



# The Technological Structure And Performance Of Export Of Manufactured Products At Global Level.

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## Abstract:

Foreign trade plays a vital role in the growth process. In a globally competitive scenario, countries rely on foreign trade of different commodities. The paper aims to analyze the structure and performance of the export of different categories of manufactured products at the global level. The percentage share, Percentage change, indices, and CAGR were computed to analyze the export of different categories of manufactured products. The result shows that from 2005 to 2021, there has been a consistent increase in the exports of manufactured products in all categories. Labor-intensive and resource-intensive manufacturers show the lowest growth as compared to other categories and High skill and technology-intensive manufacturers had the highest export growth among all the categories throughout the given period. This study highlights that there is more demand of High skill and technology-intensive product which suggest that every country should be focused on its technology capabilities to boost its export of High skill and technology-intensive products.

**Keywords:** Export, Technology Intensive, Manufactured, Performance, Technological Structure.

## Introduction:

A broad and robust domestic manufacturing base is the key to successful economic development, since it helps generate virtuous and cumulative linkages with other sectors of the economy, drives technological progress (industrial revolution), and has the strongest potential for productivity gains. (**United Nations Trade and Development Report, 2016**). The manufacturing sector is the backbone of socioeconomic transformation and plays an extensive role in the economic development of the country by providing chemicals, machinery, and equipment to mechanize agriculture and processing facilities in agro-processing to reduce post-harvest losses and promote the value of agricultural products, which helps to ensure there is enough food for everyone. It also supports other sectors of the economy such as the housing sector by providing aids for producing building materials, introducing new building designs and construction techniques, promoting the use of regional building materials, and assisting the health industry by producing hygiene, pharmaceutical, and medical equipment and also creates jobs both directly and indirectly, including those in ancillary industries like transportation, logistics, finance, and ICT. (**Okeyo, 2022**). According to Technology Intensive, manufactured products are divided into mainly four categories namely Resource-based (RB): mainly processed foods and tobacco, simple wood

products, refined petroleum products, dyes, leather (not leather products), precious stones, and organic chemicals. Low technology (LT): such as textiles, garments, footwear, other leather products, toys, simple metal and plastic products, furniture, and glassware. Medium technology (MT): mainly automotive products, most industrial chemicals, industrial machinery, and simple electrical and electronic products. *High technology* (HT): fine chemicals and pharmaceuticals, complex electrical and electronic machinery, aircraft, and precision instruments.

### Objective:

- To analyze the technological structure of the export of manufactured products in the global market.
- To analyze the performance of the export of manufactured products at the global level.

### Literature Review:

**Lall Sanjay(2000)** has done an analytical study on export patterns of manufactured goods from emerging nations that are mapped out utilizing an innovative and detailed technological leveling system. The finding of the study shows that export arrangements, which are path-dependent and challenging to alter, have significant effects on growth and development. Products with low levels of technology typically expand more slowly than products with high levels of technology, which have the most positive learning and spillover effects. With 70% of all manufactured exports, East Asia rules the developing world landscape, and its influence is growing. At the national level, concentration is similarly high and increasing. The main exporters and the technological specialization of various regions vary significantly, as do the strategies employed to boost competitiveness.

**Siddiqui (2000)** has done an empirical investigation to analyse the effect of technology export on enhancing the growth of Asian economies during the period 2001 to 2018 using panel least squares with cross-section weights and the ARDL technique to assess the relationship between the variables for each country. The finding of the study indicates that varying intensity of technology export has a different relationship with export growth. The result also suggests that the government of each nation should focus on attracting investment and promoting the export of technology-intensive goods.

**Montobbio and Rampa(2005)** has examined nine large developing countries, focusing on their innovative activities in stagnating industries. International trends partly offset national improvements in patent shares and world export shares. Technological activity is related to export gains in high technology sectors, medium technology sectors, and low technology sectors. Export performance is influenced by technical capabilities, foreign direct investments, productivity, and initial technical skills.

**Desai (2017)** has analyzed India's technology-intensive exports from a systemic perspective, focusing on the linkages between the National and International Systems of Innovation. India has experienced rapid growth in technology-intensive exports compared to low-tech or medium-tech exports in international trade. The study finds that export performance can be enhanced by improving technological capabilities. The process is influenced by international collaboration, inward and outward foreign direct investments, and codified knowledge in R&D output.

