

Research Article

Effects of Physical Sample Approval Practice on Performance and Competitiveness of Export-Oriented Garment Industries in Ethiopia

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The textile sector is one of the major economic pillars in Ethiopia. The sector is generating foreign currency by exporting textile and finished garments. However, the competitiveness of this sector is not as per the expectation due to the long delivery time and excessive manufacturing cost. This study aims to assess the main approval processes in handling garment samples between manufacturers and buyers. The study also examines the effect of physical sample approval process on export performance and competitiveness of the industry. The study employed an explanatory and exploratory multiple-case study research approach in four apparel exporting companies. Both primary and secondary data were collected using questionnaires, semistructured interviews, and observation. Result from this study showed that the export performance and competitiveness of apparel industries are mainly affected by the traditional sample approval system due to long delivery time, unnecessary approval process cost, and poor inventory management of the sampling department. The result also indicates that long lead time and costly process system made the sector incompetent in international market. Therefore, it can be concluded that the apparel manufacturing and exporting industries in Ethiopia should modify their approach to nurture better speed and comparably lower process costs. Ethiopia's apparel sector needs also to invest in creating a reliable quality manufacturing system to grow and meet government targets for expanding export sales.

1. Introduction

The Ethiopian textile and apparel industries have a huge potential and have grown an average of 51% over the last 5-6 years [1]. These sectors have received a greater emphasis from the government policy to become a significant economic pillar in Ethiopia. The country has a comparative advantage in exporting textile and garments, leather and leather products, and processed agricultural products as a result of its natural resource grants [2]. The export potential of apparel products in Ethiopia is projected to increase annually by 35% to reach in 2020 US\$320 million. Over 200 new firms are expected to enter the sector, which is going to provide additional 45,000 jobs through the development of 600 new production lines in yarn, textile, and apparel production. This projection plan shows that export-oriented

garment production will become one of the driving forces of the Ethiopian economy and a central pillar of its industrialization policy [3]. For this reason, companies operating within this industry specially those currently working for the export market must then be able to apply proficient approaches that would help to sustain the growth of the clothing sector competitively and profitably [4]. This means that by adjusting some of the existing business practices of Ethiopian apparel companies, such as their manufacturing systems, quick responsiveness and competitiveness in the international market may be perceived [5].

The first footstep to effectively carry out an apparel product line for manufacturing is the development of sample garments that meets the specifications fit and the desired look of the client requirement [6]. Garment sample development and its approval process is the most important task

during the preproduction phase of an apparel manufacturing process, by which the buyers used to evaluate the skill of the factory to determine whether they can meet the desired requirement or not [7, 8]. This process is also serving as a means of business communication which is regularly carried out between the manufacturers and buyers to execute the full order for bulk production agreement. Therefore, the physical sample approval approach is defined as the exchange of physical garment samples between the manufacturer and buyer's destination until the final approval decision is given by the buyer [9]. The number of samples developed and sent to buyers for approval are variable from customer to customer. But for export order, commonly requested samples by most of the buyer's requirement include photo sample, size set sample, preproduction sample, top of production sample, and shipment sample [10]. As buyers need to confirm all types of samples in every stage, the existing transaction method of all those samples for the approval process leads to generating a long lead time and costly process which finally resulted in downfalls for the industry's competitiveness with the international market [11].

Past researchers have attempted different studies and models for the efficient management of garment sample development process. Paras [12] reviews the probable and possible scope of web-based 3D garment simulation for further e-sampling process. His study focuses on how the fitting test of the sample could be performed by a virtual dummy (avatar) without the need of the physical touch and test. Kamal [13] also develops a conceptual model for restructuring the apparel sampling development process using virtual reality technology; his study mainly shows the negative impacts of physical sample development practice and puts his recommendation to substitute the current trend into a virtual approach. Cost minimization of sample development and approval process for kids and ladies' garments in West Bengal, India, was also done by Hossain and Samanta [9]. Furthermore, even if the conceptual and methodological scope is incompatible with this paper, Yimam [14] also conducted a study on the factors influencing export performance of garment and textile industry in Ethiopia. The scope of this study focuses on the evaluation of external factors including local industries expansion, foreign direct investment (FDI), and availability of electricity and trade capacity building programs as the major influencing factors for the industries export performance.

