

United States – India Joint Working Group Asymmetry Analysis Report On Bilateral Merchandise Trade Statistics 2018 – 2020

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Research Report

Background

As part of a Joint Working Group (JWG), the United States Census Bureau (Census) and India's Ministry of Commerce and Industry (MoCI) have been working on a merchandise trade asymmetry study to investigate differences in the official bilateral trade statistics.

The goal of this study was not to change the official statistics of either country, but rather to clarify differences in reporting and recording of the goods trade transactions, thereby facilitating a better understanding among data users in both countries of the actual trade situation. The work plan called for this research to include the published bilateral merchandise trade statistical data for calendar years 2018 through 2020. All analyses were completed using US Dollars (\$).

As shown on Table 1, over the three-year period, India imports from the US showed the following differences as a percent of imports: approximately 3.0 percent in 2018, 5.2 percent in 2019, and 1.8 percent in 2020. The US imports from India showed the following differences as a percent of imports: approximately 5.5 percent in 2018, 6.7 percent in 2019, and 4.2 percent in 2020. Over the three-year period, for both directions of trade, the differences in value were not consistent, as they increased from 2018 to 2019 followed by a decrease in 2020. This is accompanied by a decrease in overall value of trade in both directions in 2020, likely because of the COVID-19 pandemic. Additionally, there are multiple reasons for differences such as indirect trade and misclassification that amount to measurable differences that will be addressed below.

Analysis of the Harmonized System (HS) Chapters (westbound and eastbound) did not show large differences between reported data by the US and India. However, the six-digit commodity level of detail demonstrated larger differences than the chapter level, at times, and it is these larger differences at the six-digit commodity level where we focused our analysis. Also, the differences among westbound trade are around one billion dollars, much smaller in scope than the eastbound trade. It was agreed upon in a working group meeting on August 3, 2022, that the westbound differences were minimal and additional explanation was not needed at this time. Therefore, both parties agreed that the available resources should focus their time on the eastbound trade differences.

Table 1 – Overall Differences

Year	Westbound (\$ Billion)				Eastbound (\$ Billion)			
	US Exports	India Imports	Difference (US - IN)	Difference as a % of Imports	US Imports	India Exports	Difference (US - IN)	Difference as a % of Imports
2018	33.12	34.14	-1.02	2.99%	54.41	51.44	2.97	5.46%
2019	34.41	36.28	-1.87	5.15%	57.67	53.81	3.86	6.69%
2020	27.39	26.91	0.48	1.78%	51.19	49.06	2.13	4.16%

Westbound (US exports vs. India imports)

In 2018 and 2019, westbound differences were concentrated within a few select HS chapters. In 2018, these chapters include 71 – precious metals, 84 – nuclear reactors, 98 – US goods returned, 27 – oils, and 85 – electrical machinery. These chapters alone account for 59.0 percent of US exports and 57.1 percent of India imports in 2018. However, for 2018 the large positive differences for nuclear reactors, oils, and electrical machinery are offset by the large negative differences for precious metals and US goods returned.

In 2019 the chapters with concentrated differences include 84 – nuclear reactors, 85 - electrical machinery, 98 – US goods returned, and 71 – precious metals as was the case in 2018 as well as the addition of 93 – arms and ammunition. These chapters alone account for 35.5 percent of US exports and 37.0 percent of India Imports in 2019. While there are offsetting differences, as was the case in 2018, the overall differences from these select chapters account for 65.0 percent of the differences in westbound trade from 2019.

Table 2 - Top Westbound Chapter Differences

Westbound Chapter Differences (\$ Billion)				
Year	Chapter	US Export	India Import	Difference (US - IN)
2018	71	7.858	6.922	0.936
2018	84	3.297	3.968	-0.671
2018	98	0.597	0.075	0.522
2018	27	6.230	6.719	-0.489
2018	85	1.564	1.802	-0.238
2018	Top 5	19.546	19.486	0.060
2018	Total	33.120	34.144	-1.024
Year	Chapter	US Export	India Import	Difference (IN - US)
2019	84	3.455	4.372	-0.917
2019	85	1.586	2.219	-0.633
2019	98	0.632	0.091	0.541
2019	71	6.378	6.751	-0.373
2019	93	0.166	0.001	0.165
2019	Top 5	12.217	13.434	-1.217
2019	Total	34.410	36.281	-1.871
Year	Chapter	US Export	India Import	Difference (IN - US)
2020	88	0.978	0.403	0.575
2020	98	0.580	0.101	0.479
2020	89	0.001	0.291	-0.290
2020	29	1.729	1.465	0.264
2020	38	0.587	0.82	-0.233
2020	Top 5	3.875	3.08	0.795
2020	Total	27.395	26.908	0.487

