An assessment of sourcing strategies in the apparel industry

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An assessment of sourcing strategies in the Swedish apparel industry

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Abstract

Purpose – The purpose of this paper is (i) to empirically identify different types of sourcing strategies applied in the apparel industry, and (ii) to explain how various sourcing strategies are related to the apparel firm's characteristics, prerequisites and supplier performance.
Design/methodology/approach – This paper is based on a survey that was sent out to Swedish apparel firms. Commonly applied sourcing strategies, in terms of supply markets and supply channels, are first derived using cluster analysis. These strategies are then linked to relevant firm characteristics, prerequisites and supplier performance measures, where significant differences between groups of firms applying various sourcing strategies are targeted.
Findings – Five commonly applied sourcing strategies are identified. Further, several significant differences – with respect to product issues, organizational issues and supplier performance – are found between the firm groups.
Research limitations/implications – Several future research areas in conjunction with this study can be derived by widening or changing the scope. For instance, other industries as well as apparel industries in other countries can be targeted and thus provide valuable comparisons.
Practical implications – Assessing the contextual appropriateness of sourcing strategies provides a strategic sourcing benchmark for firms across industries. Notably, apparel firms' experience in exploiting low-cost supply markets may provide valuable insights for firms that just recently have recognized the potential of these markets.
Originality/value – This paper provides a contextual understanding of how various sourcing strategies are utilized in the Swedish apparel industry, and thereby contributes to the general conception of sourcing strategies.

Key words – Apparel industry, sourcing strategy, supply chain management, low-cost sourcing, supply market, supply channel.

Paper type – Research paper.

Introduction

Firms in the apparel industry have applied sourcing strategies utilizing low-cost supply markets for a long period of time – both in Western Europe and in North America. For instance, many apparel firms in Western Europe initiated low-cost sourcing by shifting manufacturing to low-cost countries even long before the 1980s (Taplin, 2006; Stengg, 2001). At the same time, relatively high-cost supply markets still house garment manufacturing, and countries like Italy, Spain and Portugal have a considerable amount of manufacturing suppliers that are subcontracted by apparel firms – both domestic and foreign (Stengg, 2001). Additionally, apparel firms source their garments through

different supply channels – some firms being manufacturers themselves whereas others source either directly from manufacturing suppliers or indirectly from these via intermediaries (Popp, 2000). In this paper, sourcing strategies are thus primarily understood in accordance with both of these dimensions, i.e. as firms' choices among possible supply markets and supply channels.

A recognized feature on the demand side of an apparel supply chain is both the end-consumers' and the garment types' diverse requirements, concerning for instance quality and innovativeness, which have created a variety of different market niches (Parrish et al., 2004). In some of these niches, firms need to adapt sourcing strategies to challenges in terms of volatile demand, increased competition, shorter product life cycles and higher shares of low-volume garments (Bruce et al., 2004; Jin, 2004; Tyler et al., 2006) whereas other firms occupy niches where they are experiencing an even demand for standardized garments (Parrish et al., 2004).

Additionally, also on the supply side of an apparel supply chain, various supply options exist – partly related to the choices among supply markets and supply channels – but also related to supplier performance. Even though manufacturing techniques of garments are naturally labor-intensive and have seen little development lately, suppliers are still different in terms of performance. The varying supplier performance – for instance in terms of price, quality, flexibility and lead times – must thus be incorporated in apparel firms' strategic sourcing decisions.

Various sourcing strategies are thus appropriate in different situations. For instance, some apparel firms' market niches are characterized by a need to respond quickly to the volatile demand and to supply high-quality garments, whereas other firms' market niches are characterized by a need to compete first of all with low prices. Yet other firms serve market niches requiring a combination of responsiveness and a price focus. These different market niches, of course, affect the appropriateness of various possible sourcing strategies. Many firms in the apparel industry have further adopted various specific supply chain and logistics solutions – such as quick response practices (Forza and Vinelli, 2000; Perry and Sohal, 2000; Christopher and Towill, 2002; Jin, 2004), postponement techniques (Dapiran, 1992; Jin, 2004) and capacity reservation (Eppen and Iyer, 1997; Serel et al., 2000) – to increase flexibility also when using distant low-cost suppliers. However, these solutions require both knowledge, negotiation power in relation to suppliers and substantial resources. The apparel industry is consequently comprised of a variety of firm types with varying firm characteristics and prerequisites as well as with varying needs in terms of supplier performance. Hence, in this paper, it is assumed that the imposed consciousness of existing supply-related trade-offs has resulted in a set of common sourcing strategies that are applied depending on firm characteristics, prerequisites and supplier performance requirements.

The purpose of this paper can therefore be divided into two parts: (i) to empirically identify different types of sourcing strategies applied in the apparel industry, and (ii) to investigate how the identified strategies are related to the apparel firms' characteristics

and prerequisites as well as to their suppliers' performance. The latter sub-purpose implies assessing appropriate contexts of the identified sourcing strategies. Fulfilling both of these sub-purposes should provide important findings in terms of lessons for inexperienced firms in different industries that for instance – with the emergence and recent development of low-cost supply markets – are considering a shift in manufacturing locations. Additionally, the results should provide researchers with findings concerning mature adaptations of sourcing strategies in an industry with a durable optional exploitation of low-cost supply markets. This paper thus adds a nuanced perspective on advantages and disadvantages of low-cost sourcing that is absent in most previous research.

The paper begins by reviewing relevant previous research, where components of sourcing strategies as well as relevant firm characteristics, prerequisites and performance issues are derived. Thereafter, the applied method is presented, followed by the empirical findings, discussion and conclusion.

Dimensions of sourcing strategies

Sourcing strategies can be understood as comprised of two paramount strategic dimensions: the choice among various supply markets and the choice among various supply channels. Fraering and Prasad (1999) express these dimensions as national versus international sourcing and as internal versus external sourcing. Levy (1995), in a similar fashion, distinguishes between what he calls location-specific factors and relational factors that can be used to describe sourcing strategies. The former factors are related to the very location of manufacturing facilities, whereas the latter factors concern the relationships between different involved actors. A similar distinguishing classification is provided by Bolisani and Scarso (1996), who specifically within the Italian apparel industry look into both where and how apparel firms employ global manufacturing strategies.

The strategic choice among various *supply markets*, the first dimension, primarily reflects the availability of the nation-specific resource sought by apparel firms – unskilled cheap labor, and the trade-offs arising due to cultural and geographical distances as well as to obtained quality-price levels (Bolisani and Scarso, 1996). This is a well-covered topic where researchers have developed several models and concepts to help firms to handle these issues, particularly in relation to low-cost sourcing that specifically is considered to generate often-neglected hidden costs (Meijbom and Vos, 1997; Christopher and Towill, 2002; Jin, 2004). In addition, Lowson (2001; 2003) focuses on how supply market choices affect apparel firms' performance in terms of cost, quality, flexibility, innovation and design.