However, there is no information on the effect of industry's internal factors such as the physical sample approval approach on its competitiveness based on the Ethiopian apparel exporting sector. Therefore, this study investigated the effect of physical sample approval practice on the performance and competitiveness of clothing export industries in Ethiopia. Basically, the focus of this study was to answer the following research questions such as what sample exchange technique is currently being implemented by Ethiopian apparel exporting industries? and what are the main problems associated with the current practice and how do these problems affect the competitiveness of the sector?

2. Research Methods

2.1. Sample Selection. The chosen methodology for this investigation has been multiple case studies. Though there are no precise guidelines as to the number of cases that should be included in this type of study, the widest accepted range falls between two and four as the minimum and 10 and 15 as the maximum [15]. The researcher chose four as this number falls into the minimum band of the recommended range. In this study, the sample units have been randomly selected. However, for comparison purpose, one leading company was included. Because of the research objectives defined in previous section, the nature of the study was both investigative and descriptive. The focus population in all four selected companies were merchandising and sampling department workers.

2.2. Methods of Data Collection. The primary data have been collected from three Ethiopian garment exporting companies in Addis Ababa city and one leading factory in Adwa city through a structured questionnaire, observation, and interviews. The data were collected through both qualitative and quantitative approaches. The qualitative type of collected data focuses on the current communication system and sampling room inventory management of the industries, whereas the quantitative type of collected data presents the existing practice of required time for approving export order (Appendix A from Tables 1–4) and the approval process cost related to export order. After collecting the data, the data was analyzed by using Microsoft Excel.

2.3. Background of Sample Industries. Table 5 shows the background information of selected Ethiopian garment industries that produces different clothing for export market. From the selected case companies, company A and company B produce knitted products and companies C and D produce both knitted and woven clothing. Sportswear are the main dominant export product that cover approximately 88% of the total export item. Most of the Ethiopian apparel manufacturers export their products to different whole sellers' and big retailers located in North America.

3. Results and Discussion

3.1. Existing Sample Approval Process of Export-Oriented Garment Industries in Ethiopia. In the existing condition, the physical sample approval process for export order is found that as a time-taking and costly process that influences the total responsiveness of the companies. After the sample development task is completed and packed as it is illustrated in Figure 1, the manufacturers send the samples to any of DHL service representative office and get its queue according to its priority class. The service provider sent it to Ethiopian airlines to transfer to the buyer's destination. After it reached from the foreign country port, the forwarder distributes to each DHL service provider branches, and finally the sample reaches the buyer's destination. Figure 2 illustrates the current sample approval process and

TABLE 1: Company A, date-wise sample approval data taken from five different orders.

| Order no. | Photo sample | | Size set sample | | Preproduction sample | | Production sample | | Shipment sample | |
|-------------------------------|--------------|---------------|-----------------|---------------|----------------------|---------------|-------------------|---------------|-----------------|---------------|
| | Sending date | Approved date | Sending date | Approved date | Sending date | Approved date | Sending date | Approved date | Sending date | Approved date |
| 1 | 12/02/2019 | 02/03/2019 | 06/03/2019 | 24/03/2019 | 28/03/2019 | 19/04/2019 | 25/04/2019 | 20/05/2019 | 29/06/2019 | 15/07/2019 |
| 2 | 09/04/2019 | 30/04/2019 | 03/05/2019 | 22/05/2019 | 25/05/2019 | 06/06/2019 | 09/06/2019 | 21/06/2019 | 10/08/2019 | 29/08/2019 |
| 3 | 05/02/2019 | 01/03/2019 | 06/03/2019 | 28/03/2019 | 03/04/2019 | 25/04/2019 | 01/05/2019 | 20/05/2019 | 13/06/2019 | 27/06/2019 |
| 4 | 06/06/2019 | 02/07/2019 | 06/07/2019 | 28/07/2019 | 05/08/2019 | 27/08/2019 | 02/09/2019 | 23/09/2019 | 24/10/2019 | 01/11/2019 |
| 5 | 21/07/2019 | 29/08/2019 | 03/09/2019 | 30/09/2019 | 05/10/2019 | 23/10/2019 | 28/10/2019 | 24/11/2019 | 18/12/2019 | 30/12/2019 |
| Mean | 26 days | | 22 days | | 19 days | | 21 days | | 14 days | |
| Total lead time in days = 102 | | | | | | | | | | |