Eastbound (US imports vs. India exports)

Similar to the westbound differences, there is a concentration of differences within a few select HS chapters. In fact, for 2018, the top five chapters account for approximately 97.0 percent of the overall eastbound differences. This trend continues for 2019 where the top five chapters account for 93.2 percent of the overall eastbound differences. The concentration of differences isn't as focused in 2020, where the top five chapters account for 58.0 percent of the overall eastbound differences. However, these differences are larger in total value, especially compared to westbound.

Across the three-year study period, the commodities with the largest differences include chapters 27 – petroleum, 29 – organic chemicals, 30 – pharmaceuticals, 38 – miscellaneous chemical products, 71 – precious stones, 84 – engines, 88 – aircraft, and 98 – US Goods Returned. Given the larger differences in the eastbound direction, it was agreed to examine in greater detail the differences in petroleum, precious stones, pharmaceuticals, and engines. The additional analysis provided a better understanding of the possible differences and underlining causes.

Table 3 - Top Eastbound Chapter Differences

Eastbound Chapter Differences (\$ Billion)				
Year	Chapter	US Import	India Export	Difference (US - IN)
2018	30	6.344	5.026	1.318
2018	71	11.328	10.540	0.788
2018	29	2.451	1.770	0.681
2018	98	0.476	0.004	0.472
2018	88	0.175	0.558	-0.383
2018	Top 5	20.774	17.898	2.876
2018	Total	54.407	51.441	2.966
Year	Chapter	US Import	India Export	Difference (US - IN)
2019	27	3.604	2.363	1.241
2019	30	7.578	6.353	1.225
2019	71	10.529	9.551	0.978
2019	29	2.819	1.882	0.937
2019	84	3.676	4.470	-0.794
2019	Top 5	28.206	24.619	3.587
2019	Total	57.665	53.815	3.850
Year	Chapter	US Import	India Export	Difference (US - IN)
2020	30	8.200	6.965	1.235
2020	84	3.113	3.943	-0.830
2020	29	2.777	2.020	0.757
2020	71	8.454	7.864	0.590
2020	38	0.302	0.823	-0.521
2020	Top 5	22.846	21.615	1.231
2020	Total	51.190	49.064	2.126

Chapter Analysis – Eastbound Chapter 27 (Petroleum)

The differences in Chapter 27 – Petroleum – focused around three commodities: HS6 - 2709.00 crude petroleum, 2710.12 light oils, and 2710.19 other oils. As can be seen in Table 4, the US reported 274.9 million dollars of crude petroleum imports from India in 2018 and 72.4 million dollars in 2019. This is unusual because for those two years India reported zero dollars in exports of crude petroleum. Additionally, in 2018, the large differences in crude petroleum and light oils are opposite in directions but are similar in absolute values. This led us to explore the possibility of misclassification of these commodities.

Table 4 – Eastbound Petroleum (prior to published revisions)

US General Imports vs India Exports Chapter 27 (\$)				
Year	HS6	US Import	India Export	Difference (US - IN)
2018	270900	274,905,175	0	274,905,175
2018	271012	1,754,252,868	2,059,625,803	-305,372,935
2018	271019	1,182,993,745	767,003,994	415,989,751
Chapter 27 Total		3,216,887,632	2,856,326,126	360,561,506
Year	HS6	US Import	India Export	Difference (US - IN)
2019	270900	72,412,277	0	72,412,277
2019	271012	2,063,886,787	1,972,269,580	91,617,207
2019	271019	1,459,895,207	358,045,691	1,101,849,516
Chapter 27 Total		3,603,554,040	2,362,671,634	1,240,882,406
Year	HS6	US Import	India Export	Difference (US - IN)
2020	270900	0	0	0
2020	271012	1,179,102,482	1,105,634,936	73,467,546
2020	271019	582,614,066	161,910,744	420,703,322
Chapter 27 Total		1,768,667,095	1,277,864,230	490,802,865

Chapter Analysis – Eastbound Chapter 30 (Pharmaceuticals)