**Nan Li(2019)** has done an analytical study on the relationship between foreign trade structure, opening degree, and economic growth of Western China (except Tibet). The finding of the study shows that the export of primary products and labour-intensive goods has a positive impact on the external development of China.

## Research Methodology:

The present study is based on time series secondary data collected through the official websites of UNCTAD.

## Period of the study

The data is taken from 2005 to 2021 for analyzing comparative advantage and to find trends, share of cotton.

## Tools and Technique:

Value and percentage share, percentage change, indices, and CAGR of export of manufactured products have been analyzed in four categories namely Labor-intensive and resource-intensive manufactures, Low-skill and technology-intensive manufactures, Medium skill and technology-intensive manufactures, and High skill and technology-intensive manufactures.

**Table 1:** World Export of Labour- intensive resource-intensive manufactures.

(Value USD million)

YEAR	Labor-intensive and resource-intensive manufactures	% Share	% Change	% Indices	Total
2005	1019807	14.03		100	7267282
2006	1122143	13.49	10.03%	110.03	8317048
2007	1256932	13.12	12.01%	123.25	9581054
2008	1337190	12.72	6.39%	131.12	10511244
2009	1131672	13.53	-15.37%	110.97	8362703
2010	1280861	12.94	13.18%	125.60	9902156
2011	1483843	13.01	15.85%	145.50	11407672
2012	1480673	12.92	-0.21%	145.19	11457146
2013	1592098	13.50	7.53%	156.12	11795874
2014	1659187	13.60	4.21%	162.70	12198243
2015	1556976	13.70	-6.16%	152.67	11368100
2016	1512626	13.53	-2.85%	148.32	11178990
2017	1587568	13.05	4.95%	155.67	12161133

<b>2018</b>	1691245	12.82	6.53%	165.84	13196358
<b>2019</b>	1671814	12.93	-1.15%	163.93	12931600
<b>2020</b>	1593500	12.87	-4.68%	156.26	12383581
<b>2021</b>	1906288	12.63	19.63%	186.93	15089007
<b>CAGR</b>	<b>3.75%</b>				

**Source:** UNCTAD Database

Table 1 represents the world export of labor-intensive and resource-intensive manufactures in terms of their value in USD millions. The data spans from 2005 to 2021, with additional information provided for the total value, percentage share, percentage change, and percentage indices.

From the table, we can observe several trends and patterns. The total value of labor-intensive and resource-intensive manufactures increased steadily over the years, with a compound annual growth rate (CAGR) of 3.75%. However, the percentage share of these types of manufactures in the total export market varied annually.

Between 2005 and 2021, the percentage share ranged from 12.63% to 14.03%. Despite minor fluctuations, there was no clear upward or downward trend in the percentage share.

Examining the percentage change, we see both positive and negative values. This indicates fluctuations in the year-on-year growth rate of labor-intensive and resource-intensive manufactures. Notably, there were significant increases in certain years, such as 2011 and 2021, with growth rates of 15.85% and 19.63%, respectively. On the other hand, there were decreases in 2009 and 2015, with growth rates of -15.37% and -6.16%, respectively.

The percentage indices provide a comparison of each year's value to the base year, 2005, which is assigned an index of 100. The indices demonstrate the relative growth or decline in the value of labor-intensive and resource-intensive manufactures over time. We can observe an increasing trend in the indices, indicating overall growth in the export value of these manufactures.

The total value of world exports for labor-intensive and resource-intensive manufactures consistently increased each year, reaching its highest value of USD 19,062,880 million in 2021. This suggests a growing global demand for these types of manufactures.

The data shows that while there were fluctuations in the percentage share and annual growth rates, the export value of labor-intensive and resource-intensive manufactures experienced steady growth over the years. This indicates the importance and global demand for these types of goods in international trade.