TABLE 2: Company B, date-wise sample approval data taken from five different orders.

| Order no. | Photo sample | | Size set sample | | Preproduction sample | | Production sample | | Shipment sample | |
|-------------------------------|--------------|---------------|-----------------|---------------|----------------------|---------------|-------------------|---------------|-----------------|---------------|
| | Sending date | Approved date | Sending date | Approved date | Sending date | Approved date | Sending date | Approved date | Sending date | Approved date |
| 1 | 11/03/2019 | 03/04/2019 | 10/04/2019 | 29/04/2019 | 16/05/2019 | 14/06/2019 | 25/06/2019 | 18/07/2019 | 29/08/2019 | 19/09/2019 |
| 2 | 09/01/2019 | 30/01/2019 | 05/02/2019 | 22/02/2019 | 28/02/2019 | 20/03/2019 | 01/04/2019 | 22/04/2019 | 13/07/2019 | 27/07/2019 |
| 3 | 04/03/2019 | 01/04/2019 | 03/04/2019 | 28/04/2019 | 04/05/2019 | 26/05/2019 | 02/06/2019 | 22/06/2019 | 11/07/2019 | 28/07/2019 |
| 4 | 06/02/2019 | 02/03/2019 | 06/03/2019 | 28/03/2019 | 01/04/2019 | 27/04/2019 | 02/05/2019 | 23/05/2019 | 24/07/2019 | 01/08/2019 |
| 5 | 21/05/2019 | 29/06/2019 | 03/07/2019 | 30/07/2019 | 05/08/2019 | 23/08/2019 | 28/08/2019 | 24/09/2019 | 15/11/2019 | 30/11/2019 |
| Mean | 27 days | | 22 days | | 23 days | | 22 days | | 15 days | |
| Total lead time in days = 109 | | | | | | | | | | |

TABLE 3: Company C, date-wise sample approval data taken from five different orders.

| Order no. | Photo sample | | Size set sample | | Preproduction sample | | Production sample | | Shipment sample | |
|------------------------------------|--------------|---------------|-----------------|---------------|----------------------|---------------|-------------------|---------------|-----------------|---------------|
| | Sending date | Approved date | Sending date | Approved date | Sending date | Approved date | Sending date | Approved date | Sending date | Approved date |
| 1 | 21/03/2019 | 15/04/2019 | 20/04/2019 | 20/05/2019 | 28/05/2019 | 19/06/2019 | 24/06/2019 | 14/07/2019 | 30/08/2019 | 19/09/2019 |
| 2 | 01/07/2019 | 24/07/2019 | 01/08/2019 | 22/08/2019 | 27/08/2019 | 21/09/2019 | 29/09/2019 | 21/10/2019 | 10/11/2019 | 29/11/2019 |
| 3 | 18/03/2019 | 13/04/2019 | 18/04/2019 | 25/05/2019 | 04/05/2019 | 23/05/2019 | 30/05/2019 | 24/06/2019 | 02/08/2019 | 21/08/2019 |
| 4 | 07/07/2019 | 26/07/2019 | 05/08/2019 | 22/08/2019 | 12/09/2019 | 27/09/2019 | 01/10/2019 | 19/10/2019 | 13/11/2019 | 20/11/2019 |
| 5 | 04/08/2019 | 01/09/2019 | 08/09/2019 | 25/09/2019 | 02/10/2019 | 23/10/2019 | 29/10/2019 | 19/11/2019 | 01/12/2019 | 18/12/2019 |
| Mean | 24 days | | 24 days | | 20 days | | 21 days | | 16 days | |
| Total lead time in days = 105 days | | | | | | | | | | |

information exchange practices of Ethiopian apparel industries for export order.