Many of the differences from HS chapter 30 pharmaceuticals are among these select commodities: HS6 3002.15 - immunological products, 3004.20 - medicaments containing antibiotics, 3004.32 - medicaments containing corticosteroid hormones, 3004.49 - medicaments containing alkaloids or derivatives thereof, others and 3004.90 - medicaments others. Eastbound differences from chapter 30 pharmaceuticals amount to over one billion dollars during each year of the study period. Of those differences, these select commodities account for 79.6 percent of the overall differences in 2018, 67.7 percent in 2019, and 51.1 percent in 2020. Often the result of misclassification, HS chapter 30 pharmaceuticals are one of the most common commodity chapters we've found when performing asymmetry analyses.

Table 5 – Eastbound Pharmaceuticals

US General Imports vs India Exports Chapter 30 (\$)				
Year	HS6	US Import	India Export	Difference (US - IN)
2018	300215	60,025,685	5,123	60,020,562
2018	300420	420,942,591	356,849,149	64,093,442
2018	300432	51,832,732	20,532,450	31,300,282
2018	300449	138,942,916	6,339,918	132,602,998
2018	300490	5,270,430,553	4,221,567,618	1,048,862,935
Chapter 30 Total		6,343,970,562	5,026,237,495	1,317,733,067
Year	HS6	US Import	India Export	Difference (US - IN)
2019	300215	17,262,354	11,814,488	5,447,866
2019	300420	598,582,917	447,186,264	151,396,653
2019	300432	140,904,296	37,576,249	103,328,047
2019	300449	142,750,145	8,459,765	134,290,380
2019	300490	6,241,670,098	5,412,067,397	829,602,701
Chapter 30 Total		7,577,801,437	6,353,054,032	1,224,747,405
Year	HS6	US Import	India Export	Difference (US - IN)
2020	300215	182,068,984	15,107,691	166,961,293
2020	300420	599,076,840	463,309,142	135,767,698
2020	300432	186,665,268	61,606,142	125,059,126
2020	300449	197,263,241	7,533,155	189,730,086
2020	300490	6,540,208,587	5,907,458,955	632,749,632
Chapter 30 Total		8,199,988,124	6,964,619,215	1,235,368,909

Chapter Analysis – Eastbound Chapter 71 (Precious Stones)

During the study, we identified large differences from select commodities from the HS chapter 71 – precious stones. Most of the difference between the US general imports and India exports for this chapter are among these two commodities: Diamonds (HS 7102.39) and precious stones other than diamonds (HS 7103.99). The differences in these two commodities account for to 97.2 percent in 2018, 91.9 percent in 2019, and 72.5 percent in 2020 of the overall chapter differences for each year in the study period as seen in Table 6.

Table 6 – Eastbound Precious Stones

US General Imports vs India Exports Chapter 71 (\$)				
Year	HS6	US Import	India Export	Difference (US - IN)
2018	710239	9,085,634,102	8,381,649,256	703,984,846
2018	710399	108,250,114	46,661,158	61,588,956
HS6 Sub-Total		9,193,884,216	8,428,310,414	765,573,802
Chapter 71 Total		11,328,050,205	10,540,048,069	788,002,136
Year	HS6	US Import	India Export	Difference (US - IN)
2019	710239	7,974,123,771	7,182,606,984	791,516,787
2019	710399	154,573,796	47,057,811	107,515,985
HS6 Sub-Total		8,128,697,567	7,229,664,795	899,032,772
Chapter 71 Total		10,529,333,352	9,551,269,581	978,063,771
Year	HS6	US Import	India Export	Difference (US - IN)
2020	710239	6,091,778,254	5,690,757,513	401,020,741
2020	710399	56,848,896	30,055,072	26,793,824
HS6 Sub-Total		6,148,627,150	5,720,812,585	427,814,565
Chapter 71 Total		8,454,471,347	7,864,417,035	590,054,312

Chapter Analysis – Eastbound Chapter 84 (engines)

