Assessing the export competitiveness of industries from Índia and Nepal - a cross-country analysis

Avaliando a competitividade das exportações das indústrias da Índia e do Nepal – uma análise entre países

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ABSTRACT

This study compares and analyses the export competitiveness of Nepal and India adopting a multi-dimensional framework to show export competitiveness in the industry. This research also emphasises the relative market importance of Indian and Nepalese industries to each other's marketplaces. To determine the export competitiveness of 97 industries in India and Nepal from 2010 to 2021, a multidimensional framework was used that takes into account industry specialisation, industry growth, and market size. According to the results of our study, approximately 68 per cent of Indian industries are dynamic, indicating that they are expanding, and 42 per cent of them are global, making them more specialised and export-oriented. However, the majority of Nepal's industries (72 per cent) are static, and their export growth rate is less than the average growth rate for the world. In addition, the research analyses realistic export opportunities for Indian and Nepalese industries in each other's markets based on relative market importance. Policymakers, government representatives, business executives, and industry leaders in both countries may use this study to focus their limited

resources on the industries that could benefit from them the most. Although export competitiveness research is extensive and contemporary, it lacks some prospective stud areas, such as cross-country analyses of various industries. Using a multi-dimensional framework, this study analyses and categorises 97 industries in India and Nepal as static or dynamic in global and domestic regions.

Keywords: Export competitiveness, Balassa index, International trade, Inter-country Industry analysis, India, Nepal

RESUMO

Este estudo compara e analisa a competitividade das exportações do Nepal e da Índia, adotando um quadro multidimensional para mostrar a competitividade das exportações na indústria. Esta pesquisa também enfatiza a importância relativa do mercado das indústrias indiana e nepalesa para os mercados uma da outra. Para determinar a competitividade das exportações de 97 indústrias na Índia e no Nepal entre 2010 e 2021, foi utilizado um quadro multidimensional que tem em conta a especialização da indústria, o crescimento da indústria e a dimensão do mercado. De acordo com os resultados do nosso estudo, aproximadamente 68 por cento das indústrias indianas são dinâmicas, indicando que estão em expansão, e 42 por cento delas são globais, o que as torna mais especializadas e orientadas para a exportação. No entanto, a maioria das indústrias do Nepal (72%) são estáticas e a sua taxa de crescimento das exportações é inferior à taxa média de crescimento mundial. Além disso, a investigação analisa oportunidades de exportação realistas para as indústrias indianas e nepalesas nos mercados umas das outras, com base na importância relativa do mercado. Os decisores políticos, representantes governamentais, executivos empresariais e líderes industriais em ambos os países podem utilizar este estudo para concentrar os seus recursos limitados nas indústrias que mais poderiam beneficiar deles. Embora a investigação sobre a competitividade das exportações seja extensa e contemporânea, faltam-lhe algumas áreas de estudo prospectivas, tais como análises

transnacionais de várias indústrias. Utilizando uma estrutura multidimensional, este estudo analisa e categoriza 97 indústrias na Índia e no Nepal como estáticas ou dinâmicas em regiões globais e nacionais.

Palavras-chave: Competitividade das exportações, índice de Balassa, comércio internacional, análise da indústria interpaíses, Índia, Nepal

1. INTRODUCTION

Over the past ten years, research and economic policy publications have extensively examined the idea of competitiveness, although there is no consensus on its definition (Krugman, 1994). The World Economic Forum (World Economic Forum, 2005) describes competitiveness as "a collection of factors, policies, and institutions which determine the level of productivity of a country and, consequently, the level of prosperity that can be attained by an economy". A country's competitiveness may also be assessed in terms of its macroeconomic or microeconomic performance. The question of whether competitiveness is a problem at the national or the firm level is one that is frequently debated. According to (Krugman, 1994), competitiveness is a firm-level problem rather than a national problem. Competitiveness, however, is a national issue, according to (Garelli, 2002). While managers and strategists concentrate on firm-specific attributes, economists emphasise the economic competitiveness aspects that are unique to a certain nation. The fact that competitiveness is a multifaceted concept is one thing that all groups concur on. Competitiveness considers the geographical locations of the study, comparing firms or trade within an area of a certain country or across countries. Comparative advantage and competitiveness are interrelated (Dunmore, 1986). It implies that countries are engaged in competition to produce products and services where they have a comparative cost advantage. A country can preserve its competitive advantage even as it becomes less competitive. In a similar vein, a country might become more competitive without enjoying a comparative advantage. According to (Barkema, 1990), competitiveness fosters a more

realistic view of the world. Lafay (1992) highlights the primary distinction between comparative advantage and c ompetitiveness. While products of one nation are evaluated in terms of comparative advantage, a cross-country comparison of a specific product or group of products is evaluated by competitiveness. The export competitiveness of various product/country groupings has been the subject of much investigation in the literature. The export competitiveness of Malaysian broiler meat products has been examined by (Benalywa et al., 2019). Sharma & Varma (2012) studies the competitiveness of Indian leather products exporters. In an effort to compare India's agricultural industry to the rest of the globe, Jagdambe, (2016) looks at its competitiveness. Akhtar et al. (2013) analyzes the export competitiveness of horticulture goods in Pakistan. Sarker & Ratnasena (2014) assesses the competitiveness of Canadian agri-food products. Competitiveness may be defined and evaluated using a variety of factors at both the micro and macro levels. The primary goal of this research is to assess the export competitiveness of 97 Indian and Nepalese firms. Additionally, this study divides the industries into groups based on criteria estimated to measure export competitiveness. This study evaluates the export competitiveness of 97 Indian and Nepalese companies using an inter-country examination.

The structure of this article is as follows: Section two provides an outline of how export competitiveness is measured. A description of relative market importance measurement is provided in Section three. The export competitiveness framework and its classification of industries are covered in Section four. The data and methodology are covered in the fifth section, the study's findings are shown in the sixth section, and the summary and conclusion are provided in the seventh section.

2. MEASURING INDUSTRY EXPORT COMPETITIVENESS

2.1. Industry specialisation

Revealed Comparative advantage, often known as the Balassa Index (BI), is a widely used indicator of industry specialisation (IS) (Balassa, 1965) . It is a competitiveness indicator for exports that is frequently used in academic literature to assess country patterns and specialisation in various commodities (Akhtar et al., 2013). Liesner (1958) initially proposed the idea of a revealed comparative advantage in 1958, and Balassa

operationalised it in 1965. It is frequently used to determine a country's strong and weak export industries (Balassa, 1965; Brakman & van Marrewijk, 2017). The idea of a revealed comparative advantage is related to how well each country has performed in trade in relation to another for a certain commodity. The original Balassa index is the ratio of a nation's product exports to its overall exports in relation to the product's global exports to all global exports, which may be written as follows:

$$\mathrm{RCAij} = \frac{\left(\frac{\mathrm{Xij}}{\mathrm{Xit}}\right)}{\left(\frac{\mathrm{Xwj}}{\mathrm{Xwt}}\right)}$$

Where X represents exports, i represents the nation, j the product or category, W the world, and t the total number of product groups. If the RCA index value is higher (lower) than one in comparison to the world or a group of reference countries, it demonstrates a comparative advantage (disadvantage) in the export of a product j by country i. A Balassa score greater than one implies that the domestic industry of a country is more specialised than the global industry in that product.

