?

This strategic question has been answered with reference to three research questions, the first of which asks how strategic priorities have changed in the UK apparel retail supply chain. The most obvious change is the growth of multi-channel retailing and, to a lesser extent, internationalisation. This creates distribution complexity, requiring its own elements of responsiveness. However, the strategic shift in retail is in contrast to the apparent lock-in to the pursuit of cost saving which has driven the apparel supply chain for decades (Lowson, 2003a; Scheffer, 2012), and continues to do so regardless of retail strategy. This highlights a deficiency of alignment between organisational and supply chain strategy, which appears to be long term, rather than transitory as suggested by Lowson (2005). There is, therefore, an unresolved trade-off between cost and other objectives and retailers expect the latter to be improved within their supply chains at little or no cost. Furthermore, suppliers who fail to keep up with changing expectations of cost and reliability run the risk of de-selection, which in turn acts as a disincentive to being responsive, because responsiveness can compromise both cost and reliability objectives (Beach et al., 2000). Indeed, strategic drivers appear to be towards standardisation to reduce disruption caused by the emerging sources of distribution complexity. It is evident that, for some retail supply chains, reducing uncertainty at the distribution stage is more important than anticipated growth in the fast fashion market, contra to prior expectations and the proposed move towards supply chain segmentation (Godsell et al., 2011; Lowson, 2003b). This is not to say that responsiveness is not important. Fast fashion is practiced, though for some retailers as a way to add interest to core lines. Responsiveness of distribution (often from suppliers' warehouses), of the NPD process and in selection of upstream supplies can all help to reduce costs through inventory and risk reduction and these are differentially practiced in supply chains for diverse products and markets.

The second question asked how strategic changes have impacted upon the design of [and design for] responsive apparel supply chains for UK apparel retailers. Consistent with Sharifi et al.'s (2006) model the dominant strategy is to '*design for*' the existing supply chain and this constrains product and process innovation. In some supply chains, there is even evidence that the NPD process controls the whole supply chain process, with the rest of the chain playing catch up and fire-fighting to meet deadlines. Of three supply chain stages, this initial NPD process provides considerable scope for added responsiveness. Seeking design and cost optimisation causes delays, prevarication and

reiteration, contra to van der Heyden's (2001) claim that Zara gets it "*approximately right*" and eliminates creative design. For suppliers streamlining NPD provides a way to speed up overall lead-time, but for retailers reducing NPD time could be a way to compensate for the additional delay and risk of accessing lower cost but unpredictable sources of production and supply – the second stage of the chain. The final stage, distribution, is dynamic and the strategic imperative in most supply chains is for distribution to progress from being a source of growing complexity to an opportunity for standardisation. However, introducing aspects of new supply chain design is not an easy option, for example the NPD process is contentious as own brand retailers see their choices constrained by time-saving processes, and brands see their integrity dependent on design differentiation. In many supply chains, rapid new style development is neither reactive nor responsive, but rather flexible, and is *push* rather than *pull* based. Meanwhile there is a shift away from replenishment to product proliferation. This leads to the conclusion that, in practice, responsiveness loses out in the trade-off with cost on one hand and design integrity on the other.

Given that '*design for*' the supply chain is dominant, existing supply chain design incorporates a relatively narrow and stable supply base, with most changes aimed at cost savings from lower cost locations rather than responsiveness from closer or more flexible suppliers. There is a move for fashion supply chains to generate proximity to support the communications and transparency necessary for responsiveness by creating retail offices close to sources of supply, while some upstream supply chains are vertically integrated to maintain control, communications and protect intellectual property. Within this global supply context, concessions to responsiveness include the use of sourcing intermediaries to access a wider supply base; sourcing of some products from closer locations, supplier selection for skills and technologies that can support product flexibility and process improvement, and a very limited return to UK supply – although this is seriously constrained by poor capability. Knowledge of the upstream supply chain is fiercely guarded by suppliers, to maintain their exclusive knowledge of low cost, reliable and responsive sources of supply. Some suppliers have learnt to take advantage of supplier held inventory to manage their upstream processes in response to their own predictions of demand, which enables them to keep costs low and generate additional sales from speculative inventory. There is little evidence of retailers and suppliers consecutively adopting the QR and ED components of fast fashion identified by Cachon and Swinney (2011), though some niche markets are approached in this way. Other niche brands compensate for their lack of scale by using responsiveness to maintain availability through replenishment, without building costly inventory. Most respondents operate a single supply chain architecture or narrow supply chain portfolio consistent with Langenberg et al. (2012), aligned to brand or own brand offer, rather than buyer behaviour *per se* as suggested by Godsell et al. (2011). Exceptions are those companies that supply both their own brand and contract manufacture, and those who practice some degree of fast fashion.

The final question seeks to establish how buyers and suppliers in the UK apparel retail supply chain will address the challenge of responsiveness in the future. Responses pointed to three possible scenarios, from which emerging supply chain configurations were devised. The first of these is focused on cost efficiencies within the global supply chain, with more rapidly changing styles pushed through the supply chain, while the second is based on a more responsive pull approach to rapid style replacement, but with greater use of close proximity between buyers and suppliers through sourcing location or buying offices close to source. Both supply chain configurations incorporate greater use of new technologies to speed new product development, and concentration of

distribution to standardise downstream processes. However the forecast efficient supply chain increasingly relies on pre-tested, modular materials and external suppliers, while the proximity chain uses less testing and increased retail control of design and processes. Surprisingly, both supply chain configurations are decreasingly dependent on robust buyer-supplier relationships and both are moving towards standardisation across at least some stages of their supply chain, notably distribution. The contrasting final supply chain configuration is based on differential treatment of various distribution channels in support of brand equity and fast fashion and uses close or local, more autonomous supply of small batches to reduce inventory, risk and cost. Cost saving and product performance are still important, but the supply chain is constrained by lack of scale and supplier capability.

So, how can buyers and suppliers in the volatile UK apparel market address the challenge of supply chain responsiveness? Due to the cost objective, it was found that the contemporary classic supply chain is consistent with Reichhart and Holweg's (2007) definition of responsiveness based on *pushing* new products through the supply chain while minimising inventory obsolescence, primarily where global sourcing is an integral part of the supply chain which keeps inventory costs low. In contrast, the proximity fast fashion and updated retro chain (in part) are more consistent with Van Hoek's (2000) definition of responsiveness, which entails reacting to end customer orders with speed and reliability of delivery. The retro chain also supports availability for brands by feeding replenishment systems in small batches rather than high risk bulk orders. Supply chains are, therefore, responsive in different ways and responsiveness means different things in different contexts: push of anticipated demand; reaction to fashion demand; or replenishment of actual demand corresponding to the three proposed supply chain configurations. To accommodate these various types of responsiveness, the future apparel supply chain scenarios lead to differing supply chain architectures, based on aspects such as global or closer proximity sourcing, changes to the NPD process, vertical integration and/ or use of intermediaries. Responsiveness is also not uniform throughout the supply chain, with differences of approach upstream and downstream and there is no supply chain configuration that fully represents the combination of ED and QR (Cachon and Swinney, 2011).

Supply chain relationships are forecast to become less focused on partnership, with transactional sourcing for flexibility, while contractual terms and commitment are set to deteriorate, even though distrust in buyer-supplier relationships inhibits information sharing (Birtwistle et al., 2003). Meanwhile, there is a lingering focus on cost as an important driver in all scenarios, an emerging trend towards standardisation in the supply chain configurations that emerge from the first two and towards sustainability in all. So, it can be concluded that, while there are different approaches to responsiveness, the future trend in all but the niche scenario suggests that the drive towards responsiveness within supply chain configurations has been surpassed in the strategic lifecycle by that to reduce cost and complexity. This is especially evident downstream in the divergent portfolio of multi-channel outlets, and retailers seek to standardise the supply chain across different markets and distribution channels where possible.

6.2 Contribution to knowledge

The project overall contributes significantly to knowledge by taking a holistic approach to supply chain research and particularly supporting understanding of the upstream stages of the supply chain, thereby filling a gap in extant knowledge. This is important, since prior research such as Khan et al.'s

(2012) Fashion Co case, overlooks the importance placed by suppliers on their contribution to NPD, risk and inventory management. Most other recent research into the apparel supply chain also takes a retail perspective and adopts a single case approach (Ferdows and de Meyer, 2004; Christopher et al., 2006; Caro and Gallien, 2007; Khan et al., 2012).

The research also highlights the gap between practice and theory, particularly in the stickiness of the cost focus, the trade-off between responsiveness and cost saving, and the willingness to adopt new NPD processes. It puts into context the media interest in backshoring (Couto et al, 2008; McKeigue 2012) and the attendant associated move towards responsiveness. It is notable that the improvements documented by Kahn et al. (2012) have been achieved through a wholesale restructure of the organisation, not just supply chain redesign; which is too costly for most fashion companies. There is a failure to adopt Fisher's concept of the '*Right Supply Chain*' to reduce marketability costs due to the availability of ultra-low manufacturing costs and failure to compromise on design. It appears that the sourcing risk identified by Christopher et al. (2011) is perceived to be outweighed by cost in most apparel supply chains. Even Brun and Castelli (2008) acknowledge that brand specific order winning criteria, such as availability, fail to outweigh cost in all circumstances. Furthermore, the legacy of the traditional product design practice is that, rather than Sharifi et al.'s (2006) concept of design for the supply chain, some aspects of the supply chain are dictated by the product design process, creating the time-pressure discussed by Thomas (2011). With this in mind, the heightened interest in NPD redesign in future supply chain configurations contradicts the apparent tardiness in adopting new practice.

The conclusions show that supply chain strategy is selectively dynamic, and has a differential impact upstream and downstream in the supply chain. However, in the supply chain architectures of the future the differential approaches to sourcing are relatively static, although sourcing location choices may vary over time. It is distribution strategy that has become dynamic. The emergence of new routes to market has caused complexity of distribution as well as product and market, and there is an emerging need to explore all three when considering supply chain alignment. This represents a significant extension to Fisher's (1997) concept which is not fully addressed elsewhere.

Furthermore, it is clear that for the majority of apparel, the level of unpredictability and complexity is higher than expected, even for basic core items termed by Fisher (1997) as functional. However, because of the extremely low cost of imported apparel items, the cost of realignment outweighs the perceived benefits, which compromises Fisher's overall approach in most segments of the market and reinforces the stubborn and unresolved gap between theory and practice (Seifert and Langenberg, 2011). This is more consistent with other authors' findings. The suggestion by Langenberg et al. (2012) that all but the most innovative business should follow a relatively narrow supply chain portfolio is supported, as are the findings of Jacobs and Swink (2011) that the disincentives to being responsive prevail, except where high volume supports the economic case for realignment, or small volume precludes any real efficiency. The lack of adoption of fast fashion supports the admission of Cachon and Swinney (2011) that full and effective fast fashion is hard to find. The findings also add gravity to Hill's (2005) passing reference to order-losing performance, since it is clear that there is a threat of loss of business at the order level, micro level of supplier de-selection and macro level of shift in sourcing location.

The inconsistent alignment between organisational and supply chain strategy builds on the proposition of Ketchen and Giunipero (2004) and opens an interesting debate based on the findings of Lawson (2005) that supply chain and organisational strategy may complement each other or not in a cyclic fashion according to external and internal factors in the strategy lifecycle. In this research, the rapidly changing move towards managing and then reducing distribution complexity supports this view, as does the short-lived growth of holistic fast fashion, with respondents' supply chains remaining a compromise between fashion push and cost savings. However, the persistence of the market driven cost imperative demonstrates better the stickiness or "*lock-in*" of some strategy consistent with Scheffer (2012:22) and Lawson (2003a) and the need to better understand the full cost of supply as proposed by Hines (2001, 2002).

The findings do support the influence of external factors on supply chain strategy, exemplified by the "*herd-like*" imperative to globalisation for cost savings (McKinsey and Co., 2012:13) and more recent search for new markets further afield to counter the lack of market growth opportunity in the UK. Over the years of apparel industry decline, agglomeration factors in most aspects of the industry have broken down, in spite of the theoretical advantages perpetuated by Doeringer and Terkla (1995), Aage and Belussi (2008) and others. There is some evidence that clustering remains important in some upstream pockets of global supply but the main benefits of agglomeration appear to have been transferred to vertical integration in the contemporary supply chain. The implication of reduced agglomeration benefit is reflected in the loss of skills and capability of domestic capacity and this is especially a constraint in the Updated Retro supply chain.

6.3 Contributions to Methodology

The research contributes to methodology by providing a thorough evaluation of recent Delphi studies in supply chain management research. As summarised in Table 3.1, Delphi has become an alternative to case study research and supply chain modelling to facilitate a holistic view of supply chain management practice. It has also been used to provide an insight into potential future developments in general supply chain strategy and specific supply chain innovations, such as Enterprise Resource Planning, logistics and sustainability. Of the eight studies evaluated, one takes an internal case study approach, while others use a combination of Likert scale and open-ended questioning or interviews to analyse supply chain futures across a range of industrial contexts. This study adds to this evaluation of supply chain Delphi applications in a number of ways.