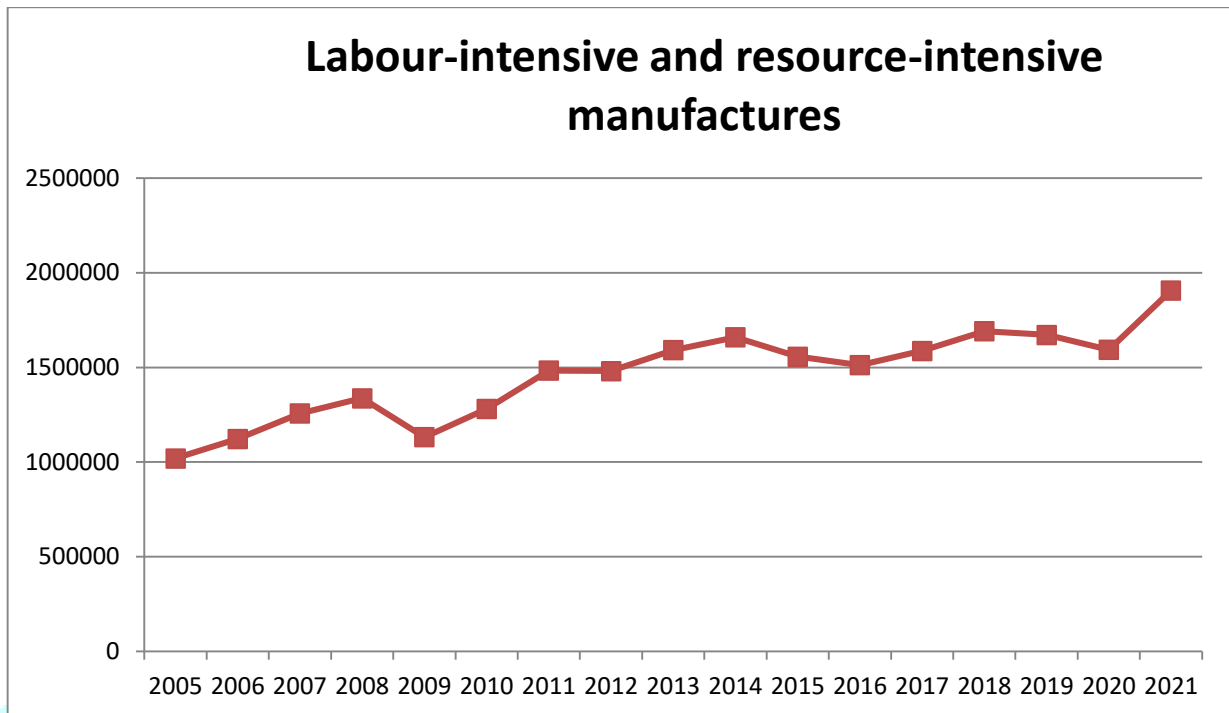
**Figure 1:** World exports of labour-intensive and resource-intensive manufactures.**Source: Table 1**

Figure 1 demonstrates the export share of the world of Labour- intensive and resource-intensive manufactures. It can be seen that world export of Labour- intensive and resource-intensive show fluctuating trends with few changes over the period.

**Table 2:** World export of Low-skill and technology-intensive manufactures.

(Value USD million)

Year	Low-skill and technology-intensive manufactures	% Share	% Change	% Indices	Total
2005	736978	10.14		100	7267282
2006	863763	10.39	17.20%	117.20	8317048
2007	1061432	11.08	22.88%	144.02	9581054
2008	1277885	12.16	20.39%	173.40	10511244
2009	894600	10.70	-29.99%	121.39	8362703
2010	1075762	10.86	20.25%	145.97	9902156
2011	1281839	11.24	19.16%	173.93	11407672
2012	1220780	10.66	-4.76%	165.65	11457146

<b>2013</b>	1194064	10.12	-2.19%	162.02	11795874
<b>2014</b>	1240262	10.17	3.87%	168.29	12198243
<b>2015</b>	1109852	9.76	-10.51%	150.60	11368100
<b>2016</b>	1039394	9.30	-6.35%	141.03	11178990
<b>2017</b>	1164432	9.58	12.03%	158.00	12161133
<b>2018</b>	1264756	9.58	8.62%	171.61	13196358
<b>2019</b>	1204835	9.32	-4.74%	163.48	12931600
<b>2020</b>	1111062	8.97	-7.78%	150.76	12383581
<b>2021</b>	1526361	10.12	37.38%	207.11	15089007
<b>CAGR</b>	<b>4.38%</b>				

**Source:** UNCTAD Database.

Table 2 represents the world exports of low-skill and technology-intensive manufactures in terms of their value in USD million, along with various percentage metrics and indices. The data spans from the year 2005 to 2021, with a CAGR (Compound Annual Growth Rate) of 4.38%.

From 2005 to 2021, there was a general upward trend in the value of low-skill and technology-intensive manufactures exported worldwide. The total exports started at 736,978 USD million in 2005 and increased to 1,526,361 USD million in 2021.