Another area that we analyzed due to large differences includes select commodities from chapter 84 – engines. These differences between the US general imports and India exports are from turbojets (HS 8411.12: +0.8 billion dollars in 2018, +1.2 billion dollars in 2019, and +1.2 billion dollars in 2020), Engines (HS 8412.90: -0.1 billion dollars in 2018, -0.3 billion dollars in 2019, and -0.3 billion dollars in 2020), and Pumps (HS 8413.91: -0.1 billion dollars in 2018, -0.1 billion dollars in 2019, and -0.04 billion dollars in 2020). Commodities found in chapter 84 are particularly sensitive to reporting errors. While the differences for turbojets exceeds the differences for the entire chapter in 2018, 2019 and 2020, the combined differences for turbojets, engines and pumps tells a different story. In 2018 these combined differences accounted for 365 million of the 544 million dollars chapter level differences. Similar results are seen in 2019 with the combined differences accounting for 813 million of the 793 million dollars chapter level differences. This continues into 2020 where the combined differences account for 860 million of the 830 million dollars chapter level difference. These large and offsetting differences may indicate miscalculations at the HS6 level.

Table 7 – Eastbound Engines

US General Imports vs India Exports Chapter 84 (\$)				
Year	HS6	US Import	India Export	Difference (US - IN)
2018	841112	17,189,460	810,659,451	-793,469,991
2018	841290	153,036,271	27,126,338	125,909,933
2018	841391	263,943,366	140,394,434	123,548,932
Chapter 84 Total		3,349,303,866	3,713,902,909	-364,599,043
Year	HS6	US Import	India Export	Difference (US - IN)
2019	841112	16,956,064	1,213,130,792	-1,196,174,728
2019	841290	340,530,603	41,808,700	298,721,903
2019	841391	242,276,576	158,272,214	84,004,362
Chapter 84 Total		3,676,068,242	4,469,925,648	-793,857,406
Year	HS6	US Import	India Export	Difference (US - IN)
2020	841112	4,817,628	1,238,245,669	-1,233,428,041
2020	841290	444,763,970	109,051,063	335,712,907
2020	841391	133,158,029	94,969,729	38,188,300
Chapter 84 Total		3,113,396,842	3,943,419,873	-830,023,031

Reasons for Differences

In some cases, we’ve identified the direct causes of differences along with corrective numerical adjustments to reported values. In other cases, we’ve identified methodological differences between how the US and India report import and export values and estimated its impact. Finally, even though we identified cases where misclassification is probable, the full extent is unknown.

Reasons for Difference – Indirect Trade

During the study, we identified that India exports are not classified by country of ultimate destination but rather country of destination¹. This difference in recording principles creates differences between US imports and India exports where the US records more imports than India exports to the US. For example, India exports precious stones to Hong Kong and records these transactions as exports to Hong Kong. If some of the same stones are then re-exported to the US from Hong Kong, in most situations, they will be recorded as having a country of origin as India, not Hong Kong. This methodological difference is a major contributor for differences, across all commodities, and especially for some select commodities and is often referred to as indirect trade. We examined country of origin versus country of export for US imports across the three-year study period where the country of origin was India. This examination, as seen in Table 8, showed that indirect trade accounted for almost 7 percent of the overall eastbound difference in each year of the study period. Across all three years of the study period, Hong Kong accounted for almost 2 of the 7 percent of indirect trade.

Table 8 – Eastbound Indirect Trade

Eastbound Indirect trade (\$ Billion)			
	2018	2019	2020
Total Trade	54.41	57.67	51.19
Indirect Trade	3.76	3.88	3.56
Percent of Indirect Trade	6.919%	6.735%	6.956%

¹ US exports are recorded using country of ultimate destination which is defined as “Country of destination for exports is the country where the goods are to be consumed, further processed, or manufactured, as known to the shipper at the time of exportation. If the shipper does not know the country of ultimate destination, the shipment is credited to the last country to which the shipper knows that the merchandise will be shipped in the same form as when exported.” India records its statistics using country of destination defined as “The country of destination, as recorded by customs, is used as the partner for the purposes of export statistics while imports are, by and large, credited to the country of consignment. No information on the last known destination for exports and country of origin for imports is compiled.”

This methodological difference is a major contributor for the differences within the chapter 71 - precious stones. Table 9 shows consistent indirect trade of more than 100 million dollars of diamonds originating from India and exported from either Hong Kong, Belgium, or United Arab Emirates across the three-year study period.