Although the methodology has been influenced by previous studies in its choice of the Delphi method, size of expert panel and combined interviews with Likert scale ranking, this study also explores new ground. Other than the case based, logistics supplier study, it is the only Delphi study identified to deliberately focus on a specific industry context by studying the apparel industry, and within that context to take a vertical approach to purposive sampling - covering the whole apparel supply chain. This has enabled the contribution of 24 industry experts from a variety of roles and backgrounds, representing significant process gain and, acknowledging the benefits of the Delphi approach, their influence has been of equal value, regardless of their role, and without the process loss of influence by dominant commercial or personal interests (Rowe et al., 1991; Lummus et al., 2005). Perhaps most innovatively, it is also the only supply chain management Delphi study to utilise a Disaggregative Delphi methodology which seeks to explore alternative futures by triangulating rich data with survey feedback, taking into account multiple views (Landeta, 2006; Bolger and Wright, 2011). This is particularly significant in that it develops a methodology that reflects Grupp and

Linstone’s (1999) conviction that there is no *one* future, but also represents the acknowledged theory by Langenberg et al. (2012) that there is no one-size-fits-all supply chain solution. Furthermore, the method also overcomes some of the limitations of conventional Delphi studies that seek consensus at all costs, and therefore at odds with the views expressed among this diverse group of 24 experts from across the supply chain. An addendum to Table 3.1 could be added, as illustrated in Table 6.1.

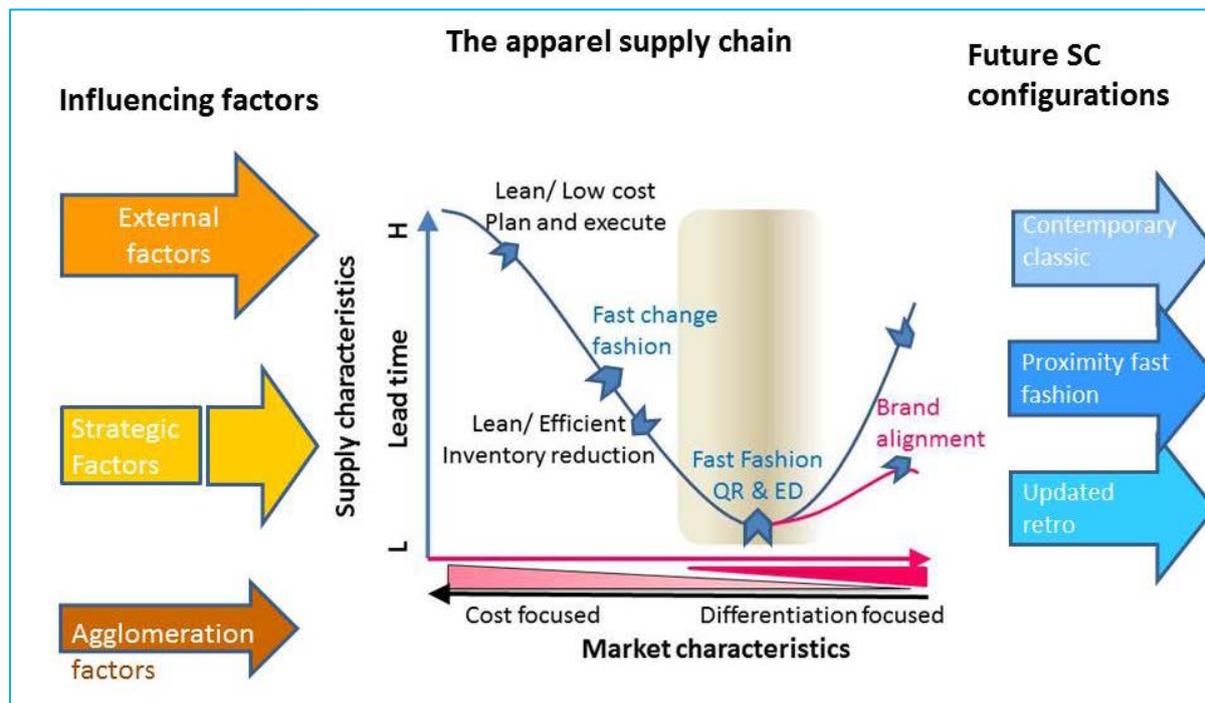
Table 6.1 Addendum to Table 3.1: Oxborrow, 2014

Authors (date)		Oxborrow, L., 2014		
Focus	Sample	Process	Ranking objectives	Reflections
Apparel industry developments in supply chain management	Total sample 24 apparel industry experts. Participation: R1 14; R2 19; R3 10	Preparation: Literature review and review of current trade press; R1 semi structured interviews R2 Rank variables by importance now and in 5 years’ R3 Confirmation of 3 future SC scenarios leading to new supply chain configurations	Combines interviews with ranking. Importance placed on qualitative findings. R2: Likert scale ranks variables by importance, now and in 5 years' from now. Seeks Dissensus. R3: seeks confirmation of 3 emerging supply chain configurations	Analysis based on descriptive statistics for purposive sample; Based on Disaggregative Delphi model: Cluster Analysis used to group responses to inform 3 scenarios.

6.4 Relating to Conceptual Framework

From this final review of the findings and contribution to extant knowledge, the research suggests one final adaptation to the conceptual framework. This is based on the multiple iterations of responsiveness in the supply chain and their impact upon the emerging supply chain configurations of the future, which deem the dyadic matrix representation too simplistic to adequately represent the relationship between cost and lead-time. This new version replaces the matrix approach with a plot of lead-time against cost and differentiation, as represented in Figure 6.1.

Figure 6.1 Revised Conceptual Framework based on Conclusions



Representation in this way demonstrates that, as differentiation increases, lead-time is also increased in current practice, but that this is predicted to change in some supply chain configurations. Similarly, this model is able to better represent the compromise between low cost, long supply chain and fast fashion, labelled here as fast change fashion, which reduces the overall lead-time but does not eliminate the global sourcing pipeline. This then contrasts with the lean/efficient chain which is characterised by rapid delivery from distribution centre, rather than make to order. As above, the model represents the pervasive influence of cost and, in this version, highlights the *fuzzy margins* where cost and differentiation vie for strategic priority. This model is also better able to illustrate the relationship between the emerging supply chain configurations and the context in which they are likely to prevail. In this sense, the slow, lean plan and execute strategy leads to the contemporary classic supply chain and fast change fashion and the downstream call-off element of lean inventory reduction relate to the proximity fast fashion configuration. Meanwhile the updated retro configuration is seen as a way to deliver both fast fashion and the new form of brand alignment derived from differentiation and replenishment. The overlap between these configurations represents the potential for any given firm to utilise elements of each depending on their imperatives, legacy and context.

6.5 Limitations and Critical Reflection

6.5a Research approach

In terms of the overall approach of the Disaggregative Delphi, it can be concluded, at least at first glance, that the project planning was better than its execution. However, reflecting on the limitations identified in section 3.6 (page 54) it is instantly apparent that this process has captured the views of a group of disparate apparel industry experts who, because of commercial and resource obstacles, as well as their range of roles, expertise and seniority, would have been highly unlikely to participate in any other form of group research. Furthermore the approach has enabled

triangulation of the findings (Stuart et al., 2002; Landeta, 2006), even where execution of the Delphi technique may be criticised and this, combined with purposive selection of experts (McKinnon and Forster, 2000); questionnaire design based on forensic analysis of prior literature in R1 and guidance from published studies in R2 (Gupta and Clarke, 1996); and comparison to extant literature (Eisenhardt, 1989) is considered to have preserved the validity of the findings. The Cluster Analysis process, during the analysis of R2 forecasts was a new and enjoyable experience for the researcher since it removed the subjectivity from the groupings, although the small sample size meant that clusters were uneven and outliers were, in the end, reallocated manually to reflect reality (Vinnari and Tapio, 2009).

The Delphi approach may have been more appropriate for team research. Seuring and Muller (2009) allude to benefits of a team approach in effective implementation, attracting a wider choice of participating experts from upstream and downstream in the supply chain and avoiding expert attrition by reducing delays between rounds, as well as team analysis to deal with complex data, all of which could have enhanced validity. As an individual, part-time researcher it is also possible to reflect that the funding and gravitas of a formal research project might secure engagement from hard to reach groups, such as apparel retailers and better maintain momentum. The project has been beset by the difficulty of attracting timely expert engagement, which, even for a researcher with a reputation within the local apparel industry and good connections, is compromised by access and confidentiality issues. However, the experience suggests that apparel businesses historically view research as a potential competitive threat rather than an opportunity to question and improve their practices – and this is reflected in the gap between theory and practice.

From the perspective of the DBA, it can also be speculated that the Delphi process could potentially have represented Documents 3, 4 and 5, although this would require a more statistically valid approach to the survey round. One might also speculate that in terms of scale and impact the project could form the basis of a PhD but objective critique of epistemological and ontological aspects of the methodology represents an obstacle, since much of the justification for the Delphi process can be found in one Journal, *Technological Forecasting and Social Change*, which advocates the Delphi method. This could have shifted the focus of the research from practical outcomes onto the robustness of the approach, which could ultimately have less professional value.

6.5b Overall experience

The Delphi approach and engagement of experts from throughout the apparel supply chain has produced findings that contrast prior research, which is primarily focused on the retail perspective and single case studies. As exploratory research, this has helped to uncover inconsistencies in strategy and alignment throughout the supply chain and issues affecting supply chain management further upstream in the supply base. This highlights gaps in previous research, illustrates further scope to explore the relatively invisible activities of upstream fabric and component supply and supports generalisability (Okoli and Pawlowski, 2004).

There have been high spots and lows during the process, but persistence has paid off, fuelled by success in different stages, such as the depth of interesting and revealing interview data, drawing fully on the experts' knowledge (Rowe 1991) and surprising willingness to share, given the difficulty of securing their involvement. The approach has facilitated a combined analysis that draws on retail strategy, branding and distribution influences on the supply chain, along with upstream practices

such as design, sourcing, supplier relationships and operational approaches to responsiveness. The results reveal a selective willingness to change, supporting response to changes in distribution, while illustrating the dominance of cost over innovations such as responsiveness and fast fashion. However, because this is predominantly exploratory research, there remains an opportunity for theory building and testing (Eisenhardt, 1989; Handfield and Melnyk, 1998) in this area, that unfortunately the Dissaggregative Delphi is unable to fully address (Tapio, 2003).

6.6 Recommendations for further research

The Delphi process is questioned for its limited generalisability (Okoli and Pawlowski, 2004) and the purpose of this research has been to explore the emerging supply chain practices in the apparel market, specifically. However, representative participation from across the retail and supply complex enhances validity and points to opportunities to test emergent theory. This would inevitably involve building on the second round survey of the Delphi process, in which case theory testing research could incorporate a wider sample, from across the supply chain, with the potential for involvement of global suppliers, international retailers and etailers. There is also potential for further exploratory research comparing the supply chain configurations emerging in different apparel markets, for example across Europe and the USA, and for new approaches to research the supply chains of retailers in emerging markets, and the impact of international ownership and vertical integration. The issues of changing retail strategy and growth in multi-channel retailing applies to other sectors, so there is, of course, also opportunity to understand how this affects supply chain management in other consumer goods sectors.

A further contribution of the research is to highlight the gap in recent research into retail strategy and its impact on the supply chain. While the operations literature is relatively rich in studies of alignment and supply chain strategy, there is really very little retail strategy research, other than very high level comparison of retail objectives and strategic implementation. This is more noticeable because of the rapid onset of multi-channel retail and its impact on aspects of distribution and supply. It is apparent that practice leads theory in this instance and there is an opportunity for dynamic research in this area. The stickiness of the cost objective also brings into question much of the research in supply chain strategy, if only to understand the obstacles to strategic alignment and how this plays out in a sector for a relatively straight forward product dominated by both cost and product design integrity. There is scope to build on seminal research by Fisher (1997) and Sharifi et al. (2006) to reflect these extra dimensions. Similarly, since the scenarios lead to more rapid adoption of streamlined NPD processes and decline in buyer-supplier relationships, there is an opportunity to understand the potential benefits and obstacles from a theoretical perspective.

Although sustainability and CSR are among the variables that grow most in importance in all scenarios, any detailed exploration of their implementation in the resulting supply chain configurations is considered outside the scope of this specific project, except where there is a direct impact upon responsiveness. This is, however, a priority area for future research, especially as some of the findings in this study appear to directly counteract operational sustainability improvements in the supply chain.

6.7 Recommendations for business practice

Generally, the responses illustrate a relatively stable supply chain, with limited breadth in the supply base, and penalties imposed at order level, rather than at relationship level. There is greater scope

to align supply chain to organisational strategy. While some cyclic mismatch may occur in times of transition, supply chain architecture needs to be more responsive to changes in retail strategy. This necessitates a more enlightened approach towards costing to explore any assumption that low product cost negates risk and associated costs, especially where supply chains are global, long and slow. An objective review of sourcing risk and location advantages is also required.

The NPD process is out of sync with the lifecycle and cost of the finished product and inhibits innovation elsewhere. A reorganisation of process is required, and there is an opportunity for this to be led by large scale production, not only niche supply, since the investment costs are more viable with scale production – potentially offset by postponed customisation. This requires culture change as well as technological innovation.

Retailers fail to fully appreciate the contribution that suppliers make to the overall supply chain process. The supply chain forecasts mainly imply a greater level of retail control and less focus on relationships, while changes currently underway in some supply chains offer benefits for suppliers from some perspectives, but threats in others. There is an urgent need for better exchange of information, better forecasting, more timely decision making and opportunities for supplier managed inventory – although poor and potentially deteriorating relationships compound this and should be addressed. Meanwhile, the trend for upstream investment made by overseas corporations, often associated with suppliers and retailers from emerging markets, throws a new light on these issues and there are opportunities to re-align the supply chain to meet the market opportunities that arise. This may provide further opportunities for standardisation, supply chain segmentation or strategic mimicry.