Similarly, from the collected data, it was found that 100% of the case companies are using physical sample exchange method during the approval process. Out of this, 75% of the responding firms are using DHL service and 25% of them are using both United Parcel Service (UPS) and DHL service to

exchange their physical samples as shown in Figure 3. Based on the respondent's information, DHL service has better speed than UPS service; however, for large weight, cost per kg of UPS service is better than DHL. Although this may be true, most of the export-oriented industries use DHL service since delivery speed is a very sensitive issue in the clothing business.

TABLE 4: Company D, date-wise sample approval data taken from five different orders.

| Order no. | Photo sample | | Size set sample | | Preproduction sample | | Production sample | | Shipment sample | |
|-------------------------------|--------------|---------------|-----------------|---------------|----------------------|---------------|-------------------|---------------|-----------------|---------------|
| | Sending date | Approved Date | Sending date | Approved date | Sending date | Approved date | Sending date | Approved date | Sending date | Approved date |
| 1 | 27/02/2019 | 25/03/2019 | 03/04/2019 | 23/04/2019 | 28/04/2019 | 17/05/2019 | 22/05/2019 | 14/06/2019 | 30/07/2019 | 18/08/2019 |
| 2 | 10/08/2019 | 02/09/2019 | 10/09/2019 | 29/09/2019 | 03/10/2019 | 21/10/2019 | 27/10/2019 | 17/11/2019 | 13/12/2019 | 26/12/2019 |
| 3 | 02/02/2019 | 21/02/2019 | 29/02/2019 | 24/03/2019 | 30/03/2019 | 18/04/2019 | 21/04/2019 | 18/05/2019 | 11/07/2019 | 24/07/2019 |
| 4 | 10/06/2019 | 05/07/2019 | 13/07/2019 | 29/07/2019 | 06/08/2019 | 24/08/2019 | 28/08/2019 | 20/09/2019 | 28/10/2019 | 20/11/2019 |
| 5 | 22/04/2019 | 20/05/2019 | 07/06/2019 | 21/06/2019 | 01/07/2019 | 28/07/2019 | 04/08/2019 | 22/08/2019 | 17/10/2019 | 12/11/2019 |
| Mean | 24 days | | 19 days | | 20 days | | 24 days | | 19 days | |
| Total lead time in days = 106 | | | | | | | | | | |

TABLE 5: Background information about selected garment companies.

| No. | Factory name | Legal form | No. of employees | Export capacity/year | Main customers | Main products | Position of the respondent |
|-----|--------------|------------|------------------|----------------------|--|---|----------------------------|
| 1 | Company A | Share | 669 | 720,000 pcs | CHAMPRO Sports and Superior Uniform, USA | Baseball pants Polo shirt | Marketing manager |
| 2 | Company B | Private | 340 | 180,000 pcs | USA and Europe | Baseball, football, and basketball ware | Not specified |
| 3 | Company C | Private | 5286 | 224,000 pcs | Duty free, Canada and Unitex, USA | Polo shirt Jeans | Marketing manager |
| 4 | Company D | Share | 638 | 108,000 pcs | Lollytogs Ltd., USA | School uniforms | Merchandising manager |



(a)



(b)



(c)

FIGURE 1: Physical garment samples which are ready to be sent to buyers for approval (photo taken from company A).