The percentage share of low-skill and technology-intensive manufactures in total exports fluctuated over the years but showed an overall increase. It began at 10.14% in 2005, reached a peak of 12.16% in 2008, and settled at 10.12% in 2021. This indicates that these types of manufactures played a significant role in global exports throughout the period.

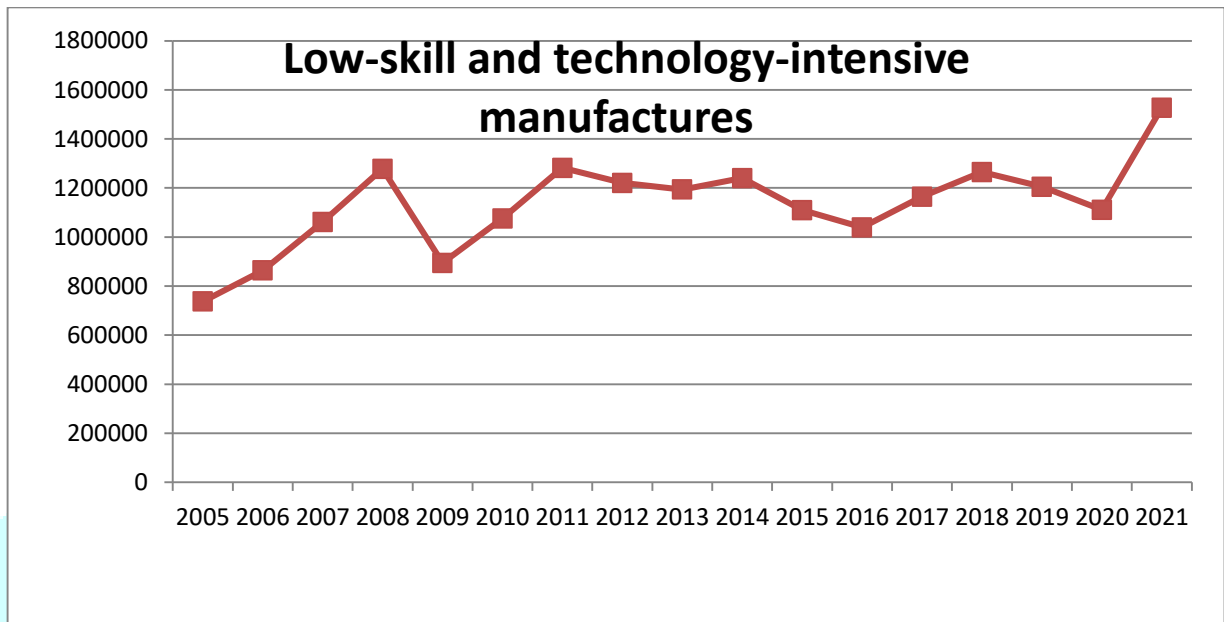
The percentage change represents the year-on-year growth or decline in exports. The values varied each year, ranging from a substantial decrease of -29.99% in 2009 to a significant increase of 37.38% in 2021. This suggests that the export market for low-skill and technology-intensive manufactures experienced both periods of contraction and expansion.

The percentage indices show the relative growth of exports compared to the base year, which is set at 100. The indices consistently increased over time, indicating a positive growth trend. The values ranged from a low of 117.20 in 2006 to a high of 207.11 in 2021, reflecting the expanding value of low-skill and technology-intensive manufactures concerning the base year.

In terms of the total exports, there was steady growth throughout the period, with fluctuations in the rate of increase. The total exports began at 7,267,282 USD million in 2005 and rose to 15,089,007 USD million in 2021.

The data suggests that low-skill and technology-intensive manufactures have been an increasingly important component of global exports, experiencing both periods of growth and decline. The positive CAGR of 4.38% indicates a moderate but consistent expansion in the export value of these types of manufactures over the years.

**Figure 2:** World exports of low-skill and technology-intensive manufactures.



**Source:** Table 2

Figure 2 demonstrates the export share of the world of Low-skill and technology-intensive. It can be seen that world export of Low-skill and technology-intensive show a fluctuating trend with few changes over the period.

