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POTENTIAL ECONOMIC IMPACT OF FIXING THE INVERTED CUSTOMS DUTY STRUCTURE: THE CASE OF INDIAN VISCOSE FIBERS[2]

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ABSTRACT

Dissolving Grade Wood Pulp (DWP) forms about 60% of the raw material cost for the manufacture of Viscose fiber, which in turn feeds into the textile and apparel industry. The wood used in DWP is not available in India due to climatic conditions. More than 85% of DWP requirements in India are met with imports from South Africa, Canada, Brazil, Sweden, and Chile. There is a 2.5% basic customs duty on imports of DWP. On the other hand, VSF imports themselves endure lower tariffs. This has resulted in an inverted duty structure. We have used a Global Trade Analysis Project (GTAP), a Computable Equilibrium Model to estimate the economic impact of fixing this inverted customs duty structure in India. Results from the model estimates show an increase in GDP of about 18 million USD and exports of 10.75 million USD at the aggregate level for the Indian economy.

Keywords: textile, GTAP model, viscose fiber, DWP, apparel, inverted duty

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INTRODUCTION

The textile and apparel industry is one of the oldest sectors in India. Apparels are a vital component of India's export basket and serve as one of the primary foreign exchange earners. The market value of the Indian textile industry is 223 billion USD, and it accounts for more than 2% of the country's GDP and about 12-14% of the manufacturing sector (RBI bulletin, 15 December 2021). Indian apparels are high in fashion and affordable and so is in great demand abroad.

There are around 30,000 manufacturing units in the country, but a majority of them are small and fragmented. The sector, particularly apparel manufacturing employs a significant proportion of skilled and unskilled labor. Data from Indian government sources suggest that the sector employs 4.5 crore people directly and more than 6 crore people in its allied sectors. The textile supply chain has various forward and backward linkages, and its success depends on the competitiveness and efficiency of such linkages.

Synthetic fibers are a vibrant and integral player within the textile industry. Viscose staple fiber (VSF) is one of the important categories of synthetic fibers that have a natural origin, cotton-like feel, and a higher moisture absorption capacity. Due to such properties, VSF is increasingly preferred in manufacturing apparel, home textiles, and non-woven apparel. It is due to its appeal as an environment-friendly and fashion-enhancing fiber, the demand for VSF is growing faster (at 5-6% p.a.) than other fibers (2.5-3% p.a.). Exports of VSF-based apparel from India has grown at a hefty CAGR of 8% from FY14 to FY20, as compared to overall apparel export growth of 1% per annum in value terms. India has evolved to become a leading player in VSF, accounting for 8% of global capacity, helping strong growth in the downstream industries.

Dissolving Grade Wood Pulp (DWP) is the key raw material for the production of VSF and it is important to note that VSF accounts for more than 50% of the manufacturing cost of VSF. It is a low-yield chemical pulp with high cellulose content and a lower hemicellulose and lignin content. Wood species are the primary raw materials for manufacturing DWP and so, geographic conditions play a key role in determining the production and export of DWP. A good quality DWP has an extremely higher alpha-cellulose content. Hemicellulose contaminants result in color and haze in the DWP output and are also insoluble which adversely impacts the production process and its efficiency. So, manufacturing DWP involves extensive pulping and bleaching. This is an important reason that the distribution of DWP and VSF have different global patterns.

Though India accounts for 8% of global VSF production, it produces only 2% of the world's DWP. In India, the production of DWP is majorly dependent on Eucalyptus. Other types of wood species are not suitable to manufacture DWP as they carry impurities. Eucalyptus is a short-rotation crop and in India, it has alternative uses. Eucalyptus is majorly used in the construction industry, agricultural implements, paper-grade mills, and so on. Paper production in India has grown exponentially in India, and so the availability of eucalyptus for manufacturing DWP is limited. Wood deficiency is a major reason for the incompetence of the Indian textile industry in manufacturing and sourcing DWP domestically. Also, wood is relatively costlier in other parts of the world where DWP is produced. The production, as well as the import of low-cost, high-quality DWP, remains a challenge for Indian industries on one hand, and on the other, the demand and application for cellulose are rapidly growing.