In contrast, small focused suppliers have the opportunity to take advantage of newly emerging niches arising from the standardisation of large scale distribution. However, this requires investment and capability enhancement for managing product, supply management, brand and distribution alignment and fulfilment strategies for multi-channel demand. Overall there is a pressing need for market driving strategy, with an aligned supply chain response, which begs the questions “Where will the retail innovations of the future come from?” and “how will the apparel supply chain need to respond?”

6.8 The Final Word

Further reflection on the experience of undertaking this project constitutes part of the accompanying Document 6 (Oxborrow, 2014). To summarise, however, this specific study represents two years of work, building on five years of prior study and more than 20 years of industry experience, hence its weight. In spite of that, there have been some surprises, especially in exploring the upstream aspects of the industry; the slow pace of change in some respects, in a sector that is dynamic in others; and the seemingly widening gap between organisational strategy and supply chain operation, and between theory and practice. It is hoped that the findings have some influence on both.

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Appendix 2.1 Strategic shifts in UK apparel retail (1991 – 2011)

Date	Economic/ market context	Manufacturer trends	Retail Trends	Forecast issues	Strategic change
1991	Prolonged recession; high mortgage rates. Anti-fashion teenage trend	Vertical integration of branded manufacturers to marketing/ retail; merger and customer deconcentration of contract mfr; off-shore sourcing by mfr.	More casual ranges replace high cost formal clothing. Growth in mid-market retail; high stock levels prior to move towards lean retail.	Call for MFA renewal; initial interest in recycling.	Growth in sales from discount outlets and sports goods stores at expense of clothing specialists and variety stores.
2001	Spending boom; growth in retail capacity leads to fierce competition and discounting; backlash against excessive consumption. Clothing price deflation peaked 1999 (-3%). Population dip of 20-24 year olds.	Phase out of MFA 1995-2005. Higher UK minimum wage and National insurance costs; Off-shore relocation of mfr; Growth in productivity benefits retailer prices, not mfr profit or investment.	Entry of continental retail chains; Retail ownership turbulence – privatisation of BHS/ Arcadia. Variety stores target ‘tweenagers’ with wider fashion offer as denim sales fall; Growth in designer labels and sports brand popularity.	Threat of reduced spending as interest rates rise; Retailers source more from overseas suppliers direct; Trend to ‘needs based’ shopping.	Growth in discount clothing offer and supermarket ranges; Mid-market variety store sales fall.
2005	Low inflation, low unemployment, GDP rising. Clothing price deflation continues; sales increase year on year.	MFA phased out. UK output fell 17% from 2001-2005. Exports rose slightly. Retail prices to manufacturers slashed.	Retailers increase spend on advertising and marketing; Growth in low-cost retailers due to Primark and Matalan. Other value retailers show strong growth.	Concern of lack of global competitiveness of some developing economies (Vietnam, Bangladesh...) versus China. Ethical and environmental initiatives initiated.	Sales through supermarkets grow rapidly at expense of clothing specialists and variety stores and department stores.
2007	Unemployment low. Hard to attract skilled workers to manufacturing industry. Onset of recession mooted.	Output increased through efficiency gains. Number of companies falls, especially lingerie and high value brands; Rate of bankruptcy fell – closure voluntary or due to relocation.	Schoolwear market deregulated. Rapid growth of supermarket sales.	Voluntary codes of ethical conduct adopted. Backlash against fast fashion/ disposable fashion predicted.	

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2009	Rising unemployment. Consumers trade down rather than scale down purchasing. Clothes provide alternative to high spend luxuries. Rise in number of 20-24 year olds.	Changes in ownership result in new investment potential.	Supermarkets fall back while specialists gain ground, providing more fashionability.		
2011	Continued recessionary effects; high unemployment and lack of consumer confidence. Growth returns to clothing following falling sales in 2009, but is thought to be short lived. Shoppers are increasingly looking for discount activity and waiting for sales.	Concern over ethical conditions in manufacture. Raw material cost increases push up manufacturers prices. Some retailers claim to be relocating manufacturing back to UK.	Young fashion chains drive growth, especially mid value speciality chains (Jack Wills, Superdry etc.). Fast fashion turnaround increasing, but low cost young chains struggle. Other than Primark value retailers struggle, in a move to quality (John Lewis strong performance).	Forecast further dip in spending due to recession. Recovery based on discounting and investment purchases.	Pure discounters stabilise, while supermarkets continue to gain market. Fashion specialists stabilise overall market share, but low cost specialists struggle while differentiated brands gain share. Department stores gain market share, at expense of independents.

Sources: Mintel, 2000; 2007; 2009; 2011; Keynote 1991; 2001; 2002; 2006; 2007; 2009; 2011; 2012.

**Appendix 2.2 Share of Expenditure on Clothing (footwear) and Accessories
by Type of Retail Outlet (1991-2010)**

% sales	1991	1997	2001	2008	2010
Clothing multiples	54	23	24	21	21
Clothing independents		11	10	6	4
Variety chains	31	19	16	9	9
Department stores		9	9	7	8
Mail order	10	9	9	8	8
Sports shops	3	8	9	8	8
Discounters/cash and carry	1	5	9	8	8
Supermarkets	1	3	4 (8)*	23	25
Footwear		7 [@]	7 [@]		
Other	1	5	4	10	9
Total	100	100	100	100	100

Sources: Keynote, 1991; 2001; 2002; 2006; 2007; 2009; 2011.

[@] includes clothing and footwear in total sales

*variation between Mintel and Key Note figures.

Appendix 3.1a Categories of paradigms and their methods

Element	Paradigm			
	Positivism	Critical theory	Constructivism	Realism
Ontology	Reality is real and apprehensible	"Virtual" reality shaped by social, economic, ethnic, political, cultural, and gender values, crystallised over time	Multiple local and specific "constructed" realities	Reality is "real" but only imperfectly and probabilistically apprehensible
Epistemology	<i>Objectivist</i> : findings true	<i>Subjectivist</i> : value mediated findings	<i>Subjectivist</i> : created findings	<i>Modified objectivist</i> : findings probably true
Common methodologies	<i>Experiments/surveys</i> : verification of hypotheses, chiefly quantitative methods	<i>Dialogic/dialectical</i> : researcher is a "transformative intellectual" who changes the social world within which participants live	<i>Hermeneutical/dialectical</i> : researcher is a "passionate participant" within the world being investigated	<i>Case studies/convergent interviewing</i> : triangulation, interpretation of research issues by qualitative and by some quantitative methods such as structural equation modelling

Notes: essentially, ontology is "reality", epistemology is the relationship between that reality and the researcher, and methodology is the technique used by the researcher to investigate that reality; adapted from Perry *et al.* (1997, p. 547) based on Guba and Lincoln (1994)

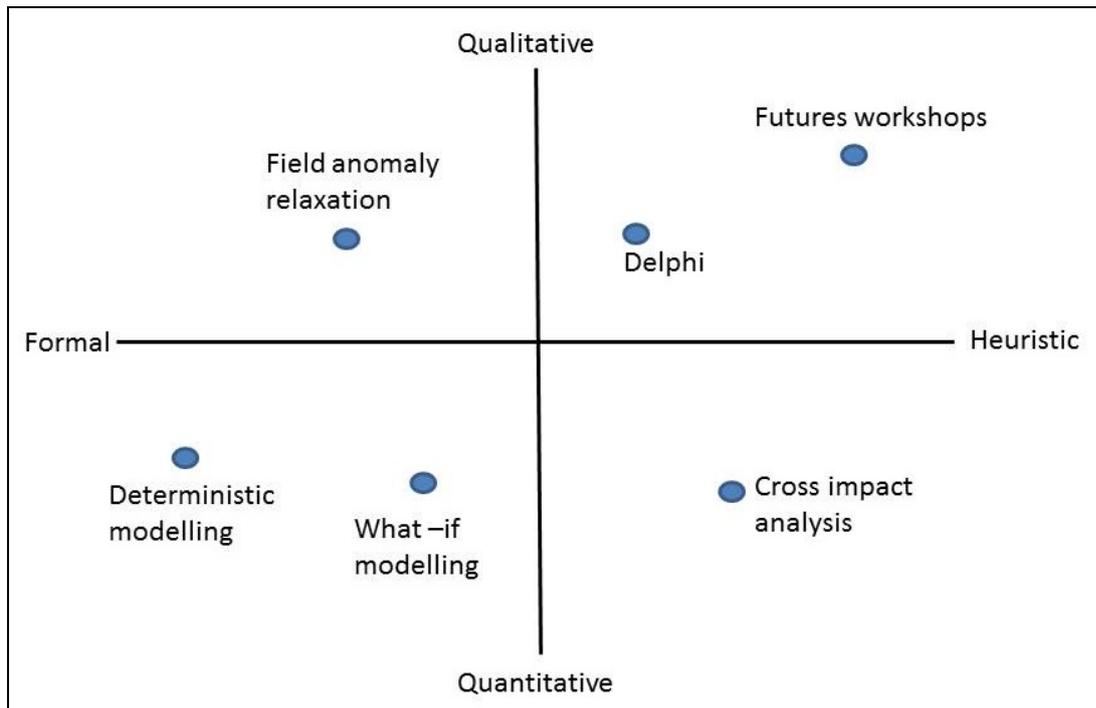
Healy and Perry (2000:119) Reprinted from *Qualitative Market Research: an International Journal*, vol. 3 (3), Healy, M. and Perry, C., 2000, Comprehensive criteria to judge validity and reliability, 118-126, with permission; © Emerald Group Publishing Limited all rights reserved. DOI: <http://dx.doi.org/10.1108/13522750010333861>

Appendix 3.1b Comparing Traditional and Disaggregative Delphi methodologies

Comparison of traditional Delphi and disaggregative Delphi and the extra characteristics of this study		
Feature	Traditional Delphi	Disaggregative Delphi
<i>Similarities</i>		
Ideal		The best argument wins
Transparency		Anonymity of arguments
Iterativity		Multiple rounds
<i>Differences</i>		
Philosophy	Consensus	Dissensus
Goal	Accurate prediction	Alternative scenarios
Feedback	Median and interquartiles	All responses and key arguments
Statistical test	e.g., analysis of variance	e.g., cluster analysis
<i>Extra characteristics of this study</i>		
Case	Individual professional	Interest group
Transparency after the study	Anonymity is retained also after the Delphi rounds	Anonymity is limited to the argument phase
Form of data	Questionnaire	Questionnaire and interview

Tapio (2003:92). Reprinted from *Technological Forecasting and Social Change*, vol. 70 (1), Tapio, P., Disaggregative Policy Delphi: Using cluster analysis as a tool for systematic scenario formation, 83–101, Copyright (2003) with permission from Elsevier. DOI: [10.1016/S0040-1625\(01\)00177-9](http://dx.doi.org/10.1016/S0040-1625(01)00177-9)

Appendix 3.2 Approaches to futures studies incorporating methods for scenario -building



Source: Tapio et al (2011: 1687). Reprinted from *Technological Forecasting and Social Change*, vol. 78 (9), Tapio, P., Paloniemi, R., Varho, V. and Vinnari, M., The unholy marriage? Integrating qualitative and quantitative information in Delphi processes, 1616–1628; Copyright (2011) with permission from Elsevier. DOI: [10.1016/j.techfore.2011.03.016](https://doi.org/10.1016/j.techfore.2011.03.016)

Appendix 3.3 Phases of the Q₂ process:

Varho and Tapio (2012) Q ₂ Process	Future Scenarios in Textiles and Apparel Q ₂
Choose and liaise with panel	Identify and invite panel
G1 first questionnaire	G1 Literature / trade journal review
G2 Interviews	G2 Interviews
A1 Analysis of G1 and G2 data	A1 Analysis of G1 and G2 data
G3 Second questionnaire	G3 First Questionnaire
A2 Cluster analysis of numerical data	A2 Cluster Analysis of numerical data
A3 Content Analysis of Qualitative data	A2 Content Analysis of G3 Qualitative data
A4 Futures table	A4 Futures Table
Report of scenario paths, interpretation and storylines	Report of scenario paths, interpretations and storylines
	G4 Validation of scenario paths, interpretations and storylines
Stages: G = data gathering; A = Analysis stages	

Varho and Tapio (2012: 4) plus own data

Appendix 3.4 Q₂ Comparative Analysis of Qualitative and Quantitative Data

Where two or more qualitative and quantitative datasets are compared in the Q2 analysis, Tapio et al. (2011) suggest the following strategies. Where:

All arguments/ statements are similar and consistent:

- Create one scenario.

Quantitative statements are similar, but contradictory and inconsistent with qualitative arguments

- Create one scenario with two sub-scenarios

Quantitative statements are contradictory, and inconsistent with broadly similar qualitative arguments

- Create two scenarios with two sub-scenarios

Quantitative statements and qualitative arguments are contradictory with others of the same category, but consistent across the quantitative/ qualitative responses

- Create two scenarios.

Where the arguments/ statements are completely different, scenarios can only be built where there is common ground shared between them.

Adapted from Tapio et al (2011: 1624)

Appendix 3.5 Round 1 Interview Schedule

Explain company and role?

Retail Strategy

1 What changes have you observed in retail strategy and objectives?

How often are changes in strategy realised?