**Table 3:** World export of Medium-skill and technology-intensive manufactures.

(Value USD million)

Year	Medium-skill and technology-intensive manufactures	% Share	% Change	% Indices	Total
2005	2538424	34.93		100	7267282
2006	2896180	34.82	14.09%	114.09	8317048
2007	3398483	35.47	17.34%	133.88	9581054
2008	3722666	35.42	9.54%	146.65	10511244
2009	2780636	33.25	-25.31%	109.54	8362703
2010	3363697	33.97	20.97%	132.51	9902156
2011	3954029	34.66	17.55%	155.77	11407672
2012	3996201	34.88	1.07%	157.43	11457146
2013	4113790	34.87	2.94%	162.06	11795874
2014	4247701	34.82	3.26%	167.34	12198243
2015	3963414	34.86	-6.69%	156.14	11368100
2016	3961490	35.44	-0.05%	156.06	11178990
2017	4290447	35.28	8.30%	169.02	12161133
2018	4634912	35.12	8.03%	182.59	13196358
2019	4554388	35.22	-1.74%	179.42	12931600
2020	4207369	33.98	-7.62%	165.75	12383581
2021	5024799	33.30	19.43%	197.95	15089007
<b>CAGR</b>	<b>4.10%</b>				

**Source:** UNCTAD Database.

Table 3 presents data on the world export of Low-skill and technology-intensive manufactures in terms of their value in USD million. It also includes information on the percentage share, percentage change, percentage indices, and the total value of exports for each year.



From 2005 to 2021, the export of Medium-skill and technology-intensive manufactures experienced fluctuations in both value and growth rate. In 2005, the total export value was USD 2,538,424 million, accounting for 34.93% of the total. Over the next few years, there was a general upward trend in value and percentage share, reaching a peak in 2011 with a total export value of USD 3,954,029 million, representing 34.66% of the total.

However, from 2011 to 2015, there was a decline in value and percentage share, with the lowest point occurring in 2015 at USD 3,963,414 million, accounting for 34.86% of the total. This decline can be attributed to a decrease in demand or other economic factors during that period.

After 2015, there was a slight recovery, but the export value remained relatively stable until 2020. In 2020, the export value dropped significantly to USD 4,207,369 million, representing a decrease of 7.62% compared to the previous year. This decline can be attributed to global economic challenges, such as the COVID-19 pandemic and its impact on international trade.

In 2021, there was a notable increase in the export value, reaching USD 5,024,799 million, which represented a growth rate of 19.43% compared to the previous year. This increase suggests a potential recovery from the challenges faced in 2020.

Calculating the compound annual growth rate (CAGR) from 2005 to 2021, the average growth rate for the export of Medium-skill and technology-intensive manufactures was 4.10%.

The data indicates a fluctuating pattern in the export of Low-skill and technology-intensive manufactures, with periods of growth, decline, and recovery. Factors such as global economic conditions and changes in demand for these products likely influenced these trends over the years.

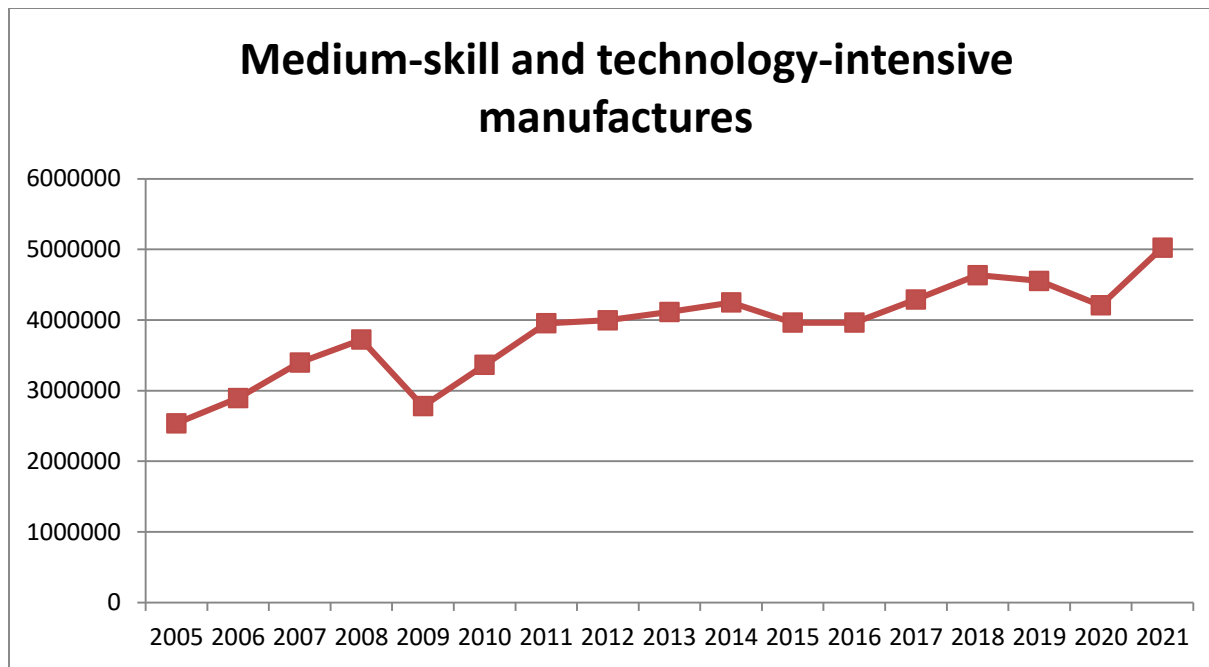
**Figure 3:** World exports of medium-skill and technology-intensive manufactures.**Source: Table 3**