3.2. Inefficiency of Lead Time Physical Sample Exchange Practice. All the respondents in sampled industry confirmed that physical sample exchange process for approval application passes through four destination points until it reaches the buyer's destination. This process takes several days before the sample is arrived at the buyer's destination. The average waiting time for sample arrival of each case company has been investigated and shown in Figure 4. But the length of time consumed for each port of destination is variant from time to another depending on the number of queues available at the hands of DHL service provider and its order of priority. As per the findings of this study, about six days are required for the arrival of samples from manufacturers to buyers for further approval. However, this time can be duplicated if the first sample will be failed for approval after approval to return to the hands of manufacturers. Because of

the current quality standard levels of Ethiopian apparel industries, rejection and rework of samples could happen during the export order production. This also negatively contributes to lengthening the lead time during the sampling phase.

As investigated by the researcher, most of the export-oriented Ethiopian garment companies are commonly developed five different types of samples which will be used as a quality control sample by the buyers before placing the final order. Because of this reason, manufacturers are expected to pass all stages of sample approval for every single order that came from their customers. Those sample approval stages are including photo sample, size set sample, preproduction sample, top of production sample, and shipment sample. As it is described in Table 4, the total lead time management for

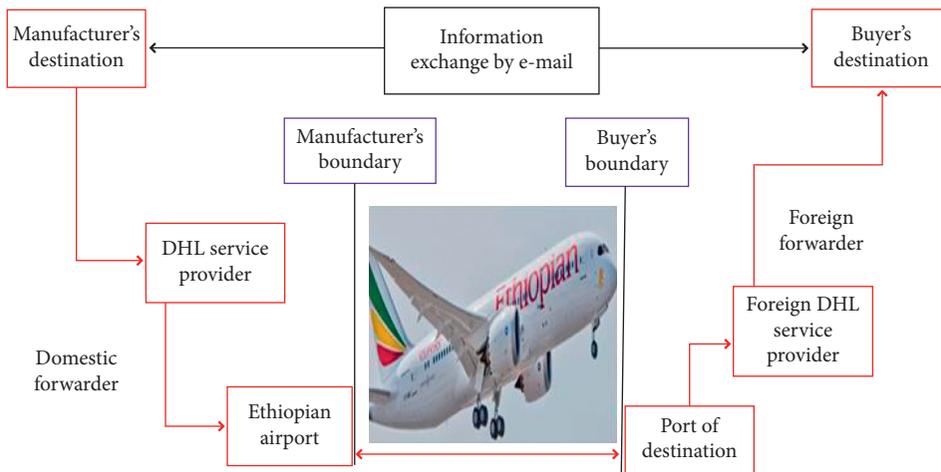


FIGURE 2: Existing sample approval application process for export orders.

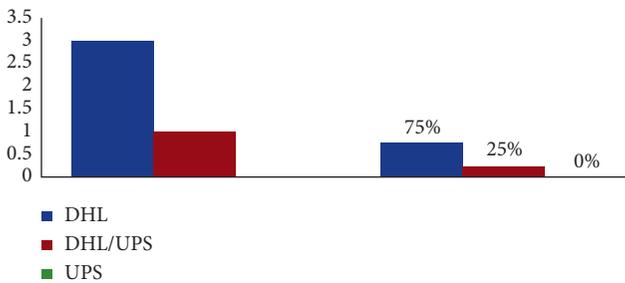


FIGURE 3: Popular service providers in the current sample exchange practice.

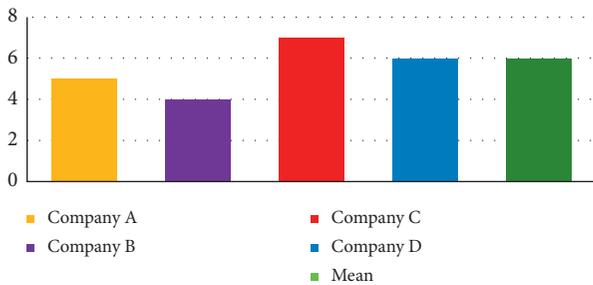


FIGURE 4: Average lead time for sample arrival at the buyer's destination.

complete order approval of the responding companies have almost the same number of days (nearly the same). Because most of the Ethiopian exporting companies are receiving orders from USA, customers were from the same destination, and all companies are using DHL service in which the speed of this service is common for all. The total lead time for the full order approval is the total delays for each sample approval stage until placing the full order for bulk production. According to the findings, photo sample approval stage is more time consuming in comparison to other approval stages with an average value of 25 days; as per the research result, the current average lead time for sampling stage of Ethiopian

garment export manufacturer is about 106 days. Figure 5 illustrates that the total lead time value of each company is almost the same which falls between 102 days and 109 days as a minimum and maximum, respectively. This is because most of the industries are working for the USA market where the destination is the same; in addition to this, they are using DHL service which has a common speed for all.

