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## ANALYSIS OF REGIONAL MARKETS FOR HEAVY INDUSTRY AND MACHINE BUILDING PRODUCTS (IN THE EXAMPLE OF AZERBAIJAN ECONOMY)

**Abstract.** *The presented article analyzes regional markets, for heavy industry and machine building products for the Azerbaijani economy. In terms of trade relations and territory, the markets of Turkey, the Russian Federation, Georgia, the Islamic Republic of Iran, Moldova, Belarus, Ukraine, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan and Armenia were selected and evaluated. The database of the study consists of mutual import and export data for the mentioned countries in 2014–2018. Based on the import-export data collected covering the years 2014–2018 on six-digit codes of regional markets, the revealed comparative advantage and localization coefficients on import and export were calculated. As a result, importing and exporting countries have been identified in the regional markets through the calculated coefficients for each of the 5 years of heavy industry and machine building products considered. Thus, in terms of imports and exports, the countries with the highest coefficients were selected.*

**Key words:** *heavy industry and machine building, Balassa index, localization coefficient, revealed comparative advantage, market demand, import-export, regional markets, Azerbaijan economy.*

### INTRODUCTION

In recent years, the role of industry in the global economy has been growing again. This growth applies to both developed and developing countries. In general, it should be noted that among sectors of the economy, industry is characterized by the complexity of its structure. One of the main criteria in the structure of world industry is the distribution of means of production and final consumption. Heavy industry and machine building mainly cover areas that combine the production of means of production. In recent decades, interesting trends have been observed both in the industry, and in its areas — heavy industry and machine building.

Due to the fact that Azerbaijan's heavy industry and machine building are partially involved in regional value chains, exports to regional markets are small. Factors such as market attractiveness, competitiveness, and profitability should be taken into account while determining which segments of a country's value chain need to be integrated first.

On the other hand, as you know, the "Strategic Roadmap for Development of Heavy Industry and Machine Building in the Republic of Azerbaijan" was approved by Decree of the President of the Republic of Azerbaijan No. 1138 from December 6, 2016 [11].

In item 2.1.1 of the Strategic Roadmap was instructed to prepare a list of goods with prospects for export to regional markets and conduct an analysis. The implementation of this item was carried out under Support and Strengthening Capacity of the WTO Department of the Ministry of Economy in the WTO Accession Negotiations, Europeaid/138167/DH/SER/AZ with financial support from the European Union at the Institute for Scientific Research on Economic Reforms of the Ministry of Economy.

Thus, during the implementation of the research:

- a database of products in the field of heavy industry and machine building was created. So that, mutual data on import-export for 14 countries of the region were collected;
- import and export prices were calculated based on the collected data;
- price indices were determined on the basis of calculated import and export prices;
- localization coefficients for each product in the countries of the region were calculated and on this basis the most suitable markets for imported and exported products in the mutual trade relations of noted countries were determined (**Appendix 2**);
- the countries with the greatest revealed comparative advantage over the years in the

regional market for competitive products were identified and evaluated (**Appendix 3**).

Thus, the study is based on a full analysis of regional markets (Azerbaijan, Turkey, the Russian Federation, Georgia, the Islamic Republic of Iran, Moldova, Belarus, Ukraine, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan and Armenia), as well as demand and export potential with considering products that have an edge in the regional value chain.

### LITERATURE REVIEW

In world practice, much work has been done on the analysis of goods in terms of trade. These works are mainly focused on the study of competitiveness, price changes, labor resources, the application of innovations and other studies based on different countries or groups of countries [8; 16]. At the same time, it should be noted that this type of research is more common in the work of international organizations.

One of the articles has examined attempt to assess the comparative advantage of Central Asian countries in international trade. Historical information, such as factor prices, transportation costs, historical production patterns, and geography and composition of products during the period under review was mainly used for this purpose [7].

W. Yingqi and B. Vudayagi jointly analyzed the manufacturing industries of China and India. They argued that it may not be feasible for India to follow China's growth strategy based on exports of labour intensive manufactures [18].

In his article, Ulrich Schetter among other directions investigated how specialization within products on quality can equalize comparative advantages across products. To this end, he conducted a regression assessment based on time series and identified a close relationship between per capita GDP and export quality [15].

Asier Minondo analyzes the influence of the comparative advantages of countries on the diversification of exports. They tried to evaluate this statement using parametric and nonparametric methods [10].

Researchers from the United Nations Industrial Development Organization have consistently explored areas such as trade, product diversification, comparative advantage, and economic growth across countries. They are mainly investigated whether the patterns of diversification of a sample of 177 countries over the period 1995–2015 conform or not the prediction of the PS framework. The results of this study have important policy implications in particular for the design of industrial policies aimed at actively shaping countries' structural transformation [3].

M. Imran, G. Zhang and H. An in their articles analyzed the effects of trade costs and comparative technology on industry location for the economy of China [6].

M. Visser, N. M. Pisa, E. P. J. Kleynhans, R. Wait South Africa's Mpumalanga evaluated the comparative advantages of the product and industry by province. On this basis, they identified products [17].

On the other hand, most product research is based on analysis of price changes. In addition, price levels in regional markets are used as an external factor in product research of particular importance and on the example of specific countries [16].

It should be noted, that the identification and analysis of markets is of particular importance in conducting this kinds of research. As is known from economic theory, trade relations are formed mainly on the basis of supply and demand. And thus the prices are formed. Of course, another important point for bringing competitive products to the market is their production at a lower price and, on this basis, become more competitive than others. The formation of the production of competitive products is an area that contributes to the diversification of the economy, as well as the development of the non-oil sector.

### TASK STATEMENT

At present, in comparison with international trends, it is considered expedient to take more intensive measures to realize the existing potential of Azerbaijan in the field of heavy industry and machine building. It should be noted that the leading countries have already entered the stage of new "Industry 4.0". It is important to upgrade technological equipment and production processes, increase labor productivity, as well as increase the share of innovative products in international sales to the level of international indicators by further increasing investment in this area.

To this end, the analysis of regional markets in terms of Azerbaijan's territorial, geographical position and trade relations is of particular importance.

As a result, countries in demand in regional markets for heavy industry and machine building products, as well as countries with the highest export potential are identified. This may provide a basis for the creation of production opportunities for products with export potential and high demand in regional markets in the example of the Azerbaijan economy, as well as measures to support existing production by the state.

### DESIGN AND METHODOLOGY

The article analyzes regional markets in terms of identifying both the markets with the highest demand for each product and with the revealed

comparative advantage. In the first case, the localization coefficients, and in the second case, the revealed comparative advantage coefficients were calculated. For this purpose, the import-export data collected for 2014–2018 on six-digit codes of regional markets were used in the calculations.

One of the most practical methods used to determine the Revealed Comparative Advantage (RCA) of countries in trade is the Balassa method [2; 4]. This method consists of the following formulas proposed by B. Balassa in 1965.

$$RCA = (X_{ij} / X_{it}) / (X_{wj} / X_{wt}) \quad (1)$$

Here: X — export, i — country under study, j — commodity or area of activity, t — commodity groups or groups of areas of activity, w — is the World.

This method determined revealed comparative advantage, as it was applied to factual data. The fact that the results are greater than one indicates a revealed comparative advantage.