2 What factors are driving change in retail strategy?

3 How has the cost priority changed in comparison to others such as responsiveness, speed, reliability and quality in retail strategy?

Has achieving responsiveness become more important in achieving retail objectives?

4 How has the adoption of fast fashion changed and why?

4b For retailers: how have in-store practices changed in response to the adoption of fast fashion?

5 How is consumer behaviour changing? Are consumers becoming more strategic – waiting for sales and markdowns?

Operations

6 How are strategic changes reflected in changing operational objectives/ practices within the supply chain?

7 What is the balance between speed, capacity or inventory in achieving responsiveness within the supply chain?

8 Have low cost sources of supply achieved current retail strategy and consumer expectations? How?

Supply Chain

9 How is the supply chain for your business structured and controlled? How has this changed?

Who has control, extent of outsourcing, extent of offshoring?

On balance has it become longer, shorter, unchanged and why?

10 How have supply chains adapted to deal with demand fluctuations ?

11 What changes in overseas/ local sourcing have you seen emerge in recent years and why?

How often are outsourcing decisions reviewed?

Will global sourcing increase in years to come?

12 How does this differ for basic/ fashion items and first orders or replenishment?

13 How often are changes made to suppliers?

Are suppliers managed within a hierarchy of permanent/ short term or similar?

14 What changes have there been in the proliferation of products, product lifecycle and replenishment strategy in your SC?

Is upstream supply managed differently in fast fashion than in conventional supply chains?

15 How has the balance between reaction to real demand and forecast driven ordering changed within SC operations?

16 What are the most important factors that influence sourcing location decisions? Which countries are favoured? How has this changed over time?

17 What would be typical capabilities of suppliers within conventional and responsive SC? How do they differ? Where are the capability gaps?

Buying and relationships

Future Scenarios in UK Apparel Supply Chains

18 How do procurement processes and supplier selection support responsiveness? **Are different processes/ relationships in place?**

19 Are different suppliers used for main stock/ replenishment/ new or fashion items?

20 What is the role of SMEs in the supply chain?

What relationship has developed between buyers and SMEs?

21 How does the supply chain deal with: Quick response?

Is it based on manufacture to order/ assemble or finish to order / call-off or deliver to order?

Have you adopted strategies of modularisation or postponement to support flexibility and reduce response times? How does this work?

How important is call-off process and how has this changed? How is call-off inventory resourced within the SC?

22 How does the supply chain deal with: The design challenge of faster changing products and short lifecycle

23 What incentives/ penalties are in place to encourage flexibility within the supply chain?

How is risk and reward shared within the SC? Does this vary for conventional and responsive supply chains?

24 How often are decisions made in the supply chain changed? What happens?

25 How do cultural factors affect buyer-supplier relationships? How are problems overcome?

26 What is the relationship between trust in relationships and flexibility, investment, improvement?

How do suppliers show they are trustworthy?

27 How have relationships changed as outsourcing has become more important

Upstream

28 How do suppliers manage their own upstream production and or outsourcing? **Do suppliers offer a range of sourcing options depending on price, speed and volume?**

What changes in upstream processes are adopted to achieve fast response?

How is reactive capacity resourced upstream in the supply chain?

29 Do you see any benefit from sourcing from localised supplier groups or clusters of supply activity?

30 How has investment in new technologies and communications systems changed?

31 How does restructuring of the supply chain influence the ability to exchange knowledge and information within the SC and from external sources?

32 How has the product design process changed?

How does the design decision making process support cost/ flexibility objectives? Does the design process constrain products/ product ranges or product introductions?

33 What are the key capabilities expected of suppliers and how well are these met in different locations? **Are suppliers honest in their assessments of what can be achieved, within cost and time constraints? How much are products made in your SC constrained by supplier capabilities?**

34 Has fashion become too fast or too unpredictable for low cost, off shore sourcing?

Will the range of source locations change in years to come? Where do you foresee investment being made in future sourcing capacity?

Appendix 3.6 Invitation to participate in the Delphi Panel

**A study into future scenarios within the supply chains
of UK apparel retailers**



by Lynn Oxborrow

Nottingham Business School

You are cordially invited to participate in a study designed to explore these key questions:

1. How have the strategic priorities of UK fashion retailers changed in recent years?
2. What are the implications of these changes for the design of apparel supply chains?
3. How will this impact on UK apparel sourcing and manufacturing in the foreseeable future?

By participating, you will be able to benefit from the findings and gain new insights into future supply chain management perspectives.

As a **leading expert** in the apparel industry I would like to invite you to join an **expert panel** to help me to research and develop realistic ***future scenarios for the supply chains of UK apparel retailers***

The Key Questions

I believe that your opinions and experience will help me to understand these key questions:

1. How have the strategic priorities of UK fashion retailers changed in recent years?
2. What are the implications of these changes for the design of apparel supply chains?
3. How will this impact on the future of UK apparel sourcing and manufacturing?

Background

UK manufacturing has become a hot topic, thanks to exposure by Mary Portas and her knickers and The Cushion Factory...**but** is there real evidence of a significant redesign of the apparel supply chain?

One view, from sourcing experts, favours continued sourcing from established suppliers in China where, although costs may be rising, productivity and innovation are also improving. Furthermore, to keep high street apparel prices low, there will be increased sourcing from emerging low cost countries, such as Nicaragua.

An alternative view proposed by some academics, points to the advantages of flexibility and responsiveness within the supply chain, using better supplier relationships and knowledge transfer. These developments make supply chains more responsive to changing consumer behaviour and expectations, making fashion firms more competitive in markets dominated by both fast fashion and product quality or differentiation. Companies like River Island and HJ Hall hosiery claim to be increasingly using UK manufacturing to meet these objectives, and other industries, such as automotive and engineering, appear to be doing the same. WHAT DO YOU THINK WILL HAPPEN?

The Process

The study will capture your views and those of other leading industry experts from apparel retailers, suppliers and other supply chain roles. The research will lead to the development of a range of possible industry scenarios that could be valuable for future planning and policy.

The process will involve:

1. Sharing of feedback from my initial interviews with 10 key industry experts.
2. A detailed questionnaire to compare your views to the initial findings and any additional issues.
3. Further feedback and discussion/questionnaire to find out what you think about these findings.
4. A brief report, giving you an insight into the overall study and the emerging key issues.

Your contribution to the on-going process would be of tremendous value. The expert panel is small and representative of diverse industry views, so **each individual contribution** is very important.

The researcher

Lynn Oxborrow is an academic at Nottingham Business School, Nottingham Trent University with several years' experience of fashion retail management and running projects with textile, apparel and retail businesses. Lynn is now a researcher and lecturer in Supply Chain Management. Contact Lynn.oxborrow@ntu.ac.uk or 0115 8486048.

Appendix 3.7 Round 2 Questionnaire formatted in Survey Monkey

The research aims to understand how the apparel supply chains of UK retailers are adapting to evolving retail strategies, changes in the global supply base and developments in the economy. Participants can see summarised findings from interviews undertaken in round 1 of the research, and then answer questions designed to capture their views, experience and predictions for the future. While you are asked for a limited amount of background data this is for analytical purposes only. Any individual data will remain strictly confidential, and all responses will remain anonymous.

This is the 2nd round of the research, and your participation is welcomed - it is not necessary to have taken part in the earlier stage. I hope that participants will also agree to take part in the 3rd and final stage of the research in a few weeks time. A summary of the findings will be provided to all participants.

This stage of the survey should take approximately 20-30 minutes to complete. After each question you have the opportunity to add comments, but please do not feel obliged to do so. The survey will close for responses at midnight on Oct 19th 2012.

In undertaking the Delphi research process it is very important to establish both the level of expertise of the panel and the diversity of their experiences. Please complete the following questions about yourself and your company(s). Individual information will NOT form part of any reports.

1. Please provide an email address. This is for ID purposes and for the final round of the survey only.

2. What is your main job title/ role?

3. How long have you been in your current role?

4. How long have you been involved in apparel supply chains or retailing?

***5. Which type of business do you principally represent?**

- manufacturer
- retail
- textiles/ component supplier
- designer
- sourcing organisation
- clothing supplier
- apparel services
- other

***6. What percentage of the products of your supply chain would you describe as:**

- Continuous (unchanging season to season)?
- Basic apparel (minor changes season to season)?
- Fashion (changes each major season, 2-4 times per year)?
- Fast fashion (changes more than 4 times each year)?
- Premium classic apparel (few seasonal changes)
- Premium high fashion (major change each season)
- None of the above?

7. Please describe your organisation in one short phrase

Apparel Retail Strategy

Initial research refers to changes in the growth of multi-channel retailing, and the continued polarisation of the UK market into differentiated, higher value brands and low cost retailing, with the decline of mid-market chains. Other issues raised include growth in international markets, increased levels of control over the supply chain, and improved clearance mechanisms through outlet retail. There is a tendency to dwell on the 1998 decision by M&S to source from overseas as a major shock that still affects the contemporary apparel supply chain, while aspects of Zara's fast fashion process are frequently mentioned as an aspirational business model.

8. In the UK apparel supply chain(s) that you work with, how important do you think each of these retail strategies are NOW?

	Irrelevant	minimal importance	some importance	Important	critical	N/A
Discount/ low cost retailing	<input type="radio"/>					
Multi-channel retailing	<input type="radio"/>					
Internationalisation of retail distribution	<input type="radio"/>					
Mid-high value, specialist brand retailing	<input type="radio"/>					
Standardisation across retail channels (online/ overseas etc.)	<input type="radio"/>					
Retail brand proliferation	<input type="radio"/>					
Fast fashion retailing	<input type="radio"/>					
Outlet (clearance) retailing	<input type="radio"/>					

Please explain how retail strategy impacts on your supply chain

9. How important do you think each will be 5 years from now?

	Irrelevant	minimal importance	some importance	Important	critical	N/A
Discount/ low cost retailing	<input type="radio"/>					
Multi-channel retailing	<input type="radio"/>					
Internationalisation of retail distribution	<input type="radio"/>					
Mid-high value, specialist brand retailing	<input type="radio"/>					
Standardisation across retail channels (online/ overseas etc.)	<input type="radio"/>					
Retail brand proliferation	<input type="radio"/>					
Fast fashion retailing	<input type="radio"/>					
Outlet (clearance) retailing	<input type="radio"/>					

Please comment on how retail strategy may effect your supply chain in the future

Apparel supply chain strategy

Reflecting the changes in retail strategy, the dominant supply chain response is based on offshore sourcing. Suppliers report differential use of direct or indirect sourcing, with the use of intermediaries apparently based on either scale, cost or a lack of need for transparency in some markets. In some cases, different models are used, but, over time, the drive is towards owned facilities as a means of retaining knowledge, quality and margins. In terms of retail control over the supply chain, there is polarisation with retailers taking on more control over bulk goods, and establishing centralised distribution facilities on one hand, while handing over the management of online distribution direct to suppliers on the other. Upstream in the supply chain, changes of ownership and control are also evident. Investment from upstream in the supply chain, mostly from overseas, is a key factor in maintaining a strong UK sourcing base.

10. In the UK apparel supply chain(s) that you work with, how important do you think each of these strategic developments is NOW?

	Irrelevant	minimal importance	some importance	Important	critical	N/A
Sourcing offshore from third party suppliers (offshore outsourcing)	<input type="radio"/>					
Off shore sourcing from own facilities	<input type="radio"/>					
Vertical integration (retailers investing in supply/ manufacture)	<input type="radio"/>					
Vertical integration (investment from upstream in manufacture/ retail)	<input type="radio"/>					
Product proliferation (more styles introduced each season)	<input type="radio"/>					
Centralisation of distribution centres	<input type="radio"/>					
Delivery flexibility	<input type="radio"/>					
Intermediation (use of sourcing companies)	<input type="radio"/>					
Disintermediation (Direct retailer - supplier contact)	<input type="radio"/>					

Please explain how strategic developments impact upon your supply chain

Future Scenarios in UK Apparel Supply Chains

11. How important do you think each will be 5 years from now?

	Irrelevant	minimal importance	some importance	important	critical	N/A
Sourcing offshore from third party suppliers (offshore outsourcing)	<input type="radio"/>					
Off shore sourcing from own facilities	<input type="radio"/>					
Vertical integration (retailers investing in manufacture/ supply)	<input type="radio"/>					
Vertical integration (investment from upstream in manufacture/ retail)	<input type="radio"/>					
Product proliferation (more styles introduced each season)	<input type="radio"/>					
Centralisation of distribution centres	<input type="radio"/>					
Delivery flexibility	<input type="radio"/>					
Intermediation (use of sourcing companies)	<input type="radio"/>					
Disintermediation (Direct retailer - supplier contact)	<input type="radio"/>					

Please comment on how strategic decisions might affect your supply chain

Strategic supply chain priorities

The dominant priority is cost. In most supply chains other objectives, such as reducing lead times, delaying ordering, environmental management are seen as subsidiary to the cost objective and are deployed where they also have the advantage of reducing costs. In branded apparel markets where product differentiation is important there are other, sometimes conflicting priorities. These support more technical and design innovations, better product quality and small batch production. However, these objectives are used indecisively as additional input costs are involved, and the benefits of higher returns are less clearly measured. One consensus is that growing product proliferation is reducing the need for replenishment; but opinions on product quality are split – with experts predicting that it will become more or less important, depending on market.