2.2. Industry growth

A longitudinal approach to the research offers a thorough understanding of the market trends. Since countries may vary their patterns of product specialisation over time, industry growth (IG) is included in the framework used by Fetscherin et al. (2012) to measure export competitiveness. Additionally, IG demonstrates the distinction between dynamic and static industries. Shorrocks (1978) mobility index, which analyses export volume and determines the net change to rank the industries based on the degree of specialisation, has been employed in several studies to quantify industrial growth. The compound annual growth rate (CAGR) of exports over a specific time period, however, provides a more accurate and better indicator of changes in industry specialisation (Cooper, 2006) . A country is more likely to be competitive in a given industry if its export growth rate in that industry exceeds the global average growth rate for that industry. The CAGR formula for a given country i and industry j and for a specific time t can be expressed as follows:

$$\mathrm{IG_{ij(t0,t)}} = \left(\frac{X_{ijt}}{\mathrm{X_{ijt0}}}\right)^{\frac{1}{t-\mathrm{t0}}}$$

Where, X_{ijt} and $\mathrm{X_{ijt0}}$ represents the exports of a certain product j in country i during a given time (t) and the exports of the same product j in the same country i during the preceding period (t0), respectively. t-t0 is the number of years taken into account when calculating growth.

To summarise the framework, the export growth rate expressed in terms of CAGR is a suitable proxy for industry growth over a certain time period, whereas RCA is a good proxy for industry specialisation.

2.3. Relative Industry size

An industry j of a country i is positioned in a two x two matrix by the aforementioned criteria. The significance of the industry's proportional weight in respect to the scale of the global industry is sometimes overlooked. Some researchers in the past have acknowledged that the size of the industry does affect competitiveness (Fetscherin et al., 2012; Porter, 1990). The relative size or weight (W) is calculated by dividing the share of exports from a specific industry j and country i (Xij) by the total global exports from that industry j (Xwj). The size of the circle in the framework represents the size of the industry. Bigger the size of the circle, the larger is the industry size. The formula for the area of a circle is $A = \pi r^2$, where r can be arbitrarily selected. The overall area would be one hundred per cent. The overall formula for the circle area of a particular industry j in country i can be expressed as:

$$\mathrm{A}_{ij} = \left(\frac{\mathrm{Xij}}{\mathrm{Xwj}}\right) * \pi \mathrm{r}^2$$

The application of the framework in the context of India and Nepal utilising data from 97 different sectors over a twelve-year period from 2010 – 2021 is presented in the next part to demonstrate the applicability of our approach.

3. MEASURING RELATIVE MARKET IMPORTANCE

Cuyvers (2004) employed the relative market importance measure as a fourth filter in their decision support model to identify realistic market opportunities of Thailand. With the use of this, we were able to determine which products from India and Nepal had a greater market presence in Nepal and Indian markets respectively.

The degree of market importance (μ_{ijk}) of a particular country i's export of a product group k to country j is given by:

$$\mu_{ijk} = \frac{\left(\frac{X_{ijk}}{X_{wjk}}\right)}{\left(\frac{X_{ik}}{X_{wk}}\right)}$$

Where, X_{ijk} is country i's exports of product k to country j; X_{wjk} is world w's exports of product k to country j; X_{ik} country i's total exports of product k; and X_{wk} is world w's total exports of product k. Using the above formula, $\mu_{(India,k,Nepal)}$ and $\mu_{(Nepal,k,India)}$ is calculated. A comparison has to be made now with $\mu_{(SIX,k,j)}$, the combined degree of market importance of the six exporting countries with the largest exports of the product category k to the country in question (in our case its India & Nepal). By calculating the difference between country i's (India/Nepal) degree of market importance and that of the six dominant exporting countries of product group k to country j (Nepal/India), we can now determine whether India's or Nepal's relative market share is large or small in Nepal and India, respectively. Therefore, we are applying the following general guidelines:

- $\mu_{(SIX,k,j)} - \mu_{(i,k,j)} > 3$: the relative market share of Country i is relatively small;
- $1.5 < \mu_{(SIX,k,j)} - \mu_{(i,k,j)} \leq 3$: the relative market share of Country i is intermediately small;
- $0 < \mu_{(SIX,k,j)} - \mu_{(i,k,j)} \leq 1.5$: the relative market share of Thailand is intermediately high;
- $\mu_{(SIX,k,j)} - \mu_{(i,k,j)} \leq 0$: the relative market share of country i is relatively high.

According to their relative market significance, Table VI shows the actual export potential for Indian and Nepalese products to Nepal and India, respectively.

4. TYPES OF EXPORT-COMPETITIVE INDUSTRIES

Figure I shows the framework for the three measurements discussed in the previous section. The RCA, which serves as a proxy for industry specialisation, is on the x-axis, the CAGR, which serves as a proxy for industry growth rate in exports, is on the y-axis, and the various-sized circles represent the industry's relative size to the size of the global industry with respect to the export market share. This may be seen as a 2*2 matrix, classifying the industries into four categories: Domestic static, domestic dynamic, global dynamic, and global static industries are listed in that order.

Industries that are dynamic have growth rates that are higher than the global average. Industries classified as static see slower growth than the global average growth rate. Domestic industries are those that are not export-oriented and are only engaged with the domestic market, whereas global industries are those that are export-oriented and more specialised. Accordingly, the industries that fit within the various quadrants are described as follows based on these definitions.

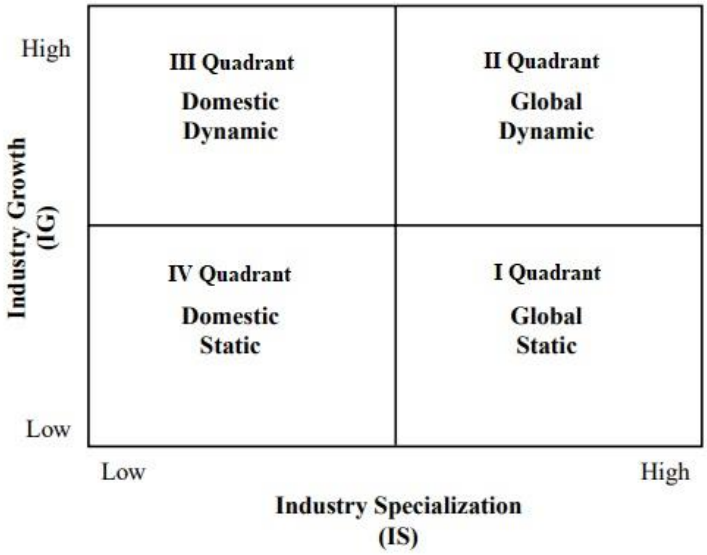
Quadrant I: The industries that fit under this category are Global Static, which are highly specialised and export focused yet have slow growth rates when compared to the global average. These industries have the potential to export goods to international markets, and with the right export promotion help, they might develop into globally competitive sectors.