On a broader perspective, the cultivation of Eucalyptus in India has attracted controversies as studies revealed the adverse impacts of Eucalyptus planting on the water table. Such problems question the long-term prospects of Eucalyptus cultivation and DWP production in India. Companies have explored and experimented with the possibilities of substituting eucalyptus with other wood species like bamboo, Casuarina, pine, Acacia, etc. But they have not been effective due to multiple reasons the most important being, higher manufacturing costs, low competitiveness, and a loss in quality. The loss in quality of DWP produced impacts the quality of VSF and so the end garment. So, finding a lucrative and sustainable alternative to DWP requires more investment and a greater span of time revealing that India's dependence on imported DWP will stay on for a longer period.

In 2021, India produced around 110000 Tons of DWP which accounts for 97.02 million USD. On the other hand, India imported 597.52 million USD of DWP and it is the highest from South Africa (42.42%), Hong Kong (18.97%), Canada (16.85%), Germany (8.62%), Sweden (5.6%), and the USA (5.35%).

VSF production has been increasing in India since 2014 excluding the Covid19 hit period 2020-21. India produced 452,000 tons of VSF in 2021 which in turn accounts for 1225 million USD and its imports amount to 181.5891 million USD (as per ITC data). The top Import sources include Austria (25%), Indonesia (24.66%), China (15.66%), and Thailand (14.39%). The initial tariff is 5% for most of these countries and due to the FTA with ASEAN, VSF can be imported from ASEAN members at zero duty rates.

Currently, customs duties imposed on imported DWP are too high as a cost component of VSF production while VSF imports themselves face lower tariffs. This has led to the presence of an inverted duty structure in this sector, implying that it may be potentially cheaper to import VSF rather than to Import DWP and produce VSF domestically. This implies consequences for GDP and employment in the country. Also, it reduces the cost competitiveness of India's VSF and textile output as other textile-producing countries including China, Indonesia, Germany, Thailand, and Japan have not imposed any duty on the imports of DWP into their country.

There are several arguments that support the removal of duties on the import of DWP and some of them are the following. 1. VSF production in India has significant prospects and this could be a valuable addition to the 'Make in India' program. 2. Import of VSF from ASEAN countries is done at zero rates and comparing this against the 2.5% tariff imposed on DWP it is only natural to be motivated to import VSF directly. This has led to an inverted tariff structure which in turn impacts the growth prospects of the VSF industry. 3. The prospect for use of viscose fiber in the textile industry is continuously expanding. DWP is the beginning of the VSF supply chain. The domestic incompetence in producing DWP may adversely impact the entire supply chain and the dominant value add that India holds in the global textile market. 4. Eliminating tariffs on DWP may not impact domestic DWP producers as they are already very few. Also, having an import duty seems to have no broader purpose in terms of the conventional argument of protecting domestic producers.

The objective of the study is to examine the potential economic impact of the elimination of these tariffs on the imports of DWP and analyze how such a step would boost the output of the VSF and textiles Sector. We do so by presenting the impact on macroeconomic parameters including GDP, employment, wages, exports, imports, output, and prices.