Figure 3 demonstrates the export share of the world of Medium skill and technology-intensive. It can be seen that world export of Medium skill and technology-intensive show fluctuating trends with few changes over the period.

**Table 4:** World export of High-skill and technology-intensive manufactures.

(Value USD million)

Year	High-skill and technology-intensive manufactures	% Share	% Change	% Indices	Total
2005	2972073	40.90		100	7267282
2006	3434963	41.30	15.57%	115.57	8317048
2007	3864207	40.33	12.50%	130.02	9581054
2008	4173502	39.71	8.00%	140.42	10511244
2009	3555795	42.52	-14.80%	119.64	8362703
2010	4181836	42.23	17.61%	140.70	9902156
2011	4687961	41.09	12.10%	157.73	11407672
2012	4759491	41.54	1.53%	160.14	11457146

<b>2013</b>	4895923	41.51	2.87%	164.73	11795874
<b>2014</b>	5051093	41.41	3.17%	169.95	12198243
<b>2015</b>	4737858	41.68	-6.20%	159.41	11368100
<b>2016</b>	4665480	41.73	-1.53%	156.98	11178990
<b>2017</b>	5118686	42.09	9.71%	172.23	12161133
<b>2018</b>	5605446	42.48	9.51%	188.60	13196358
<b>2019</b>	5500563	42.54	-1.87%	185.07	12931600
<b>2020</b>	5471650	44.18	-0.53%	184.10	12383581
<b>2021</b>	6631558	43.95	21.20%	223.13	15089007
<b>CAGR</b>	<b>4.83%</b>				

**Source:** UNCTAD Database

The table presents the world export of high-skill and technology-intensive manufactures, measured in USD million. The data spans from 2005 to 2021, with additional information on the percentage share, percentage change, percentage indices, and total value.

