



Global Value-Addition of Bangladesh Textile–Clothing Industry’s Export: A Sub-sectoral Analysis

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Abstract

Bangladesh's textile-clothing industry imports a large number of raw materials (intermediate components) from the outer world hence assembled them and exported to high-fashion demanded countries. This paper aims to analyze the gross exports of textile–clothing outputs in the global value chains in terms of various value–added components. This paper attempts to provide an overview of the raw materials' import (foreign value addition) scenario compared to domestic value-added in sub-sectors of the textile-clothing industry. This paper has utilized multi-regional input-output table of 2001, 2011 and 2019 from the Asian Development Bank and Bangladesh export and import values of textile finished goods and intermediate products for the years 2001, 2011 and 2019 from UNCTAD. The paper finds that the domestic value-added and foreign value-added in the textile–clothing industry’s exports were 87% and 11% respectively in 2011, whereas the double–counted amount was 2%. Domestic value-added has increased to 89% in 2019.

Keywords— Trade in value–added, textile–clothing industry, export accounting, multiregional input output analysis, domestic value–added, foreign value–added

1. Introduction

Textile-clothing industry (TCI) of Bangladesh is a great contributor to the gross domestic product (GDP), employment generation, women empowerment, foreign currency earnings, socio-economic development and industrialization. The summary of the contribution is given here in Table 1.

Table 1: The contributions of TCI to Bangladesh's economy

Parameters	2019
Share of TCI in GDP	84% [3]
Employment in TCI	4.4 million [3]
Women share in TCI's employment	80% [3]
TCI's export share	83% [4]
No. of establishments	4800 [4]

The Revolution of Bangladesh's TCI has been flourished after the 1980s becoming a more labor-intensive sector and gradually becoming the most influential industrial sector [1]. With the rise of the textile industry in Bangladesh, its gross domestic product (GDP) has been elevated from \$6.29 billion to \$286 billion from 1972 to 2019 in which about 84% has come from textile and clothing products employing 4.4 million population (80% women) [2]. As of the fiscal year, 2021 textile clothing export of Bangladesh has uplifted to USD 42 billion and has aimed to secure \$50 billion by 2030 [3]. Bangladesh's Government has adopted a special export policy and continuously revising this policy to foster more and more growth [5]. The main focus of this policy is to reduce foreign value added (FVA) as import raw materials by attaining self-adequacy in domestic value added (DVA) and upholding the constant progress in textile-clothing export [2]. Although the textile-clothing sector indicates the final product export as finished clothing (apparel manufacturing), it has substantial

backward chain linkages termed as spinning (yarn manufacturing), weaving/ knitting (fabric manufacturing), dyeing/ printing/ washing (coloration), trims-accessories factories (trims and accessories manufacturing) [5]. Figure 1 illustrates the backward chain linkages of textile-clothing industry.

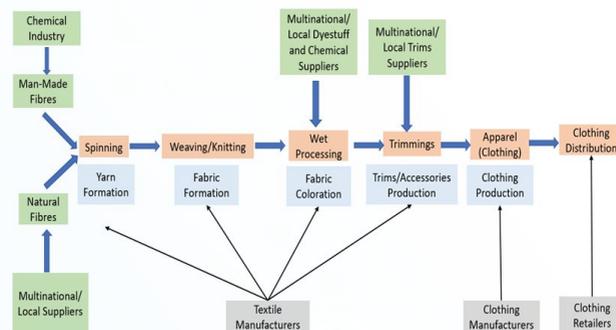


Figure 1: Textile clothing manufacturing process; modified from [6]

The export accounting of TCI shows that it (TCI) exports 97% as clothing and the rest 3% as intermediate raw materials, e.g., 2% yarn and 1% fabric [7]. The TCI uses 73% intermediate inputs and 27% primary inputs in the production process [8]. The trade-in value-added of the TCI's exports has not been addressed in the previous literature. This research answers the following research questions:

1. How much is the DVA embodied in textile-clothing exports from Bangladesh?
2. How much is the FVA embodied in Bangladesh's textile-clothing exports?