During analyzing regional markets, identifying the market with the highest demand for each product provides a basis for choosing that direction as a priority and supporting exports.

The localization coefficient during the year is calculated as a ratio of imports of a particular product, to imports of all products in a country divided by the ratio of imports of that product in the region to total imports in the region [5].

$$\begin{aligned} \text{Localization coefficient} = \\ = (IM_{\text{country}} / TIM_{\text{country}}) / (IM_{\text{region}} / TIM_{\text{region}}) \end{aligned} \quad (2)$$

Here:

$IM_{\text{country}}$  — the value of the country's imports of the product during the year;

$TIM_{\text{country}}$  — the value of imports for all products of the country during the year;

$IM_{\text{region}}$  — the value of importing that product in the region during the year;

$TIM_{\text{region}}$  — the value of total imports in the region during the year.

If the localization coefficient is greater than one, it indicates that the country's market has demand for this product. If several countries are studied, then the country (market) with the highest coefficient is taken as the basis. This is an indicator of the strongest, most fertile, most demanding and promising market.

Localization coefficient is a general concept. Defining this concept specifically requires an approach from two main aspects. These are supply and demand approaches. If the task ahead is to determine demand, then it is calculated using import indicators, that is the degree of demand of any market for a selected product is determined (**Formula 2**). If markets with higher supply need to be identified, then export figures are used and it is determined which market has the highest supply,

that is the highest exports (**Formula 1**). The ratio that reflects the supply and demand of these markets is called the revealed comparative advantage ratio. At the same time, in many literatures this indicator is also called the localization coefficient.

## DATA

Regional markets should be analyzed to determine the export potential of heavy industry and machine building products to regional markets. For this purpose, a database should be created that can reflect trade relations. Priority was given to markets with easier access and lower costs — the markets of neighboring countries. Therefore, as an object of research, initially, the import-export relations of these countries with each other were studied. For this purpose, Turkey, the Russian Federation, Georgia, the Islamic Republic of Iran, Moldova, Belarus, Ukraine, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan and Armenia were selected as the countries of the region. It is known that Azerbaijan has enough trade relations with other countries besides Armenia.

In accordance with the purpose of the study, the database was collected and processed for the countries of the region, taking into account the regional markets. It should be noted that Azerbaijan's trade relations with the countries of the region mean mutual import-export operations with countries in the region.

In order to analyze the markets on the basis of the countries of the region, mutual import and export data were collected for these 14 countries (including Azerbaijan). It should be noted that the State Statistics Committee of the Republic of Azerbaijan (SSC) and international sources were used in data collection. The database is formed in the classification of 6-digit HS codes on an annual basis, covering the years 2014–2018.

Mutual import-export data of the countries was collected for all product groups in the classification of six-digit HS codes. In accordance with the purpose of the study, product groups suitable for heavy industry and machine building were selected from the collected products. Thus, according to the classification provided by the Ministry of Economy of the Republic of Azerbaijan, product groups related to heavy industry and mechanical engineering have been identified (**Appendix 1**).

## RESULTS

Analysis and assessments were conducted on the basis of the given methodology and collected data. Of course, this list is quite extensive while considering six-digit codes. For this reason, the results given in the appendices are mainly for product groups that show higher results. The analysis

was conducted for 5 years. The results for the reviewed 5 years will be quite broad in terms of generalization and volume, so the results are mainly based on the data for 2017 and 2018.

Thus, based on the research, the countries with the highest demand for heavy industry and machine building products in the regional market were identified, primarily on the basis of localization coefficients (**Appendix 2**). These results can be considered important in the analysis of trade relations of each country. In addition, it should be noted that these results are the ones obtained for the reviewed region. That is, the different selection of region countries or the inclusion of data from the rest of the world in the study may change the results.

Along with the identification of countries in demand for products of heavy industry and machine

building, finding countries with a revealed comparative advantage in exports of these products is important for market analysis. For this purpose, on the basis of this methodology, countries with a revealed comparative advantage in exports of heavy industry and machine building products were identified (**Appendix 3**).

The main purpose of the study is to present the results of the Azerbaijani economy. Therefore, based on the obtained results, the products with the highest demand within the countries of the region and the highest comparative advantage in terms of exports were analyzed.

The following **Table 1** lists products with the highest demand of the Azerbaijani market among the selected countries of the region based on the calculated coefficients for 2017 and 2018.

Table 1

**List of products that are in high demand in the Azerbaijani market among the countries of the region HS code Product I**

HS code	Product	localization coefficient
		2017
250410	Natural graphite in powder or in flakes	6.1
251512	Marble and travertine, merely cut, by sawing or otherwise, into blocks or slabs of a square or rectangular shape	9.0
251690	Porphyry, basalt and other monumental or building stone, whether or not roughly trimmed or merely cut, by sawing or otherwise, into blocks or slabs of a square or rectangular shape (excluding in the form of granules, chippings or powder, or already with the characteristics of setts, curbstones and flagstones, monumental or building stone of an apparent specific gravity of > = 2,5, granite and sandstone)	13.9
280110	Chlorine	5.9
281530	Peroxides of sodium or potassium	25.4
283525	Calcium hydrogenorthophosphate "dicalcium phosphate"	29.4
290244	Mixed xylene isomers	6.5
292242	Glutamic acid and its salts	5.0
320110	Quebracho extract	18.6
340600	Candles and the like	3.8
360690	Ferro-cerium and other pyrophoric alloys in all forms; metaldehyde, hexamethylenetetramine and similar products in tablets, sticks or similar forms, for use as fuel; alcohol-based fuels and prepared fuels of a similar kind, whether solid or in paste form; resin torches, firelighters and the like	5.3
381511	Supported catalysts with nickel or a nickel compound as the active substance, n.e.s.	5.8
390410	Poly"vinyl chloride", in primary forms, not mixed with any other substances	3.1
390791	Unsaturated polyallyl esters and other polyesters, in primary forms (excluding polycarbonates, alkyd resins, poly "ethylene terephthalate" and poly "lactic acid")	11.1
400931	Tubes, pipes and hoses, of vulcanised rubber (excluding hard rubber), reinforced or otherwise combined only with textile materials, without fittings	2.4
401219	Retreaded pneumatic tyres, of rubber (excluding of a kind used on motor cars, station wagons, racing cars, buses, lorries and aircraft)	28.0
440795	Ash "Fraxinus spp.", sawn or chipped lengthwise, sliced or peeled, whether or not planed, sanded or end-jointed, of a thickness of > 6 mm	4.1
440929	Wood, incl. strips and friezes for parquet flooring, not assembled, continuously shaped "tongued, grooved, rebated, chamfered, V-jointed beaded, moulded, rounded or the like" along any of its edges, ends or faces, whether or not planed, sanded or end-jointed (excluding coniferous wood and bamboo)	11.5
690390	Retorts, crucibles, mufflers, nozzles, plugs, supports, cupels, tubes, pipes, sheaths, rods and other refractory ceramic goods (excluding those of siliceous fossil meals or similar siliceous earths, those of heading 6902, containing > 50 % carbon or containing > 50 % by weight of alumina [Al2O3] or a mixture or compound of alumina and silica [SiO2])	6.1