The second dimension of sourcing strategies, the choice among various *supply channels*, involves assessing firms' strategic choices in terms of available relational options concerning garment manufacturing. Initially, there is a make-or-buy decision (Cánez et al., 2000; Fill and Visser, 2000), which implies sourcing from a firm's internal

manufacturing facilities or sourcing from external suppliers. Bolisani and Scarso (1996) distinguish between direct investments and joint ventures as two types of internally controlled manufacturing operations, and subcontracting as sourcing from external suppliers. Further, there is a need to divide external sourcing into direct sourcing from manufacturers and indirect sourcing through agents or intermediaries (Popp, 2000). Consequently there are three main strategic sourcing options concerning the choice among supply channels: internal sourcing (own manufacturing as partial or whole ownership), direct external sourcing and indirect external sourcing.

In addition to this generally developed model of sourcing strategies, a specific strategic tool is commonly employed in the apparel industry – quick response practices. In this paper, quick response practices are specifically understood as *double sourcing*: i.e. use of one close, quick and expensive supplier and of one distant, slow and inexpensive supplier for the very same garment (Forza and Vinelli, 2000; Perry and Sohal, 2000; Christopher and Towill, 2002; Jin, 2004). Double sourcing allows for low-cost sourcing from distant supply markets and, at the same time, for responsiveness. Consequently, double sourcing must be considered as a conscious mixed supply market strategy with specific desired implications in comparison to other mixed sourcing solutions.

Firm characteristics' and prerequisites' influence on sourcing strategies

Firm characteristics and prerequisites with relevance for explaining the variety of applied sourcing strategies are touched upon in numerous research studies. In particular, two types of firm-related issues are described in conjunction with sourcing and sourcing strategies: product issues and organizational issues (Fraering and Prasad, 1999).

Product issues with impact on sourcing strategies are frequently addressed in the supply chain literature. Fisher (1997) distinguishes between lean and agile supply chains that are suitable for functional and innovative products respectively. He thus foresees that a variety of product-related issues have impact on the appropriateness of various sourcing strategies. Bruce et al. (2004) apply that conceptual classification specifically in the apparel industry and also use the approach of "leagile" supply chains. Bruce and Moger (1999) as well as Trent and Monzcka (2003) show that firms' varying need for *innovation* capabilities has an influence on applied sourcing strategies; the former authors for instance investigate the impact on sourcing strategies from "me-too" products – relying on well-known design, materials and manufacturing techniques – and new innovative products respectively. Bolisani and Scarso (1996) further show that firms with a *quality* focus have a tendency of choosing close collaboration with suppliers and these firms' suppliers are closely located in terms of both geographical and cultural distances. In opposition, firms with a *price* focus apply totally reversed sourcing strategies (Bolisani and Scarso, 1996; Bruce and Moger, 1999). The two-tailed quality-price issue is also highlighted by Cho and Kang (2001), who claim that finding suppliers who supply quality garments at a low cost is the competitive focus of firms in the apparel industry. Yet another relevant product issue is a firm's sourced *volume* of a product – where the particularly high number of units kept in stock is an industry-specific feature that makes

apparel sourcing complicated (Jin, 2004). Cho and Kang (2001) as well as Alguire et al. (1994) thus maintain that firms with high product volumes are more suited for global sourcing strategies than those with small product volumes.

In addition, organizational issues are often said to affect firms' choice among various sourcing strategies. Trent and Monzcka (2003) as well as Cho and Kang (2001), in that sense, argue that firm size affects the degree of sophistication of sourcing operations, where large firms are more likely to have implemented advanced global sourcing practices. Bruce and Moger (1999) also state that firm size influences sourcing behavior, where large firms have better possibilities to arrange co-partnerships with suppliers in distant supply markets. Bolisani and Scarso (1996) conclude that this is not necessarily so: instead, small firms sometimes have stronger incentives than large ones to apply low-cost sourcing strategies. According to Bruce and Moger (1999), both *absolute firm size* and *relative firm size* affect the choice of sourcing strategy – where small firms thus need to find supply markets with small suppliers and vice versa. Further, Bolisani and Scarso (1996) as well as Cho and Kang (2001) suggest that firms' *experience* may influence the chosen sourcing strategy, whereas Bruce and Moger (1999) note that firms which have their *own retail outlets* behave differently from firms which do not. The retailers' important roles and strong positions in apparel supply chains have implications for chosen sourcing strategies, since these firms have access to point-of-sales data that, for instance, are essential for effective demand-responsive sourcing (Tyler et al., 2006).

Supplier performance and sourcing strategies

It is widely argued that sourcing strategies with high integration between buyer and supplier render high supplier performance (Tan et al., 1998; Bruce and Moger, 1999; Trent and Monzcka, 2003); this is in fact the focal argument in the supply chain management literature. Sourcing strategies with close collaboration are, however, difficult to realize when a low-cost focus is applied – due for example to cultural and geographical distances – and such a focus may thus contribute to hidden costs often neglected by firms (Lowson, 2001; Warburton and Stratton, 2002; Lowson, 2003). Several performance indicators must therefore be considered simultaneously to illustrate the performance trade-off experienced by firms choosing between various sourcing strategies.

Price and quality performance is often the focus of previous research (e.g. Cho and Kang, 2001; Warburton and Stratton, 2002; Teng and Jaramillo, 2005). Performance issues in terms of deliveries and lead times are also frequently discussed (e.g. Cho and Kang, 2001; Lowson, 2003; Bruce et al., 2004; Teng and Jaramillo, 2005). In addition, performance in terms of issues concerning the relationship between buyer and supplier – such as communication, relationship atmosphere or obtained flexibility – is commonly considered in previous research (e.g. Trent and Monzcka, 2003; Bruce et al., 2004; Teng and Jaramillo, 2005; Tyler et al., 2006). Finally, supplier performance in terms of working conditions is occasionally considered, and notably in relation to garment manufacturing in low-cost countries (e.g. Emmelhainz and Adams, 1999).

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Conceptual model

This paper is based on the conceptual model which was derived from the reviewed literature. Figure 1 contains the model and illustrates the analysis structure. The model guided the entire research process and determined the steps of the analysis. Firstly, empirical data concerning supply markets and supply channels were collected; secondly, they were aggregated into sourcing strategies. Thirdly, the appropriate context of the applied strategies was assessed with respect to firm characteristics and prerequisites as well as to supplier performance; these variables were also collected as empirical data.