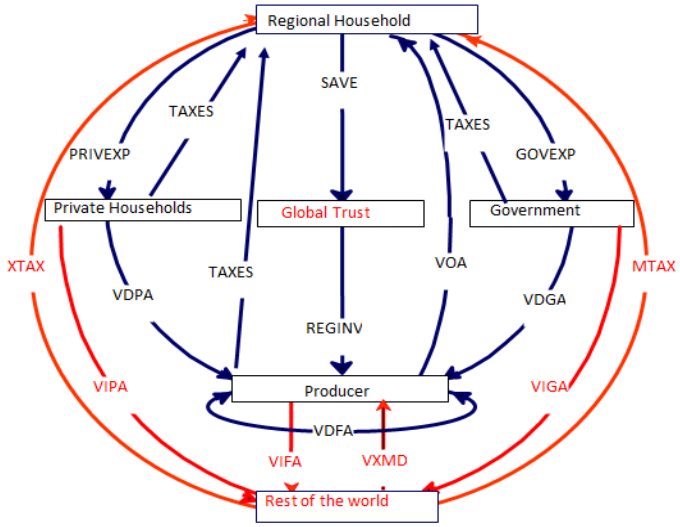
1. METHODOLOGY

1.1. Model Description

General Equilibrium models have the power to capture the complex interlinkages and interactions that exist between different markets in the same or different economies. They have the ability to present an extensive, elaborate representation of the economy and so are increasingly preferred in policy analysis. Computable General Equilibrium (CGE) models leverage the power of General Equilibrium models and the computing power of systems that have evolved over the ages. To analyze and present the impact of the elimination of duties on the imports of DWP into India, we need a model that can capture the interlinkages between different sectors including DWP, VSF, textiles, and different countries that serve as a source of import for the DWP and VSF sector. In economic models like partial equilibrium models, the modeling focuses on only one sector at a time. CGE models have the ability to capture the above-mentioned economic interactions effectively and so, we intend to use a Computable General Equilibrium model for the same. CGE models are generally built through a series of equations that capture the economic and behavioral responses of firms, households, or governments. Their unique ability to present such an extensive analysis helps the modeler gain a deeper picture while estimating the impact of a policy shock.

The economic impact of a policy or shock is estimated by comparing the scenario before (baseline) and after (policy) the shock. The baseline is prepared by curating the base year data for the equations and different behavioral parameters in the model. The baseline describes an equilibrium position. After we shock the model with policy change, which here is the elimination of tariffs on DWP imports, the model arrives at a new equilibrium. By capturing the changes in prices, supply, and demand in the model to bring the economy to a new equilibrium after being subjected to a shock from policy, we estimate the impact of that policy shock.

Figure 1: Simplified view of the Accounting Structure of the GTAP model



We have used GTAP (Global Trade Analysis Project), a multi-sector, multi-regional CGE model designed and developed by the Centre for Global Trade Analysis, Purdue University (Global Trade Analysis Project, 2018). It works on the assumptions of perfect competition

and constant returns to scale. The model captures supply-demand linkages and equates them by accounting for changes in production, consumption, exports, and imports. The behavioral equations in the model dictate production, private consumption, exports, imports, and market-clearing conditions that equate supply with demand. Elasticities determine the substitution between various input and output parameters in the production and consumption behavioral equation.

Figure 1 offers a simplified structure of the original complex GTAP model. Here, the regional household receives factor payments (VOA) from different agents including private households, firms, and the government for the supply of factors like land, labor, and capital. The residual that remains after households' expenditure on private consumption and government consumption is savings. The model is based on the Cobb-Douglas utility function that preserves the share of private consumption and government consumption. Global trust accumulates savings and then distributes them across different regions as investments and this happens based on the rate of returns. This becomes a capital input to the firms that also use factor inputs (VOA) and intermediate inputs from domestic (VDFA) as well as imported (VIFA) to produce the output. This output caters to the consumption demand of private households (VDPA), and the government (VDGA) and also serves as an intermediate input to firms (VDFA). The private household and the governments can consume from the domestic output (VDPA/VDGA) as well as from imports (VIPA/VIGA) the consumption of which is governed by the Armington assumption. The international transactions in the figure are marked in red and the domestic transactions are differentiated in blue color. Fore technical details, refer T.W. Hertel (1997).

1.2. Database preparation

We use the latest available GTAP 10.0 database to perform the simulation and analysis. The database is very exhaustive covering 141 countries and 65 sectors and is referenced to the year 2014. The GTAP database (Aguiar, A., et al., 2019) is built from several international data sources including national input-output (I-O) tables, FAO, IMF, IEA, OECD, etc. as well as from individual contributors who specialize in building IO tables for their regions/countries.

Because the latest available GTAP database is referenced to the year 2014, we adjust and scale the database using macroeconomic data from reliable international sources like World Bank and IMF. In our study, the regional focus is on India and its import sources for DWP and VSF. So, we aggregate the 141 countries/regions into 26 countries/regions retaining only those that are relevant to the study.

A preliminary survey of literature available on DWP and VSF, along with data curated from World Integrated Trade Solution revealed that the key sources for India to import DWP are South Africa, Hong Kong, Canada, Germany, Sweden, USA, Chile, Brazil, Switzerland, and that of VSF is Austria

Indonesia, China, Thailand, Sri Lanka, Greece, Germany, the UK, Slovenia, Netherlands, Hong Kong, Singapore, the USA, Italy, Japan, Belgium, Israel, and Korea. While aggregating the regions, we retain the above-mentioned countries so as to present a broader picture of the analysis.