2. Methodology

We decompose TCI's gross export into 9 terms. The terms are displayed in the following Figure 2. The sum of the first 6 terms is domestic value-added (DVA) and the sum of (7), (8) and (9) is foreign value-added (FVA) or vertical specialization (VS).

1. Textile-clothing industry includes textile industry (Fiber, yarn, fabric, etc.) and clothing industry (finished apparel or ready-made garments).

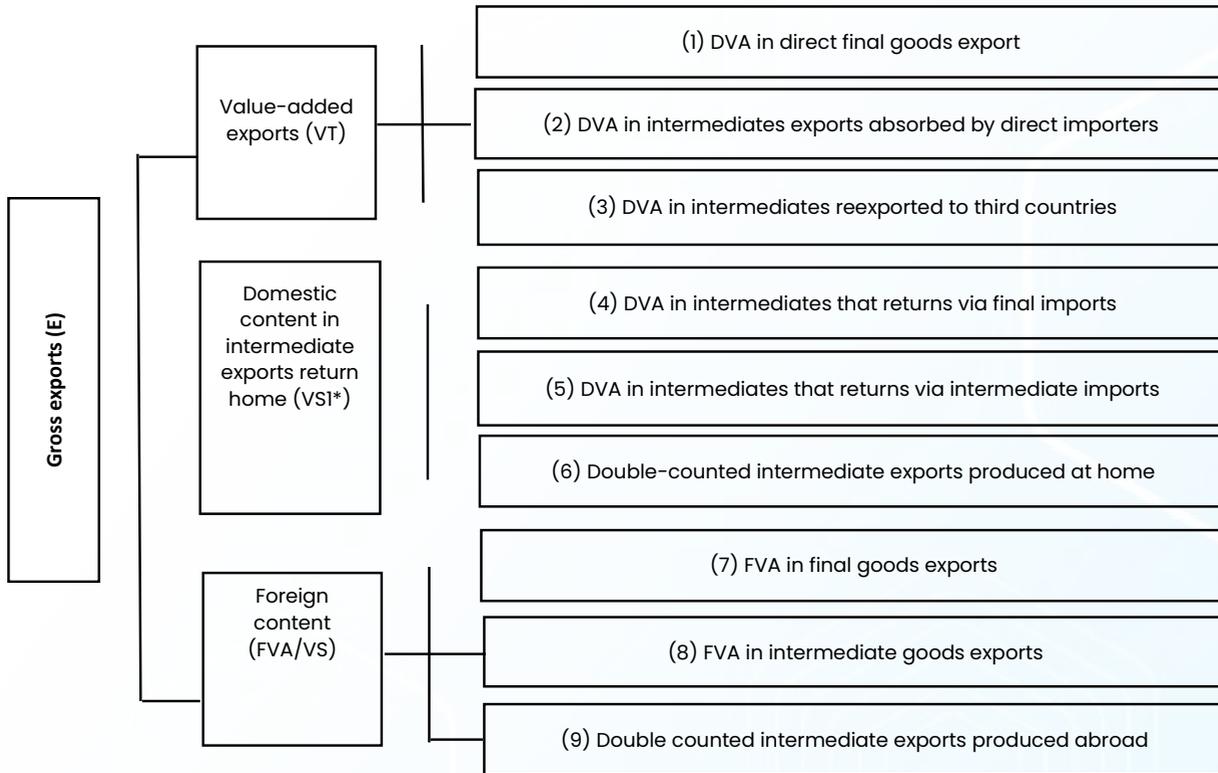


Figure 2: Accounting of gross exports [9]

Notes: (i) Value-added exports by a country equals (1) + (2) + (3); (ii) GDP in exports equals (1) + (2) + (3) + (4) + (5); (iii) Domestic content in a country's exports equals (1) + (2) + (3) + (4) + (5) + (6); (iv) (7) + (8) + (9) is labeled as VS and (3) + (4) + (5) + (6) is part of VS1 labeled by [10]; (v) (4) is labeled as VS1* by [11]; (vi) (4) through (9) involve value-added that crosses national borders at least twice and are the sources of multiple counting in official trade statistics; (3) should not be included in double counting, because when this value crosses a border for the second time, it becomes foreign value in the direct importer's exports. For this reason, it is not included as double counting to avoid an overcorrection.