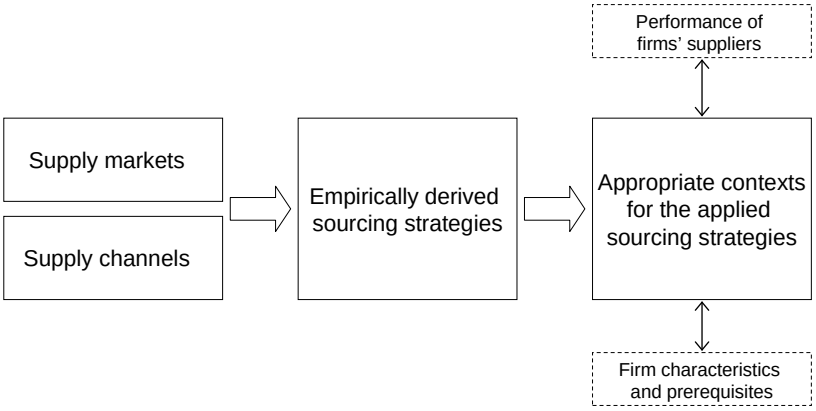

Figure 1: Conceptual model and analysis structure

Methodology

This paper utilizes results from a survey both to empirically determine sourcing strategies in accordance with the identified dimensions and to link these strategies to the applying apparel firms' characteristics, to their prerequisites and to their suppliers' performance. Initially below, the selection and data collection are presented; thereafter, operationalizations of the variables into a survey instrument and data reductions through factor analysis are conducted.

Selection and data collection

For the survey, a selection of the total population of Swedish firms regarded as apparel firms was used. The group of firms was conceptually defined as firms who for resell purposes engage in sourcing of garments, and who also make specifications concerning the garments that have implications for their manufacturing. Through using a database of all firms registered in Sweden, a first set of potential firms was generated (firms with NACE codes 17, 18, 51 or 52). The number of firms missing in the database is assumed to be low and negligible as principally all awaited firms were found in the generated list. A minimum turnover of five million Swedish krona (SEK) – equivalent to about 550,000 Euro – was introduced as a criterion, not only to limit the size of the selection, but also to

ensure that the firms had a certain scale of their operations. A subjective deletion of firms not corresponding to the conceptual definition was conducted by considering descriptions of the firms' businesses from annual reports in the database. Purchasers at the remaining firms were contacted by phone and either deleted – when not fulfilling the conceptual definition – or asked to fill in the survey. The final list contained 197 firms with acknowledged purchasing representatives and the survey was sent out to them. Of these firms, 116 actually responded after one reminding e-mail and one reminding phone call; the response rate was therefore 58.9%.

A non-response ANOVA analysis based on turnover and firm age data from the database showed that no significant difference between responding and non-responding firms could be seen concerning turnover, the means being 143 and 131 million Swedish krona (SEK) respectively. However, on the $p < 0.10$ level, a difference in firm age was found where responding firms on average were founded in 1980 whereas non-responding firms were founded in 1985. Hence, a bias towards older firms exists in the survey results. The implication for the reliability may however – due to the small actual difference – be considered as low or negligible. The obtained results can therefore arguably be generalized to the entire population.

Survey instrument

Operationalizations of the sourcing strategy dimensions, firm characteristics and prerequisites as well as supplier performance were conducted by considering previous research. Moreover, interviews with purchasers in seven Swedish apparel firms of different types were utilized to increase the validity of the survey instrument – several improvements and adjustments could therefore be implemented in several steps to maximize the interpretability before the survey was sent out. All variables, operationalizations and optional answers of the survey instrument are shown in Appendix A.

Operationalizing *sourcing strategies* implies assessment of supply markets, supply channels and double sourcing (Appendix A). Two difficulties occur when first operationalizing supply markets. The first is to geographically define appropriate supply markets, and the other is to incorporate the scale of firms' sourcing from the different markets. Lowson (2001) in his paper uses continents, where Europe is divided into EU and non-EU; he additionally uses percent of total purchasing volume to determine the scale. Cho and Kang (2001) also use continents, but divide Asia into smaller entities to explore the major supply markets there. They, too, use percent of total purchasing volume to assess the scale. These approaches were followed here for the purpose of mirroring important apparel supply markets. Further, percent of total purchasing volume was used to determine the sourcing scale. The second dimension – supply channels – is less commonly operationalized, but the literature review and interviewees revealed three clearly distinguishable supply channels that cover all theoretically possible setups; own manufacturing, sourcing from a manufacturer and sourcing from a manufacturer via an agent. The nuance of Swedish or foreign location was added to provide a clear

operationalization for the respondents. Percent of total purchasing volume was again used to determine the scale. A straightforward yes-or-no question was asked to assess the use of double sourcing.

Three important *product issues* were identified above: product innovation, the quality-price issue and garment volumes (Appendix A). These issues are however difficult to measure; Cho and Kang (2001) for instance distinguish between women's, men's and children's wear, whereas Bolisani and Scarso (1996) in a paper based on case studies distinguish between formal wear, informal wear, casual wear and sportswear. Instead, this survey utilized propositions concerning the responding firms' garment offers, where degree of agreement was measured with seven-point Likert scales. The propositions concerning the quality-price issue focused on quality in terms of using exclusive materials and high manufacturing skill requirements. Consequently, a price focus (as a potentially sensitive issue) was assumed to oppose the use of exclusive materials and highly skilled manufacturers. Comparing retail prices would have provided a more exact measure, but does not necessarily correspond to supply side issues – as expensive garments are not necessary expensive to source. At the same time, firms are not likely to present purchased prices. Garment volumes were also considered, as suggested by Cho and Kang (2001) as well as Alguire et al. (1994), and directly operationalized as the number of garment models annually (and not stock-keeping units, since adding for instance sizes and colors does not necessarily complicate the sourcing process as different garment models do). The turnover per model was further calculated and used as a less size-dependent measure of model volumes.

Organizational issues are focused on firm size, experience and downstream supply chain design – interpreted as retailing (Appendix A). Absolute firm size is usually measured in terms of turnover (e.g. Bolisani and Scarso, 1996; Cho and Kang, 2001), which was used in this survey too. Relative firm size, as mutual interdependence (Bruce and Moger, 1999), is also difficult to operationalize. Here the largest supplier's proportion of the buying firms' total purchases and the buying firm's proportion of the same supplier's output were used to roughly assess a responding firm's business situation. Additionally, the number of suppliers annually was measured to determine firm size, and was further combined to form turnover per supplier and models per supplier. Experience was operationalized as years of sourcing in foreign countries (Cho and Kang 2001), but firm age was also used. Finally, as suggested by Bruce and Moger (1999), apparel firms' retail solutions were assessed in terms of having own retail outlets or not, which provides a necessary picture of the downstream supply chain.