Continuation of table 1

HS code	Product	Localization coefficient
		2017
690590	Ceramic chimney pots, cowls, chimney liners, architectural ornaments and other ceramic constructional goods (excluding of siliceous fossil meals or similar siliceous earths, refractory ceramic constructional components, pipes and other components for drainage and similar purposes, and roofing tiles)	24.6
701333	Drinking glasses of lead crystal (excluding stemware)	14.9
701341	Glassware of lead crystal, of a kind used for table or kitchen purposes (excluding articles of heading 7018, drinking glasses, glass preserving jars "sterilising jars", vacuum flasks and other vacuum vessels)	8.7
701391	Glassware, of lead crystal, of a kind used for toilet, office, indoor decoration or similar purposes (excluding glassware of a kind used for table or kitchen purposes, glassware of glass ceramics or lead crystal, articles of heading 7018, mirrors, leaded lights and the like, lighting fittings and parts thereof, atomizers for perfume and the like)	11.3
701399	Glassware of a kind used for toilet, office, indoor decoration or similar purposes (excluding glassware of lead crystal or of a kind used for table or kitchen purposes, articles of heading 7018, mirrors, leaded lights and the like, lighting fittings and parts thereof, atomizers for perfume and the like)	11.5
701510	Glasses for corrective spectacles, curved, bent, hollowed or the like, but not optically worked (excluding flat glass for such purposes)	36.8
702000	Articles of glass, n.e.s.	12.3
720836	Flat-rolled products of iron or non-alloy steel, of a width of $> = 600$ mm, in coils, simply hot-rolled, not clad, plated or coated, of a thickness of $> = 10$ mm, not pickled, without patterns in relief	8.9
720840	Flat-rolled products of iron or non-alloy steel, of a width of $> = 600$ mm, not in coils, simply hot-rolled, not clad, plated or coated, with patterns in relief directly due to the rolling process	2.8
722870	Angles, shapes and sections of alloy steel other than stainless, n.e.s.	6.6
730630	Tubes, pipes and hollow profiles, welded, of circular cross-section, of iron or non-alloy steel (excluding products having internal and external circular cross-sections and an external diameter of $> 406,4$ mm, or line pipe of a kind used for oil or gas pipelines or casing and tubing of a kind used in drilling for oil or gas)	4.9
732119	Appliances for baking, frying, grilling and cooking and plate warmers, for domestic use, of iron or steel, for solid fuel or other non-electric source of energy (excluding liquid or gaseous fuel, and large cooking appliances)	4.8
761510	Table, kitchen or other household articles and parts thereof, and pot scourers and scouring or polishing pads, gloves and the like, of aluminium (excluding cans, boxes and similar containers of heading 7612, articles of the nature of a work implement, spoons, ladles, forks and other articles of heading 8211 to 8215, ornamental articles, fittings and sanitary ware)	4.1
761520	Sanitary ware and parts thereof, of aluminium (excluding cans, boxes and similar containers of heading 7612, and fittings)	12.2
820190	Scythes, sickles, hay knives, timber wedges and other hand tools of a kind used in agriculture, horticulture or forestry, with working parts of base metal (excluding spades, shovels, mattocks, picks, hoes, rakes, axes, billhooks and similar hewing tools, poultry shears, secateurs and similar one-handed pruners and shears, hedge shears, two-handed pruning shears and similar two-handed shears)	3.0
821210	Non-electric razors of base metal	3.4
841280	Engines and motors (excluding steam turbines, internal combustion piston engine, hydraulic turbines, water wheels, gas turbines, reaction engines, hydraulic power engines and motors, pneumatic power engines and motors and electric motors)	7.0
841583	Air conditioning machines comprising a motor-driven fan, not incorporating a refrigerating unit but incorporating elements for changing the temperature and humidity (excluding of a kind used for persons in motor vehicles, and self-contained or "split-system" window or wall air conditioning machines)	4.7
841919	Instantaneous or storage water heaters, non-electric (excluding instantaneous gas water heaters and boilers or water heaters for central heating)	4.2
845019	Household or laundry-type washing machines, of a dry linen capacity $< = 6$ kg (excluding fully-automatic machines and washing machines with built-in centrifugal drier)	9.0
845490	Parts of converters, ladles, ingot moulds and casting machines of a kind used in metallurgy or in metal foundries, n.e.s.	21.1
846596	Splitting, slicing or paring machines, for working wood	7.8
846890	Parts of machinery and apparatus for soldering, brazing, welding or surface tempering, non-electric, n.e.s.	4.0
853329	Fixed electrical resistors for a power handling capacity $> 20$ W (excluding heating resistors)	6.2
854519	Electrodes of graphite or other carbon, for electrical purposes (excluding those used for furnaces)	14.8
860400	Railway or tramway maintenance or service vehicles, whether or not self-propelled, e.g., workshops, cranes, ballast tampers, trackliners, testing coaches and track inspection vehicles	23.4
860500	Railway or tramway passenger coaches, luggage vans, post office coaches and other special purpose railway or tramway coaches (excluding self-propelled railway or tramway coaches, vans and trucks, railway or tramway maintenance or service vehicles and goods vans and wagons)	10.8



The end of table 1

HS code	Product	Localization coefficient
		2017
860500	Railway or tramway passenger coaches, luggage vans, post office coaches and other special purpose railway or tramway coaches (excluding self-propelled railway or tramway coaches, vans and trucks, railway or tramway maintenance or service vehicles and goods vans and wagons)	10.8
860800	Railway or tramway track fixtures and fittings (excluding sleepers of wood, concrete or steel, sections of track and other track fixtures not yet assembled and railway or tramway track construction material); mechanical, incl. electromechanical, signalling, safety or traffic control equipment for railways, tramways, roads, inland waterways, parking facilities, port installations or airfields; parts of the foregoing	6.9
901831	Syringes, with or without needles, used in medical, surgical, dental or veterinary sciences	11.6
940210	Dentists', barbers' or similar chairs having rotating as well as both reclining and elevating movement, and parts thereof, n.e.s.	8.4
940350	Wooden furniture for bedrooms (excluding seats)	4.4

Source: Developed by the authors.

The following table lists the products with the highest revealed comparative advantage in terms of exports in the regional market of Azerbaijan for 2017 and 2018.

**Table 2** lists the products of Azerbaijan with high revealed comparative advantage in exports. It is clearly seen in the list that the main advantages in exports are raw materials and semi-finished