The earlier measures of trade in value-added [10] were limited to measuring the imported inputs embodied into exported outputs, labeled as Vertical Specialization (VS). [11] extended the VS to a new level measuring the value of a country's exports that used imported inputs

from the rest of the world that are shipped back home. As a subsequent measure of value-added exports, [12] uses the ratio of value-added exports to gross exports as a summary measure of value-added content of exports. By definition, as value-added is a 'net' concept, double counting is not allowed [9]. [9]² proposed a new accounting framework for export analysis, which breaks down the DVA and FVA into more sensible terms.

$$\begin{aligned}
 uE_s^* = & \left\{ V_s \sum_{r \neq s} B_{ss} Y_{sr} + V_s \sum_{r \neq s} B_{sr} Y_{rr} + V_s \sum_{r \neq s} \sum_{t \neq s, r} B_{sr} Y_{rt} \right\} \\
 & + \left\{ V_s \sum_{r \neq s} B_{sr} Y_{rs} + V_s \sum_{r \neq s} B_{sr} A_{rs} (I - A_{ss})^{-1} Y_{ss} \right\} \\
 & + V_s \sum_{r \neq s} B_{sr} A_{rs} (I - A_{ss})^{-1} E_s^* \\
 & + \left\{ \sum_{t \neq s} \sum_{r \neq s} V_t B_{ts} Y_{sr} + \sum_{t \neq s} \sum_{r \neq s} V_t B_{ts} A_{sr} (I - A_{rr})^{-1} Y_{rr} \right\} \\
 & + \sum_{t \neq s} V_t B_{ts} A_{sr} \sum_{r \neq s} (I - A_{rr})^{-1} E_r^*
 \end{aligned}
 \tag{Equation1}$$

²The detailed mathematical calculations are available in Koopman, Wang, & Wei (2014).

uEs^* is defined as the country's gross export to the world, r is the exporting country, s is the destination country, G indicates countries, N indicates sectors, A and B are $GN \times GN$ matrices; V and VB are $G \times GN$ matrices. V_s denotes a $1 \times N$ row vector of direct value-added coefficient, A_{sr} is a $N \times N$ block input coefficient matrix, B_{sr} denotes the $N \times N$ block Leontief inverse matrix, which is the total requirement matrix that gives the amount of gross output in producing country, s required for a one-unit increase in final demand in destination country r . From ADB MRIOT and data from UNCTAD we have prepared sub-sectoral MRIOT for Bangladesh TCI.

3. Results and discussion

From above mathematical format analysis, DVA in the textile-clothing industry of Bangladesh is found 86% in 2001 which increased to 88% in 2011 and gradually also raised to a high level of 89% in 2019. On the other hand, FVA is found 14% in 2001, 12% in 2011 and 11% in 2019. During analysis of individual value addition terms, we found that DVA in direct final goods export (apparel/clothing) accounts for 65% in 2001 which has shown a strong increasing rate by capturing 71% in 2011 and still in 2019 kept this rate constant. This term (DVA in direct final goods export) is the ultimate indicator of domestic value-added in Bangladesh's textile-clothing industry's export. The 2nd term indicates DVA in intermediate exports (yarn, fabric, dyes-chemical, trims and accessories) which is found at 18% in 2001 which has figured at a lower decent to 13% in 2011 but in 2019 it has been raised to an upper value of 15%. The 3rd term denotes DVA in intermediates re-exported to third countries has held a persistent value of 2% from 2001 to 2019. In the case of foreign value addition, the 7th term FVA in final goods accounted for 13% in 2001 which uniformly decreased to 11% in 2011 and 10% in 2019. This

decreasing value dictates a good indication that DVA is boosting in comparison with FVA. This is because since our export volume has increased from 4583.75 million USD in 2001 to 27949.19 million USD in 2019 our DVA in intermediates does not capture a high amount as Bangladesh has to import a large value of intermediates which are assembled in final goods export.³ The details of value addition terms with the corresponding values in individual and total are illustrated in Table 2.