Quadrant II: The Global Dynamic industries, which lead the country in exports, belong under this group. The countries' primary sources of export income come from these sectors. In order to maintain these industries' positions in the market, the government should develop suitable export strategies.

Quadrant III: Domestic dynamic industries fit into this category since they are growing by concentrating primarily on the domestic market. Such industries might be the focus of government efforts to promote exports, acquire market data, and encourage exporters in the country to look for opportunities abroad.

Quadrant IV: Domestic static industries that neither develop greatly nor specialise come under this group. When a country's resources are limited and it cannot allocate resources to all industries, it is easy to overlook these industries and focus on other sectors. However, the government can identify the ca uses of their poor growth, offer appropriate aid, and turn them into dynamic industries.

Figure I - Categories of Industries based on Export Competitiveness



The above 2*2 matrix is helpful in two ways: (1) it enables an intra-country analysis by determining the level of competitiveness of an industry within the same country, and (2) it enables an inter-country analysis by comparing the domestic industry's competitiveness to that of the same industry in other countries.

5. METHODOLOGY AND DATA COLLECTION

The World Integrated Trade Solution (WITS) export data for India and Nepal for the twelve-year period 2010 to 2021 is the basis for this article. All 97 two-digit product groups from HS 2007 are considered in this analysis. Appendix 1 is a list of the two-digit HS industry codes. Two groups (groups 77 and 98) are removed from the total 99 product categories that serve as a broad categorisation of goods exported internationally, leaving 97 industries with a two-digit HS code.

To evaluate the export competitiveness, the study employed the framework developed by (Fetscherin et al., 2012). This framework can also used for 3-digit (sub-industry level) or 4-digit (sub-category level) level assessments. Using the framework, this study aimed to evaluate the export competitiveness of 97 industries in India and Nepal. We begin by giving a quick summary of India and Nepal's foreign trade patterns compared to those of other leading Asian nations. Then, we examine export competitiveness and categorise the 97 industries based on their degree of industry specialisation and industry export growth during the chosen time period.

Additionally, market significance assessments were conducted to identify the realistic export opportunities for Indian and Nepalese industries in each other's markets.

6. RESULTS AND DISCUSSION

6.1. International Trade comparison

The overall export value (in US $) of the top Asian countries from 2010 to 2021, as well as their associated compound annual growth rate (CAGR), are summarised in Table I.

Overall, from 2010 to 2021, all of the nations in Table I (apart from Japan) saw positive CAGR in exports, ranging from 0.25 per cent for Israel to 13 per cent for Vietnam (with China being the next highest, with 6.51 per cent).

With US$ 3,362 billion, China had the biggest export value among the major Asian nations in 2021, followed by Japan with US$ 757 billion, South Korea with US$ 644 billion, and Singapore with US$ 457 billion. India ranked fifth that year with exports of US$ 394 billion, while Nepal got the bottom spot with exports at US$ 1.6 billion, making it a relatively poor exporter. According to Table I, between 2010 and 2021, the average growth rates of exported goods—nearly 63% of products for India and 26% for Nepal—were greater than the overall average growth rates of 4.97% and 5.43% for India and Nepal, respectively. This demonstrates that both nations have risen in prominence on the global level. India's top exports included "Mineral fuels, mineral oils, and products of distillation" (US$ 56.4 billion), "Natural or cultured pearls, precious or semi-precious stones" (US $38.1 billion), "Nuclear reactors, boilers, machinery" (US$ 24.1 billion), "Iron and steel"

(US $21.2 billion), "Organic chemical" (US $21.1 billion), and "Pharmaceutical products (US $19.4 billion). 'Animal or vegetable fats and oils' (US $890 million), 'Man-made staple fibres' (US $86.8 million), 'Coffee, tea, matT and spices' (US $78.6 million), and 'Carpets and other textile floor coverings' (US $71.3 million) were Nepal's top exports.

Since there aren't enough specific comparison data at the industry level across various metrics, understanding international trade in terms of absolute and relative values is insufficient for assessing an industry's export competitiveness. These indicators, which are discussed in the following section, will be taken into account by the framework used.

Table I - Exports of Leading Asian countries 2010 – 2021 (US $ billion)

Country	2010	**2012**	**2014**	**2016**	**2018**	**2020**	**2021**	**CAGR (%)**
China	1577.76	2048.78	2342.29	2097.64	2486.44	2589.10	3362.30	6.51
Japan	769.8	798.6	690.2	644.9	738.2	641.3	757.1	-0.13
South Korea	466.4	547.9	573.1	495.4	604.8	512.7	644.4	2.73
Singapore	353.2	415.6	415.4	338.1	411.7	373.7	457.5	2.18
India*	**220.4**	**289.6**	**317.5**	**260.3**	**322.3**	**275.5**	**394.8**	**4.97**
Vietnam	**72.2**	**114.5**	**150.2**	**176.6**	**243.7**	**281.4**	**335.8**	**13.66**
UAE	147.8	241.3	202.6	149.9	173.4	236.7	301.5	6.12
Malaysia	198.8	227.4	234.1	189.4	248.7	234.1	299.2	3.47
Saudi Arabia	245.7	380.8	334.3	175.6	285.8	176.5	274.3	0.91
Thailand	195.3	229.5	227.3	215.0	252.2	231.4	266.7	2.63
Indonesia	157.8	190.0	176.0	144.5	180.2	163.2	231.5	3.25
Turkey	113.9	152.5	166.5	149.2	177.2	169.7	225.2	5.85
Nepal*	**0.9**	**0.9**	**0.9**	**0.7**	**0.8**	**0.9**	**1.7**	**5.43**
World	13748.97	16706.67	17289.78	14597.40	18340.58	16682.00	20969.40	3.58
***Share of India in World exports**	1.603 %	1.733 %	1.837 %	1.783 %	1.757 %	1.651 %	1.883 %	
***Share of Nepal in World exports**	0.006 %	0.005 %	0.005 %	0.005 %	0.004 %	0.005 %	0.008 %	

6.2. Industry Export Competitiveness

For each of the 97 industries in India and Nepal, we determined the values for the three essential variables. Figures II and III give an overview of the various industries in India and Nepal, respectively, and how competitive they are on the global market in terms of market size, industry growth, and specialisation. The reference point for industry growth (vertical axis) was the global average export growth of 3.58 per cent for the period 2010–2021, while the reference point for the Balassa Index (horizontal axis) was a threshold value of 1 (which, as previously indicated, has been used in prior research)