3.3. Cost Inefficiency of Physical Sample Exchange. The service charge for sample approval exchange is always variable based on the distance between the manufacturer and buyer's destination, the total kg of samples sent, and the class of priority (urgent issue or normal issue) based on the queues available to the DHL service provider. Table 6 shows the DHL/UPS service cost during each sample approval stage. From the analysis in the sample industry, the cost to launch one export order was found to be about 1452.52 Ethiopian Birr for DHL service. This expense can be projected by multiplying the number of orders that will be handled by the manufacturer per month or year. As selling price is considered as a basic factor for competitiveness, the current exaggerated manufacturing cost puts the Ethiopian apparel exporting sector to become unprofitable and less competitive in the global market.

The total expense experience from each case company implies that the sum of each cost debited during every sample approval stage (approval cost of size set sample + preproduction sample + top of production sample + shipment sample)—the average approval cost for each sampling stage is shown in Figure 6—has been charged only for the single order to be produced for a certain period. Therefore, while the manufacturer starts new order, the company always incurs this expense. On the contrary, the sent sample might be rejected by the buyers that need reworking and resending the samples again for approval, and this also might result in extra approval cost on the manufacturer.

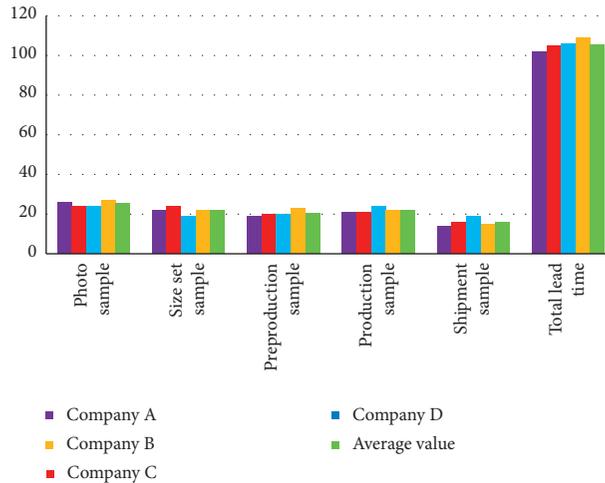


FIGURE 5: Lead time management status of Ethiopian apparel industries working for export.

TABLE 6: DHL service cost for the sample approval process.

| Sample approval stages | Size set sample | Preproduction sample | Production sample | Shipment sample |
|--|-----------------|----------------------|-------------------|-----------------|
| The average weight of samples (kg) | 10.5 | 7.2 | 8 | 4.2 |
| Average DHL service cost per kg in ETB | 485.67 | 485.67 | 485.67 | 485.67 |
| Total DHL service cost | 5099.53 | 3496.82 | 3885.36 | 2039.81 |
| Total cost in ETB | | | | 14521.52 |

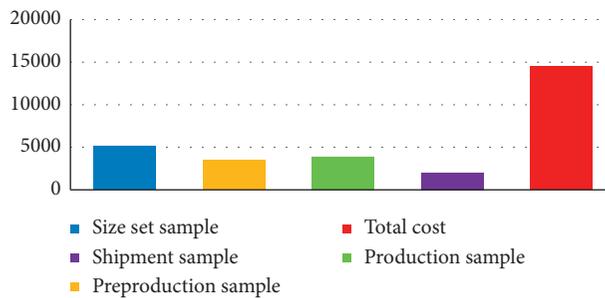


FIGURE 6: Sample approval cost for export order.