Table 2: Accounting of gross textile-clothing exports from Bangladesh to the world

		Value addition	Year					
	Broad type	Value addition terms	2001	Total	2011	Total	2019	Total
Gross exports (E)	Value-added exports (VT)	(1) DVA in direct final goods export	0.65	Total DVA = 0.88	0.71	Total DVA = 0.88	0.71	Total DVA = 0.89
		(2) DVA in intermediates exports absorbed by direct importers	0.18		0.13		0.15	
		(3) DVA in intermediates reexported to third countries	0.02		0.02		0.02	
	Domestic content in intermediate exports return home (VSI*)	(4) DVA in intermediates returns via final imports	0.00	Total DVA = 0.14	0.00	Total FVA = 0.12	0.00	Total FVA = 0.11
		(5) DVA in intermediates returns via intermediate imports	0.00		0.00		0.00	
		(6) Double-counted intermediate exports produced at home	0.01		0.02		0.01	
	Foreign content (FVA/VS)	(7) FVA in final goods exports	0.13	Total FVA = 0.14	0.11	Total FVA = 0.12	0.10	Total FVA = 0.11
		(8) FVA in intermediate goods exports	0.00		0.00		0.00	
		(9) Double-counted intermediate exports produced abroad	0.01		0.01		0.01	

Besides being the world's 2nd large finished clothing exporting country, Bangladesh has to import a high value of intermediate components from the outer world. We have gone through regional (continents) import-export of total intermediate components. Total intermediate imports from Asia in 2001 were USD 1957.5 million which eventually increased to a high value of 8051.2 million USD in 2011 and maintain an incremental rate being raised to 12804.5 million USD in 2019. The same scenario has been found in the case of Europe also. These increasing values mirror the image of high import figures of intermediate components by Bangladesh and it

³Source: Bangladesh Garment Manufacturers and Exporters Association (BGMEA)

also visualizes the dependency of Bangladesh on the outer world for clothing export. Among these imported intermediate components, a

significant portion (fibers/yarn) is assembled to produce textile fabrics which are directly exported to many countries as shown in table 3.

Table 3: Total intermediate import and export of Bangladesh in thousands of USD

Continents	Total intermediate import			Total intermediate export		
	2001	2011	2019	2001	2011	2019
Asia	1957513.46	8051239.84	12804546.56	166950.54	599393.32	786109.12
Europe	151540.16	402692.07	498718.85	70123.64	116841.61	653710.49
Northern America	97454.35	369910.22	377988.22	140275.83	148557.38	440229.88
South America	8641.04	43928.46	65653.25	1278.50	13508.11	14697.58
Africa	47506.893	131978.243	1277492.511	11131.66	34729.74	88536.81
Oceania	23934.199	121707.834	81088.548	7734.06	11491.58	57474.71
TOTAL	2286590.118	9121456.67	15105487.95	397494.22	924521.74	2040758.5

Source: *Compiled from United Nations Conference on Trade and Development (UNCTAD)*

Bangladesh's clothing industry's export has gained a remarkable upward figure in the last two decades. In 2001 Bangladesh has exported finished goods (finished clothing) capturing a value of 4.5 billion USD which eventually get almost five times higher to the value of 19.5 billion USD holding an incremental pattern to the value of 32 billion USD in 2019. Among these export values, most of the partition was exported to Asia, Europe and North America.