12. How important are each of these strategic objectives in your apparel supply chain experience, NOW?

	Irrelevant	minimal importance	some importance	important	critical	N/A
Reducing cost	<input type="radio"/>					
Reducing lead time	<input type="radio"/>					
Reducing inventory	<input type="radio"/>					
Flexibility through decisions made closer to selling season	<input type="radio"/>					
Replenishing good sellers	<input type="radio"/>					
Managing demand through discount/ special offers	<input type="radio"/>					
Stimulating consumer purchases by limiting availability	<input type="radio"/>					
Monitoring product quality against specification	<input type="radio"/>					
Differentiating product by quality, durability and performance	<input type="radio"/>					
Environmental Sustainability	<input type="radio"/>					
Transparency of suppliers, materials, chemicals, labour etc.	<input type="radio"/>					

Please explain how strategic objectives affect your supply chain operation

13. How important will each become 5 years from now?

	Irrelevant	minimal importance	some importance	Important	critical	N/A
Reducing cost	<input type="radio"/>					
Reducing lead time	<input type="radio"/>					
Reducing inventory	<input type="radio"/>					
Flexibility through decisions made closer to selling season	<input type="radio"/>					
Replenishing good sellers	<input type="radio"/>					
Managing demand through discount/ special offers	<input type="radio"/>					
Stimulating consumer purchases by limiting availability	<input type="radio"/>					
Monitoring product quality against specification	<input type="radio"/>					
Differentiating product by quality, durability and performance	<input type="radio"/>					
Environmental Sustainability	<input type="radio"/>					
Transparency of suppliers, materials, chemicals, labour etc.	<input type="radio"/>					

Please comment on how strategic objectives might affect your supply chain

Ordering and processes

A number of practices are in flux, with call-off from stock becoming less important for some retailers, in favour of FOB, although this is not consistent across the board. Batch sizes have fallen, in line with product proliferation and reduced stock, which has implications in terms of sourcing decisions and cost. Some practices appear to have failed to catch on formerly, such as supplier managed inventory, but are practiced informally at suppliers' risk. Information sharing is limited to selected large suppliers, who question the quality of the information. Because retailers' style decisions are notoriously slow, it is orders placed close to the selling season that drive the need for fast reaction speeds, rather than an objective of fast fashion per se.

14. In your apparel supply chain experience, how important is each of these ordering processes and practices, NOW?

	Irrelevant	minimal importance	some importance	Important	critical	N/A
Reducing batch sizes	<input type="radio"/>					
Call-off from supplier's distribution centre	<input type="radio"/>					
Retail ordering FOB (Free on Board) consignments from overseas	<input type="radio"/>					
Suppliers delivering online orders direct to consumer	<input type="radio"/>					
Pre-booking capacity, with styles confirmed later	<input type="radio"/>					
Cancelling/ changing orders once placed	<input type="radio"/>					
Ordering within selling season	<input type="radio"/>					
Supplier contributions to markdown and promotion costs	<input type="radio"/>					
Sharing retail sales data upstream in supply chain	<input type="radio"/>					
Supplier management of inventory	<input type="radio"/>					

Please explain how ordering/ delivery processes affect your supply chain

15. How important do you think each will become 5 years from now?

	irrelevant	minimal importance	some importance	important	critical	N/A
Reducing batch sizes	<input type="radio"/>					
Call-off from supplier's distribution centre	<input type="radio"/>					
Retailers ordering FOB (Free on Board) consignments from overseas	<input type="radio"/>					
Suppliers delivering online orders direct to consumer	<input type="radio"/>					
Pre-booking capacity, with styles confirmed later	<input type="radio"/>					
Cancelling / changing orders once placed	<input type="radio"/>					
Ordering within selling season	<input type="radio"/>					
Supplier contributions to markdown and promotion costs	<input type="radio"/>					
Sharing retail sales data upstream in supply chain	<input type="radio"/>					
Supplier management of inventory	<input type="radio"/>					

Please comment on how ordering / delivery processes might affect your supply chain in the future

Product development

It may be commonly perceived that retailers have taken more control over the design process, but suppliers feel that it is their own design expertise that creates a point of difference and wins them business. Attempts to change the design process are slow, and some, such as use of technology instead of sampling, and reducing fabric/component options to speed up the process, meet with obstacles, both perceived and real. Limitations to the design process include lack of confidence in design decisions, and complex approval practices. While there is some potential for garment finishing, such as dyeing, printing and labelling to take place close to market, this too is limited by a number of factors.

16. How important is each of these product design/ development practices in your UK apparel supply chain experience NOW?

	irrelevant	minimal importance	some importance	important	critical	N/A
Retailers designing inhouse for own brands	<input type="radio"/>					
Retailers controlling the product design process	<input type="radio"/>					
Use of external designers/ suppliers to inject new styles	<input type="radio"/>					
Building a portfolio of design developments ready to use	<input type="radio"/>					
Introducing new styles quickly in response to media/events	<input type="radio"/>					
Gradual/ incremental product changes	<input type="radio"/>					
Re-engineering designs to reduce product costs	<input type="radio"/>					
Rigorous product testing of materials and components	<input type="radio"/>					
Designs using a limited choice of pre-tested or stock fabric and components	<input type="radio"/>					
Using technology to replace physical sampling	<input type="radio"/>					
Delayed finishing - dye, print, embroider, etc - of greige/part finished goods	<input type="radio"/>					

Please explain how product development affects your supply chain

Future Scenarios in UK Apparel Supply Chains

17. How important do you think each will be 5 years from now?

	Irrelevant	minimal importance	some importance	important	critical	N/A
Retailers designing inhouse for own brands	<input type="radio"/>					
Retailers controlling the product design process	<input type="radio"/>					
Use of external designers/ suppliers to inject new styles	<input type="radio"/>					
Building a portfolio of design developments ready to use	<input type="radio"/>					
Introducing new styles quickly in response to media/events	<input type="radio"/>					
Gradual/ incremental product changes	<input type="radio"/>					
Re-engineering designs to reduce product costs	<input type="radio"/>					
Rigorous product testing of materials and components	<input type="radio"/>					
Designs using a limited choice of pre-tested or stock fabric and components	<input type="radio"/>					
Using technology to replace physical sampling	<input type="radio"/>					
Delayed finishing - dye, print, embroider, etc - of pre/part finished goods	<input type="radio"/>					

Please comment on how product development might affect your supply chain in the future

Sourcing Options in apparel supply chains

Everyone has their favoured off-shore sourcing locations, though there have been some changes recently, reflecting differing experiences of sourcing from China, new lower cost options such as Cambodia gaining potential, and traditional sources such as Sri Lanka losing duty-free status. Whatever the precise location opinions are relatively consistent that the benefits of low-cost sourcing outweigh the difficulties. There are exceptions, and in some markets small volume or trial orders are sourced from closer proximity suppliers, such as in Turkey and within Europe. However, there are often different, but no less significant difficulties associated with these decisions, such as lack of efficiency, limited capability and cultural issues. These issues appear to become more problematic and less tolerable when higher unit costs are taken into account.

18. How important is each of these sourcing practices in your apparel supply chain experience, NOW?

	Irrelevant	minimal importance	some importance	important	critical	N/A
Re-locating sourcing based primarily on lowest cost suppliers	<input type="radio"/>					
Locating sourcing to find duty-free sources of supply	<input type="radio"/>					
Locating sourcing to find the most reliable of low cost suppliers	<input type="radio"/>					
Competing for capacity in Chinese factories/ logistics	<input type="radio"/>					
Locating manufacturing to be close to sources of materials	<input type="radio"/>					
Locating manufacturing to access high quality skills and technologies	<input type="radio"/>					
Sourcing from local suppliers or agents with off-shore production	<input type="radio"/>					
Establishing overseas retail buying offices close to suppliers	<input type="radio"/>					
Sourcing from suppliers with production close to market	<input type="radio"/>					
Sourcing from UK suppliers	<input type="radio"/>					
Dual sourcing (same product, more than 1 source)	<input type="radio"/>					

Please explain how sourcing practices affect your supply chain

Future Scenarios in UK Apparel Supply Chains

19. How important do you think each will be 5 years from now?

	irrelevant	minimal importance	some importance	important	critical	N/A
Re-locating sourcing based purely on lowest cost suppliers	<input type="radio"/>					
Locating sourcing to find duty-free sources of supply	<input type="radio"/>					
Locating sourcing to find the most reliable of low cost suppliers	<input type="radio"/>					
Competing for capacity in Chinese factories/ logistics	<input type="radio"/>					
Locating manufacturing to be close to sources of materials	<input type="radio"/>					
Locating manufacturing to access high quality skills and technologies	<input type="radio"/>					
Sourcing from local suppliers or agents with off-shore production	<input type="radio"/>					
Establishing overseas retail buying offices close to suppliers	<input type="radio"/>					
Sourcing from suppliers with production close to market	<input type="radio"/>					
Sourcing from UK suppliers	<input type="radio"/>					
Dual sourcing (same product, more than 1 source)	<input type="radio"/>					

Please comment on how sourcing practices might affect your supply chain in the future

Supporting supply chain practices

A number of other factors have been raised. The most consistent relates to finance for both investment and working capital, which is affecting many practices within the supply chain. Aspects include lack of finance for investment, partly compensated by overseas companies buying into retail supply chains; issues relating to ownership of inventory within the supply chain and when ownership is exchanged; and 'short sighted' perceptions of cost/benefit analysis. These in turn affect working capital and ordering processes. Other aspects include marketing, and the potential for the supply chain to provide market winning advantages such as: overseas investors with their own retail chains; and product associations (for example through UK/ Italian design and manufacture). Relationships are seen as critical, and yet the depth and duration of relationships and level of trust within relationships is variable.

20. In your apparel supply chain experience, how important are each of these supporting practices, NOW?

	irrelevant	minimal importance	some importance	important	critical	N/A
Lengthening payment terms to suppliers	<input type="radio"/>					
Suppliers requesting upfront payments	<input type="radio"/>					
Foreign investment in UK based suppliers	<input type="radio"/>					
Ordering based on lowest unit cost/ highest gross margins	<input type="radio"/>					
Comprehensive financial measures of supply chain performance	<input type="radio"/>					
Developing long term relationships	<input type="radio"/>					
Use of overseas supply base to access new markets	<input type="radio"/>					
Use of UK supply to create a marketing advantage	<input type="radio"/>					
Ability to access finance for materials and production	<input type="radio"/>					
Investment in capacity/skill base of close proximity suppliers	<input type="radio"/>					
Consistent strategic and operational alignment	<input type="radio"/>					

Please explain how these or any other practices affect your supply chain

21. How important do you think each will be 5 years from now?

	irrelevant	minimal importance	some importance	important	critical	N/A
Lengthening payment terms to suppliers	<input type="radio"/>					
Suppliers requesting upfront payments	<input type="radio"/>					
Foreign investment in UK based suppliers	<input type="radio"/>					
Ordering based on lowest unit cost/ highest gross margins	<input type="radio"/>					
Comprehensive financial measures of supply chain performance	<input type="radio"/>					
Developing long term relationships	<input type="radio"/>					
Use of overseas supply base to access new markets	<input type="radio"/>					
Use of UK supply to create a marketing advantage	<input type="radio"/>					
Ability to access finance for materials and production	<input type="radio"/>					
Investment in capacity/skill base of close proximity suppliers	<input type="radio"/>					
Consistent strategic and operational alignment	<input type="radio"/>					

Please comment on these or any other practices that you think will affect your supply chain in the future

In summary it can be concluded, from the initial research, that there are changes in retail strategy and these are, to some extent, reflected in changes within the apparel supply chain of UK retailers. However, there are challenges to the adoption of new practices that could otherwise lead to more efficient and effective use of the apparel supply chain as a means of improving retail competitiveness. Issues include finance within the supply chain, and changes in capacity and logistics in the Far East, compounded by competition from larger, global retailers, and the economic climate, and these in turn provoke the need for change. The supply chain deals inconsistently with these challenges, variously helped and hindered by the need to effectively measure improvements, deal with buyer-supplier relationships and reconcile strategic direction from the controlling partners with practices considered useful by those involved at an operational level.

22. Your experience may, of course, be different and you may think that the aspects of UK apparel retail supply mentioned above will change. Please add your comments and experiences below....

Thank you very much for participating in the survey to understand more about future scenarios in UK apparel retail supply chains. Your contribution will be extremely valuable.

The research process ends with a final survey round that will test how well you agree, or disagree, with the findings. I would like to have the opportunity to send you the summarised findings from this stage of the research in order to capture your views and predictions for the future. I expect this to be in late October and the survey to be shorter. If you would prefer not to be contacted again, please tick below.