Table 9 – Indirect Trade in Diamonds

Diamonds (HS 710239) (\$ Millions)			
Year	Country of Origin	Country of Export	Value
2018	India	Hong Kong	819
2018	India	United Arab Emirates	138
2019	India	Hong Kong	858
2019	India	United Arab Emirates	158
2019	India	Belgium	118
2020	India	Hong Kong	737
2020	India	United Arab Emirates	188

Reasons for Difference – Misclassifications

When commodities have offsetting differences at the HS6 level, meaning large positive differences as well as large negative differences for similar commodities, they exemplify the principle of "cancellation", where subgroups of larger differences show smaller differences when combined into a larger group. This can be between two commodities within a chapter, or several. We may further offer that this is due to misclassification, by one side or both. The pair of commodities as shown in Figures 1, 2 and 3 provide sufficient evidence for misclassification of this kind in chapters 61 - Articles of Apparel, 63 - Worn Clothing and Other Textiles, and 64 - Footwear. For these commodities, the combined differences when adjusting for misclassifications amount to as little as -6 million dollars while the individual differences are as large as 391 million dollars.

Additionally, further analysis showed that only a small percentage of these data from these chapters entered a Foreign Trade Zone. An even smaller percentage came from India via an intermediary country. This further indicates that misclassification may be the cause of differences for these commodities. We observed many other HS6 in these chapters which appeared to be candidates for the cancellation scheme, although tracking many of these smaller cases was not feasible.

Figure 1 – Misclassification in Articles of Apparel (Chapter 61)

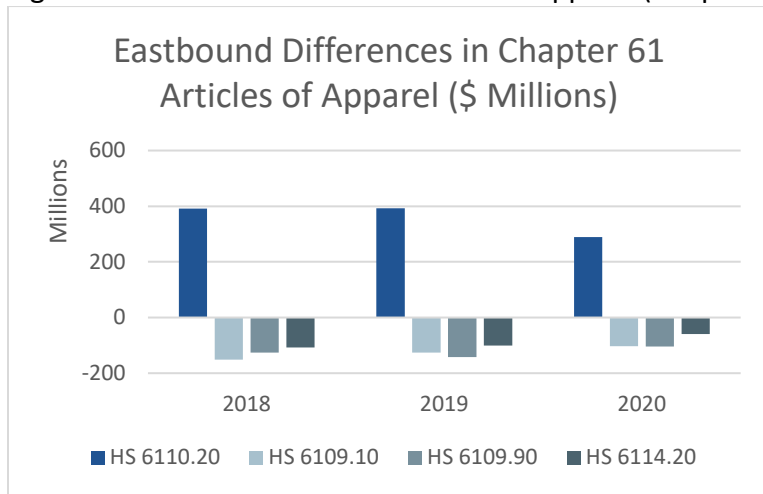


Figure 2 – Misclassifications in Worn Clothing and Other Textiles (Chapter 63)

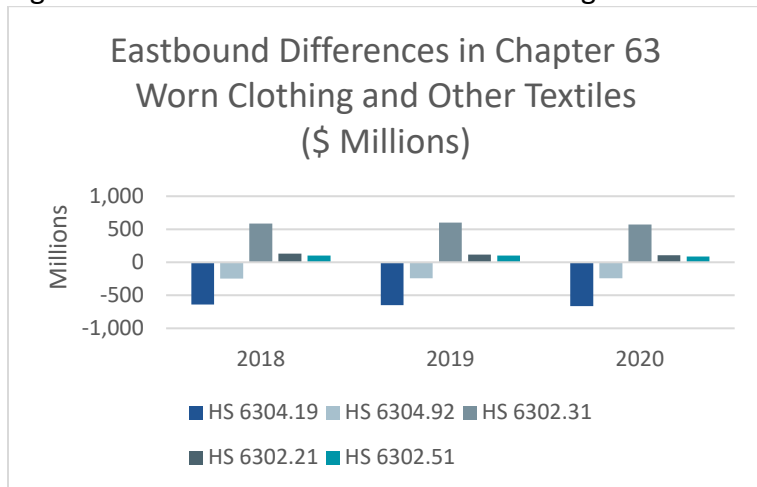
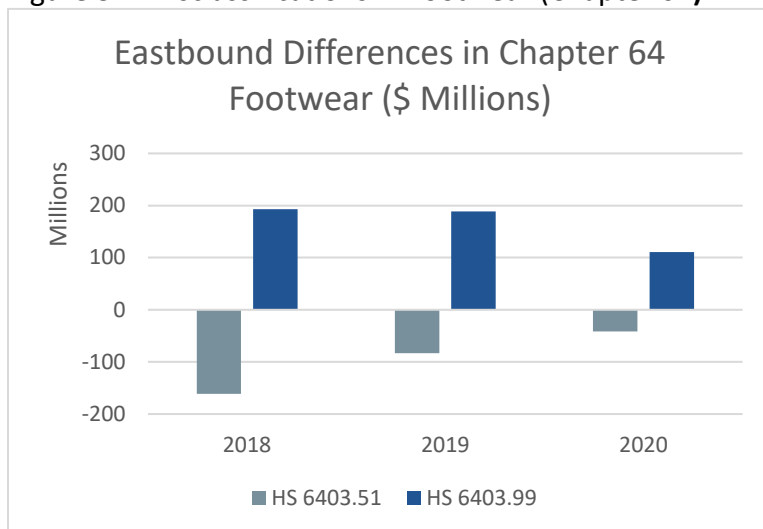