Besides export Bangladesh also import a significant amount of clothing from Asia most. This is because textile-clothing factories are very much export oriented and these products do not match our local traditional clothing pattern. Bangladesh has to import traditional clothing (especially womenswear, home textile products) from India, Pakistan, China, etc. as depicted in Table 4.

Table 4: Total finished goods import and export of Bangladesh in thousands of USD

Continents	Total finished goods import			Total finished goods export		
	2001	2011	2019	2001	2011	2019
Asia	7134.88	58015.67	162140.68	46553.51	1384845.35	2980133.51
Europe	6225.40	4123.92	8060.19	2473064.44	12375311.98	21602284.71
Northern	192.77	799.46	1808.58	2002504.62	5268018.74	6204787.79
South America	15.89	12.14	17.36	2995.73	161308.72	393725.34
Africa	62.20	0.91	100.74	9882.76	67547.63	131703.24
Oceania	2.25	12.48	79.54	3454.76	255694.16	744825.0
TOTAL	13633.40	62964.58	172207.08	4538455.83	19512726.61	32057459.62

Source: *Compiled from United Nations Conference on Trade and Development (UNCTAD)*

3.1 Value addition analysis from fiber production

From the fast evolution of the textile-clothing industry in Bangladesh, high-value cotton fiber has been imported as illustrated in Table 5. We have analyzed that in 2001 Bangladesh had FVA of 90% in fiber usage while DVA of only 10% with some local cotton producers. FVA in fiber usage has been lowered to 89% in 2011 but in 2019 FVA in fiber usage has been found 94%. From 2011 to 2019 this rapid change is due to the regular incremental mode of clothing orders by

foreign customers. In 2001 cotton fiber (cotton bale) imported by Bangladesh's textile industry was 355 million USD value and among this value USA (21.8%), India (13.2%) and Russia (11.5%) were prominent. This import view has been raised to 2110 million USD in 2011 mainly from Iran (21.2%), India (20.7%) and the USA (16.1%). The incremental import view has continued to uphold a higher figure of the value of 1900 million USD in 2019 intensifying countries like India (28.8%), the USA (20.5%) and Brazil (16.2%).

Table 5: Value addition fiber production in gross textile-clothing export

Value addition from fiber			Year					
	Broad Type	Value addition terms	2001	Total	2011	Total	2019	Total
Gross exports (E)	Value-added exports (VT)	(1) DVA in direct final goods export	0.10	Total DVA = 0.10	0.11	Total DVA = 0.11	0.06	Total DVA = 0.06
		(2) DVA in intermediates exports absorbed by direct importers	0.00		0.00		0.00	
		(3) DVA in intermediates re exported to third countries	0.00		0.00		0.00	
	Domestic content in intermediate exports return home (VST*)	(4) DVA in intermediates that returns via final imports	0.00	Total DVA = 0.10	0.00	Total DVA = 0.11	0.00	Total DVA = 0.06
		(5) DVA in intermediates that returns via intermediate imports	0.00		0.00		0.00	
		(6) Double-counted intermediate exports produced at home	0.00		0.00		0.00	
	Foreign content (FVA/VS)	(7) FVA in final goods exports	0.79	Total FVA = 0.90	0.72	Total FVA = 0.89	0.75	Total FVA = 0.94
		(8) FVA in intermediate goods exports	0.11		0.17		0.19	
		(9) Double-counted intermediate exports produced abroad	0.00		0.00		0.00	

3.2 Value addition analysis from yarn manufacturing (spinning)

In 2001, DVA in yarn usage was 61% which has shifted upward to 79% in 2011 but has lowered to 74% in 2019. The high price of locally produced yarn is responsible for this lowering pattern. Cotton fiber price has been elevated to a high value in the last few years which is directly impacting local yarn selling prices.

In table 6 it has been shown that FVA in yarn usage for finished goods export was 16% and for intermediate products was 10% to a total of 26% in 2019. In 2011 Bangladesh has imported cotton yarn of major portion from India (55.2%), Pakistan (13.2%) and China (11.8%). This import scenario has been changed in 2019 with increasing imports from India (62.7%) and China (18.4%).