Figure II - Industry export competitiveness for India

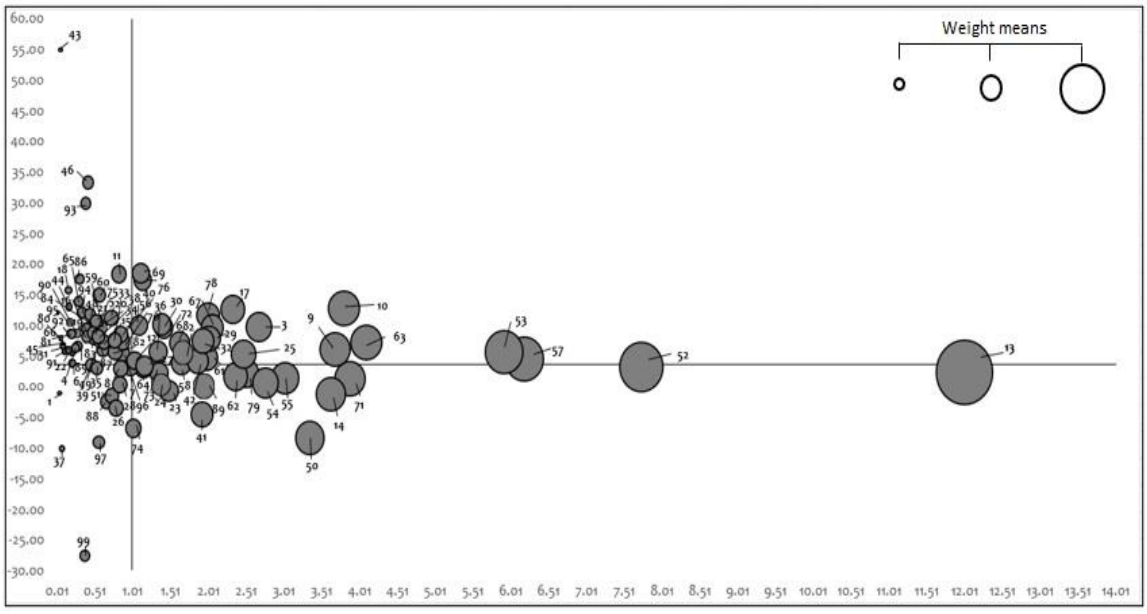
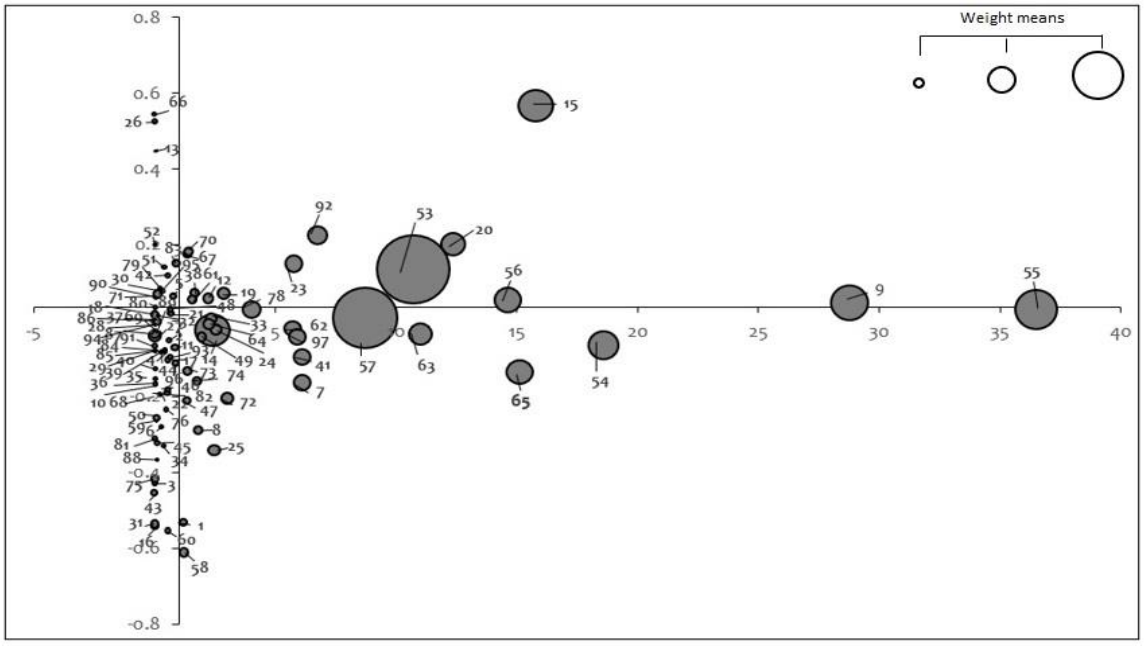


Figure III - Industry export competitiveness for Nepal



Figures IV and V show the percentage of Indian and Nepalese industries in each of the four quadrants, together with their average specialisation (IS), average export growth rate (IG), and export market share (W).

The results reveal that 68% of industries are dynamic, either domestically dynamic (44%) or globally dynamic (24%) dynamic industries, both of which had greater average export growth rates of 38 and 20.4%, respectively, than the worldwide average of 3.58 per cent. Additionally, 42% of India's industries are global, making them more specialised than the world average.

While most industries in Nepal (72%) remain static, this country's growth rate is lower than the global average growth rate —3.06% for global static and 1.63% for domestic static.

The most specialised industries in India are lac, gums, resins, vegetable saps, and extracts nes (12.0); cotton (7.74); Carpets and other textile floor coverings (6.1); Other vegetable textile fibres; paper yarn, woven fabrics of paper yarn (5.9); Other made up textile articles; sets; worn clothing and worn textile articles; rags (4.09); and Natural or cultured pearls, precious or semi-precious stones, precious metals (3.8). The major dynamic industries of Nepal are Man-made staple fibres (36.4); Coffee, tea, matT and

spices (28.7); Man-made filaments; strip and the like of man-made textile materials (18.5); and Animal or vegetable fats and oils (15.7).