The final issue of interest here is *supplier performance*, where both actual and perceived performances are operationalized (Appendix A). Actual supplier performance is difficult to measure and particularly to compare between firms. However, an exception is lead times (Lowson, 2003) and these were consequently assessed in this survey. Lead times concerning fast, average and slow suppliers were asked for to provide a range rather than an average. Perceived satisfaction with supplier performance is easier to operationalize and here seven satisfaction indicators, in accordance with the literature review above,

were targeted. Firms were thus asked to state their present agreement with seven propositions concerning their suppliers' performance, and seven-point Likert scales were used.

Since seven variables were used to measure perceived satisfaction with supplier performance, factor analysis was used to reduce those data. The variable of working conditions was excluded from the further analysis because it decreased the derived factors' reliability.

A final factor analysis of the six remaining satisfaction variables, found two factors with Eigenvalues over 1, thus fulfilling the Kaiser criterion (Hair et al., 1998) and together explain 73% of the total variance. All variables could be assigned to either the first or the second factor with factor loadings ranging from 0.66 to 0.87 (Table 1). When testing for inter-item reliability, the equal-weight indices related to the first derived factor (consisting of the variables product communication, production communication and relationship atmosphere) got a Cronbach's alpha of 0.78 and the second (consisting of price, quality and delivery) got an alpha of 0.75, both of which are considered satisfactory (Hair et al., 1998). When thereafter applying the rule of thumb for reliability (Hair et al., 1998) – at least 0.30 correlation among variables in a factor and at least 0.50 correlation between the variables and the factor itself (represented by a summated scale; an equal-weight index is used here) – it was shown that both factors are internally consistent.

Table 1: Factor loadings for Factor 1 and Factor 2

Variables	Factor 1: Soft issues	Factor 2: Hard issues
Price	-0.05	**0.87**
Quality	0.52	**0.67**
Delivery	0.54	**0.66**
Product communication	**0.86**	0.09
Production communication	**0.68**	0.43
Atmosphere	**0.87**	0.11

Principal component factor analysis with orthogonally Varimax-rotated component matrix. Eigenvalues for factors 1 and 2 are 3.36 and 1.01, respectively. Figures in **bold** indicate variables with loadings >0.6.

The two factors can thus be represented by two reliable equal-weight indices. The indices are further interpretable: the first index is satisfaction with suppliers' performance regarding "soft" issues such as communication, flexibility and relationship atmosphere, whereas the second index is satisfaction with "hard" issues such as price, quality and delivery. Grouping the supplier performance variable into soft and hard performance is supported by previous research (e.g. Birou and Fawcett, 1993; Lowson, 2001; Teng and Jaramillo, 2005). Two equal-weight indices representing the six satisfaction variables are thus used in the subsequent analysis, whereas supplier performance in terms of working conditions is considered separately.

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Findings

The findings were derived through data analysis in several steps. Initially, a taxonomy of empirical sourcing strategies was derived through cluster analysis, a well established methodology for identifying empirical taxonomies of distinct clusters of firms. Previous cluster analysis studies have for example developed taxonomies of manufacturing strategies (Miller and Roth, 1994), advanced manufacturing technology adoption (Boyer et al., 1996) and supply chain joint ventures (Tokman et al., 2007). Here, focus is on identifying distinct supply channel and supply location clusters. Groups of firms applying the derived strategies were then compared in terms of firm characteristics, prerequisites and supplier performance. First, firm groups representing all the identified sourcing strategies were compared; thereafter groups of firms applying Asia- and Europe-focused strategies respectively and firm groups applying various Asia-focused strategies were compared.

Empirical sourcing strategies

The first dimension comprising a sourcing strategy – the choice among various supply markets – was assessed by responding firms' percentage of volume sourced from various geographically defined supply markets. Hierarchical clustering of firms yielded six distinctive clusters, since the change in the agglomeration coefficient is steepest between the seventh and the sixth clusters (41% increase) and because a six-cluster solution has the result that each geographical area is represented by a cluster of firms having the majority of their garments manufactured there. Of the six clusters only three have more than ten members. Thus, three larger groups of firms – based on the clusters – were created by merging the Southeast Asia (n=3) and South Asia (n=6) with the China-dominated cluster, creating a Pan-Asian group, and by merging the Swedish cluster (n=2) with the Western Europe cluster (n=12), see Table 2. This elaboration can be motivated by interpreting distances – both geographical and cultural – where Asia, Western Europe and Eastern Europe, from an apparel manufacturing point of view, can be considered as well-defined and commonly accepted entities (e.g. Stengg, 2001).

Table 2: Three supply market groups (volume in percent per market)

		Group		
	Total	Asia	Eastern E	Western E
	n = 114	n = 71	n = 29	n = 14
China (%)	35.5	**52.7**	8.2	4.5
East Europe, Turkey (%)	27.1	11.5	**77.0**	3.2
West Europe (%)	14.2	8.2	3.1	**67.5**
South Asia (%)	11.0	**15.7**	4.0	1.9
Southeast Asia (%)	6.1	**8.2**	1.0	6.1
Sweden (%)	4.0	0.4	6.7	**16.8**
Other market (%)	2.1	3.3	0.0	0.0

Figures show mean percentage values. **Bold** figures indicate the dominant variables of the respective group.

The *Asia group* is the dominant group and its members have 77% of their sourced volumes coming from Asian countries. However, these companies also have as much as

20% of their volumes sourced from Europe. Firms in the *Eastern Europe group* have 77% of their volume sourced from countries in Eastern Europe and additional small volumes from Asia (13%) and Sweden (7%). Obviously, firms in both the Asia and the Eastern Europe groups are complementing sourcing from their main areas with sourcing from other areas. Finally, firms in the *Western Europe group* have 84% of their volumes sourced from countries in Western Europe (whereof 17% from Sweden) and only small complementing volumes from low-cost supply markets.

The second dimension comprising a sourcing strategy – the choice among supply channels – was assessed as responding firms' use of different types of supply channels in terms of volumes sourced through them. By clustering with respect to these retrieved values, four distinct clusters of firms were formed, since the steepest change in the agglomeration coefficient occurs between the fifth and fourth clusters (114% increase). It was seen that the four clusters represent direct supply (n=80), ownership supply (n=18) and supply from Swedish (n=3) and foreign (n=12) agents respectively. It can also be noted that if five clusters were formed, due to the rather steep change in the agglomeration coefficient between the sixth and fifth clusters (28% increase), an own manufacturing in Sweden cluster would occur. Here, however, that cluster was added through the agglomeration process to the general owned manufacturing cluster, and four clusters were thus kept. Both agent clusters were small and the difference between them – from a supply chain point of view – is of limited importance in this study; these two clusters were thus merged into one agent group. With three groups, the options of partial or whole ownership, direct purchase from manufacturer, and purchase through agents or intermediaries are all represented (Table 3).