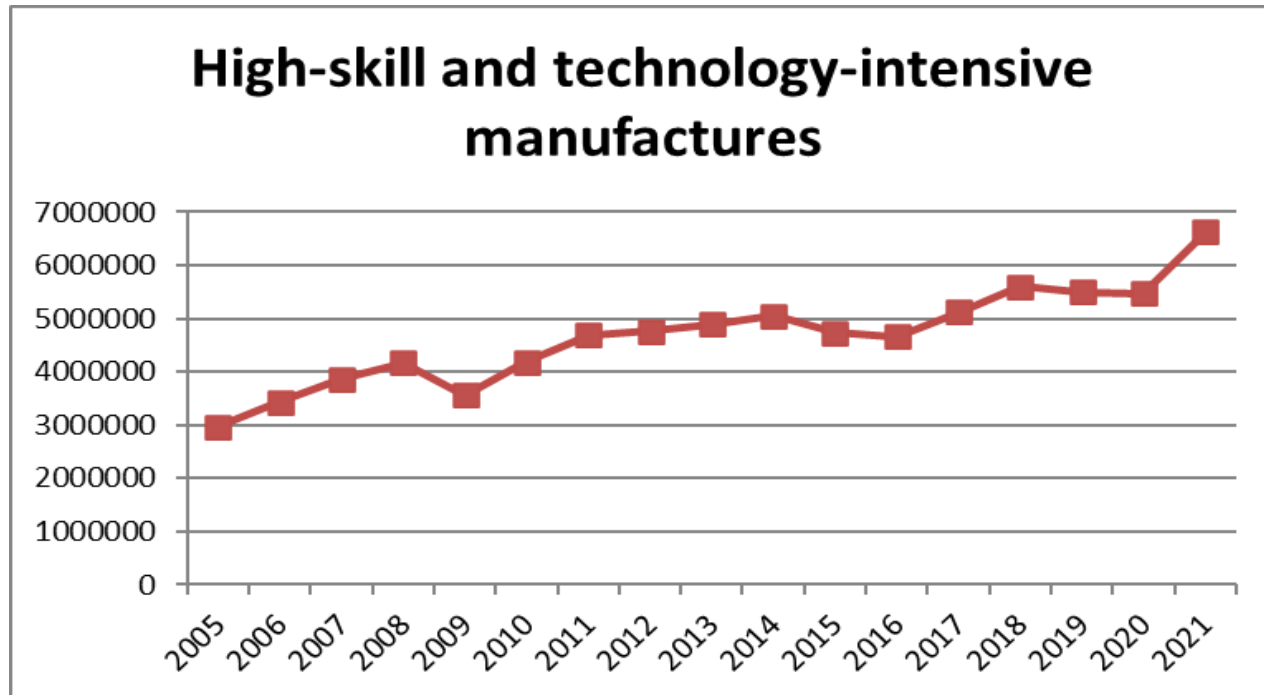
Over the period analyzed, the export value of high-skill and technology-intensive manufactures experienced fluctuations and growth. In 2005, the export value stood at 2,972,073 USD million, accounting for 40.90% of the total. The percentage share indicates the proportion of these manufactures in the overall exports.

From 2005 to 2007, there was a steady increase in both the export value and percentage share. The export value reached its peak in 2008 at 4,173,502 USD million, representing 39.71% of the total. This suggests the growing importance of high-skill and technology-intensive manufactures in global exports. However, the global financial crisis in 2009 had a significant impact, causing a decrease in the export value to 3,555,795 USD million. Despite the decline, the percentage share increased to 42.52%, indicating a relative increase in the importance of these manufactures compared to other goods.

In the following years, there was a recovery and subsequent growth. The export value reached its highest point in 2021, with 6,631,558 USD million, constituting 43.95% of the total. This signifies a substantial increase in the value and prominence of high-skill and technology-intensive manufactures in global trade. The percentage change and percentage indices provide additional insights into the growth patterns. The percentage change indicates the annual growth rate of the export value compared to the previous year. The percentage indices show the relative growth compared to the base year (2005). Between 2005 and 2021, the compound annual growth rate (CAGR) of high-skill and technology-intensive manufactures' export value was calculated at 4.83%. This indicates a moderate but steady growth trend over the analyzed period.

The data highlights the increasing significance of high-skill and technology-intensive manufactures in global exports. Despite some fluctuations, there has been consistent growth, reflecting the importance of these industries in driving international trade and economic development.

**Figure 4:** World exports of High-skill and technology-intensive manufactures



**Source:** Table 4

Figure 4 demonstrates the export share of the world of High skill and technology-intensive. It can be seen that world export of High skill and technology-intensive show fluctuating trend with few changes over the period.

### Conclusion:

From 2005 to 2021, there has been a consistent increase in the export of manufactured products in all categories. However, the growth rates and magnitudes vary across the different types of manufacturing. Labour-intensive and resource-intensive manufactures: This category shows the lowest export values compared to other categories. It experienced steady growth from 2005 to 2008, followed by a decline during the global financial crisis in 2009. It then gradually recovered and continued to increase until 2021, reaching the highest export value of 1,906,288 in that year. Low-skill and technology-intensive manufactures: The export values in this category started relatively low in 2005 but experienced significant growth over the years. It showed consistent upward trends, reaching its peak at 1,526,361 in 2021. The growth rate was slower compared to the high-skill and technology-intensive categories but faster than the labor-intensive and resource-intensive categories. Medium-skill and technology-intensive manufactures: This category exhibited a similar growth pattern as the low-skill and technology-intensive category but with higher export values. The growth was steady and consistent, reaching its highest export value of 5,024,799 in 2021. High-skill and technology-intensive

manufactures: This category had the highest export values among all the categories throughout the given period. It showed substantial growth from 2005 to 2021, with the highest increase in export values compared to the other categories. In 2021, it reached its peak export value of 6,631,558.

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