Figure IV - Types of export competitiveness: aggregated data (India)

Domestic Dynamic 44% (45 industries) IS: 0.4 IG: 38% Weight: 4.08%	**Global Dynamic** 24% (25 Industries) IS: 2.4 IG: 20.4% Weight: 12.66%
Domestic Static 12% (12 Industries) IS: 0.5 IG: 2.1% Weight: 1.51%	**Global Static** 18% (17 Industries) IS: 3.2 IG: 3.52% Weight: 11.9%

Industry Growth (IG)

Industry specialisation (IS)

Figure V - Types of export competitiveness: aggregated data (Nepal)

Domestic Dynamic 13% (13 industries) IS: 0.27 IG: 19.7% Weight: 0.4	**Global Dynamic** 13% (13 Industries) IS: 8.1 IG: 15.3% Weight: 13.94%
Domestic Static 47% (48 Industries) IS: 0.21 IG: 1.63% Weight: 1.68%	**Global Static** 23% (24 Industries) IS: 6.2 IG: 3.065% Weight: 15.8%

Industry Growth (IG)

Industry specialisation (IS)

Tables II(a) and III(a), which present the findings of the ANOVA analysis for India and Nepal, respectively, may be used to ascertain if there is a statistically significant difference between the means of the three variables across four quadrants. At a 95% confidence level, there is a statistically significant difference between each group (domestic static, domestic dynamic, global dynamic, and global static). From this, it can be inferred that each category's industries vary from one another. The table II(b) and III(b) show multiple comparisons assessing which groups differed from each other. The Tukey post hoc test is generally the preferred test for conducting post hoc tests on a one-way ANOVA.

The difference in Industry Specialization (IS), as well as Export Market Share (W), between the domestic static and domestic dynamic categories, was not statistically significant. The results are not unexpected given that each industry in these two categories has a Balassa Index between 0 and 1, leaving little room for differentiation. The non-statistical difference in the relative size of the export market supports the “domestic” dimension by showing that both are primarily focused on their home market and have a low average export market share (0.5 and 0.4 per cent, respectively). Regarding IS and industry size (W), there was another insignificant difference between global static and global dynamic. The same justification as the above is also valid here, but both groups have a greater average export market share (3.2 and 2.4 per cent, respectively).

Finally, the difference between domestic and global static was not statistically significant regarding the IG rate. Since there was not anticipated to be a major variation in the growth rates of the industries in those two groups, this finding again makes sense and supports the dimension "dynamic".

Table II(a) - ANOVA test of category differences (India)

	Mean (S.D)					
	Domestic Static	Domestic Dynamic	Global Static	Global Dynamic	Sig	F
Industry specialisation (IS)	0.57 (0.29)	0.40 (0.24)	3.10 (2.80)	2.35 (1.41)	0.000 *	21.674
Industry Growth (IG)	-3.52 (8.81)	11.24 (8.83)	-0.007 (3.46)	8.38 (4.00)	0.000 *	19.441
Industry Size (W)	0.12 (0.06)	0.09 (0.05)	0.70 (0.67)	0.52 (0.31)	0.000 *	19.887

Note: * Significant at 0.05 level; figure in parentheses is SD

Table II (b) - ANOVA results – post hoc Tukey HSD test (India)

(I) Group	(J) Group	Mean Difference (I-J)	S.E	Sig
Industry Specialisation (IS)				
Domestic Static	Domestic Dynamic	0.167	0.447	0.982
	Global Static	**-2.527**	0.517	0.000*
	Global Dynamic	**-1.780**	0.485	0.002*
Domestic Dynamic	Global Static	**-2.694**	0.392	0.000*
	Global Dynamic	**-1.948**	0.348	0.000*
Global Static	Global Dynamic	0.746	0.435	0.322
Industry Growth (IG)				
Domestic Static	Domestic Dynamic	**-14.76**	2.333	0.000*
	Global Static	3.513	2.701	0.565
	Global Dynamic	**-11.90**	2.533	0.000*
Domestic Dynamic	Global Static	**11.24**	2.046	0.000*
	Global Dynamic	2.857	1.818	0.400
Global Static	Global Dynamic	**-8.390**	2.271	0.002*
Industry Size (W)				
Domestic Static	Domestic Dynamic	0.032	0.105	0.989
	Global Static	**-0.538**	0.122	0.000*
	Global Dynamic	**-0.401**	0.114	0.004*
Domestic Dynamic	Global Static	**-0.611**	0.092	0.000*
	Global Dynamic	**-0.434**	0.082	0.000*
Global Static	Global Dynamic	0.176	0.102	0.320

Note: The mean difference is significant at *0.05 level

In the case of Nepal, there was a statistically significant distinction between the groups as a whole (Table III(a)). But the outcomes of the Tukey post hoc test differed (Table III(b)). Because the Balassa Index values only range from 0 to 1, there is a statistically negligible difference between the groups of industry specialisation. The results for the IG rate were identical to those of India. The results for Industry Size were unexpected because none of the categories had any statistically significant results. This shows that the Nepalese industries' export market share is extremely small when compared to the global export market share of the relevant industry. Therefore, it would seem that the results are consistent with the idea that industries may be divided into one of the four groups

and that each quadrant has a unique set of characteristics. The major exporting industries from India and Nepal are listed in detail in Tables IV and V, respectively.

Table III(a) - ANOVA test of category differences (Nepal)

	Mean (S.D)				Sig	F
	Domestic Static	Domestic Dynamic	Global Static	Global Dynamic		
Industry specialization (IS)	0.21 (0.26)	0.27 (0.29)	6.23 (8.03)	8.13 (8.15)	0.000*	14.294
Industry Growth (IG)	-0.163 (0.164)	0.196 (0.181)	-0.133 (0.171)	0.153 (0.139)	0.000*	25.252
Industry Size (W)	0.00014 (0.00016)	0.00017 (0.00018)	0.13 (0.33)	0.010 (0.019)	0.020*	3.457

Note: * Significant at 0.05 level; figure in parentheses is SD

Table III(b) - ANOVA results – post hoc Tukey HSD test (Nepal)

(I) Group	(J) Group	Mean Difference (I-J)	S.E	Sig
Industry Specialisation (IS)				
Domestic Static	Domestic Dynamic	-0.056	0.090	0.987
	Global Static	**-6.013**	1.676	0.010*
	Global Dynamic	**-7.918**	2.262	0.024*
Domestic Dynamic	Global Static	**-5.956**	1.678	0.010*
	Global Dynamic	**-7.861**	2.263	0.025*
Global Static	Global Dynamic	-1.905	2.815	0.982
Industry Growth (IG)				
Domestic Static	Domestic Dynamic	**-0.360**	0.558	0.000*
	Global Static	-0.029	0.430	0.980
	Global Dynamic	**-0.317**	0.045	0.000*
Domestic Dynamic	Global Static	**0.330**	0.061	0.000*
	Global Dynamic	0.043	0.063	0.981
Global Static	Global Dynamic	**-0.287**	0.052	0.000*
Industry Size (W)				
Domestic Static	Domestic Dynamic	-0.00003	0.00005	0.988
	Global Static	-0.0128	0.0070	0.372
	Global Dynamic	-0.0105	0.0053	0.318
Domestic Dynamic	Global Static	-0.0128	0.0070	0.375
	Global Dynamic	-0.0105	0.0053	0.321
Global Static	Global Dynamic	0.0022	0.0088	0.318