Table 3: Three supply channel groups (volume in percent per channel)

		Group		
	Total	Direct	Ownership	Agent
	n = 113	n = 80	n = 18	n = 15
Own manufacturing in Sweden (%)	2.8	2.4	**5.0**	2.8
Other manufacturing in Sweden (%)	0.8	0.3	1.1	3.0
Manufacturing by wholly or partially owned company abroad (%)	11.4	0.7	**68.8**	0.0
Direct purchase from manufacturer abroad (%)	62.6	**82.3**	18.6	9.0
Purchase through Swedish agents (%)	12.6	6.5	3.6	**56.3**
Purchase through foreign agents (%)	9.8	7.8	2.9	**28.9**

Figures show mean percentage values. **Bold** figures indicate the dominant variables of the respective group.

The *direct group* – sourcing directly from manufacturers – does this for 82% of their volumes, but they also utilize agents for 14% of their volumes. By contrast, firms in the *ownership group* source 74% of their volumes from own manufacturing facilities, but they source 19% of their volumes directly from external manufacturers. Finally, firms in the *agent group* source 85% of their volumes from agents, but they also source 9% of their volumes directly from manufacturers.

When both sourcing dimensions – represented by the supply location and the supply channel groups – were allowed to form a matrix, it was seen that out of nine possible combinations, only five were utilized by more than five percent of the firms (Table 4). It was further seen that *Asia direct* sourcing – i.e. sourcing directly from manufacturers in

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Asia – is the most common sourcing strategy. Other applied strategies include: *Asia agent* sourcing – i.e. use of agents sourcing from manufacturers in Asia; *Eastern Europe ownership* sourcing – i.e. ownership of manufacturers in Eastern Europe; and finally, *Eastern Europe direct* sourcing as well as *Western Europe direct* sourcing – i.e. direct sourcing from manufacturers in Eastern and Western Europe respectively.

Table 4: Matrix of sourcing strategy dimensions

Supply location groups		Supply channel groups			
		Direct	Ownership	Agent	Total
Asia	n =	**57**	5	**9**	71
	within location (%)	**80,3**	7	**12,7**	100
	within supplier (%)	**71,3**	27,8	**64,3**	63,4
	of Total (%)	**50,9**	4,5	**8**	63,4
Eastern E	n =	**12**	**11**	4	27
	within location (%)	**44,4**	**40,7**	14,8	100
	within supplier (%)	**15**	**61,1**	28,6	24,1
	of Total (%)	**10,7**	**9,8**	3,6	24,1
Western E	n =	**11**	2	1	14
	within location (%)	**78,6**	14,3	7,1	100
	within supplier (%)	**13,8**	11,1	7,1	12,5
	of Total (%)	**9,8**	1,8	0,9	12,5
Total	n =	80	18	14	
	within location (%)	71,4	16,1	12,5	
	within supplier (%)	100	100	100	
	of Total (%)	71,4	16,1	12,5	

Cells with **bold** figures indicate combinations of supply location and supply channel groups utilizing more than five percent of the total number of firms.

Obviously, sourcing via agents is most preferred when sourcing from Asia (64% of the agent sourcing firms are in the Asia group) whereas ownership is most preferred when sourcing from Eastern Europe (61% of the ownership sourcing firms are in the Eastern Europe group). However, dealing directly with manufacturers is actually the dominant supply channel group in all three supply markets – only in the Eastern Europe group is the ownership supply group nearly as large as the direct supply group (with 41% versus 44% of the firms in the Eastern Europe group).

Firm characteristics, prerequisites and supplier performance

The analysis of the relation between the empirically derived sourcing strategies and firm characteristics, prerequisites as well as supplier performance was conducted in three steps. In the first step, all five identified sourcing strategies were considered (Table 5).

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Table 5: Comparison of all sourcing strategies

		Asia direct (a)	Eastern Europe ownership (b)	Eastern Europe direct (c)	Asia agent (d)	Western Europe direct (e)	Significance[1)]	Bonferroni tests
		n = 57	n = 11	n = 12	n = 9	n = 10		
Quick response through double sourcing (yes %)	C	32.1	18.2	18.2	22.2	20.0	0.848	
Innovativeness in fashion or functionality (1-7)	A	4.7	5.3	4.3	4.0	4.9	0.632	
Costly materials (1-7)	A	4.7	5.7	5.7	4.4	5.4	0.162	
Advanced manufacturing methods (1-7)	A	4.9	6.2	5.8	4.0	5.5	0.035 **	b>d*
Models annually (no.)	A	736.3	336.0	174.3	200.0	251.1	0.610	
Turnover per model (MSEK)	A	0.4	0.2	0.3	0.3	0.2	0.557	
Turnover (MSEK)	A	199.7	45.3	42.8	52.3	18.2	0.253	
Biggest supplier's part of buyer's business (%)	A	33.2	45.0	53.3	45.1	44.2	0.011 **	a>c*
Buyer's part of biggest supplier's business (%)	A	32.8	65.0	40.0	20.0	36.0	0.171	
Suppliers annually (no.)	A	28.0	12.1	8.2	9.1	7.1	0.058 *	
Turnover per supplier (MSEK)	A	6.1	5.2	6.3	6.7	3.2	0.523	
Models per supplier (no.)	A	28.3	38.9	23.2	21.7	35.2	0.827	
Firm age (year of company foundation)	A	1981.4	1960.9	1979.3	1994.6	1986.0	0.012 **	b>e*ad**
Experience sourcing outside Sweden (years)	A	24.4	18.7	14.8	19.7	25.0	0.247	
Own retail outlets (yes %)	C	29.8	18.2	50.0	33.3	50.0	0.501	
Lead time - short (weeks)	A	6.6	2.3	4.1	6.7	3.9	0.000 **	b<d*a**
Lead time - long (weeks)	A	17.5	13.4	11.4	23.2	16.9	0.000 **	a>c*; d>bc**
Lead time - average (weeks)	A	12.2	6.8	6.4	16.8	8.9	0.000 **	d>a*bce**; a>bc*
Satisfaction - index of hard issues (1-7)	A	6.1	5.1	5.2	5.9	6.3	0.131	
Satisfaction - index of soft issues (1-7)	A	6.2	6.3	6.0	6.2	6.3	0.478	
Satisfaction - working conditions (1-7)	A	6.0	6.1	6.2	5.5	6.1	0.207	