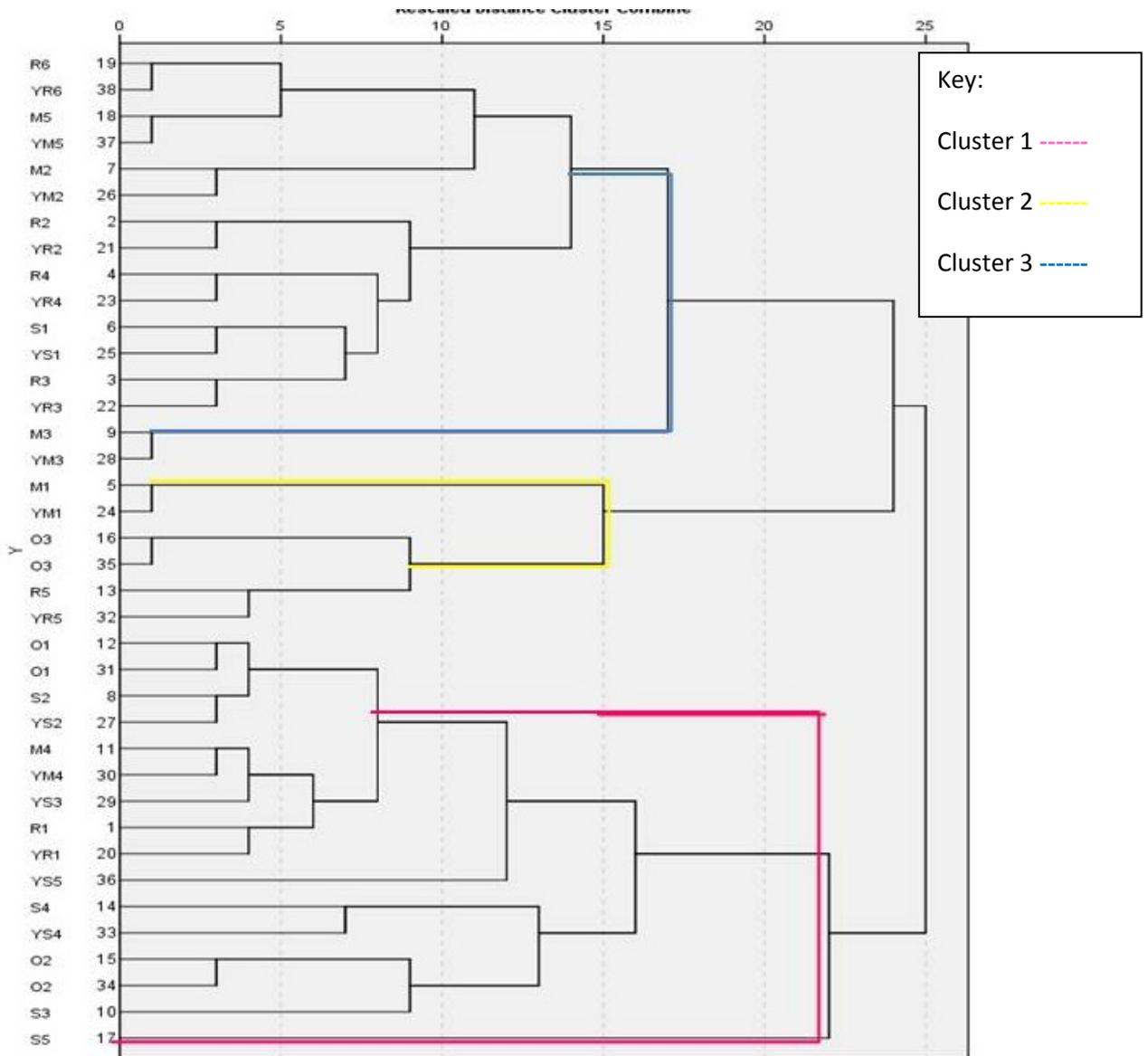
If you have any queries, or would like to contact me you can email: lynn.oxborrow@ntu.ac.uk or tel: 0115 8486048.

THANK YOU

23. If you would prefer not to be contacted again, please indicate here

do not contact

Appendix 3.8a Hierarchical Cluster Analysis: Dendrogram using complete linkage between cases



Appendix 3.8b Defining Cluster Membership

Hierarchical Clusters x3	K Means test 3 Clusters	Actual clusters selected	KEY
R1 YR1	YM2	YR1	M3/ R2/ S1 = Importance 'Now' response YM1/YS2/ YR3 = Importance '5 years from now' response
S2 YS2	YS2	YM2	
S3 YS3	YS3	YS2	
M4 YM4	YM4	YS3	
O1 YO1	YS4	YM4	
S4 YS4	YO2	YO1	
O2 YO2	YS5	YS4	
S5 YS5	YR1	YO2	
R2 YR2	YR2	YS5	
R3 YR3	YR3	YR2	
R4 YR4	YR4	YR3	
S1 YS1	YS1	YR4	
M2 YM2	YM5	YS1	
M3 YM3	YR6	YM5	
M5 YM5	YM1	YR6	
R6 YR6	YR5Y	YM1	
M1 YM1	YO1	YM3	
R5 YR5	YM3	YR5	
O3 YO3	YO3	YO3	

Appendix 3.9 Futures Table

Example of a Futures Table based on Cluster Analysis

The futures table of both the consumer and expert future images of the factors affecting meat consumption in Finland in 2030.

Variables		Consumers					Experts			
		Traditional Approach	Business as Usual	Humans First	Wellness	Vegetarian	Traditional Approach	Business as Usual	Humans First	Vegetarian
Economic	Increased income levels will have increased meat consumption	↑	↑	↔	↔	↓↓	↓	↔	↔	↓↓
	The global increase in meat prices will have decreased meat consumption	↓	↔	↔	↑↑	↑	↑	↑	↓	↑↑
	Cheap foreign meats will have entered the market	↑	↑	↓	↑↑	↓	↓↓	↑	↔	↓↓
Social	The number of vegetarians will have increased	↔	↑	↑	↑	↑↑	↓	↑	↑	↑↑
	Human remoteness from food production will have increased meat consumption	↓	↔	↓	↑↑	↓	↓↓	↔	↓	↓
	Interest in health factors will have increased the number of vegetarians	↔	↑	↑↑	↑↑	↑↑	↓	↑	↑	↑↑
Technical	An increase in the number and diversity of meat substitutes (such as soy and wheat protein products) will have decreased meat consumption	↓↓	↔	↔	↑↑	↑↑	↓↓	↑	↔	↑↑
	Laboratory grown artificial meat will have replaced conventional meats	↓↓	↓	↓↓	↑	↓	↓↓	↓	↓↓	↔
	Development of less fatty meat products will have increased meat consumption	↔	↑	↑	↑↑	↔	↔	↑	↔	↓↓
Environmental and Ethical	Global increases in the price of raw materials and scarce resources (water, energy and land) will have decreased meat consumption	↓	↔	↔	↑	↑	↑	↑	↓	↑↑
	Increases in animal diseases will have decreased meat consumption	↓↓	↔	↔	↑↑	↓	↓↓	↔	↓↓	↔
	An increase in animal rights issues in society will have decreased meat consumption	↓↓	↔	↔	↑	↑↑	↓↓	↔	↓	↑↑
Number of cases in the cluster	Preferable	9	15	0	50	28	2	4	8	3
	Probable	7	94	4	7	1	0	12	5	0
	Total	16	109	4	57	29	2	16	13	3

■ - very undesirable or very improbable. ■ - very preferable or very probable.

Source Vinnari and Tapio (2009:274). Reprinted from Futures, vol. 41, 2009, Vinnari, M. and Tapio, P., Future Images of meat consumption in 2030, pp269-278, Copyright 2009 with permission from Elsevier, <http://dx.doi.org/10.1016/j.futures.2008.11.014>

Key:

Rankings of 0-2 and 8-10 (of 10) labelled ↓↓ or ↑↑ respectively

Rankings of 2-4 and 6-6 (of 10) labelled as ↓ or ↑ respectively

Ranking 4-6 as ↔

Appendix 4.1 Sample Interview Transcription: contract clothing and brand manufacturer

Withheld to preserve confidentiality

Appendix 4.2 Full range of variables with their perceived importance now and predicted importance in 5 years' time.

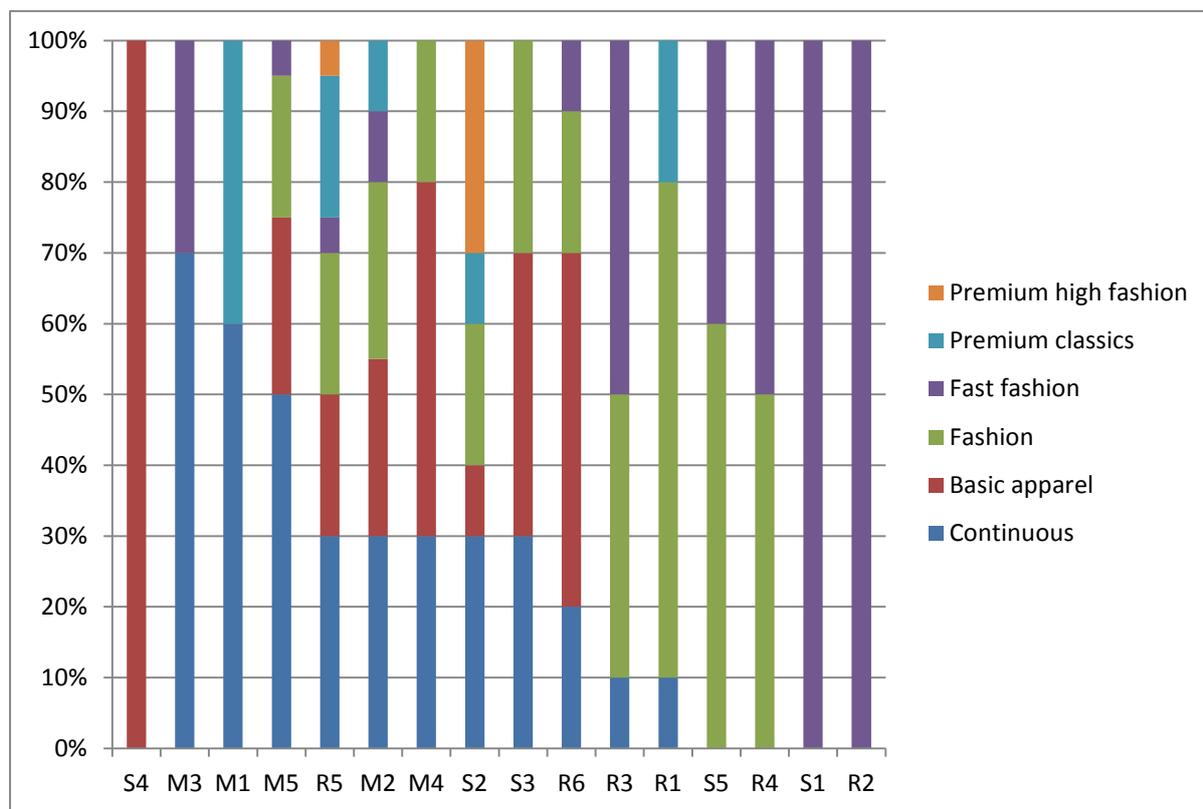
Rank of Importance - all variables Now and in 5 years from now

Supply chain strategic/ operational variable	Mean NOW	StDev NOW	Rank Now	Mean 5 Years	StDev 5 Years	Rank in 5 Years
Delivery flexibility	4.5	0.6	1	4.6	0.6	1
Multi-channel retailing	4.4	0.8	2	4.6	0.6	2
Monitoring product quality against specification	4.3	0.7	3	4.3	0.7	5
Flexibility through decisions made closer to selling season	4.2	0.7	4	4.2	0.8	13
Reducing lead time	4.2	1.0	5	4.5	0.7	3
Replenishing good sellers	4.2	0.9	6	4.1	0.9	15
Reducing cost	4.2	1.0	7	4.4	0.8	4
Developing long term relationships	4.1	0.8	8	4.0	1.0	18
Sourcing offshore from third party suppliers (offshore outsourcing)	4.1	1.0	9	3.9	1.1	25
Introducing new styles quickly in response to media/events	4.0	1.0	10	4.3	0.8	7
Mid-high value, specialist brand retailing	3.9	0.9	11	3.9	0.7	21
Disintermediation (Direct retailer - supplier contact)	3.9	0.9	12	3.9	0.8	22
Standardisation across retail channels (online/ overseas etc.)	3.9	0.8	13	4.2	0.9	11
Re-engineering designs to reduce product costs	3.9	0.9	14	4.2	0.8	12
Differentiating product by quality, durability and performance	3.8	1.0	15	4.2	0.8	10
Internationalisation of retail distribution	3.8	1.1	16	4.3	0.8	9
Rigorous product testing of materials and components	3.8	0.8	17	3.9	0.9	23
Use of external designers/ suppliers to inject new styles	3.8	0.9	18	4.1	0.7	17
Ordering within selling season	3.8	0.8	19	4.1	1.0	16
Transparency of suppliers, materials, chemicals, labour etc.	3.8	1.0	20	4.3	0.9	6
Locating sourcing to find the most reliable of low cost suppliers	3.8	1.1	21	4.0	1.2	20
Comprehensive financial measures of supply chain performance	3.8	1.2	22	4.0	1.2	19
Retail ordering FOB (Free on Board) consignments from overseas	3.6	1.6	23	3.6	1.4	41
Fast fashion retailing	3.6	1.4	24	3.9	0.9	24
Ability to access finance for materials and production	3.6	1.5	25	3.7	1.4	33
Retailers controlling the product design process	3.6	1.2	26	3.6	1.1	39
Intermediation (use of sourcing companies)	3.6	0.8	27	3.4	0.8	49
Product proliferation (more styles introduced each season)	3.5	0.8	28	3.8	1.0	28
Discount/ low cost retailing	3.5	1.2	29	3.6	1.0	38
Reducing inventory	3.5	1.3	30	4.2	0.8	14
Cancelling/ changing orders once placed	3.5	1.1	31	3.4	1.1	50
Pre-booking capacity, with styles confirmed later	3.5	1.3	32	3.6	1.5	42
Ordering based on lowest unit cost/ highest gross margins	3.4	1.3	33	3.9	1.3	27
Retail brand proliferation	3.4	1.2	34	3.6	0.9	37
Use of overseas supply base to access new markets	3.4	1.5	35	3.6	1.4	43
Consistent strategic and operational alignment	3.4	1.6	36	3.8	1.7	30
Centralisation of distribution centres	3.4	0.9	37	3.8	1.0	29
Environmental Sustainability	3.4	1.0	38	4.3	0.7	8
Locating manufacturing to access high quality skills and technologies	3.3	1.0	39	3.8	1.1	31