Out of the 65 sectors present in the GTAP database, DWP (HS code- 47020000) is aggregated within paper and paper products (ppp in GTAP), and the VSF sector (HS Codes - 550410 and 550490) is aggregated within the textiles. We first aggregate the 65 sectors in the GTAP database into 34 sectors retaining the textiles and apparel, paper, and other related industries as individual sectors at the disaggregated level. To improve the effectiveness of the analysis, we split the DWP and VSF from their parent sectors in GTAP using Splitcom (Horridge M., 2005), a software tool designed and developed by the Centre for Policy Studies (CoPS), Melbourne, Australia. We use the production, export, and import data to do the same. The exact aggregation is presented in the appendix.

Table 1: VSF and DWP macroeconomic data in 2021

Parameter (in millions USD)	DWP	VSF
Production	97.02	1225
Exports	0	181.74
Imports	597.52	181.59

Table 2: Imports of VSF and DWP in 2021

VSF imports into India		DWP imports into India	
Exporters	**Value (in million USD)**	**Exporters**	**Value (in million USD)**
Austria	53.47	South Africa	253.46
Indonesia	33.62	Hong Kong	113.35
China	22.14	Canada	100.69
Thailand	19.58	Germany	51.56
Greece	15.83	Sweden	33.46
Sri Lanka	15.48	USA	31.98
Germany	8.14	Chile	5.86
Netherlands	3.96	Brazil	2.60
Hong Kong	3.09	Switzerland	1.93
Slovenia	2.94	Austria	1.20
Singapore	1.53	Portugal	1.12
USA	0.88	Thailand	0.20
UK	0.40		
Italy	0.24		
Japan	0.18		
Israel	0.09		
Belgium	0.04		
Korea Rep.	0.01		

Source *- World Integrated Trade Source.*

The production data for DWP in India is curated from the Hawkins Wright study as per which the total output is 110000 Tons and converting this in dollar amounts, it makes up to 97.02 million USD. The production data for VSF is curated from Industry, Textile Commissioner's Office, and CRISIL Research and the value amount to 1225 million USD.

The trade data is extracted from the World Integrated Trade Systems (WITS) which is built based on the UN COMTRADE. At the aggregate level, the exports of VSF from India amounted to 181.74 million USD, and there were no exports of DWP. The imports of VSF into India amounted to 181.59 million USD and that of the DWP amounted to 597.52 million USD. Table 2 presents the country-wise data for imports of VSF and DWP into India.

Considering 2021 as the base year, we then scale and calibrate the GDP, aggregate exports, and aggregate imports of each country included in our study. The GDP data is extracted from World Bank and the trade data is from World Integrated Trade Source (WITS). We use GTAPAdjust (Horridge M., 2011) from CoPs to do the same.

2. MODELING

We use the standard GTAP model, which is a comparative static model to estimate the impact of tariff elimination on the imports of DWP into India. To do this, we first incorporate the tariff information into the model. It is useful to do this adjustment in the initial, pre-simulation database. The GTAP database has observed trade and tariff data referenced to the year 2014. Because we are changing the base year to reflect 2021, we incorporate the latest data into the database and model.

We do so by using the ALTERTAX procedure developed by the GTAP center, the technical details of which are presented in Malcolm (1998). When we have to adjust the import duty, it is undesirable to just change one particular tax as it would impact the consistency of the already balanced database. Using ALTERTAX, we incorporate the latest import duty and let other flows in the database adjust for themselves so as to ensure that the consistency is still retained.

As per data extracted from the India Trade Portal (dated 9 September 2022), the tariff rate for DWP for imports into India is 2.5%. Considering VSF, it is duty-free for imports from ASEAN member countries into India and 5% duty for imports from other countries. In this study we eliminate the import tariff rates for DWP for India, essentially importing DWP at no tariff rate.

3. RESULTS AND DISCUSSION

Based on the simulation we analyze the impact on various macroeconomic indicators. This study primarily focuses on the impact on the DWP, VSF, and textile sectors on account of tariff removal on the DWP imports. Given that there is a full tariff elimination on DWP, the import price for this sector reduces and therefore there is an increase in total imports. The total increase in DWP imports is 6.34 million USD (1.06% increase). The drop in import prices leads to an additional demand for DWP. The price decline not only replaces the already minuscule domestic production but also creates a higher demand for DWP which is a major input into the VSF sector and eventually the textile sector. Table 3 shows the top six source countries whose export to India increases.