Table 6: Value addition from yarn manufacturing in gross textile-clothing export

Value addition from yarn manufacturing (Spinning)			Year					
	Broad type	Value addition terms	2001	Total	2011	Total	2019	Total
Gross exports (E)	Value-added exports (VT)	(1) DVA in direct final goods export	0.61	Total DVA = 0.61	0.79	Total DVA = 0.79	0.74	Total DVA = 0.74
		(2) DVA in intermediates exports absorbed by direct importers	0.00		0.00		0.00	
		(3) DVA in intermediates re-exported to third countries	0.00		0.00		0.00	
	Domestic content in intermediate exports return home (VSI*)	(4) DVA in intermediates that returns via final imports	0.00		0.00		0.00	
		(5) DVA in intermediates that returns via intermediate imports	0.00		0.00		0.00	
		(6) Double-counted intermediate exports produced at home	0.00		0.00		0.00	
	Foreign content (FVA/VS)	(7) FVA in final goods exports	0.26	Total FVA = 0.39	0.12	Total FVA = 0.21	0.16	Total FVA = 0.26
		(8) FVA in intermediate goods exports	0.13		0.09		0.10	
		(9) Double-counted intermediate exports produced abroad	0.00		0.00		0.00	

3.3 Value addition analysis from fabric manufacturing (weaving/knitting)

Table 7 dictates value addition from fabric usage in textile-clothing industry's gross export. FVA in fabric usage has fallen from 44% in 2001 to 27% in 2011 thus

emphasizing our DVA in fabric usage to make finished goods (finished clothing). But with the rising clothing order and cheap fabric prices in some countries like China, Chinese Taipei, Hong Kong, Bangladesh imported 3020 USD value of

the woven fabric in 2019 most of which was from China (98.8%). Not only woven fabric but also Bangladesh imported knit fabric of 427 million USD in 2001 which has

been raised to 1400 million USD in 2019. Moreover, DVA in fabric usage has kept a remarkable growth pattern.

Table 7: Value addition from fabric manufacturing in gross textile-clothing export

Value addition from fabric manufacturing (weaving/knitting)			Year					
	Broad type	Value addition terms	2001	Total	2011	Total	2019	Total
Gross exports (E)	Value-added exports (VT)	(1) DVA in direct final goods export	0.56	Total DVA = 0.56	0.73	Total DVA = 0.73	0.65	Total DVA = 0.65
		2) DVA in intermediates exports absorbed by direct importers	0.00		0.00		0.00	
		(3) DVA in intermediates reexported to third countries	0.00		0.00		0.00	
	Domestic content in intermediate exports return home (VSI*)	(4) DVA in intermediates that returns via final imports	0.00	Total DVA = 0.56	0.00	Total DVA = 0.73	0.00	Total DVA = 0.65
		(5) DVA in intermediates that returns via intermediate imports	0.00		0.00		0.00	
		(6) Double-counted intermediate exports produced at home	0.00		0.00		0.00	
	Foreign content (FVA/VS)	(7) FVA in final goods exports	0.44	Total FVA = 0.44	0.27	Total FVA = 0.27	0.35	Total FVA = 0.35
		(8) FVA in intermediate goods exports	0.00		0.00		0.00	
		(9) Double-counted intermediate exports produced abroad	0.00		0.00		0.00	

3.4 Value addition analysis from dyes-chemicals manufacturing

In Bangladesh dyeing and printing industrial sectors import an immensely high value of dyes and chemicals holding an import value of 17.1 million USD in 2001 which eventually increased to 99.9 million USD in 2011 and has grabbed a significantly high value of 152 million USD in 2019 with the continuous increment in clothing work order. From Table 8, it is visible that

foreign value-added (FVA) in dyes-chemical usage is 98% (90% in finished goods export and 8% in intermediate goods export) which has lowered to 94% in 2011 but in 2019 this FVA has increased to 96% (89% in finished goods export and 7% in intermediate goods export). From this analysis, it can be remarkably noticed that Bangladesh is compulsorily dependent on FVA in the case of dyes-chemicals usage.