Figure 3 – Misclassifications in Footwear (Chapter 64)



Reasons for Difference – Petroleum Corrections

The classification of light oils (HS6 2710.12) as crude oils (HS6 2709.00) between the years 2018 and 2019 by US importers is one of the cases confirmed as misclassification and thus, has been corrected. This misreporting was first identified in May 2021 and corrected with the annual revisions published in June 2022. After accounting for these corrections, the reported differences in light oils greatly reduced in 2018, however the difference increased in 2019 as shown in Figure 4 below.

Figure 4 – Revisions to HS6 271012

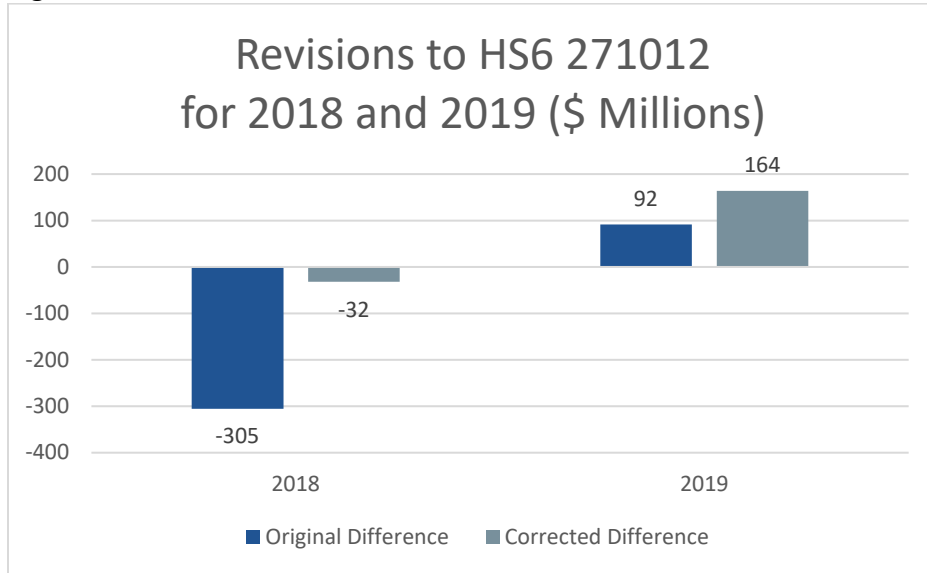


Table 10 – Eastbound Petroleum (after published revisions)

US General Imports vs India Exports Chapter 27 (\$) (Updated)				
Year	HS6	US Import	India Export	Difference (US - IN)
2018	271012	2,027,519,861	2,059,625,803	-32,105,942
2018	271019	1,182,993,745	767,003,994	415,989,751
Chapter 27 Total		3,216,887,632	2,856,326,126	360,561,506
Year	HS6	US Import	India Export	Difference (US - IN)
2019	271012	2,136,299,064	1,972,269,580	164,029,484
2019	271019	1,459,895,207	358,045,691	1,101,849,516
Chapter 27 Total		3,603,554,040	2,362,671,634	1,240,882,406
Year	HS6	US Import	India Export	Difference (US - IN)
2020	271012	1,179,102,482	1,105,634,936	73,467,546
2020	271019	582,614,066	161,910,744	420,703,322
Chapter 27 Total		1,768,667,095	1,277,864,230	490,802,865

Conclusions

We focused our analysis and findings on eastbound trade as the differences in this direction were much more significant than the differences in westbound trade. The differences in eastbound trade became more apparent when analyzing more detailed commodities. For some differences, we found direct evidence of misclassification because revisions to petroleum data in 2018 and 2019 were identified and published in 2022. For other differences, while evidence suggests that misclassification occurred between similar commodities, the full extent is unknown. Finally, and mostly importantly, the methodological differences in measuring country of origin between US imports and India exports, also referred to as indirect trade, account for most of the remaining eastbound differences.