There is a 4% increase in the use of DWP as an intermediate good to produce VSF. The increase in the supply of DWP leads to an increase in the output of VSF and a decline in VSF imports. VSF is an important input to the textile sector and the increased domestic production of VSF reduces the price of VSF, thereby increasing the demand for the same. This finally feeds into the textile sector leading to a 1.13 million USD increase in the output of the textile sector. India is one of the global leaders in the textile sector, and therefore the increase in the output of the textile sector boosts India's textile exports by 0.9 million USD. Additionally, textile imports also reduce by 0.06 million USD.

Table 3: Top six exporters of DWP to India: Simulation Results

Country/Region	Absolute Value change in imports (in USD millions)
South Africa	2.69
Hong Kong	1.21
Canada	1.07
Germany	0.55
Sweden	0.36
USA	0.34

There is a 4% increase in the use of DWP as an intermediate good to produce VSF. The increase in the supply of DWP leads to an increase in the output of VSF and a decline in VSF imports. VSF is an important input to the textile sector and the increased domestic production of VSF reduces the price of VSF, thereby increasing the demand for the same. This finally feeds into the textile sector leading to a 1.13 million USD increase in the output of the textile sector. India is one of the global leaders in the textile sector, and therefore the increase in the output of the textile sector boosts India's textile exports by 0.9 million USD. Additionally, textile imports also reduce by 0.06 million USD.

Table 4: Change in macroeconomic aggregates.

Macroeconomic Variables	% Change	Absolute change (Millions USD)
GDP	0.00057	18.057
Exports	0.00230	10.754
Imports	0.00139	7.919

Given that DWP is not a very labor-intensive sector, the reduction in domestic output does not lead to job losses. Additionally, the positive effect on sectors such as VSF and textile where DWP is intermediary input leads to overall job creation of 5.484K additional employment.

Overall, there is a positive impact on the macroeconomy. Given that DWP's contribution to India's total imports is 0.16%, the total change in both GDP and exports is positively significant. India is estimated to increase its GDP by 18 million USD and its total trade balance is net positive amounting to 2.84 million USD.

CONCLUSION

DWP is used as a raw material in the production of VSF which in turn is used as a raw material in the textile industry. Currently, the production of DWP in India is a very small fraction of the requirement. DWP is majorly imported into India and is converted to VSF within India. VSF can also be directly imported into India. The reduction in tariffs on VSF from ASEAN countries has made imports of VSF cost-effective. This study analyzes if the removal of tariffs on DWP would give a positive boost to the economy.

The production of VSF in India has witnessed significant growth from 2014-2021. The operating rate of VSF in India stands at about 80 percent in the year 2021. This represents an underutilized capacity leading to economic waste. The removal of the tariff on DWP should ensure that this idle capacity is also utilized benefitting the economy as a whole.

The study finds that the removal of tariffs on DWP increases the GDP and exports while also generating more employment. There is also an increase in imports, but this is offset by the benefits obtained as a result of the increase in exports along with the generation of additional employment.

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APPENDIX A: Regional and Sectoral Aggregation details

Regional Aggregation	Sectoral Aggregation	
China	Agriculture	Air Transport
Hong Kong	Mining	Warehousing
Japan	Food Processing	Communication
Korea	Textiles	Financial services
Indonesia	VSF	Insurance
Singapore	Leather	Real estate
Thailand	Wood	Business services
India	Paper Processing	Recreation
Sri Lanka	DWP	Public services
Canada	Coal & Petroleum	Education
USA	Chemicals	Healthcare
Brazil	Rubber Plastics	Dwelling
Chile	Non-metallic minerals	Transport equipment
Austria	Other Metals	Other manufacturing
Belgium	Mach	EGW
Germany	Electrical equipment	Construction
Greece	Machinery & Equipment	Trade
Italy	Motor vehicles	Accommodation
Netherland	Water transport	Other transport
Slovenia		
Sweden		
UK		
Switzerland		
Israel		
South Africa		
Rest of the World		