Note: The mean difference is significant at *0.05 level

Table IV - India's Top exporting industries for 2021

Code	Industry	IS	IG	Size	Category
27	Mineral fuels, mineral oils and products of their distillation; bituminous substances; mineral waxes	1.167	3.35	0.26	Global static
71	Natural or cultured pearls, precious or semi-precious stones, precious metals, metals clad with precious metals and articles thereof, imitation jewellery; coin	3.880	1.36	0.84	Global static
72	Iron and steel	1.419	9.68	0.32	Global dynamic
29	Organic chemicals	2.020	7.81	0.45	Global dynamic
30	Pharmaceutical products	1.395	10.16	0.32	Global dynamic
10	Cereals	3.801	12.76	0.87	Global dynamic
52	Cotton	7.741	3.18	1.74	Global static
76	Aluminum and articles thereof	1.140	17.36	0.27	Global dynamic
73	Articles of iron or steel	1.358	2.3	0.30	Global static
61	Articles of apparel and clothing accessories, knitted or crocheted	1.984	4.64	0.44	Global dynamic
62	Articles of apparel and clothing acccessories, not knitted or crocheted	2.374	1.63	0.53	Global static

Table V - Nepal's Top exporting industries for 2021

Code	Industry	IS	IG	Size	Category
15	Animal or vegetable fats and oils and their cleavage products; prepared edible fats; animal or vegatable waxes	15.78	0.57	1.54	Global dynamic
55	Man-made staple fibres	36.49	0.03	2.38	Global static
9	Coffee, tea, matT and spices	28.79	0.05	1.86	Global dynamic
57	Carpets and other textile floor coverings	8.70	0.01	5.69	Global static
23	Residues and waste from the food industries; prepared animal fodder	5.78	0.15	0.39	Global dynamic
53	Other vegetable textile fibres; paper yarn, woven fabrics of paper yarn	10.70	0.13	7.16	Global dynamic
20	Preparations of vegetables, fruit, nuts or other parts of plants	12.35	0.20	0.80	Global dynamic
56	Wadding, felt and nonwovens; special yarns; twine; cordage, ropes, and cables and articles thereof	14.62	0.05	0.99	Global dynamic
61	Articles of apparel and clothing accessories, knitted or crocheted	1.55	0.06	0.10	Global dynamic
38	Miscellaneous chemical products	1.66	0.07	0.10	Global dynamic
19	Preparations of cereals, flour, starch or milk; pastrycooks' products	2.85	0.07	0.19	Global dynamic

6.3. Market Importance

Industries with a high market share adopt "market maintenance' by taking a defensive approach. For industries with an intermediately high market share, the government can actively adopt an aggressive export promotion strategy of 'market expansion'. Since they are not viewed as realistic export opportunities, industries with relatively small market shares should be ignored when developing export promotion plans. Although it is preferable for industries with an intermediately small market share to take a defensive approach, these opportunities might be thoroughly investigated with the assistance of trade counsellors and the government department of export promotion.

The relative market share of India to Nepal is already large (78%). So, a defensive strategy of market maintenance is appropriate. The products ‘silk’ and ‘Natural or cultured pearls, precious or semi-precious stones, precious metals’ have moderately high market share. These products have already experienced considerable success in the Nepalese market. Thus, through an aggressive export promotion strategy, Indian exporters can further expand their market share of these products. "Coffee, tea, matT and spices" and "Articles of garments and clothing accessories, knitted or crocheted" are the items with a small market share. Indian exporters may explore these opportunities in the Nepalese market with the right government aid.

Nearly 50% of Nepal's industries have a sizable market share in India. ‘Nuclear reactors, boilers, machinery and mechanical appliances; parts thereof’ and ‘Toys, games and sports requisites; parts and accessories thereof’ are the items with a small market share. Nepalese exporters may explore these opportunities in the Indian market with proper export strategy and government assistance. ‘Pulp of wood or of other fibrous cellulosic material’ and ‘Wood and articles of wood; wood charcoal’ have intermediately high market share in India. Hence Nepalese exporters can further expand their market share through an active and offensive export strategy. The other 29 industries, which have relatively small market share, may be overlooked due to the limited resources Nepal can spend on export promotion programmes, but they may collect and communicate market information to the Nepalese exporters on these opportunities.

Overall when we look at the total merchandise exports of Nepal to India over the period of 2010 – 2021, it is substantial in comparison with the world. India is considered

a strong destination market for the majority of Nepalese industries. Some major product groups were 'Animal or vegetable fats and oils', 'Coffee, tea, matT and spices','Man-made staple fibres' and 'Other vegetable textile fibres'. On the other hand, the portion of merchandise exports from India to Nepal is very negligible when compared to that of World market. The main Indian product groups which is exported to Nepal are 'Mineral fuels, mineral oils', 'Iron and steel', 'Nuclear reactors, boilers, machinery', 'Cereals' and 'Electrical machinery and equipment'.

Figure VI(a) and VI(b) shows the overall merchandise exports of India and Nepal to each other as destination markets and to the world, respectively.

Figure VI(a) - Total Indian merchandise exports to Nepal and World markets (Value in US$)

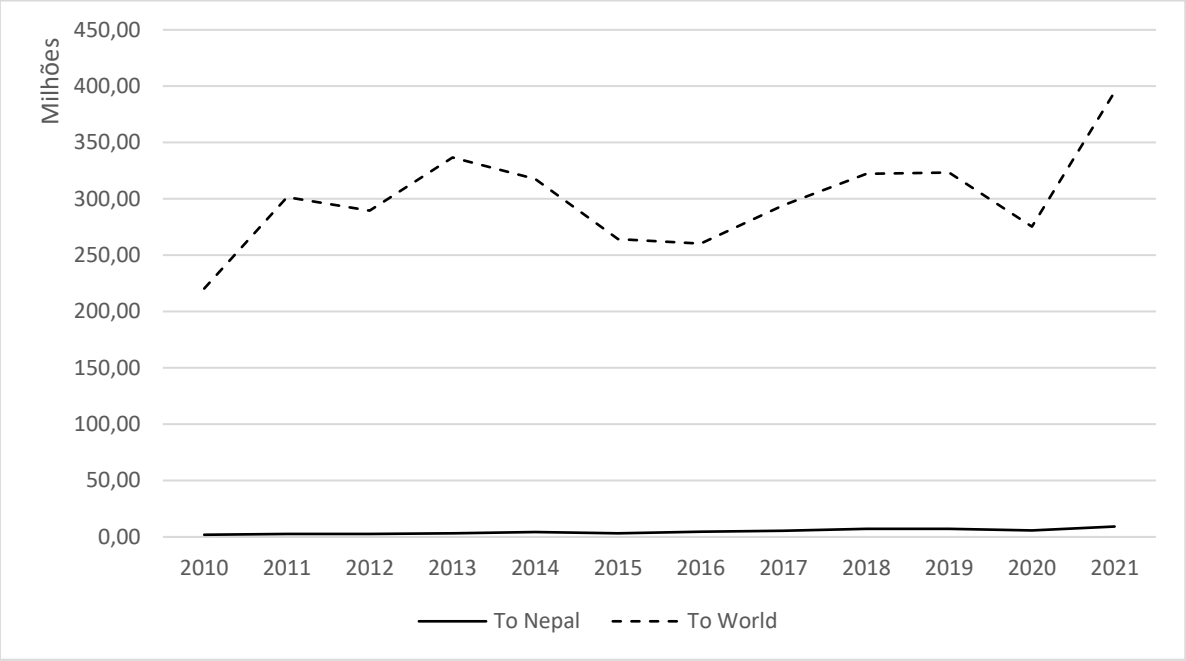


Figure VI(b) - Total Nepalese merchandise exports to India and World markets (Value in US$)