Table 2

**List of products of Azerbaijan with the highest revealed comparative advantage for export in the regional market**

HS code	Product	Revealed comparative advantage
		2017
252310	Cement clinkers	8.4
270799	Oils and other products of the distillation of high temperature coal tars; similar products in which the weight of the aromatic constituents exceeds that of the non-aromatic constituents (excluding chemically-defined compounds, benzol "benzene", toluol "toluene", xylol "xylenes", naphthalene, aromatic hydrocarbon mixtures of subheading 2707.50, and creosote oils)	12.0
270900	Petroleum oils and oils obtained from bituminous minerals, crude	2.8
271114	Ethylene, propylene, butylene and butadiene, liquefied (excluding ethylene of a purity of > = 95 % and propylene, butylene and butadiene of a purity of > = 90 %)	13.0
271121	Natural gas in gaseous state	19.8
280120	Iodine	36.7
290511	Methanol "methyl alcohol"	10.9
290512	Propan-1-ol "propyl alcohol" and propan-2-ol "isopropyl alcohol"	21.5
380190	Preparations based on graphite or other carbon in the form of pastes, blocks, plates or other semi-manufactures (excluding carbonaceous pastes for electrodes and similar pastes for furnace linings)	5.3
721810	Steel, stainless, in ingots and other primary forms (excluding waste and scrap in ingot form, and products obtained by continuous casting)	31.1
730539	Tubes and pipes having circular cross-sections and an external diameter of > 406,4 mm, of iron or steel, welded (excluding products longitudinally welded or of a kind used for oil or gas pipelines or of a kind used in drilling for oil or gas)	27.1
740721	Bars, rods and profiles, of copper-zinc base alloys "brass", n.e.s.	12.9
741539	Screw hooks, screw rings and the like, threaded, of copper (excluding standard screws and bolts and nuts)	37.5
760120	Unwrought aluminium alloys	3.6
760611	Plates, sheets and strip, of non-alloy aluminium, of a thickness of > 0,2 mm, square or rectangular (excluding expanded plates, sheets and strip)	24.1
760612	Plates, sheets and strip, of aluminium alloys, of a thickness of > 0,2 mm, square or rectangular (excluding expanded plates, sheets and strip)	14.1

Source: Developed by the authors.

products. It reflects the flow of raw materials from the country to other regions, which isn't good for the future. The influx of raw materials and semi-finished products to other regions is one of the most important factors that can make the economy dependent in the future. The influx of these products to other markets could lead to a break in the value chain in the country. Considering that material resources, including natural resources, are depleted and have a large share in exports, it is not difficult to imagine what kind of crisis the economy will face in a few years. However, the production of these products in the country in the areas to which they belong is profitable and has a potential advantage in foreign markets. Nevertheless, production in the areas to which it belongs is profitable and has a potential advantage in foreign markets. It is more expedient and promising to export these products not as raw materials and semi-finished products, but as finished products. The production of goods from these products will have a positive impact on the formation of the value chain, the creation of new value added, real GDP growth, thus, influencing other sectors of the economy and the solution of unemployment by creating new jobs.

## CONCLUSION

Since the time of the Industrial Revolution, heavy industry and machine building have dominated in the industrial structure. In recent decades, this trend has intensified. Because, the most scientific and technological innovations are applied in these areas. On the other hand, with the decline in the share of the mining industry, the role of the engineering and chemical industries in the manufacturing sector has especially increased. The factor that characterizes the heavy industry and machine building is the full representation of the technological range (from low technology to medium and high technology) in this area. Another key point is to identify the regional market in terms of imports and exports and to conduct analysis on this basis. Because imports and exports for each country are formed mainly in regional markets.

In view of the above, the identification of regional markets for Azerbaijan and the analysis and evaluation of heavy industry and machine building products on this basis is an urgent direction.

The research provided serves as a basis for selecting the countries with the highest demand and the highest export potential for each of the products of heavy industry and machine building in the selected regional markets.

In general, the approach presented in the article can be applied to any other countries. Thus, it is possible to assess the country on the basis of

trade relations, production potential, geographical location, etc., based on the identification of regional markets. It is also possible to achieve better results by adding this approach to all countries of the world, or to the countries of the region and the rest of the world.

The methodology and regional markets presented in the article have been identified taking into account expert discussions and the current situation. The selected market was analyzed for all heavy industry and machine building products, and the countries with the highest demand for each product and the highest revealed comparative advantage in exports were evaluated on this basis.

Within the framework of the regional market analysis it was determined that Azerbaijan has the highest revealed comparative advantage in exports, as well as a list of specific products in which Azerbaijan has the highest demand for heavy industry and machine building products in this regional market was identified.

These results can be considered as substantiated results for the development of state support mechanisms for the selected products in the next stage and, on this basis, it can contribute the economic development.

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## АНАЛІЗ РЕГІОНАЛЬНИХ РИНКІВ ТОВАРІВ ВАЖКОЇ ПРОМИСЛОВОСТІ ТА МАШИНОБУДУВАННЯ (НА ПРИКЛАДІ ЕКОНОМІКИ АЗЕРБАЙДЖАНУ)

**Резюме.** У пропонованій увазі читачів статті проаналізовано регіональні ринки продукції важкої промисловості та машинобудування на прикладі економіки Азербайджану. У контексті торгових відносин і територій було обрано й оцінено ринки Туреччини, Російської Федерації, Грузії, Іранської Ісламської Республіки, Молдови, Білорусі, України, Казахстану, Киргизстану, Таджикистану, Туркменістану, Узбекистану та Вірменії. База даних дослідження складається з даних про взаємний імпорт та експорт зазначених країн за 2014–2018 роки. На основі даних імпорту-експорту, які було зібрано впродовж 2014–2018 рр. за шестизначними кодами регіональних ринків, було розраховано виявлені порівняльні переваги та коефіцієнти локалізації з імпорту й експорту. Відповідно до результатів, країни-імпортери та країни-експортери були ідентифіковані на регіональних ринках за допомогою розрахункових коефіцієнтів зазначеної продукції важкої промисловості та машинобудування для кожної країни терміном на п'ять років. Таким чином, з точки зору імпорту та експорту було обрано країни з найвищими коефіцієнтами.

**Ключові слова:** важка промисловість і машинобудування, індекс Баласса, коефіцієнт локалізації, виявлені порівняльні переваги, ринковий попит, імпорт-експорт, регіональні ринки, економіка Азербайджану.

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Appendix 1

### Product groups on heavy industry and machine building

HS Kod	Product groups on heavy industry and machine building
25	Salt; sulphur; earths and stone; plastering materials, lime and cement
26	Ores, slag and ash
27	Mineral fuels, mineral oils and products of their distillation; bituminous substances; mineral waxes
28	Inorganic chemicals; organic or inorganic compounds of precious metals, of rare-earth metals, of radioactive elements or of isotopes
29	Organic chemicals
30	Pharmaceutical products
31	Fertilisers
32	Tanning or dyeing extracts; tannins and their derivatives; dyes, pigments and other colouring matter; paints and varnishes; putty and other mastics; inks
33	Essential oils and resinoids; perfumery, cosmetic or toilet preparations
34	Soap, organic surface-active agents, washing preparations, lubricating preparations, artificial waxes, prepared waxes, polishing or scouring preparations, candles and similar articles, modelling pastes, "dental waxes" and dental preparations with a basis of plaster
35	Albuminoidal substances; modified starches; glues; enzymes
36	Explosives; pyrotechnic products; matches; pyrophoric alloys; certain combustible preparations
38	Miscellaneous chemical products
39	Plastics and articles thereof
40	Rubber and articles thereof
44	Wood and articles of wood; wood charcoal
68	Articles of stone, plaster, cement, asbestos, mica or similar materials
69	Ceramic products
70	Glass and glassware
72	Iron and steel
73	Articles of iron or steel
74	Copper and articles thereof
75	Nickel and articles thereof
76	Aluminium and articles thereof
78	Lead and articles thereof
79	Zinc and articles thereof
81	Other base metals; cermets; articles thereof
82	Tools, implements, cutlery, spoons and forks, of base metal; parts thereof of base metal
83	Miscellaneous articles of base metal
84	Machinery, mechanical appliances, nuclear reactors, boilers; parts thereof
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
86	Railway or tramway locomotives, rolling stock and parts thereof; railway or tramway track fixtures and fittings and parts thereof; mechanical (including electromechanical) traffic signalling equipment of all kinds
87	Vehicles other than railway or tramway rolling stock, and parts and accessories thereof
89	Ships, boats and floating structures
90	Optical, photographic, cinematographic, measuring, checking, precision, medical or surgical instruments and apparatus; parts and accessories thereof
94	Furniture; bedding, mattresses, mattress supports, cushions and similar stuffed furnishings; lamps and lighting fittings, not elsewhere specified or included; illuminated signs, illuminated nameplates and the like; prefabricated buildings

Source: The Republic of Azerbaijan Ministry of Economy.