3.4. *Inventory Management Inefficiency of Physical Sample Development Practice.* Based on the researcher investigation, all samples come from different customers and have been stored in the sampling room for the original file purpose. As most of the industries sampling room working culture, designers develop the new sample based on the original sample specification; then, only the new samples are sent to their customers for approval application. Because of this approach, manufacturers put all original samples in their design room for further order and reference. This results in a large number of sample collections being stored in their design room. Sometimes the buyer sends original patterns for each style instead of garment samples and the manufacturer’s store is full of original garment samples and original patterns in the hard paper as shown in Figure 7 in case of company A design and sampling room. In this case, there are difficulties in searching the required original sample and original patterns with this crowded area of the sampling room; especially for new workers, the problem is too difficult.

Because every activity is done in a manual approach, customer order record files, original and modified garment samples, specification sheets, and modified and original patterns were stored together in hard copy. This phenomenon makes the design room very crowded and a poor workplace. During the research, the above pictures have been taken from company A; sampling department workers were engaged for a long time to search old customer order files that have been previously produced there. But this task is not easy to find the required files from such kind of traditional and crowded sampling room. As shown in Figure 7, many file holders and pattern papers were put on the table surface during visual observation [16]. According to the respondent’s answer, the manufacturers did not want to remove the original samples, even their customers stopped to order similar samples. Since they are expecting that, the previous customers will order again in other time or similar type of order might take place from the other customer. This is the



FIGURE 7: Sample making and designing room (photo taken from company A).

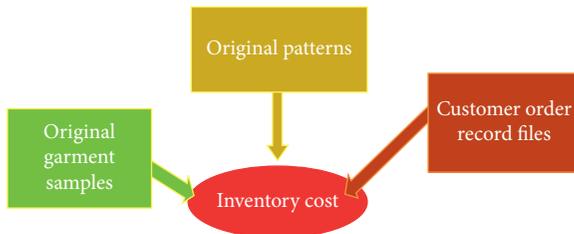


FIGURE 8: Manufacturer's inventory cost components.

main reason for keeping many original samples and customer order files for a long time. Figure 8 clearly explains the manufacturer's inventory management inefficiency that was caused by the physical sample processing approach.

4. Conclusions

The Ethiopian apparel sectors are currently encouraged and incentivized by the government policy to enter the export market. However, the existing export performance of the country is still behind the global competition. Through the analysis of the practical data, it has been found that the existing sample development and approval practice is fully traditional and the main factor for greater lead time and costly process. As the study findings confirmed that, the export-oriented garment industries in Ethiopia acquired an average of 106 days to process the sample approval of a single export order. From the analysis, the physical sample development and approval approach force the manufacturer to store a large number of static files in the sampling department which resulted in an uncomfortable workplace for sampling department workers. This is also the other contributor to generating long lead time caused by the current practice. By these reasons, the sector is in a very disadvantageous situation due to the long lead time created by the physical sample approval process which is directly affecting its export growth and competitiveness. On the other hand, sample transaction cost is also the main factor hammering the Ethiopian apparel exporting sector competitiveness. It was found that, to launch one export order, the manufacturer paid an average of 1452.52 Ethiopian Birr for DHL service. This extra cost addition to the manufacturing cost made the sector unprofitable and less competitive. In conclusion, considering the above analysis, it has been found that physical sample approval practice is negatively affecting the Ethiopian apparel exporting sector through hammering its quick responsiveness due to long lead time and

aggravating the manufacturing cost. The result also indicates that the Ethiopian apparel industries, those currently engaged in the export market, are demanded to change the existing approach by implementing best practices of sample approval system to survive in the global market competitively and profitability.

Appendix

A. Datewise Data Collected from Four Selected Companies

Datewise data collected from four selected companies are provided in Tables 1–4.

Data Availability

The data used to support the findings of this study are included within the article.

Conflicts of Interest

The author declares there are no conflicts of interest regarding the publication of this paper.

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