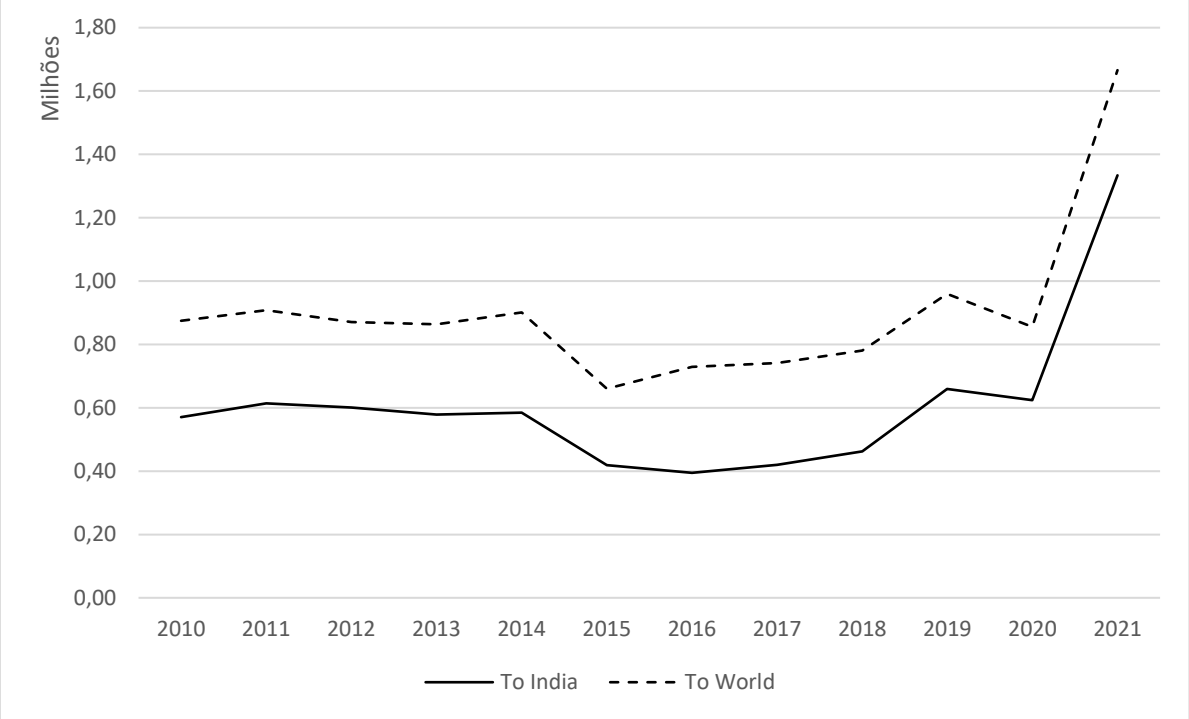


Table VI - Realistic export opportunities according to their relative market importance.

	Relatively High	Intermediately high	Intermediately small	Relatively small	Total
Market Importance of India to Nepal	75 industries (78%)	3 industries (3%)	3 industries (3%)	16 industries (16%)	97
Market Importance of Nepal to India	31 industries (49%)	2 industries (3%)	2 industries (3%)	29 products (45%)	64

7. CONCLUSION

The purpose of this study is to measure the export competitiveness of Indian and Nepalese industries using a framework developed by (Fetscherin et al., 2012). Van Assche, Hong, & Miranda (2008), argues that more meaningful information is obtained when using

multiple variables to measure competitiveness. This framework takes into account three key indicators: (1) Industry specialisation, (2) Industry export growth rate, and (3) export market share, to evaluate export competitiveness. This framework provides the basis for intra and inter-country comparisons of industries. Most Indian industries (68%) are "dynamic", showing above-average export growth rates. And, overall, 42 per cent of Indian industries are categorised as "global", with a world export market share between 11 and 12.6 per cent. The most specialised industries in India are lac, gums, resins, vegetable saps, and extracts nes (12.0); cotton (7.74); Carpets and other textile floor coverings (6.1). The results reveal that more specialization in the products, higher its export market share. And since less than half of the dynamic industries are globally competitive, India still has a long way to gain its leading position in world exports across a spectrum of various industries. On the other hand, most industries in Nepal (72%) remain static, this country's growth rate is lower than the global average growth rate - 3.06% for global static and 1.63% for domestic static. Nearly 47 per cent of industries in Nepal are domestic static, indicating that they are neither specialised in those products nor attained better market share. The major dynamic industries of Nepal are Man-made staple fibres (36.4); Coffee, tea, matT and spices (28.7); Man-made filaments; strip and the like of man-made textile materials (18.5). This framework is useful for companies of various industries to see where they stand in terms of exports compared to others. This can also be used for industry associtaions and government policy makers to identify the export oppurtunities across various spectrum of products, and how they perform in terms of export size, market share and specialisation. Policy makers can identify weak and strong industries and take industry-specific actions through export promotion programs.

Additionally, it was discovered that a wide range of product categories are involved in India's actual export potential to the Nepalese market in terms of market importance (nearly 75 industries). However, 16 industries have a relatively small market share and should not be seen as a prospective export market for Nepal. In terms of Nepal, around 50% of product groupings fall into the categories of high and low market importance to India. The development of export programmes for the former should be the exclusive priority of the Nepali government. Although few product groups seem to be realistic export opportunities, more in-depth research is required for specific industries under the product

sub-category level (i.e. four-digit Harmonised Standard code). To expand the scope of future studies, more comparison assessments might be conducted in additional niche markets and product categories using the framework.