The highest consumer markets for products with a high localization factor (countries) (a part)

HS code	Product	2017		2018	
		coef.	country	coef.	country
750720	Tube or pipe fittings, of nickel	481.5	Moldova	614.6	
852712	Pocket-size radiocassette players [dimensions < = 170 mm × 100 mm × 45 mm], with built-in amplifier, without built-in loudspeakers, capable of operating without an external source of electric power	13.8	Ukraine	428.2	
841011	Hydraulic turbines and water wheels, of a power < = 1.000 kW (excluding hydraulic power engines and motors of heading 8412)	107.6	Armenia	382.1	
261310	Roasted molybdenum ores and concentrates	311.6	Armenia	329.8	
870895	Safety airbags with inflator system and parts thereof, for tractors, motor vehicles for the transport of ten or more persons, motor cars and other motor vehicles principally designed for the transport of persons, motor vehicles for the transport of goods and special purpose motor vehicles, n.e.s.	364.6	Moldova	313.4	
284329	Silver compounds, inorganic or organic, whether or not chemically defined (excluding of mercury and silver nitrate)	137.2	Armenia	251.5	
847090	Accounting machines, postage-franking machines, ticket-issuing machines and similar machines, incorporating a calculating device (excluding calculating machine, cash registers and automatic vending machines)	4.3	Armenia	245.4	
854810	Waste and scrap of primary cells, primary batteries and electric accumulators; spent primary cells, spent primary batteries and spent electric accumulators	240.9	Moldova	242.0	
270220	Agglomerated lignite (excluding jet)	31.8	Kyrgyzstan	217.0	
820760	Interchangeable tools for boring or broaching	248.7	Moldova	210.8	
846820	Gas-operated machinery and apparatus for soldering, brazing, welding or surface tempering (excluding hand-held blow pipes)	162.0	Armenia	195.2	
320190	Tanning extracts of vegetable origin (excluding quebracho extract and wattle extract); tannins and their salts, ethers, esters and other derivatives (excluding organic or inorganic compounds of mercury whether or not chemically defined)	102.8	Moldova	183.4	
252010	Gypsum; anhydrite	214.2	Moldova	179.8	
251200	Siliceous fossil meals	164.8	Armenia	171.9	
750620	Plates, sheets, strip and foil, of nickel alloys (excluding expanded plates, sheets or strip)	1.9	Russian Federation	167.9	
842122	Machinery and apparatus for filtering or purifying beverages (excluding water)	19.8	Moldova	167.4	
845522	Cold-rolling mills for metal (excluding tube mills)	1.8	Russian Federation	167.0	
291813	Salts and esters of tartaric acid	237.9	Moldova	164.1	
680229	Monumental or building stone and articles thereof, simply cut or sawn, with a flat or even surface	70.4	Armenia	163.7	
282810	Calcium hypochlorites, incl. commercial calcium hypochlorite	249.1	Moldova	163.0	
852290	Parts and accessories suitable for use solely or principally with sound reproducing and recording apparatus and with video equipment for recording and reproducing pictures and sound (excluding pick-up devices for grooved recording media)	1.6	Ukraine	151.6	
284170	Molybdates	197.6	Kyrgyzstan	145.1	
291219	Acyclic aldehydes, without other oxygen function (excluding methanal [formaldehyde] and ethanal [acetaldehyde])	9.9	Iran	144.5	
901480	Navigational instruments and apparatus (excluding for aeronautical or space navigation, compasses and radio navigational equipment)	180.7	Moldova	142.4	
680292	Calcareous stone, in any form	142.4	Kyrgyzstan	141.0	
871140	Motorcycles, incl. mopeds, with reciprocating internal combustion piston engine of a cylinder capacity > 500 cm <sup>3</sup> but < = 800 cm <sup>3</sup>	24.5	Georgia	139.9	

Continuation of appendix 2

HS code	Product	2017		2018	
		coef.	country	coef.	country
853321	Fixed electrical resistors for a power handling capacity < = 20 W (excluding heating resistors)	77.5	Moldova	129.6	
731600	anchors, grappels and parts thereof, of iron or steel	4.5	Ukraine	127.3	
280540	Mercury	175.5	Tajikistan	122.8	
381512	Supported catalysts with precious metal or a precious-metal compound as the active substance, n.e.s.	2.0	Russian Federation	122.3	
846890	Parts of machinery and apparatus for soldering, brazing, welding or surface tempering, non-electric, n.e.s.	64.6	Armenia	114.4	
441232	Plywood consisting solely of sheets of wood < = 6 mm thick, with at least one outer ply of non-coniferous wood or other tropical wood than specified in Subheading Note 1 to this chapter (excluding of bamboo, and sheets of compressed wood, cellular wood panels, inlaid wood and sheets identifiable as furniture components)	35.6	Moldova	113.2	
903190	Parts and accessories for instruments, appliances and machines for measuring and checking, n.e.s.	119.9	Moldova	112.3	
842481	Agricultural or horticultural mechanical appliances, whether or not hand-operated, for projecting, dispersing or spraying liquids or powders	69.5	Moldova	110.5	
847180	Units for automatic data-processing machines (excluding processing units, input or output units and storage units)	2.6	Armenia	104.4	
320641	Ultramarine and preparations based thereon of a kind used for colouring any material or produce colorant preparations (excluding preparations of heading 3207, 3208, 3209, 3210, 3213 and 3215)	267.3	Moldova	99.4	
292145	1-Naphthylamine "alpha-naphthylamine", 2-naphthylamine "beta-naphthylamine" and their derivatives; salts thereof	1.6	Russian Federation	97.3	
940540	Electric lamps and lighting fittings, n.e.s.	118.0	Armenia	97.0	
320110	Quebracho extract	27.3	Moldova	95.0	
760529	Wire, of aluminium alloys, having a maximum cross-sectional dimension of < = 7 mm (other than stranded wires, cables, ropes and other articles of heading 7614, electrically insulated wires, strings for musical instruments)	92.2	Tajikistan	92.2	
251830	Dolomite ramming mix	11.2	Turkey	90.3	
900290	Lenses, prisms, mirrors and other optical elements, mounted, of any material, being parts of or fittings for instruments or apparatus	3.6	Belarus	89.4	
903082	Instruments and apparatus for measuring or checking semiconductor wafers or devices	73.0	Armenia	86.4	
853922	Filament lamps of a power < = 200 W and for a voltage > 100 V (excluding tungsten halogen filament lamps and ultraviolet or infra-red lamps)	63.4	Kyrgyzstan	86.3	
680293	Granite, in any form, polished, decorated or otherwise worked (excluding tiles, cubes and similar articles of subheading 6802.10, imitation jewellery, clocks, lamps and lighting fittings and parts thereof, original sculptures and statuary, curbstones and flagstones)	12.0	Iran	85.6	
890120	Tankers	1.9	Russian Federation	85.0	
251690	Porphyry, basalt and other monumental or building stone, whether or not roughly trimmed or merely cut, by sawing or otherwise, into blocks or slabs of a square or rectangular shape	45.4	Armenia	84.8	
441600	Casks, barrels, vats, tubs and other coopers' products parts thereof, of wood, incl. staves	13.2	Moldova	84.4	
903039	Instruments and apparatus for measuring or checking voltage, current, resistance or electrical power, with recording device (excluding multimeters, and oscilloscopes and oscillographs)	24.5	Armenia	83.3	
846630	Dividing heads and other special attachments for machine tools, n.e.s.	7.3	Turkey	83.2	
821290	Parts of non-electric razors of base metal (excluding safety razor blades and razor blade blanks in strips)	10.2	Armenia	83.1	
680291	Marble, travertine and alabaster, in any form (excluding tiles, cubes and similar articles of subheading 6802.10, imitation jewellery, clocks, lamps and lighting fittings and parts thereof, buttons, original sculptures and statuary, curbstones and flagstones)	25.7	Armenia	80.7	