Table 8: Value addition from dyes-chemical manufacturing in gross textile-clothing export

Value addition from dyes-chemicals (dyeing)			Year					
	Broad type	Value addition terms	2001	Total	2011	Total	2019	Total
Gross exports (E)	Value-added exports (VT)	(1) DVA in direct final goods export	0.02	Total DVA = 0.02	0.06	Total DVA = 0.06	0.04	Total DVA = 0.04
		2) DVA in intermediates exports absorbed by direct importers	0.00		0.00		0.00	
		(3) DVA in intermediates reexported to third countries	0.00		0.00		0.00	
	Domestic content in intermediate exports return home (VST*)	(4) DVA in intermediates that returns via final imports	0.00		0.00		0.00	
		(5) DVA in intermediates that returns via intermediate imports	0.00		0.00		0.00	
		(6) Double-counted intermediate exports produced at home	0.00		0.00		0.00	
	Foreign content (FVA/Vs)	(7) FVA in final goods exports	0.90	Total FVA = 0.98	0.87	Total FVA = 0.94	0.89	Total FVA = 0.96
		(8) FVA in intermediate goods exports	0.08		0.07		0.07	
		(9) Double-counted intermediate exports produced abroad	0.00		0.00		0.00	

3.5 Value addition analysis from trims and accessories manufacturing

From Table 9, we have found FVA in trims and accessories usage is 83% leaving only 17% DVA in 2001. FVA has been lowered to 61% in 2011 and almost same pattern in 2019 by help of some locally set up trims and accessories factories in Bangladesh. In 2001 Bangladesh has imported 10.2 million USD value of trims and accessories prominently from Hong kong (25.1%), Singapore

(21.1%) and Thailand (14.4%). This import scenario has been significantly moderated in 2011 to a high value of 46.5 million USD from China (58.9%), India (7.53%) and Hong kong (7.25%) and others. But in 2019 import value of trims and accessories has been found 45.8 million USD.

Table 9: Value addition from trims & accessories manufacturing in gross textile-clothing export

Value addition from trims and accessories			Year					
	Broad type	Value addition terms	2001	Total	2011	Total	2019	Total
Gross exports (€)	Value-added exports (VT)	(1) DVA in direct final goods export	0.17	Total DVA = 0.17	0.39	Total DVA = 0.39	0.37	Total DVA = 0.37
		2) DVA in intermediates exports absorbed by direct importers	0.00		0.00		0.00	
		(3) DVA in intermediates reexported to third countries	0.00		0.00		0.00	
	Domestic content in intermediate exports return home (VSI*)	(4) DVA in intermediates that returns via final imports	0.00		0.00		0.00	
		(5) DVA in intermediates that returns via intermediate imports	0.00		0.00		0.00	
		(6) Double-counted intermediate exports produced at home	0.00		0.00		0.00	
	Foreign content (FVA/VS)	(7) FVA in final goods exports	0.83	Total FVA = 0.83	0.61	Total FVA = 0.61	0.63	Total FVA = 0.63
		(8) FVA in intermediate goods exports	0.00		0.00		0.00	
		(9) Double-counted intermediate exports produced abroad	0.00		0.00		0.00	

4. Conclusion

This paper figures out the sources of value-added in terms of sub-sectors of the textile-clothing industry, which is more reliable export statistics than gross value to gauge value-added contribution of textile-clothing exports from Bangladesh. From the above analysis, it can be concluded that although Bangladesh has captured a significant export share of clothing it is mostly dependent on foreign value addition (import). Moreover, this paper helps policy makers in decision making concerning effective supply chain management. Country-specific sources of value-added would be more effective features to know the consequences of the global value chain of textile-clothing production in Bangladesh. Research work can be performed in country based foreign value addition.

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Conflict of interest

The authors have no conflict of interest.

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