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Reducing batch sizes	3.3	1.1	40	3.4	1.2	51
Sharing retail sales data upstream in supply chain	3.3	1.4	41	3.6	1.5	36
Designs using a limited choice of pre-tested or stock fabric and components	3.3	1.1	42	3.7	1.2	34
Re-locating sourcing based primarily on lowest cost suppliers	3.3	1.2	43	3.7	1.2	35
Locating manufacturing to be close to sources of materials	3.2	1.4	44	3.5	1.5	45
Retailers designing inhouse for own brands	3.2	1.4	45	3.4	1.4	47
Gradual/ incremental product changes	3.2	0.6	46	3.4	1.0	46
Using technology to replace physical sampling	3.2	1.0	47	3.9	1.0	26
Delayed finishing - dye, print, embroider, etc - of greige/part finished goods	3.1	1.4	48	3.6	1.3	40
Lengthening payment terms to suppliers	3.1	1.5	49	3.4	1.4	48
Competing for capacity in Chinese factories/ logistics	3.1	1.3	50	2.9	1.4	61
Building a portfolio of design developments ready to use	3.1	1.6	51	3.7	0.9	32
Outlet (clearance) retailing	3.1	0.9	52	3.3	0.8	53
Off shore sourcing from own facilities	3.1	1.3	53	3.2	1.3	57
Dual sourcing (same product, more than 1 source)	3.0	1.4	54	3.1	1.5	58
Supplier management of inventory	2.9	1.7	55	3.5	1.5	44
Investment in capacity/skill base of close proximity suppliers	2.9	1.5	56	2.8	1.8	66
Managing demand through discount/ special offers	2.9	1.6	57	2.7	1.5	67
Locating sourcing to find duty-free sources of supply	2.9	1.5	58	3.2	1.5	56
Use of UK supply to create a marketing advantage	2.9	1.4	59	2.9	1.2	63
Vertical integration (retailers investing in supply/ manufacture)	2.8	1.1	60	3.1	1.4	59
Sourcing from local suppliers or agents with off-shore production	2.8	1.6	61	2.9	1.6	62
Suppliers requesting upfront payments	2.8	1.4	62	2.9	1.3	64
Vertical integration (investment from upstream in manufacture/ retail)	2.7	0.9	63	3.3	1.0	54
Establishing overseas retail buying offices close to suppliers	2.7	1.3	64	3.2	1.5	55
Sourcing from suppliers with production close to market	2.7	1.5	65	3.3	1.6	52
Call-off from supplier's distribution centre	2.6	1.6	66	2.6	1.8	69
Sourcing from UK suppliers	2.4	1.3	67	2.6	1.3	70
Foreign investment in UK based suppliers	2.3	1.4	68	2.9	1.5	65
Supplier contributions to markdown and promotion costs	2.2	1.4	69	2.6	1.4	68
Stimulating consumer purchases by limiting availability	2.2	1.3	70	2.3	1.5	71
Suppliers delivering online orders direct to consumer	2.0	1.5	71	3.0	1.3	60

Appendix 4.3 Mix of seasonal products among respondents



Key to respondent codes:

- S Supplier
- M Manufacturer
- R Retailer

Omits 'other' service providers with no direct product to categorise.

Key to product seasonality categories:

- Continuous: unchanging season to season
- Basic apparel: minor changes season to season
- Fashion: changes each major season, 2-4 times per year
- Fast fashion: changes more than 4 times each year
- Premium classics: few seasonal changes
- Premium high fashion: major change each season

Appendix 4.4 Summary of the top 20 variables for each cluster ranked in order of importance, now and in 5 years' time.

Cluster 1: Contemporary classic chain priorities now	Cluster 2: Fast fashion supply priorities now	Cluster 3: Updated retro response priorities now
<ol style="list-style-type: none"> 1. Sourcing offshore from third party suppliers (offshore outsourcing) 2. Reducing lead time 3. Flexibility through decisions made closer to selling season 4. Delivery flexibility 5. Reducing cost 6. Monitoring product quality against specification 7. Mid-high value, specialist brand retailing 8. Multi-channel retailing 9. Replenishing good sellers 10. Comprehensive financial measures of supply chain performance 11. Developing long term relationships 12. Locating sourcing to find the most reliable of low cost suppliers 13. Differentiating product by quality, durability and performance 14. Use of external designers/ suppliers to inject new styles 15. Introducing new styles quickly in response to media/events 16. Reducing batch sizes 17. Ordering within selling season 18. Sharing retail sales data upstream in supply chain 19. Internationalisation of retail distribution 20. Retail ordering FOB (Free on Board) consignments from overseas 	<ol style="list-style-type: none"> 1. Delivery flexibility 2. Use of overseas supply base to access new markets 3. Multi-channel retailing 4. Rigorous product testing of materials and components 5. Monitoring product quality against specification 6. Ability to access finance for materials and production 7. Internationalisation of retail distribution 8. Fast fashion retailing 9. Developing long term relationships 10. Re-engineering designs to reduce product costs 11. Introducing new styles quickly in response to media/events 12. Building a portfolio of design developments ready to use 13. Ordering within selling season 14. Standardisation across retail channels (online/ overseas etc.) 15. Flexibility through decisions made closer to selling season 16. Transparency of suppliers, materials, chemicals, labour etc. 17. Reducing lead time 18. Dual sourcing (same product, more than 1 source) 19. Investment in capacity/skill base of close proximity suppliers 20. Use of UK supply to create a marketing advantage 	<ol style="list-style-type: none"> 1. Delivery flexibility 2. Multi-channel retailing 3. Disintermediation (Direct retailer - supplier contact) 4. Replenishing good sellers 5. Reducing cost 6. Developing long term relationships 7. Monitoring product quality against specification 8. Mid-high value, specialist brand retailing 9. Standardisation across retail channels (online/ overseas etc.) 10. Retailers controlling the product design process 11. Product proliferation (more styles introduced each season) 12. Retailers designing in-house for own brands 13. Flexibility through decisions made closer to selling season 14. Reducing inventory 15. Intermediation (use of sourcing companies) 16. Re-engineering designs to reduce product costs 17. Introducing new styles quickly in response to media/events 18. Discount/ low cost retailing 19. Lengthening payment terms to suppliers 20. Fast fashion retailing

Cluster 1: Contemporary classic chain 5 years from now	Cluster 2: Fast fashion proximity 5 years from now	Cluster 3: Updated retro response 5 years from now
<ol style="list-style-type: none"> 1. Reducing lead time 2. Multi-channel retailing 3. Sourcing offshore from third party suppliers (offshore outsourcing) 4. Use of external designers/ suppliers to inject new styles 5. Delivery flexibility 6. Reducing cost 7. Comprehensive financial measures of supply chain performance 8. Reducing inventory 9. Monitoring product quality against specification 10. Transparency of suppliers, materials, chemicals, labour etc. 11. Flexibility through decisions made closer to selling season 12. Mid-high value, specialist brand retailing 13. Disintermediation (Direct retailer - supplier contact) 14. Differentiating product by quality, durability and performance 15. Internationalisation of retail distribution 16. Replenishing good sellers 17. Re-engineering designs to reduce product costs 18. Introducing new styles quickly in response to media/events 19. Environmental Sustainability 20. Ordering based on lowest unit cost/ highest gross margins 	<ol style="list-style-type: none"> 1. Delivery flexibility 2. Standardisation across retail channels (online/ overseas etc.) 3. Centralisation of distribution centres 4. Introducing new styles quickly in response to media/events 5. Sourcing from suppliers with production close to market 6. Investment in capacity/skill base of close proximity suppliers 7. Multi-channel retailing 8. Monitoring product quality against specification 9. Transparency of suppliers, materials, chemicals, labour etc. 10. Internationalisation of retail distribution 11. Environmental Sustainability 12. Ordering within selling season 13. Locating sourcing to find the most reliable of low cost suppliers 14. Building a portfolio of design developments ready to use 15. Establishing overseas retail buying offices close to suppliers 16. Rigorous product testing of materials and components 17. Reducing lead time 18. Differentiating product by quality, durability and performance 19. Developing long term relationships 20. Consistent strategic and operational alignment 	<ol style="list-style-type: none"> 1. Delivery flexibility 2. Multi-channel retailing 3. Reducing cost 4. Replenishing good sellers 5. Introducing new styles quickly in response to media/events 6. Environmental Sustainability 7. Re-engineering designs to reduce product costs 8. Mid-high value, specialist brand retailing 9. Monitoring product quality against specification 10. Internationalisation of retail distribution 11. Differentiating product by quality, durability and performance 12. Product proliferation (more styles introduced each season) 13. Reducing inventory 14. Reducing lead time 15. Transparency of suppliers, materials, chemicals, labour etc. 16. Ability to access finance for materials and production 17. Standardisation across retail channels (online/ overseas etc.) 18. Retailers designing in-house for own brands 19. Intermediation (use of sourcing companies) 20. Rigorous product testing of materials and components

Appendix 4.5 Individual Feedback and Request for Round 3 Comments

Withheld to preserve confidentiality

Appendix 5.1 Coding Table for Round 1 and Round 2 findings

Topic/ code	Qualitative evidence	Quantitative evidence	Cross Impact
order winners/ qualifiers		Managing consumer demand through discounts or limited availability less important going forwards	
Cost	Always behind decisions, seemingly regardless of other objectives	Reducing cost important now -set increase. Reducing inventory forecast to increase markedly.	Very, very cheap to cheap suppliers to support best quality
Delivery/ speed	Decision process pushes decisions closer to delivery Mechanism to reduce inventory cost/ risk Results in last minute orders form flexible contractors	Reducing lead time important now and set to increase slightly to become top priority.	Speed supports reduced inventory cost, but reducing cost delays lead time.
Quality	Dependence on established relationships Cost of compliance per unit has increased because of smaller batches	Quality against specification ranked high, but stable; Quality for differentiation predicted to increase	Trade-off between time and quality because of tests and capacity of high quality suppliers
Performance / reliability	Highly important – another given in some markets.	Current sourcing decisions based on reliability as well as cost, though cost decisions set to increase faster. Dual sourcing moderate importance with little increase.	Fast turnaround/ payments secures reliability upstream
Flexibility/ responsiveness	Pressure to improve but at low/ no cost	Most important criteria, but stable going forwards. Replenishment and flexibility to late decisions set to decrease in priority	Short seasons create milestones in NPD process

Future Scenarios in UK Apparel Supply Chains

Topic/ code	Qualitative evidence	Quantitative evidence	Cross Impact
Innovative-ness	<p>Design expertise/ innovation in collaborative product development provides supplier point of difference (lingerie/ hosiery)</p> <p>Costly tests, sampling costs increase – not proportionate to batch size or frequency of new product</p> <p>Modular materials, pre-testing etc. not acceptable to retailers – limits choice for innovative designs; supplier knowledge enables cost and performance to be combined with fabric aesthetics</p> <p>Processes only feasible if large volumes concerned and committed by retailers</p> <p>Physical sampling prevails</p>	<p>Currently most important and set to increase: introducing new styles quickly, re-engineering designs for cost and use of external design input.</p> <p>Less important now but predicted to increase faster: designs using pre-tested fabric, virtual sampling, postponed finishing and design portfolio buffering. Rigorous materials testing important but marginally increasing</p>	<p>Design process is slow and lengthens lead time/ passes time pressure to production and delivery</p> <p>Disloyalty – designs passed to good performers</p> <p>Postponement etc supports responsive lead time but only viable for very large batch size.</p>
Services	<p>Supplier held inventory for call-off. Provides competitive advantage for basics. Supports IT for contract mfr; availability for performance or brand and supports direct sales and ecomm. High risk for fashion. Retail data is inferior</p> <p>Knowledge of upstream supply is protected</p> <p>Management of upstream supply valued by smaller retailers – provides flexibility for small batches</p> <p>Little evidence of pre-booked capacity</p>	<p>Short-order is the most significant service area, but little increase predicted.</p> <p>Less important now but predicted to increase faster: Sales data shared upstream, supplier managed inventory and supplier contribution to marketing costs.</p> <p>Supplier distribution of online orders increases rapidly.</p>	<p>Design/ NPD/ testing is part of high level service even for SME</p>
Business Environment	<p>Retail channels create complexity</p> <p>Brands more cautious of placing production orders – wait and pilot.</p> <p>Overseas ownership – buy into customer base, support mfr capacity overseas, buy into know-how for emerging retail/ supply business.</p>	<p>Multi-channel retail most important factor and set to grow,</p> <p>Along with internationalisation and standardisation.</p> <p>Overseas investment in UK capacity forecast to grow from low base.</p> <p>Sustainability set to become high priority.</p> <p>Overseas supply for access to new markets more important than domestic supply for market advantage.</p>	