1) Pearson Chi-Square asymptotic significance (2-sided) for Chi-Square tests (C) and F test significance for ANOVA tests (A).
* p < 0.10 ** p < 0.05

Initially, concerning product issues, a significant difference related to manufacturing methods was found. There is a significant difference between the Eastern Europe ownership and the Asia agent groups, where the latter use less advanced manufacturing methods. Further, volume sourced from the largest supplier differs significantly between the Asia direct and the Eastern Europe ownership groups. There is also a significant difference with respect to number of suppliers (but no significant differences between the groups could be seen using a Bonferroni test). Further, Eastern Europe ownership firms are significantly older than firms in other groups – except in comparison to the Eastern Europe direct group. Concerning supplier performance in terms of lead times, several significant differences between the groups were found. Not surprisingly, all Europe-focused groups stand out with significantly lower lead times than Asia-focused groups in all three situations – short, long and average lead times. Further, average lead times vary significantly between the Asia agent group and the Asia direct group.

In a second step of the analysis, sourcing in Asia and Europe respectively was addressed. The results derived here thus highlight differences occurring primarily with respect to the choice among supply markets. All three Europe groups and both Asia groups were thus brought together and compared (Table 6).

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Table 6: Comparison of Asia- versus Europe-focused sourcing strategies

		Asia (a)	Europe (b)	Significance[1)]
		n = 66	n = 33	
Quick response through double sourcing (yes %)	C	30.8	18.8	0.209
Innovativeness in fashion or functionality (1-7)	A	4.6	4.8	0.596
Costly materials (1-7)	A	4.7	5.6	0.008 **
Advanced manufacturing methods (1-7)	A	4.8	5.9	0.003 **
Models annually (no.)	A	665.9	248.8	0.170
Turnover per model (MSEK)	A	0.4	0.2	0.111
Turnover (MSEK)	A	181.2	36.2	0.055 *
Biggest supplier's part of buyer's business (%)	A	34.8	47.7	0.006 **
Buyer's part of biggest supplier's business (%)	A	31.5	45.0	0.126
Suppliers annually (no.)	A	25.4	9.2	0.022 **
Turnover per supplier (MSEK)	A	6.2	5.0	0.428
Models per supplier (no.)	A	27.4	31.4	0.661
Firm age (year of company foundation)	A	1983.2	1975.2	0.088 *
Experience sourcing outside Sweden (years)	A	23.8	19.2	0.141
Own retail outlets (yes %)	C	30.3	39.4	0.366
Lead time - short (weeks)	A	6.6	3.4	0.000 **
Lead time - long (weeks)	A	18.3	13.6	0.001 **
Lead time - average (weeks)	A	12.9	7.3	0.000 **
Satisfaction - index of hard issues (1-7)	A	6.1	6.2	0.382
Satisfaction - index of soft issues (1-7)	A	6.2	6.3	0.495
Satisfaction - working conditions (1-7)	A	5.9	6.1	0.380

1) Pearson Chi-Square asymptotic significance (2-sided) for Chi-Square tests (C) and F test significance for ANOVA tests (A).
* $p < 0.10$ ** $p < 0.05$

Again, significant differences concerning product issues were found. In particular, using costly materials and advanced manufacturing methods have higher values for firms in the Europe group. Variables that can be associated with size – turnover, number of suppliers, and volumes purchased from largest supplier – significantly indicate that firms sourcing from Asia are larger firms than firms sourcing from Europe; that difference is considerable also in real terms. However, in contrast, firms sourcing from Asia are not older than firms sourcing from Europe; instead firms in the Europe group are significantly older. Finally and naturally, firms sourcing from Europe have significantly shorter lead times in all three situations than firms sourcing from Asia.

In a third step of the analysis, various Asia-focused strategies were examined. The aim is to reveal effects concerning different strategic options when sourcing from Asia. In particular, the Asia direct group was split in two – one group with and one without double sourcing. Additionally, the Asia agent group was kept unchanged. The results are presented in Table 7.

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Table7: Comparison of different Asia-focused sourcing strategies

		Asia direct DS (a)	Asia direct non DS (b)	Asia agent (c)	Significance[1)]	Bonferroni tests
		n = 18	n = 38	n = 9		
Quick response through double sourcing (yes %)	C	100.0	0.0	22.2	0.000 **	
Innovativeness in fashion or functionality (1-7)	A	5.1	4.5	4.0	0.298	
Costly materials (1-7)	A	4.6	4.7	4.4	0.860	
Advanced manufacturing methods (1-7)	A	4.9	4.9	4.0	0.404	
Models annually (no.)	A	804.0	725.7	200.0	0.690	
Turnover per model (MSEK)	A	0.3	0.4	0.3	0.744	
Turnover (MSEK)	A	396.3	116.1	52.3	0.051 *	a>b*
Biggest supplier's part of buyer's business (%)	A	29.7	35.1	45.1	0.195	
Buyer's part of biggest supplier's business (%)	A	30.2	34.4	20.0	0.641	
Suppliers annually (no.)	A	54.6	16.3	9.1	0.001 **	a>bc**
Turnover per supplier (MSEK)	A	5.1	6.6	6.7	0.755	
Models per supplier (no.)	A	22.5	31.1	21.7	0.782	
Firm age (year of company foundation)	A	1982.2	1980.8	1994.6	0.120	
Experience sourcing outside Sweden (years)	A	26.1	23.7	19.7	0.467	
Own retail outlets (yes %)	C	50.0	21.1	33.3	0.089 *	
Lead time - short (weeks)	A	4.4	7.6	6.7	0.031 **	b>a**
Lead time - long (weeks)	A	16.1	18.2	23.2	0.019 **	c>b*a**
Lead time - average (weeks)	A	9.9	13.4	16.8	0.001 **	a<bc**
Satisfaction - index of hard issues (1-7)	A	6.0	6.2	5.9	0.416	
Satisfaction - index of soft issues (1-7)	A	6.1	6.2	6.0	0.627	
Satisfaction - working conditions (1-7)	A	5.8	6.0	5.5	0.393	

1) Pearson Chi-Square asymptotic significance (2-sided) for Chi-Square tests (C) and F test significance for ANOVA tests (A).
* p < 0.10 ** p < 0.05

No significant differences between the groups concerning product issues were found. Again, however, a difference between groups with respect to size was found. Interestingly, it was seen that firms which use double sourcing are significantly larger – in terms of turnover and number of suppliers – than those which do not. It should again be noted that the difference in turnover is considerable also in real terms. Firms in the double sourcing group further have significantly more suppliers than firms in the agent group. There is also a significant difference in terms of having retail outlets (but no significant differences between the groups could be seen using a Bonferroni test). Finally, significant differences concerning lead times were found. It was seen that double-sourcing direct firms have significantly shorter lead times than non-double-sourcing direct firms. Firms in the Asia agent group have longer lead times than other firms; the differences are significant both towards direct groups concerning long lead times, and towards the double sourcing group concerning average lead times.