Continuation of appendix 2

HS code	Product	2017		2018	
		coef.	country	coef.	country
261690	Precious-metal ores and concentrates (excluding silver ores and concentrates)	91.8	Kyrgyzstan	79.5	
720270	Ferro-molybdenum	112.7	Armenia	78.5	
271600	Electrical energy	43.5	Armenia	77.3	
283220	Sulphites (excluding sodium)	259.3	Moldova	77.2	
260700	Lead ores and concentrates	108.0	Tajikistan	77.2	
852849	Cathode-ray tube monitors, not incorporating television reception apparatus	129.1	Tajikistan	76.4	
293890	Glycosides, natural or reproduced by synthesis, and their salts, ethers, esters and other derivatives (excluding rutoside "rutin" and its derivatives)	76.2	Georgia	76.3	
252100	Limestone flux; limestone and other calcareous stone, of a kind used for the manufacture of lime or cement	77.5	Moldova	76.1	
282090	Manganese oxides (excluding manganese dioxide)	102.3	Georgia	74.4	
690919	Ceramic wares for chemical or other technical uses	66.7	Armenia	74.2	
253010	Vermiculite, perlite and chlorites, unexpanded	46.7	Armenia	73.7	
854232	Electronic integrated circuits as memories	52.8	Moldova	73.6	
940600	Prefabricated buildings, whether or not complete or already assembled	18.0	Georgia	73.3	
251520	Ecaussine and other calcareous monumental or building stone of an apparent specific gravity of > = 2,5, and alabaaster, whether or not roughly trimmed or merely cut, by sawing or otherwise, into blocks or slabs of a square or rectangular shape	8.9	Turkey	72.8	
871150	Motorcycles, incl. mopeds, with reciprocating internal combustion piston engine of a cylinder capacity > 800 cm <sup>3</sup>	15.4	Georgia	71.7	
902131	Artificial joints for orthopaedic purposes	170.6	Armenia	71.2	
902190	Articles and appliances, which are worn or carried, or implanted in the body, to compensate for a defect or disability (excluding artificial parts of the body, complete hearing aids and complete pacemakers for stimulating heart muscles)	19.7	Armenia	70.2	
270300	Peat, incl. peat litter, whether or not agglomerated	37.4	Armenia	69.5	
902300	Instruments, apparatus and models designed for demonstrational purposes, e.g. in education or exhibitions, unsuitable for other uses (excluding ground flying trainers of heading 8805, collectors' pieces of heading 9705 and antiques of an age > 100 years of heading 9706)	3.8	Armenia	67.4	
821110	Sets of assorted articles of knives of heading 8211; sets in which there is a higher number of knives of heading 8211 than of any other article	33.4	Armenia	67.1	
940381	Furniture of bamboo or rattan (excluding seats and medical, surgical, dental or veterinary furniture)	110.7	Georgia	64.5	
310310	Superphosphates (excluding those in tablets or similar forms, or in packages with a gross weight of < = 10 kg)	61.1	Uzbekistan	64.5	
711292	Waste and scrap of platinum	61.1	Uzbekistan	64.5	
690710	Unglazed ceramic tiles, mosaic cubes and similar articles, whether or not square or rectangular, the largest surface area of which is capable of being enclosed in a square of side of < 7 cm, whether or not on a backing	61.1	Uzbekistan	64.5	
282911	Chlorate of sodium	60.9	Uzbekistan	64.5	
282919	Chlorates (excluding sodium)	1.8	Russian Federation	64.4	
293980	Non-vegetal alkaloïds, natural or reproduced by synthesis, and their salts, ethers, esters and other derivatives	60.5	Uzbekistan	64.2	
854160	Mounted piezoelectric crystals	33.4	Moldova	63.9	
830990	Clasps, frames with clasps without locks, buckles and buckle-clasps, of base metal, for clothing, footwear, handbags, travel goods or other made-up articles, incl. parts of articles of heading 8308, of base metal (excluding hooks, eyes, eyelets and tubular or bifurcated rivets)	83.4	Moldova	63.4	



HS code	Product	2017		2018	
		coef.	country	coef.	country
291469	Quinones (excluding anthraquinone)	1.8	Russian Federation	63.3	
870891	Radiators and parts thereof, for tractors, motor vehicles for the transport of ten or more persons, motor cars and other motor vehicles principally designed for the transport of persons, motor vehicles for the transport of goods and special purpose motor vehicles, n.e.s.	80.1	Kyrgyzstan	62.9	
310319	Superphosphates (excl. such products containing by weight => 35 % of diphosphorus pentaoxide, or in tablets or similar forms, or in packages with a gross weight of < = 10 kg)	10.4	Kazakhstan	62.4	
280110	Chlorine	6.6	Kazakhstan	61.6	
846620	Work holders for machine tools	6.3	Belarus	61.4	
902830	Electricity supply or production meters, incl. calibrating meters therefor	62.5	Moldova	61.0	
260800	Zinc ores and concentrates	65.1	Tajikistan	60.8	
843510	Presses, crushers and similar machinery used in the manufacture of wine, cider, fruit juices or similar beverages	29.0	Moldova	60.7	
741991	Articles of copper, cast, moulded, stamped or forged, but not further worked, n.e.s.	53.5	Uzbekistan	60.0	
390430	Vinyl chloride-vinyl acetate copolymers, in primary forms	57.5	Uzbekistan	58.4	
291713	Azelaic acid, sebacic acid, their salts and esters	40.9	Armenia	58.2	
390512	Poly "vinyl acetate", in aqueous dispersion	41.6	Armenia	56.5	
250810	Bentonite	29.7	Armenia	56.3	
741012	Copper alloy foil, not backed, of a thickness of < = 0,15 mm	48.7	Uzbekistan	56.1	
780419	Lead plates; lead sheets, strip and foil, of a thickness "excluding any backing" of > 0,2 mm	4.7	Turkey	55.4	
870821	Safety seat belts for motor vehicles	103.9	Moldova	54.8	
760200	Waste and scrap, of aluminium	26.6	Moldova	54.2	
282300	Titanium oxides	4.5	Iran	54.1	
780200	Lead waste and scrap (excluding ashes and residues from lead production heading No. 2620, and ingots or other similar unwrought shapes, of remelted waste and scrap, of lead "heading No. 7801" and waste and scrap of primary cells, primary batteries et electric accumulators)	11.4	Kazakhstan	53.4	