Future Scenarios in UK Apparel Supply Chains

Topic/ code	Qualitative evidence	Quantitative evidence	Cross Impact
Company capability	Fast Fashion associated with more control of process by retailer.	Centralised distribution predicted to increase.	
Vertical integration	Contract manufacture for retail brands – use owned capacity for control and delivery. Brands – use own facility for IP Can be inefficient – need to fill capacity and minimise overheads. Need to own facilities to be profitable	Predicted to increase most is investment into downstream SC from suppliers; with some investment upstream. Use of owned facilities for production moderate and stable.	Limits mix flexibility – can only make what own capacity can do (hosiery).
Outsourcing	Contract manufacture for retail brands – outsource for cost Brand retailer/ performance wear: outsource for flexibility to volume and quality as well as cost	Use of own factories is of moderate importance and little change predicted. Use of intermediaries and sourcing from third party suppliers set to decrease though of higher overall importance. Product proliferation, smaller batch sizes set to increase, but sourcing focus primarily cost/ reliability orientated but with proximity increasing faster.	Ownership of design process provides more flexibility to source for responsiveness
Subcontract	Overlooked in theoretical terms – supports fast fashion and made to order. Provides flexibility, responsiveness and reactive capacity Small volumes, fast turnaround, high levels of service. Control for brand and local supply	Third part sourcing important but decreases. Could result in more direct retail subcontract – retail control of design is stable.	Overcapacity thing of the past – pressure to keep market share, rather than provide extra services, as long as costs low.
Supplier Assessment	Little evidence of new supplier evaluation except upstream for innovative components. Decision sequence ...Location – supplier – which product to place. Use of intermediary to source small volume/ high quality and high volume/ low price Assessment of existing suppliers based on performance against reliability/ quality and compliance. Cost/ poor delivery performance results in less business rather than de-selection.	Location decisions based increasingly on cost and skills/ technology Sourcing locally to access overseas supply is less important that increasing proximity between market/ buying office and production. Reduced use of intermediaries is predicted.	Stereotype existing and potential suppliers according to country/ custom – affects speed and responsiveness

Future Scenarios in UK Apparel Supply Chains

Topic/ code	Qualitative evidence	Quantitative evidence	Cross Impact
Current	Choose most appropriate supplier for each product from existing list. Varies by brand/ own contract.	Most important factors for location/ supplier selection are reliability (at cost), cost and skills/ technologies.	
Available/ New	Big decision to relocate production to new upstream supplier. May be stage of developing own production or JV Closer suppliers provide speed but at cost. Skills lacking in UK. Increasingly appraised on ability to deal with volume flexibility	Future location decisions based on reliability, with increased emphasis on cost, skills/ technologies, proximity of materials. Fastest increase predicted to be in proximity to market, or buying offices with proximity to supply, though with little emphasis on domestic supply.	
Upstream	Choose the best, not just based on costs or location “close to needlepoint”. Selection for innovation and specialisation. Some specified by retailer. Change for each product – Zara few/ bulk vs M&S many/small batch model Subject to exclusivity deals to prevent transparency leading to opportunism. Supplier skill is to match retailer selection to price/ performance and availability. Sometimes involves local agent for knowledge.	Locating manufacturing close to fabrics is predicted to increase slightly from moderate importance. Finance for production of moderate importance but relatively stable.	Restricts responsiveness, quality or cost of production Knowledge is key – supplier retained. Some retail pre-selection of fabrics

Appendix 5.2 Q2 Analysis of variables by cluster 5 years from now and change from now

Factors with largest/ most consistent increase in importance

Supply chain strategic/ operational variable	Mean C1 5Y	Mean C2 5Y	Mean C3 5Y	Selected Qualitative findings (from survey only)
Reducing lead time	4.7	4.5	4.0	Must be on time, when needed M4; Priorities are speed logistics and Critical Path R1 Most important processes will reduce lead time to market S4
Multi-channel retailing	4.4	4.7	4.8	We expect more online niche retail custom M1 Puts pressure on retail distribution and inventory systems S3 Online will grow = I want in now anytime of day culture R6
Sourcing offshore from third party suppliers (offshore outsourcing)	4.4	3.2	3.8	It's survival of the fittest, failure will reduce choice M3
Use of external designers/ suppliers to inject new styles	4.3	4.0	3.5	Priority is newness at speed, but creative suppliers need investment to achieve other priorities M3 As an agent we need to offer a design service to supplement retailers' team S5
Delivery flexibility	4.3	5.0	4.8	
Reducing cost	4.3	4.3	4.5	Forces suppliers to use cheaper components; pressure to reach price points adds to risk M3
Comprehensive financial measures of supply chain performance	4.2	4.3	3.0	Cash flow is a current problem; retailers' cash is tied in unsold inventory – makes new season ordering erratic and inefficient. M4
Reducing inventory	4.2	4.2	4.0	Short leadtimes force suppliers to risk stock fabricM3
Monitoring product quality against specification	4.2	4.7	4.0	Faster response dictates need for right first time R1
Transparency of suppliers, materials, chemicals, labour	4.2	4.7	4.0	Pressure for visibility within whole pipeline R1 Accreditation is further cost for suppliers M3 Metrics will become as normal as quality M4 This is a valuable secondary story for our niche garments S4
Flexibility through decisions made closer selling season	4.1	4.5	3.8	
Mid-high value, specialist brand retailing	4.1	3.7	4.0	
Disintermediation (Direct retailer - supplier contact)	4.1	4.0	3.5	Some retailers avoid direct contact as suppliers are not compliant R7
Differentiating product by quality, durability, performance	4.1	4.5	4.0	
Internationalisation of retail distribution	4.1	4.7	4.0	Puts pressure on inventory and logistics; stock holding and distribution need to be aligned for global markets R1 Thinking that a tired western retail concept will wow them in China O1
Replenishing good sellers	4.1	4.0	4.3	V. important In our core repeat business S2
Re-engineering designs to reduce product costs	4.0	4.4	4.3	Stifles creativity M3 Design for efficient production M4
Introducing new styles quickly in response to media/events	4.0	4.8	4.3	
Environmental Sustainability	4.0	4.7	4.3	V. difficult for small suppliers to manage M1
Ordering based on lowest unit cost/ highest gross margins	4.0	4.0	3.3	Less onus on price R1

Future Scenarios in UK Apparel Supply Chains

Sharing retail sales data upstream in supply chain	4.0	4.3	0.0	
Ordering within selling season	4.0	4.7	2.5	
Standardisation across retail channels (online/ overseas etc.)	4.0	4.8	3.8	
Product proliferation (more styles added each season)	3.4	4.3	4.0	Future is buying tight R1. In the future there will be better balance between the spray and prey offer – lots of SKUs - and the narrow and deep method of choosing fewer products but buying larger quantities M6

Factors with variable change in importance C1-C3 (predominantly increasing)

Locating sourcing to find the most reliable of low cost suppliers	3.9	4.6	3.5	As a supplier we have to look at new quality, low cost sources to keep our business S5
Reducing batch sizes	3.9	3.2	1.5	Pressure for smaller batch sizes R1 For some items we start with 1-2000 and then repeat as sales take-off – 45,000 is the record M6
Pre-booking capacity, with styles confirmed later	3.9	4.3	0.0	They book less in advance – hold back, They are scared to commit to anything in advance - but that helps us M6
Developing long term relationships	3.9	4.5	3.7	Some suppliers have been with us for 20 years, tied in by technological investments M4; Greater onus on collaboration R1 Greater pressure for margin discourages relationships M3 We have sought suppliers that we can build relationships with S4 If you have a good relationship an extra 5p or 10p per item is neither here nor there R7
Locating manufacturing to access high quality skills and technologies	3.8	4.4	3.0	Access to technical skills will become more critical in NPD, QC and multi-channel retail O2 Suppliers need more skills to fill former retail/ creative roles M3
Delayed finishing - dye, print, embroider, etc - of greige/part finished goods	3.8	4.4	2.3	Need more customisation to create point of difference M3
Using technology to replace physical sampling	3.8	4.4	3.5	Technology can help speed sampling S4 We would prefer to use more technology, but retailers increasingly ask for physical samples S5
Retail ordering FOB (Free on Board) consignments from overseas	3.8	4.0	1.5	Puts huge pressure on retailers – no more vendor based inventory; retailers should concentrate on selling not buying S3 Retailers are taking more control with FOB S2
Consistent strategic and operational alignment	3.8	4.5	3.0	If retail strategy changes our SC is massively affected S2; Key to future success M4
Rigorous product testing of materials and components	3.7	4.6	3.8	We are constantly asked to repeat tests for small batches. It costs £250 a go and stops production M6
Fast fashion retailing	3.7	4.3	3.8	
Re-locating sourcing based on lowest cost suppliers	3.4	4.2	3.5	Less movement to lowest cost R1 Sourcing in rich countries is about finding suppliers in poor countries O1
Centralisation of distribution centres	3.4	4.8	3.3	
Building portfolio of design developments ready to use	3.4	4.6	3.3	
Cancelling/ changing orders once placed	3.4	3.7	2.5	
Retail brand proliferation	3.4	4.0	3.5	
Discount/ low cost retailing	3.4	3.8	3.8	We have to cut corners to maintain these prices R7
Use of overseas supply base to access new markets	3.4	4.5	2.7	

Future Scenarios in UK Apparel Supply Chains

Designs using a limited choice of pre-tested or stock fabric and components	3.4	4.0	3.8	We hold fabric for fast/ flexible production; we need to broaden holding for wider markets M1 The most successful speed to market strategy involves pre-tested BOM M4 Our processes involve use of tried and tested fabrics. Technology will reduce design costs & speed it up S4 This is interesting. We like to do this but it depends on the market – classic or high fashion S5
Intermediation (use of sourcing companies)	3.3	3.3	3.8	As an agent I need to make sure we offer added value such as design/ service S5
Gradual/ incremental product changes	3.3	4.0	3.0	Small batches help retailers to make changes if needed during season. M6
Locating sourcing to find duty-free sources of supply	3.3	4.4	1.5	Sourcing is a combination of low cost, quality and duty free S4
Retailers designing in-house for own brands	3.3	3.4	3.8	Central design is very important to the retailers but I think they will centralise design more to avoid duplication M6.
Locating manufacturing close to sources of materials	3.3	4.0	3.3	We are having to source cheaper materials from lower cost countries M3 Real question is where to locate design functions – near customer or near supply? S2
Supplier management of inventory	3.3	4.2	2.5	Moves to upstream management of fabrics M3
Vertical integration (investment from upstream in manufacture/ retail)	3.2	3.8	2.5	VI helps with quality control in some situations
Retailers controlling the product design process	3.2	4.4	3.5	75% of what we do is retail design M6
Ability to access finance for materials and production	3.2	4.5	4.0	Banks will need to be more supportive M3
Outlet (clearance) retailing	3.1	3.5	3.3	More JIT will lead to demise of outlet retail S4
Lengthening payment terms to suppliers	3.0	4.3	3.7	Suppliers with longer payment terms will be favoured M3 Most retailers have extended terms to 60 days S5 Our customers pay in 7 days for Fast Fashion M6

Factors with divergent change in importance C1-C3

Establish overseas retail buying offices - close suppliers	2.9	4.6	2.3	Once they get to a certain size retailers all have own offices overseas S5
Off shore sourcing from own facilities	2.7	4.0	3.0	
Suppliers delivering online orders direct to consumer	2.7	3.3	3.5	As a small retailer what hurts us is large retailers able to use click and collect in their stores. We can't compete with that.
Dual sourcing (same product, more than 1 source)	2.6	4.5	2.8	Need varied suppliers for different retailers – even for same products M3; Divides retail loyalty M6 We have to forward order from overseas, but then have to cut back on short order from UK as we don't have the cashflow R7
Sourcing from suppliers - production close to market	2.6	4.8	3.0	Our main customer sources enough from UK for us to feel secure in building a bigger factory M6
Foreign investment in UK based suppliers	2.6	4.5	1.7	
Investment in capacity/skill base of close proximity suppliers	2.4	4.8	1.3	We have made personal decision to invest ourselves in expanding UK production M6
Use of UK supply to create a marketing advantage	2.3	4.3	3.0	Our small online customers are finding us for UK made story M1 and responsiveness;
Sourcing from local suppliers or agents with off-shore production	2.2	4.2	3.0	

Factors with generally falling importance

Call-off from supplier's distribution centre	3.1	2.5	0.5	Retailers want JIT but don't consider the batch size issues S2 Call-off only by pre-arrangement S5
Competing for capacity in Chinese factories/ logistics	3.0	2.8	3.0	Much debate about post-China sources O2
Suppliers requesting upfront payments	2.9	3.3	2.7	
Vertical integration (retailers investing in supply/ manufacture)	2.9	3.8	2.3	
Managing demand through discount/ special offers	2.3	3.3	2.8	"Potentialising sales" R1
Supplier contributions to markdown & promotion costs	2.3	3.2	2.0	
Sourcing from UK suppliers	2.1	3.6	2.3	We set up UK production for high end, but it has to be financially viable M3 Cost and quality combine to make offshore sourcing more attractive than UK; UK only relevant to specialist performance wear S4 We can't source anything complex in UK because the skills don't exist here anymore and the price would be too high R7
Stimulating consumer purchases by limiting availability	2.1	3.0	1.8	We need to better understand our customers – the only certainty is uncertainty M4
	Key			No change in importance
		Substantial increase in importance		Fall in importance
		Some increase in importance		Substantial fall in importance