Discussion

In this section, the empirically derived sourcing strategies are first discussed. Thereafter implications of firm characteristics, prerequisites and supplier performance as determinants for firms' strategic choices are targeted. Finally, possible generalizations from this paper's results are outlined.

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Empirical sourcing strategies

Five distinct sourcing strategies were identified, and any of these are applied by practically all firms in the Swedish apparel industry. Of the strategies, four focus mainly on sourcing from low-cost supply markets – either from Asia or Eastern Europe – whereas one strategy focuses on sourcing from Western Europe. Although sourcing from low-cost supply markets is dominant among Swedish apparel firms, strategies still persist either with a focus on, or with considerable complementing volumes from, high-cost supply markets. Additionally, sourcing directly from manufacturers is the dominant channel, but again exceptions are common – as separate strategies or as mixed strategies.

Sourcing directly from manufacturing suppliers is the dominant supply channel in all supply markets; the reason may be that direct sourcing can achieve both relative flexibility in manufacturing capacity and relative control over and closeness to manufacturing operations. Further, ownership of supplying manufacturing facilities is primarily seen in Eastern Europe, whereas agents mainly are operating in Asia. Distance is obviously an important factor here; cultural and geographical distances may be bridged with agents offering specialized purchasing competence, whereas usefulness of ownership may depend on control ability offered by relative proximity. However, ownership sourcing is not particularly common in the Western Europe group, with firms also sourcing from a nearby location. The reason may be that suppliers in Western Europe have a long tradition and therefore are both reliable and easy to communicate with; ownership of suppliers may thus not add any immediate advantages in Western Europe. The apparel industry in Eastern Europe has, by contrast, emerged in the last two decades (Stengg, 2001) and cultural distances still persist – ownership may thus be advantageous for ensuring manufacturing capacity and for providing tight operational control ability. Additionally, many Swedish firms that have had own manufacturing in Sweden have shifted locations and moved their equipment to nearby and low-cost Eastern Europe, thereby ending up with an ownership solution.

As already noted, mixed strategies are commonly employed concerning both sourcing dimensions. When it comes to supply markets, Asia firms have considerable volumes coming from Europe, which arguably can be derived from practices utilizing double sourcing. Firms in the Eastern Europe group instead complement their offers with volumes from both Sweden and Asia – these volumes may be from their own remaining manufacturing in Sweden and from simple complementing garments respectively. Concerning supply channels, direct firms also use agent supply to some extent, whereas both ownership and agent firms additionally use direct supply. Arguably, direct firms may sometimes – in certain contexts – get better deals from value-adding agents, whereas agent firms sometimes can get better deals direct from manufacturers. Finally, ownership firms – with a fixed manufacturing capacity – may sometimes need to source demand increases from external suppliers.

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Firm characteristics, prerequisites and supplier performance

It is obvious that a variety of sourcing strategies are applied by firms in the Swedish apparel industry, but also that firm characteristics and prerequisites – rather than mere arbitrariness – influence firms' choice of sourcing strategy. In addition, paying attention to achieved and perceived supplier performance contributes to the understanding of sourcing strategies applied by firms.

It was seen that firms saying that they provide high-quality goods, in terms of both costly materials and advanced manufacturing processes, utilize suppliers in Europe; thus, European suppliers can presumably be regarded as high-quality suppliers. Firms using an Asia agent strategy thus tend to provide least costly garments, whereas Eastern Europe ownership firms are found at the other end of that spectrum with exclusive garments. This is in accordance with Bolisani and Scarso (1996), who point out that supply market and supply channel should influence the quality-cost ratio as seen here. The results can also be comprehended in terms of lean supply chains for standard products and agile supply chains for innovative products (Fisher, 1997). However, it is quite obvious that an adjustment of the concept specifically for the apparel industry is needed, since garments in most cases tend to have innovative characteristics and in some cases also standard characteristics. Thus, a "leagile" approach as applied by Bruce et al. (2004), together with a pure agile sourcing approach, may be useful to explain how apparel firms perform sourcing. Nonetheless, the quality-cost trade-off and volatile capacity demand, as well as vast differences in cost and distances of various supply markets, even further complicate the relation between product issues and sourcing strategies in the apparel industry.

It was also seen that firm size influences sourcing strategies as suggested by, for instance, Bruce and Moger (1999) as well as by Cho and Kang (2001). Firms sourcing directly from manufacturers in Asia are larger than firms applying other strategies. Substantial resources are clearly required for this type of sourcing. Further, many small firms are operating in Eastern Europe and often through ownership – implying a mutual dependence in terms of sourced volumes. The dependence can arguably be explained by assuming that ownership firms maximize utilization of their own manufacturing facilities. Concerning experience, interesting and significant results were found in relation to firm age, but not in relation to experience of foreign sourcing, as suggested by Bolisani and Scarso (1996) as well as by Cho and Kang (2001). It was noted that firms operating in Eastern Europe, and especially those owning manufacturing facilities there, are older firms than others. Apparently, firms that have had manufacturing in Sweden have moved their operations to Eastern Europe, whereas recently established firms choose to start sourcing directly from Asia; this observation indicates differing supply competences in manufacturing and sourcing respectively. It is further seen that firms utilizing double sourcing more often have own retail outlets – which of course is required for an effective response to unpredictable demand, and which was expected in accordance with Bruce and Moger (1999).

Not surprisingly, it was seen that Asia-focused firms experience longer lead times than Europe-focused firms. However, it was also seen that long lead times can be reduced with

use of double sourcing as suggested by, for instance, Jin (2004). Consequently, the supply market rather than the supply channel is determining lead times. Interestingly, sourcing from Western Europe renders similar lead times in comparison to sourcing from Eastern Europe. Naturally, Eastern Europe and Western Europe suppliers compete in terms of price and quality whereas European and Asian suppliers additionally compete in terms of lead times. No significant difference was seen concerning perceived supplier performance, either with "soft" issues, with "hard" issues or with working conditions. The reason may be that apparel firms' expectations correspond to their suppliers' performance.