**Markets with high revealed comparative advantage in exports in regional markets (countries) (a part)**

HS code	Product	2017		2018	
		coef.	country	coef.	country
291471	Chlordecone "ISO"	8.3	Kazakhstan	112.6	
251010	Natural calcium phosphates and natural aluminium calcium phosphates, natural and phosphatic chalk, unground	36.8	Azerbaijan	109.4	
350219	Egg albumin (excluding dried [e.g. in sheets, scales, flakes, powder])	18.1	Iran	109.4	
270120	Briquettes, ovoids and similar solid fuels manufactured from coal	23.9	Turkmenistan	105.1	
290311	Chloromethane "methyl chloride" and chloroethane "ethyl chloride"	41.2	Turkmenistan	104.5	
380850	Goods of heading 3808 containing one or more of the following substances	54.5	Kyrgyzstan	100.6	
291412	Butanone "methyl ethyl ketone"	46.1	Turkmenistan	100.1	
291242	Ethylvanillin "3-ethoxy-4-hydroxybenzaldehyde"	44.0	Turkmenistan	98.7	
293212	2-Furaldehyde "furfuraldehyde"	42.6	Turkmenistan	97.6	
843230	Seeders, planters and transplanters for use in agriculture, horticulture and forestry	25.5	Moldova	88.1	
310311	Superphosphates containing by weight $\geq$ 35 % of diphosphorus pentoxide "P2O5" (excl. such products in tablets or similar forms, or in packages with a gross weight of $\leq$ 10 kg)	8.3	Kazakhstan	84.4	
382488	Mixtures and preparations containing tetra-, penta-, hexa-, hepta- or octabromodiphenyl ethers	7.6	Kazakhstan	82.9	
844317	Gravure printing machinery	37.1	Iran	77.6	
890590	Light-vessels, fire-floats, floating cranes and other vessels, the navigability of which is subsidiary to their main function (excluding dredgers, floating or submersible drilling or production platforms; fishing vessels and warships)	6.6	Kazakhstan	76.5	
844859	Parts and accessories of machines of heading 8447, n.e.s.	13.1	Turkmenistan	76.4	
440310	Wood in the rough, treated with paint, stains, creosote or other preservatives (excluding rough-cut wood for walking sticks, umbrellas, tool shafts and the like; wood in the form of railway sleepers; wood cut into boards or beams, etc.)	31.9	Azerbaijan	72.8	
847510	Machines for assembling electric or electronic lamps, tubes or valves or flashbulbs, in glass envelopes	5.1	Belarus	72.8	
871000	Tanks and other armoured fighting vehicles, motorised, whether or not fitted with weapons, and parts of such vehicles, n.e.s.	77.2	Tajikistan	72.8	
290377	Halogenated derivatives of acyclic hydrocarbons containing two or more different halogens, perhalogenated only with fluorine and chlorine (excluding chlorodifluoromethane, dichlorotrifluoroethanes, dichlorofluoroethanes, chlorodifluoroethanes, dichloropentafluoropropanes, bromochlorodifluoromethane, bromotrifluoromethane and dibromotetrafluoroethanes)	8.3	Kazakhstan	71.3	
280540	Mercury	8.3	Kazakhstan	71.1	
850630	Mercuric oxide cells and batteries (excluding spent)	4.1	Ukraine	70.2	
440139	Sawdust and wood waste and scrap, whether or not agglomerated in logs, briquettes or similar forms (excluding pellets)	71.2	Moldova	68.7	
310319	Superphosphates (excl. such products containing by weight $\geq$ 35 % of diphosphorus pentoxide, or in tablets or similar forms, or in packages with a gross weight of $\leq$ 10 kg)	4.6	Belarus	67.1	
900710	Cinematographic cameras	36.9	Armenia	66.8	
843510	Presses, crushers and similar machinery used in the manufacture of wine, cider, fruit juices or similar beverages (excluding machinery for the treatment of these beverages, incl. centrifuges, filter presses, other filtering equipment and domestic appliances)	49.4	Moldova	66.5	
442190	Other articles of wood, n.e.s.	36.3	Moldova	65.7	
844621	Power looms for weaving fabrics of a width $>$ 30 cm, shuttle type	30.8	Iran	64.8	

HS code	Product	2017		2018	
		coef.	country	coef.	coef.
690810	Glazed ceramic tiles, mosaic cubes and similar articles, whether or not square or rectangular, the largest surface area of which is capable of being enclosed in a square of side of < 7 cm, whether or not on a backing	67.8	Tajikistan		64.6
260120	Roasted iron pyrites	35.5	Kyrgyzstan		64.5
810296	Molybdenum wire	5.1	Belarus		60.1
841610	Furnace burners for liquid fuel	13.8	Iran		59.7
401169	Pneumatic tyres, new, of rubber, having a "herring-bone" or similar tread (excluding of a kind used on agricultural or forestry and construction or industrial handling vehicles and machines)	36.5	Moldova		59.5
843240	Manure spreaders and fertiliser distributors for use in agriculture, horticulture and forestry	31.6	Moldova		58.9
940381	Furniture of bamboo or rattan (excluding seats and medical, surgical, dental or veterinary furniture)	25.3	Georgia		58.3
690710	Unglazed ceramic tiles, mosaic cubes and similar articles, whether or not square or rectangular, the largest surface area of which is capable of being enclosed in a square of side of < 7 cm, whether or not on a backing	33.8	Tajikistan		58.3
844513	Drawing or roving machines	29.6	Turkmenistan		57.4
290920	Cyclanic, cyclenic or cycloolefinic ethers and their halogenated, sulphonated, nitrated or nitrosated derivatives	4.8	Georgia		54.9
841630	Mechanical stokers, incl. their mechanical grates, mechanical ash dischargers and similar appliances (excluding burners)	5.9	Kazakhstan		54.3
283330	Alums	10.8	Uzbekistan		53.8
441871	Flooring panels for mosaic floors, assembled, of wood	56.1	Moldova		53.7
720712	Semi-finished products of iron or non-alloy steel containing, by weight, < 0,25 % of carbon, of rectangular "other than square" cross-section, the width measuring > = twice the thickness	7.3	Azerbaijan		53.4
741012	Copper alloy foil, not backed, of a thickness of < = 0,15 mm (excluding stamping foils of heading 3212, metal yarns and metallised yarns and foil made up as christmas tree decorating material)	50.6	Kyrgyzstan		53.2
900890	Parts and accessories for image projectors, photographic enlargers and reducers, n.e.s.	8.3	Kazakhstan		52.9
440721	Mahogany "Swietenia spp.", sawn or chipped lengthwise, sliced or peeled, whether or not planed, sanded or end-jointed, of a thickness of > 6 mm	42.1	Kyrgyzstan		52.8
294120	Streptomycins and their derivatives; salts thereof	5.1	Belarus		51.9
844831	Card clothing for machines for preparing textile fibres	19.9	Turkmenistan		51.7
250490	Natural graphite (excluding in powder or in flakes)	4.0	Belarus		50.6
300441	Medicaments containing ephedrine or its salts, not containing hormones, steroids used as hormones or antibiotics, put up in measured doses "incl. those for transdermal administration" or in forms or packings for retail sale	22.2	Iran		50.1
381519	Supported catalysts, n.e.s. (excluding with precious metal, a precious-metal compound, nickel or a nickel compound as the active substance)	41.9	Turkmenistan		49.9
292221	Aminohydroxynaphthalenesulphonic acids and their salts	8.3	Kazakhstan		48.6
282741	Chloride oxides and chloride hydroxides of copper	61.8	Turkmenistan		48.1
290331	Ethylene dibromide "ISO" "1,2-dibromoethane"	24.6	Armenia		48.1
810920	Unwrought zirconium; zirconium powders	15.6	Kyrgyzstan		48.1
283719	Cyanides and cyanide oxides (excluding sodium and mercury)	37.1	Iran		48.1
293790	Hormones, natural or reproduced by synthesis	5.1	Belarus		48.0