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APPENDIX 1: 2-DIGIT HS CODES

Product Code	Description	Category (Nepal)	Category (India)
1	Live animals; animal products	1	4
2	Meat and edible meat offal	4	2
3	Fish and crustaceans, molluscs and aquatic invertebrates	4	2
4	Dairy produce; birds' eggs; natural honey, edible products of animal origin, not elsewhere specified or included	4	3
5	Products of animal origin, not elsewhere specified or included	3	3
6	Live trees and other plants; bulbs, roots and the like; cut flowers and ornamental foliage	4	3
7	Edible vegetables and certain roots and tubers	1	4
8	Edible fruit and nuts; peel of citrus fruit or melons	1	4
9	Coffee, tea, matT and spices	2	2
10	Cereals	4	2
11	Products of the milling industry; malt; starches; insulin; wheat gluten	4	3
12	Oil seeds and oleaginous fruits; miscellaneous grains, seeds and fruit; industrial or medicinal plants; straw and fodder	2	2
13	Lac; gums, resins and other vegetable saps and extracts	3	1
14	Vegetable plaiting materials; vegetable products not elsewhere specified or included	1	1
15	Animal or vegetable fats and oils and their cleavage products; prepared edible fats; animal or vegatable waxes	2	3
16	Preparations of meat, of fish or of crustaceans, molluscs or other aquatic invertebrates	4	3
17	Sugars and sugar confectionery	4	2
18	Cocoa and cocoa preparations	4	3
19	Preparations of cereals, flour, starch or milk; pastrycooks' products	2	3

20	Preparations of vegetables, fruit, nuts or other parts of plants	2	3
21	Miscellaneous edible preparations	4	3
22	Beverages, spirits and vinegar	4	3
23	Residues and waste from the food industries; prepared animal fodder	2	1
24	Tobacco and manufactured tobacco substitutes	1	1
25	Salt; sulphur; earths and stone; plastering materials, lime and cement	1	2
26	Ores, slag and ash	3	4
27	Mineral fuels, mineral oils and products of their distillation; bituminous substances; mineral waxes	4	1
28	Inorganic chemicals; organic or inorganic compounds of precious metals, rare earth metals, radioactive elements or of isotopes	4	4
29	Organic chemicals	4	2
30	Pharmaceutical products	3	2
31	Fertilisers	4	3
32	Tanning or dyeing extracts; tannins and their derivatives; dyes, pigments and other colouring matter; paints and varnishes; putty and mastics; inks	4	2
33	Essential oils and resinoids; perfumery, cosmetic or toilet preparations	1	3
34	Soap, organic surface-active agents, washing preparations, lubricating preparations, artificial waxes, prepared waxes, polishing or scouring preparations, candles and similar articles, modeling pastes and dental waxes.	4	3
35	Albuminoidal substances; modified starches; glues; enzymes	4	4
36	Explosives; pyrotechnic products; matches; pyrophoric alloys; certain combustible preparations	4	2
37	Photographic or cinematographic goods	4	4
38	Miscellaneous chemical products	2	2

39	Plastics and articles thereof	4	3
40	Rubber and articles thereof	4	3
41	Raw hides and skins(other than furskins) and leather	1	1
42	Articles of leather; saddlery and harness; travel goods, handbags and similar containers; articles of animal gut (other than silkworm gut)	3	2
43	Furskins and artificial fur; manufacturers thereof	4	3
44	Wood and articles of wood; wood charcoal	4	3
45	Cork and articles of cork	4	3
46	Manufactures of straw, of esparto or of other plaiting materials; basketware and wickerwork	4	3
47	Pulp of wood or of other fibrous cellulosic material; recovered (waste or scrap) of paper or paperboard	1	3
48	Paper and paperboard; articles of paper pulp, of paper or of paperboard	4	3
49	Printed books, newspapers, pictures, and other products of the printing industry; manuscripts, typescripts and plans	1	4
50	Silk	4	1
51	Wool, fine or coarse animal hair; horsehair yarn and woven fabric	3	4
52	Cotton	3	1
53	Other vegetable textile fibres; paper yarn, woven fabrics of paper yarn	2	2
54	Man-made filaments; strip and the like of man-made textile materials	1	1
55	Man-made staple fibres	1	1
56	Wadding, felt and nonwovens; special yarns; twine; cordage, ropes, and cables and articles thereof	2	3
57	Carpets and other textile floor coverings	1	2
58	Special woven fabrics; tufted textile fabrics; laces; tapestries; trimmings; embroidery	1	2
59	Impregnated, coated, covered or laminated textile fabrics; textile articles of a kind suitable for industrial use	4	3

60	Knitted or crocheted fabrics	4	3
61	Articles of apparel and clothing accessories, knitted or crocheted	2	2
62	Articles of apparel and clothing acccessories, not knitted or crocheted	1	1
63	Other made-up textile articles; sets; worn clothing and worn textile articles; rags	1	2
64	Footwear, gaiters and the like; parts of such articles	1	1
65	Headgear and parts thereof	1	3
66	Umbrella, sun umbrellas, walking-sticks, seat sticks, whips, riding crops and parts thereof	3	3
67	Prepared feathers and down and articles made of feathers or of down; artificial flowers ; articles of human hair	2	2
68	Articles of stone, plaster, cement, asbestos, mica and similar materials	4	2
69	Ceramic products	4	2
70	Glass and glassware	2	3
71	Natural or cultured pearls, precious or semi-precious stones, precious metals, metals clad with precious metals and articles thereof, imitation jewellery; coin	3	1
72	Iron and steel	1	2
73	Articles of iron or steel	1	1
74	Copper and articles thereof	1	1
75	Nickel and articles thereof	4	3
76	Aluminum and articles thereof	4	2
78	Lead and articles thereof	1	2
79	Zinc and articles thereof	3	1
80	Tin and articles thereof	4	3
81	Other base metals; cermets; article thereof	4	3
82	Tools, implements, cutlery, spoons and forks, of base metal; parts thereof of base metal	4	3
83	Miscellaneous articles of base metal	3	3

84	Nuclear reactors, boilers, machinery and mechanical appliances; parts thereof	4	3
85	Electrical machinery and equipment and parts thereof; sound recoreders and reproducers, television image and parts and accessories of such articles	4	3
86	Railway or tramway locomotives, rolling-stock and parts thereof; railway or tramway track fixtures, traffic signalling equipments of all kinds	4	3
87	Vehicles other than railway or tramway rolling-stock and parts and accessories thereof	4	3
88	Aircraft, spacecraft, and parts thereof	4	4
89	Ships, boats and floating structures	4	1
90	Optical, photographic, cinematographic, measuring, checking, precision, medical or surgical instruments and apparatus; parts and accessories thereof	3	3
91	Clocks and watches and parts thereof	4	3
92	Musical instruments; parts and accessories of such articles	2	3
93	Arms and ammunition; parts and accessories thereof	4	3
94	Furniture; bedding, mattresses, mattress supports, cushions and similar stuffed furnishings; lamps and lighting fittings, not elsewhere specified or included; prefabricated buildings	4	3
95	Toys, games and sports requisites; parts and accessories thereof	3	3
96	Miscellaneous manufactured articles	4	3
97	Works of art, collectors' pieces and antiques	1	4
99	Commodities not specified according to kind	-	4