Generalizations to other industries

Low-cost sourcing has been utilized in the apparel industry for decades, but only lately emerged as a viable option for firms in a wider array of manufacturing industries, due to recent developments of suppliers in low-cost supply markets. The apparel industry is thus a potential source of insightful lessons for a vast number of firms now considering a shift of sourcing focus towards low-cost supply markets – by moving their own facilities, by starting to source from external suppliers or by changing suppliers.

Applying low-cost sourcing may have severe impact on firms' supply chain performance, and many firms' recent low-cost initiatives in various industries have consequently failed to deliver predicted results, due to absence of sufficient supply chain considerations and inappropriate sourcing strategies being therefore frequently applied by firms (Levy, 1995; Christopher and Towill, 2002; Trent and Monzcka, 2003). By studying the apparel industry, these firms may identify pitfalls as well as possibilities, which will help them to formulate appropriate sourcing strategies – sometimes, but not necessarily, incorporating the use of low-cost supply markets. This paper emphasizes the variety of available sourcing strategies and the need to relate strategic sourcing options to firm characteristics and prerequisites as well as to achievable supplier performance.

Conclusion

This study, using a survey of the Swedish apparel industry, empirically tests and validates supply channel, supply market and leagile theories. Findings reveal five commonly applied sourcing strategies based on supply market and supply channel options. It was seen that the most frequently applied strategy is sourcing directly from manufacturers in Asia. However, several other options persist where various markets and channels of supply are utilized: sourcing in Asia via agents, sourcing in Eastern Europe from own manufacturing facilities as well as direct sourcing from manufacturers in both Eastern and Western Europe. It was further seen that firm characteristics and prerequisites vary in the different groups in terms of both product issues (innovativeness, manufacturing requirements and materials) and organizational issues (firm size, firm age and retailing solutions). Moreover, it was found that actual supplier performance (in terms of lead times) varies between firms applying different sourcing strategies, but also that no significant differences in terms of perceived satisfaction exist.

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The results call for a general appreciation of the need for firms to apply sourcing strategies based on actual firm characteristics, as different firm categories have typical prerequisites and requirements. It is often claimed that firms' need to capture the total cost rather than merely comparing prices – this article points further beyond that to the necessity of a mutual fit between partnering firms. As an example, a firm with outstanding production competence thus – to sustain its own competitive advantage – needs to find a partner that is possible to communicate such issues with. It is therefore not recommended to utilize a distant Chinese supplier, particularly not if the buying firm lacks both experience and resources of sourcing in China. Firms considering a reformulation of their sourcing strategy – for instance with the emergence of viable low-cost options – thus need to thoroughly analyze their own settings, internally with respect to product issues and organizational issues, and externally with respect to supplier issues in terms of supplier characteristics and performance. Neither price nor total cost provide an understanding of which supply market(s) and which type(s) of suppliers a firm should choose to successfully improve its sourcing operations – adaptations to a changing sourcing environment are necessary for all firms, but the analysis must consider the partners' prerequisites and requirements. This paper may serve as input to such a process with important insights from the apparel industry, which is an industry particularly experienced in low-cost sourcing practices.

Several future research propositions can be derived from the study. First of all, concerning generalizations, it would be interesting to assess sourcing strategies in other industries where both mature and recent low-cost sourcing practices can be found, and to compare these with the strategies presented here. Similarly, assessing apparel sourcing strategies in other developed countries would reveal the extent of relevance of the strategies presented here – in terms both of which strategies are applied and of how common they are. Further, in this paper it is assumed that the derived strategies exist because they serve firms' requirements. However, by adding financial performance to the research scope, it could be investigated whether the various sourcing strategies – or the various niches where they are applied – have an impact on firms' profitability and growth.

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Appendix A: Issues, operationalizations and optional answers

Issues	Operationalizations	Optional answers
Sourcing strategies		
Supply markets	What volume does your firm purchases from: a) Sweden, b) Western Europe (except Sweden), c) Eastern Europe and Turkey, d) South Asia (India, Pakistan, Bangladesh, Sri Lanka and Nepal), e) China, f) Asia (other than mentioned) and g) other areas?	0-100%, sum should amount to 100%
Supply channels	What volume does your firm purchases from: a) Own or partly owned manufacturing in Sweden, b) Swedish manufacturers, c) Swedish agents, d) own or partly owned manufacturing abroad, e) manufacturers abroad and f) agents abroad?	0-100%, sum should amount to 100%
Quick response practices through double sourcing	Does your firm sometimes source the same garment from one cheap distant supplier and one expensive local supplier?	Yes/no
Product issues		
Innovation	My firm is driving the development in terms of fashion and/or functionality of garments.	1-7 Likert scale: 1 = Do not agree at all 7 = Agree completely
Quality-price	My firm's garments are characterized by expensive materials.	1-7 Likert scale: 1 = Do not agree at all 7 = Agree completely
	My firm's garments are characterized by high manufacturing skill requirements.	1-7 Likert scale: 1 = Do not agree at all 7 = Agree completely
Volume	How many garment models does your firm purchase annually? Turnover per model (calculated).	0- MSEK*
Organizational issues		
Absolute firm size	Annual turnover (from database).	5- MSEK*
Relative firm size	How much of your firm's garment volumes is supplied by the largest supplier?	0-100%
	How much of your firm's largest supplier's volume is purchased by your firm?	0-100%
	How many suppliers does your firm use annually? Turnover per supplier (calculated).	0- MSEK*
Experience	Year of firm foundation (from database).	0- years
	How long has your firm been sourcing garments outside Sweden?	0- years
Own retail outlets	Does your firm have any own retail outlets?	Yes/no
Supplier performance		
Lead time	What are your firm's short/average/long lead times?	0- weeks
Price	My firm is satisfied with suppliers' price levels.	1-7 Likert scale: 1 = Do not agree at all 7 = Agree completely
Quality	My firm can trust that our suppliers deliver expected quality levels.	1-7 Likert scale: 1 = Do not agree at all 7 = Agree completely
Delivery	My firm can trust that our suppliers deliver right quantities on time.	1-7 Likert scale: 1 = Do not agree at all 7 = Agree completely
Product communication	My firm can communicate well with our suppliers with respect to garment fabrication.	1-7 Likert scale: 1 = Do not agree at all 7 = Agree completely
Production communication	My firm can communicate well with our suppliers with respect to deliveries and production planning.	1-7 Likert scale: 1 = Do not agree at all 7 = Agree completely
Atmosphere	My firm have a good atmosphere in relationships with our suppliers.	1-7 Likert scale: 1 = Do not agree at all 7 = Agree completely
Working conditions	My firm is satisfied with our suppliers' working conditions .	1-7 Likert scale: 1 = Do not agree at all 7 = Agree completely

* Million Swedish krona (SEK)