HS code	Product	2017		2018	
		coef.	country	coef.	country
850690	Parts of primary cells and primary batteries, n.e.s.	36.9	Iran	47.9	
843031	Self-propelled coal or rock cutters and tunnelling machinery (excluding hydraulically operated self-advancing supports for mines)	7.5	Ukraine	47.7	
700490	Sheets of glass, drawn or blown, but not otherwise worked (excluding glass coloured throughout the mass "body tinted" opacified, flashed or having an absorbent, reflecting or non-reflecting layer)	37.2	Armenia	47.6	
320415	Synthetic organic vat dyes, incl. those usable in that state as pigments; preparations based on synthetic organic vat dyes of a kind used to dye fabrics or produce colorant preparations (excluding preparations of heading 3207, 3208, 3209, 3210, 3213 and 3215)	25.8	Iran	47.1	
840910	Parts suitable for use solely or principally with internal combustion piston engine for aircraft, n.e.s.	35.7	Iran	47.1	
840710	Spark-ignition reciprocating or rotary internal combustion piston engine, for aircraft	23.2	Iran	46.7	
293729	Steroidal hormones, their derivatives and structural analogues, used primarily as hormones (excluding cortisone, hydrocortisone, prednisone "dihydrocortisone", prednisolone "dehydrohydrocortisone", halogenated derivatives of corticosteroidal hormones, oestrogens and progestogens)	5.3	Russian Federation	46.6	
750521	Wire of non-alloy nickel (excluding electrically insulated products)	35.7	Iran	46.5	
290715	Naphthols and their salts	29.7	Iran	46.3	
284390	Inorganic or organic compounds of precious metals, whether or not chemically defined (excluding silver and gold); amalgams of precious metals	35.1	Iran	46.3	
847751	Machinery for moulding or retreading pneumatic tyres or for moulding or otherwise forming inner tubes of rubber or plastics	36.5	Iran	46.2	
720610	Ingots, of iron and non-alloy steel (excluding remelted scrap ingots, continuous cast products, iron of heading 7203)	12.7	Iran	45.9	
840490	Parts of auxiliary plant of heading 8402 or 8403 and condensers for steam or other vapour power units, n.e.s.	14.2	Turkmenistan	45.9	
440710	Coniferous wood sawn or chipped lengthwise, sliced or peeled, whether or not planed, sanded or end-jointed, of a thickness of > 6 mm	25.9	Tajikistan	45.8	
294000	Sugars, chemically pure (excluding sucrose, lactose, maltose, glucose and fructose)	4.8	Russian Federation	45.3	
283691	Lithium carbonates	23.4	Iran	45.1	
293319	Heterocyclic compounds with nitrogen hetero-atom[s] only, containing an unfused pyrazole ring, whether or not hydrogenated, in the structure (excluding phenazone "antipyrine" and its derivatives)	28.9	Iran	45.0	
282300	Titanium oxides	32.9	Iran	44.9	
844811	Doobies and jacquards; card reducing, copying, punching or assembling machines for use therewith	32.5	Iran	44.9	
293020	Thiocarbamates and dithiocarbamates (excluding inorganic or organic compounds of mercury)	16.6	Iran	44.8	
294150	Erythromycin and its derivatives; salts thereof	5.1	Belarus	44.7	
721310	Bars and rods, hot-rolled, in irregularly wound coils of iron or non-alloy steel, with indentations, ribs, grooves or other deformations produced during the rolling process	47.3	Turkmenistan	44.6	
847529	Machines for manufacturing or hot working glass or glassware (excluding machines for making optical fibres and preforms thereof and furnaces and heating apparatus for manufacturing toughened glass)	10.2	Uzbekistan	43.9	
292111	Methylamine, dimethylamine or trimethylamine and their salts	30.3	Iran	43.6	
282735	Nickel chloride	8.2	Armenia	43.6	
290389	Halogenated derivatives of cyclanic, cyclenic or cycloterpenic hydrocarbons	36.7	Iran	43.4	
291513	Esters of formic acid	5.2	Russian Federation	43.3	



Continuation of appendix 3

HS code	Product	2017		2018	
		coef.	country	coef.	country
290729	Polyphenols and phenol-alcohols (excluding resorcinol and hydroquinone "quinol" and their salts, and 4,4'-isopropylidenediphenol "bisphenol A, diphenylolpropane" and its salts)	10.3	Iran	43.2	
290529	Unsaturated monohydric acyclic alcohols (excluding acyclic terpene alcohols)	17.4	Iran	43.0	
840140	Parts of nuclear reactors, n.e.s. [Euratom]	11.1	Iran	42.8	
844520	Textile spinning machines (excluding extruding and drawing or roving machines)	34.3	Iran	42.8	
870340	Motor cars and other motor vehicles principally designed for the transport of	35.5	Iran	42.5	
290713	Octylphenol, nonylphenol and their isomers; salts thereof	36.7	Iran	42.4	
271490	Bitumen and asphalt, natural; asphaltites and asphaltic rocks	24.8	Turkmenistan	42.1	
690790	Unglazed ceramic flags and paving, hearth or wall tiles	20.9	Azerbaijan	42.1	
680430	Hand sharpening or polishing stones	21.7	Turkmenistan	41.9	
721911	Flat-rolled products of stainless steel, of a width of > = 600 mm, not further worked than hot-rolled, in coils, of a thickness of > 10 mm	6.2	Georgia	41.6	
901210	Electron microscopes, proton microscopes and diffraction apparatus	6.3	Kazakhstan	41.3	
283010	Sodium sulphides	55.0	Armenia	41.2	
291620	Cyclanic, cyclenic or cycloterpenic monocarboxylic acids, their anhydrides, halides, peroxides, peroxyacids and their halogenated, sulphonated, nitrated or nitrosated derivatives (excluding inorganic or organic compounds of mercury)	31.4	Iran	41.0	
852873	Reception apparatus for television, black and white or other monochrome, whether or not incorporating radio-broadcast receivers or sound or video recording or reproducing apparatus, designed to incorporate a video display or screen	12.3	Uzbekistan	40.9	
382370	Fatty alcohols, industrial	24.3	Iran	40.9	
261710	Antimony ores and concentrates	4.2	Turkey	40.8	
940110	Seats for aircraft	7.9	Iran	40.8	