Appendix 1

HS Descriptions

27	Mineral fuels, mineral oils and products of their distillation; bituminous substances; mineral waxes
2709.00	Petroleum oils and oils obtained from bituminous minerals, crude:
2710.12	Light oils and preparations
2710.19	Petroleum oils and oils obtained from bituminous minerals, other than crude; preparations not elsewhere specified or included, containing by weight 70 percent or more of petroleum oils or of oils obtained from bituminous minerals, these oils being the basic constituents of the preparations; waste oils: Other
29	Organic chemicals
30	Pharmaceutical products
3002.15	Immunological products, put up in measured doses or in forms or packings for retail sale
3004.20	Medicaments (excluding goods of heading 3002, 3005 or 3006) consisting of mixed or unmixed products for therapeutic or prophylactic uses, put up in measured doses (including those in the form of transdermal administration systems) or in forms or packings for retail sale: (con.): Other, containing antibiotics
3004.32	Containing corticosteroid hormones, their derivatives or structural analogues
3004.49	Medicaments (excluding goods of heading 3002, 3005 or 3006) consisting of mixed or unmixed products for therapeutic or prophylactic uses, put up in measured doses (including those in the form of transdermal administration systems) or in forms or packings for retail sale: (con.): Other
3004.90	Medicaments (excluding goods of heading 3002, 3005 or 3006) consisting of mixed or unmixed products for therapeutic or prophylactic uses, put up in measured doses (including those in the form of transdermal administration systems) or in forms or packings for retail sale: Other
38	Miscellaneous chemical products
61	Articles of apparel and clothing accessories, knitted or crocheted
6109.10	T-shirts, singlets, tank tops and similar garments, knitted or crocheted: Of cotton
6109.90	T-shirts, singlets, tank tops and similar garments, knitted or crocheted: of other textile materials
6110.20	Sweaters, pullovers, sweatshirts, waistcoats (vests) and similar articles, knitted or crocheted: of cotton
6114.20	Other garments, knitted or crocheted: Of cotton
63	Other made up textile articles; needlecraft sets; worn clothing and worn textile articles; rags
6302.21	Bed linen, table linen, toilet linen and kitchen linen: of cotton
6302.31	Bed linen, table linen, toilet linen and kitchen linen: of cotton: Containing any embroidery, lace, braid, edging, trimming, piping or applique work
6302.51	Bed linen, table linen, toilet linen and kitchen linen: Other table linen: of cotton
6304.19	Other furnishing articles, excluding those of heading 9404: Bedspreads: Other: of cotton
6304.92	Other furnishing articles, excluding those of heading 9404: Not knitted or crocheted, of cotton
64	Footwear, Gaiters, etc. and Parts Thereof
6403.99	Footwear, with outer soles of rubber, plastics, leather or composition leather and uppers of leather: Other

6403.51	Footwear, with outer soles of rubber, plastics, leather or composition leather and uppers of leather: Covering the ankle
71	Natural or cultured pearls, precious or semiprecious stones, precious metals, metals clad with precious metal, and articles thereof; imitation jewelry; coin
7102.39	Diamonds, whether or not worked, but not mounted or set: Nonindustrial: Other
7103.99	Precious stones (other than diamonds) and semiprecious stones, whether or not worked or graded but not strung, mounted or set; ungraded precious stones (other than diamonds) and semiprecious stones, temporarily strung for convenience of transport: Otherwise worked: Other
84	Machinery and mechanical appliances; electrical equipment; parts thereof; sound recorders and reproducers, television image and sound recorders and reproducers, and parts and accessories of such articles
8411.12	Turbojets: of a thrust exceeding 25 kN
8412.90	Other engines and motors: Other
8413.91	Parts: of Pumps
85	Electrical machinery and equipment and parts thereof; sound recorders and reproducers, television image and sound recorders and reproducers, And parts and accessories of such articles
88	Aircraft, spacecraft, and parts thereof
89	Ships, boats and floating structures
93	Arms and Ammunition; Parts and Accessories Thereof
98	Special Classification Provisions